द्वारिका प्रसाद 'विप्र' महाविद्यालय बिलासपुर (छ.ग.)

स्थापित १९६९

श्रद्धावान लभते ज्ञानम्

50 स्वर्ण जयंती वर्ष

D.P. VIPRA COLLEGE
BILASPUR
ACCREDITED "A" GRADE BY NAAC

1.3.2

Average percentage of students enrolled in Certificate/ Add-on programs as against the total number of students during the last five years

D.P. Vipra College

Old High Court Road, Bilaspur

Chhattisgarh, India 495001

Summary-Sheet

Criteria	1.Curricular Aspects
Key Indicator	1.3: Curriculum Enrichment
Metric	1.3.2: Average percentage of courses that include experiential learning through project work/field work/internship during last five years
DVV Clarification	Please provide 1. tabulated list of programs having experimental learning through project work/field work/internship program wise, for all 5 assessment years, showing sl. no., name of program, no. of. students, department, date, year and duration, and year, in excel sheet. Please provide scanned images of 2. tabulated list of programs having experimental learning through project work/field work/internship program wise, for all 5 assessment years, showing sl. no., name of program, no. of. students, department, date, year and duration, location, in the College letterhead, attested by Principal. 3. tabulated list of project work/internship/field work allocation of all students programs in the letterhead of the College, attested by Principal, to match the HEI input. 4. attendance sheet/certificate of successful completion of project work/internship/field work by competent authority of the organizations where project work/internship/field work is done, indicating the period with signature of students, attested by Principal.

Average percentage of courses that include experiential learning through project work/field work/internship during last five years

Year	2016-17	2017-18	2018-19	2019-20	2020-21
No. of courses that include experiential learning through project work/field work/internship year-wise during last five years	**60**	**60**	**60**	**60**	**60**

Note:
Since all supporting documents for this metric exceeds the upload limit of 5Mb, hence we have hosted the scanned documents as per SOP on institutional website on the following links,

Description	Relevant link
1) Tabulated List of the Courses that include experiential learning through project work/field work/internship program wise, for all 5 assessment years are attached. **(Appendix-I)**	https://dpvipracollege.in/wp-content/uploads/2022/06/dvv_1.3.2.pdf
2) Supporting document (Syllabus Copy) showing the experimental learning through project work/field work/internship as prescribed by the affiliating university / affiliating university curriculum. **(Appendix-II)**	

IQAC Co-ordinator
D.P. Vipra College
BILASPUR (C.G.)
IQAC Coordinator

PRINCIPAL
D.P. Vipra College
Bilaspur (C.G.)
Principal

D.P. VIPRA COLLEGE
BILASPUR
ACCREDITED "A" GRADE BY NAAC

Appendix I

D.P. Vipra College
Old High Court Road, Bilaspur
Chhattisgarh, India 495001

OFFICE OF THE PRINCIPAL
D. P. VIPRA COLLEGE, BILASPUR (C.G.)
NAAC ACCREDITED "A" GRADE
PHONE : 07752-424497, E-mail - dpvipracollege@gmail.com

1.3.2 Average percentage of courses that include experiential learning through project work/field work/internship during last five years (10)

2016-17						
Program name	**Program code**	**Name of the Course that include experiential learning through project work/field work/internship**	**Course code**	**Year of offering**	**Name of the student studied course on experiential learning through project work / field work / internship**	**Link to the relevant document**
Bachelor of ARTS	B.A.I	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2016-17	All students Enrolled for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Geography	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2017/BAFirstYear-01&19-2019New.pdf
	B.A.II	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2016-17	All students Enrolled for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Geography	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/BA-Part-II-All-ExamCode-02.pdf
	B.A.III	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2016-17	All students Enrolled for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Geography	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/BA-Part-3-2021-22.pdf
Bachelor of Science	B.Sc.I	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2016-17	All students Enrolled for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2016-17	All Students Enrolled for the Subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Botany	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
		Zoology	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
		Chemistry	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
		Microbiology	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
		Physics	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
		Computer Science	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
		Electronics	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
		Biotechnology	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
		Biochemistry	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
		ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2016-17	All students Enrolled for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Botany	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
		Zoology	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
		Chemistry	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf

Bachelor of Science	B.Sc.II	Microbiology	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
		Physics	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
		Computer Science	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
		Electronics	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
		Biotechnology	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
		Biochemistry	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
Bachelor of Science	B.Sc.III	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2016-17	All students Enrolled for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Botany	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
		Zoology	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
		Chemistry	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
		Microbiology	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
		Physics	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
		Computer Science	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
		Electronics	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
		Biotechnology	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
		Biochemistry	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
Bachelor of Computer Application	BCA-I	Computer Science	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2017/BU%20BCA%20I%20(NEW%20COURSE)%202017-18.pdf
		ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2016-17	All Students Enrolled for the Subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
Bachelor of Computer Application	BCA-II	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2016-17	All Students Enrolled for the Subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Computer Science	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2017/BU%20BCA%20II%20(NEW%20COURSE)%202017-18.pdf
Bachelor of Computer Application	BCA-III	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2016-17	All Students Enrolled for the Subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Computer Science	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2017/BU%20BCA%20III%20(NEW%20COURSE)%202017-18.pdf
Diploma in Computer Application	DCA	Computer Science	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2017/BU%20DCA%202017-18.pdf
Bachelor of Commerce	B.COM-I	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2016-17	All Students Admitted for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Computer Application	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BCOMPART1.pdf
Bachelor of Commerce	B.COM-II	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2016-17	All Students Admitted for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Computer Application	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BCOMPART2.pdf
Bachelor of Commerce	B.COM-III	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2016-17	All Students Admitted for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Computer Application	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BCOMPart3.pdf

Post Graduate Diploma in Computer Application	P.G.D.C.A	Computer Science	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2017/PGDCA.pdf
Post Graduate Diploma in Business Management	P.G.D.B.M.	Management	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2017/PGDBM.pdf
Master of Arts	M.A. I to IV sem	Geography	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus/2020NewCoursePGSem/M.A.%20GEOGRAPHY001.pdf
Master of Commerce	M.COM IV sem	Commerce	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus/2020NewCoursePGSem/MCOM.pdf
Master of Science	M.SC. I To IV sem	Zoology	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus/2020NewCoursePGSem/M.SC.%20ZOOLOGY001.pdf
		Microbiology	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus/2020NewCoursePGSem/M.SC.%20MICROBIOLOGY001.pdf
		Botany	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus/2020NewCoursePGSem/M.SC.%20BOTANY001.pdf
		Chemistry	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus/2020NewCoursePGSem/M.SC.%20CHEMISTRY001.pdf
		Physics	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus/2020NewCoursePGSem/M.SC.%20PHYSICS001.pdf
		Computer Science	NA	2016-17	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus/2020NewCoursePGSem/M.SC.%20COMPUTER%20SC.001.pdf
2017-18						
Bachelor of ARTS	B.A.I	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2017-18	All students Enrolled for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Geography	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2017/BAFirstYear-01&19-2019New.pdf
	B.A.II	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2017-18	All students Enrolled for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Geography	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/BA-Part-II-All-ExamCode-02.pdf
	B.A.III	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2017-18	All students Enrolled for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Geography	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/BA-Part-3-2021-22.pdf
Bachelor of Science	B.Sc.I	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2017-18	All students Enrolled for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2017-18	All Students Enrolled for the Subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Botany	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
		Zoology	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
		Chemistry	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
		Microbiology	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
		Physics	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
		Computer Science	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
		Electronics	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
		Biotechnology	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
		Biochemistry	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
		ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2017-18	All students Enrolled for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf

Bachelor of Science	B.Sc.II	Botany	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
		Zoology	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
		Chemistry	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
		Microbiology	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
		Physics	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
		Computer Science	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
		Electronics	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
		Biotechnology	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
		Biochemistry	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
Bachelor of Science	B.Sc.III	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2017-18	All students Enrolled for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Botany	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
		Zoology	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
		Chemistry	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
		Microbiology	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
		Physics	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
		Computer Science	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
		Electronics	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
		Biotechnology	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
		Biochemistry	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
Bachelor of Computer Application	BCA-I	Computer Science	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2017/BU%20BCA%20I%20(NEW%20COURSE)%202017-18.pdf
		ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2017-18	All Students Enrolled for the Subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
Bachelor of Computer Application	BCA-II	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2017-18	All Students Enrolled for the Subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Computer Science	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2017/BU%20BCA%20II%20(NEW%20COURSE)%202017-18.pdf
Bachelor of Computer Application	BCA-III	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2017-18	All Students Enrolled for the Subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Computer Science	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2017/BU%20BCA%20III%20(NEW%20COURSE)%202017-18.pdf
Diploma in Computer Application	DCA	Computer Science	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2017/BU%20DCA%202017-18.pdf
Bachelor of Commerce	B.COM-I	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2017-18	All Students Admitted for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Computer Application	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BCOMPART1.pdf
Bachelor of Commerce	B.COM-II	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2017-18	All Students Admitted for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Computer Application	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BCOMPART2.pdf

Bachelor of Commerce	B.COM-III	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2017-18	All Students Admitted for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Computer Application	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BCOMPart3.pdf
Post Graduate Diploma in Computer Application	P.G.D.C.A	Computer Science	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2017/PGDCA.pdf
Post Graduate Diploma in Business Management	P.G.D.B.M.	Management	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2017/PGDBM.pdf
Master of Arts	M.A. I to IV sem	Geography	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus/2020NewCoursePGSem/M.A.%20GEOGRAPHY001.pdf
Master of Commerce	M.COM IV sem	Commerce	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus/2020NewCoursePGSem/MCOM.pdf
Master of Science	M.SC. I To IV sem	Zoology	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus/2020NewCoursePGSem/M.SC.%20ZOOLOGY001.pdf
		Microbiology	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus/2020NewCoursePGSem/M.SC.%20MICROBIOLOGY001.pdf
		Botany	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus/2020NewCoursePGSem/M.SC.%20BOTANY001.pdf
		Chemistry	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus/2020NewCoursePGSem/M.SC.%20CHEMISTRY001.pdf
		Physics	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus/2020NewCoursePGSem/M.SC.%20PHYSICS001.pdf
		Computer Science	NA	2017-18	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus/2020NewCoursePGSem/M.SC.%20COMPUTER%20SC.001.pdf
2018-19						
Bachelor of ARTS	B.A.I	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2018-19	All students Enrolled for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Geography	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2017/BAFirstYear-01&19-2019New.pdf
	B.A.II	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2018-19	All students Enrolled for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Geography	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/BA-Part-II-All-ExamCode-02.pdf
	B.A.III	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2018-19	All students Enrolled for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Geography	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/BA-Part-3-2021-22.pdf
Bachelor of Science	B.Sc.I	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2018-19	All students Enrolled for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2018-19	All Students Enrolled for the Subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Botany	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
		Zoology	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
		Chemistry	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
		Microbiology	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
		Physics	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
		Computer Science	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
		Electronics	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
		Biotechnology	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf

		Biochemistry	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
Bachelor of Science	B.Sc.II	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2018-19	All students Enrolled for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Botany	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
		Zoology	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
		Chemistry	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
		Microbiology	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
		Physics	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
		Computer Science	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
		Electronics	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
		Biotechnology	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
		Biochemistry	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
Bachelor of Science	B.Sc.III	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2018-19	All students Enrolled for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Botany	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
		Zoology	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
		Chemistry	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
		Microbiology	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
		Physics	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
		Computer Science	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
		Electronics	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
		Biotechnology	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
		Biochemistry	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
Bachelor of Computer Application	BCA-I	Computer Science	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2017/BU%20BCA%20I%20(NEW%20COURSE)%202017-18.pdf
		ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2018-19	All Students Enrolled for the Subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
Bachelor of Computer Application	BCA-II	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2018-19	All Students Enrolled for the Subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Computer Science	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2017/BU%20BCA%20II%20(NEW%20COURSE)%202017-18.pdf
Bachelor of Computer Application	BCA-III	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2018-19	All Students Enrolled for the Subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Computer Science	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2017/BU%20BCA%20III%20(NEW%20COURSE)%202017-18.pdf
Diploma in Computer Application	DCA	Computer Science	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2017/BU%20DCA%202017-18.pdf
Bachelor of Commerce	B.COM-I	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2018-19	All Students Admitted for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Computer Application	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BCOMPART1.pdf

Bachelor of Commerce	B.COM-II	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2018-19	All Students Admitted for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Computer Application	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BCOMPART2.pdf
Bachelor of Commerce	B.COM-III	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2018-19	All Students Admitted for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Computer Application	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BCOMPart3.pdf
Post Graduate Diploma in Computer Application	P.G.D.C.A	Computer Science	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2017/PGDCA.pdf
Post Graduate Diploma in Business Management	P.G.D.B.M.	Management	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2017/PGDBM.pdf
Master of Arts	M.A. I to IV sem	Geography	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus/2020NewCoursePGSem/M.A.%20GEOGRAPHY001.pdf
Master of Commerce	M.COM IV sem	Commerce	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus/2020NewCoursePGSem/MCOM.pdf
Master of Science	M.SC. I To IV sem	Zoology	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus/2020NewCoursePGSem/M.SC.%20ZOOLOGY001.pdf
		Microbiology	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus/2020NewCoursePGSem/M.SC.%20MICROBIOLOGY001.pdf
		Botany	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus/2020NewCoursePGSem/M.SC.%20BOTANY001.pdf
		Chemistry	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus/2020NewCoursePGSem/M.SC.%20CHEMISTRY001.pdf
		Physics	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus/2020NewCoursePGSem/M.SC.%20PHYSICS001.pdf
		Computer Science	NA	2018-19	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus/2020NewCoursePGSem/M.SC.%20COMPUTER%20SC.001.pdf
2019-20						
Bachelor of ARTS	B.A.I	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2019-20	All students Enrolled for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Geography	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2017/BAFirstYear-01&19-2019New.pdf
	B.A.II	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2019-20	All students Enrolled for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Geography	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/BA-Part-II-All-ExamCode-02.pdf
	B.A.III	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2019-20	All students Enrolled for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Geography	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/BA-Part-3-2021-22.pdf
Bachelor of Science	B.Sc.I	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2019-20	All students Enrolled for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2019-20	All Students Enrolled for the Subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Botany	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
		Zoology	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
		Chemistry	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
		Microbiology	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
		Physics	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf

		Computer Science	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
		Electronics	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
		Biotechnology	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
		Biochemistry	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
Bachelor of Science	B.Sc.II	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2019-20	All students Enrolled for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Botany	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
		Zoology	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
		Chemistry	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
		Microbiology	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
		Physics	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
		Computer Science	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
		Electronics	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
		Biotechnology	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
		Biochemistry	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
Bachelor of Science	B.Sc.III	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2019-20	All students Enrolled for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Botany	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
		Zoology	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
		Chemistry	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
		Microbiology	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
		Physics	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
		Computer Science	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
		Electronics	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
		Biotechnology	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
		Biochemistry	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
Bachelor of Computer Application	BCA-I	Computer Science	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2017/BU%20BCA%20I%20(NEW%20COURSE)%202017-18.pdf
		ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2019-20	All Students Enrolled for the Subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
Bachelor of Computer Application	BCA-II	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2019-20	All Students Enrolled for the Subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Computer Science	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2017/BU%20BCA%20II%20(NEW%20COURSE)%202017-18.pdf
Bachelor of Computer Application	BCA-III	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2019-20	All Students Enrolled for the Subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Computer Science	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2017/BU%20BCA%20III%20(NEW%20COURSE)%202017-18.pdf
Diploma in Computer Application	DCA	Computer Science	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2017/BU%20DCA%202017-18.pdf

Bachelor of Commerce	B.COM-I	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2019-20	All Students Admitted for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Computer Application	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BCOMPART1.pdf
Bachelor of Commerce	B.COM-II	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2019-20	All Students Admitted for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Computer Application	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BCOMPART2.pdf
Bachelor of Commerce	B.COM-III	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2019-20	All Students Admitted for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Computer Application	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BCOMPart3.pdf
Post Graduate Diploma in Computer Application	P.G.D.C.A	Computer Science	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2017/PGDCA.pdf
Post Graduate Diploma in Business Management	P.G.D.B.M.	Management	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2017/PGDBM.pdf
Master of Arts	M.A. I to IV sem	Geography	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus/2020NewCoursePGSem/M.A.%20GEOGRAPHY001.pdf
Master of Commerce	M.COM IV sem	Commerce	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus/2020NewCoursePGSem/MCOM.pdf
Master of Science	M.SC. I To IV sem	Zoology	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus/2020NewCoursePGSem/M.SC.%20ZOOLOGY001.pdf
		Microbiology	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus/2020NewCoursePGSem/M.SC.%20MICROBIOLOGY001.pdf
		Botany	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus/2020NewCoursePGSem/M.SC.%20BOTANY001.pdf
		Chemistry	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus/2020NewCoursePGSem/M.SC.%20CHEMISTRY001.pdf
		Physics	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus/2020NewCoursePGSem/M.SC.%20PHYSICS001.pdf
		Computer Science	NA	2019-20	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus/2020NewCoursePGSem/M.SC.%20COMPUTER%20SC.001.pdf
2020-21						
Bachelor of ARTS	B.A.I	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2020-21	All students Enrolled for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Geography	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2017/BAFirstYear-01&19-2019New.pdf
	B.A.II	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2020-21	All students Enrolled for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Geography	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/BA-Part-II-All-ExamCode-02.pdf
	B.A.III	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2020-21	All students Enrolled for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Geography	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/BA-Part-3-2021-22.pdf
		ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2020-21	All students Enrolled for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2020-21	All Students Enrolled for the Subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Botany	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
		Zoology	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf

Bachelor of Science	B.Sc.I	Chemistry	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
		Microbiology	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
		Physics	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
		Computer Science	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
		Electronics	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
		Biotechnology	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
		Biochemistry	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BScFirstYear2019.pdf
Bachelor of Science	B.Sc.II	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2020-21	All students Enrolled for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Botany	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
		Zoology	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
		Chemistry	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
		Microbiology	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
		Physics	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
		Computer Science	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
		Electronics	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
		Biotechnology	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
		Biochemistry	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2019/B.Sc-Part-II-ExamCode-05.pdf
Bachelor of Science	B.Sc.III	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2020-21	All students Enrolled for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Botany	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
		Zoology	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
		Chemistry	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
		Microbiology	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
		Physics	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
		Computer Science	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
		Electronics	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
		Biotechnology	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
		Biochemistry	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BSc-Part-3.pdf
Bachelor of Computer Application	BCA-I	Computer Science	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2017/BU%20BCA%20I%20(NEW%20COURSE)%202017-18.pdf
		ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2020-21	All Students Enrolled for the Subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
Bachelor of Computer Application	BCA-II	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2020-21	All Students Enrolled for the Subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Computer Science	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2017/BU%20BCA%20II%20(NEW%20COURSE)%202017-18.pdf
Bachelor of Computer Application	BCA-III	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2020-21	All Students Enrolled for the Subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf

Application		Computer Science	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2017/BU%20BCA%20III%20(NEW%20COURSE)%202017-18.pdf
Diploma in Computer Application	DCA	Computer Science	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2017/BU%20DCA%202017-18.pdf
Bachelor of Commerce	B.COM-I	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2020-21	All Students Admitted for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Computer Application	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BCOMPART1.pdf
Bachelor of Commerce	B.COM-II	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2020-21	All Students Admitted for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Computer Application	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BCOMPART2.pdf
Bachelor of Commerce	B.COM-III	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	NA	2020-21	All Students Admitted for the subject EVS	https://www.bilaspuruniversity.ac.in/PDF/2017/Syllabus%20ENVIRONMENTAL%20STUDIES%20&%20HUMAN%20RIGHTS.pdf
		Computer Application	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus202122/BCOMPart3.pdf
Post Graduate Diploma in Computer Application	P.G.D.C.A	Computer Science	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2017/PGDCA.pdf
Post Graduate Diploma in Business Management	P.G.D.B.M.	Management	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/2017/PGDBM.pdf
Master of Arts	M.A. I to IV sem	Geography	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus/2020NewCoursePGSem/M.A.%20GEOGRAPHY001.pdf
Master of Commerce	M.COM IV sem	Commerce	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus/2020NewCoursePGSem/MCOM.pdf
Master of Science	M.SC. I To IV sem	Zoology	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus/2020NewCoursePGSem/M.SC.%20ZOOLOGY001.pdf
		Microbiology	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus/2020NewCoursePGSem/M.SC.%20MICROBIOLOGY001.pdf
		Botany	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus/2020NewCoursePGSem/M.SC.%20BOTANY001.pdf
		Chemistry	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus/2020NewCoursePGSem/M.SC.%20CHEMISTRY001.pdf
		Physics	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus/2020NewCoursePGSem/M.SC.%20PHYSICS001.pdf
		Computer Science	NA	2020-21	All Students Admitted	https://www.bilaspuruniversity.ac.in/PDF/Syllabus/2020NewCoursePGSem/M.SC.%20COMPUTER%20SC.001.pdf

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D.P. VIPRA COLLEGE
BILASPUR
ACCREDITED "A" GRADE BY NAAC

Appendix II

D.P. Vipra College
Old High Court Road, Bilaspur
Chhattisgarh, India 495001

D.P. VIPRA COLLEGE
BILASPUR
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2016-17

D.P. Vipra College

Old High Court Road, Bilaspur

Chhattisgarh, India 495001

Part-I

SYLLABUS FOR ENVIRONMENTAL STUDIES AND HUMAN RIGHTS FOR UNDER GRADUATE

'इन्वाहरमेंटल साईसेस' के पाठ्यक्रम को स्नातक स्तर भाग–एक की कक्षाओं में विश्वविद्यालय अनुदान आयोग के निर्देशानुसार अनिवार्य रूप से शिक्षा सत्र 2003–2004 (परीक्षा 2004) से प्रभावशील किया गया है । स्वशासी महाविद्यालयों द्वारा भी अनिवार्य रूप से अंगीकृत किया जाएगा ।

भाग 1, 2 एवं 3 में से किसी भी वर्ष में पर्यावरण प्रश्न –पत्र उत्तीर्ण करना अनिवार्य है । तभी उपाधि प्रदाय योग्य होगी ।

पाठ्यक्रम 100 अंकों का होगा, जिसमें से 75 अंक सैद्धांतिक प्रश्नों पर होगें एवं 25 अंक क्षेत्रीय कार्य (Field Work) पर्यावरण पर होगें ।

सैद्धांतिक प्रश्नों पर अंक –75 (सभी प्रश्न इकाई आधार पर रहेगें जिसमें आंतरिक विकल्प रहेगा)

(अ) लघु प्रश्नोंत्तर – 25 अंक

(ब) निबंधात्मक – 50 अंक

Field Work – 25 अंकों का मूल्यांकन आंतरिक मूल्यांकन पद्धति से कर विश्वविद्यालय को प्रेषित किया जावेगा । अभिलेखों की प्रायोगिक उत्तर पुस्तिकाओं के समान संबंधित महाविद्यालयों द्वारा सुरक्षित रखेगें ।

उपरोक्त पाठ्यक्रम से संबंधित परीक्षा का आयोजन वार्षिक परीक्षा के साथ किया जाएगा ।

पर्यावरण विज्ञान विषय अनिवार्य विषय है, जिसमें अनुत्तीर्ण होने पर स्नातक स्तर भाग–एक के छात्र/छात्राओं को एक अन्य विषय के साथ पूरक की पात्रता होगी । पर्यावरण विज्ञान के सैद्धांतिक एवं फील्ड वर्क में संयुक्त रूप से 33% (तैतीस प्रतिशत) अंक उत्तीर्ण होने के लिए अनिवार्य होंगे ।

स्नातक स्तर भाग–एक के समस्त नियमित/भूतपूर्व/अमहाविद्यालयीन छात्र/छात्राओं को अपना फील्ड वर्क सैद्धांतिक परीक्षा की समाप्ति के पश्चात् 10 (दस) दिनों के भीतर संबंधित महाविद्यालय/परीक्षा केन्द्र में जमा करेंगे एवं महाविद्यालय के प्राचार्य/केन्द्र अधिक्षक, परीक्षकों की नियुक्ति के लिए अधिकृत रहेंगे तथा फील्ड वर्क जमा होने के सात दिनों के भीतर प्राप्त अंक विश्वविद्यालय को भेजेंगे ।

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कृपया पर्यावरण विज्ञान व मानवाधिकार [illegible] का पाठ्यक्रम अनुमोदनार्थ प्रस्तुत है।

Dr R[illegible]
11/11/13

1. Prof A.K. Gupta
2. Prof C.L. Patel
3. Prof R. Prasad

11.11.13

11-11-13

बिलासपुर विश्वविद्यालय, बिलासपुर (छ.ग.)

पुराना हाईकोर्ट भवन, बिलासपुर (छ.ग.) 495001,
फोन : 07752–220031, फैक्स 07752–260294, ई–मेल : bilaspuruniversity.2012@gmail.com,
वेबसाईट : www.bilaspuruniversity.ac.in

क्र. 1186 /अका./2014

बिलासपुर दिनांक 11/9/14

अधिसूचना

बिलासपुर विश्वविद्यालय से सम्बद्ध समस्त महाविद्यालय को सूचित किया जाता है कि केन्द्रीय अध्ययन मण्डल द्वारा अनुमोदित पर्यावरण अध्ययन के संशोधित पाठ्यक्रम "पर्यावरण अध्ययन व मानवाधिकार" स्नातक स्तर पर शिक्षा सत्र 2014–15 से प्रभावशील होगा । (अनुमोदित पाठ्यक्रम संलग्न)

आदेशानुसार,

कुलसचिव

पृ.क्रमांक 1187 /अका./2014

बिलासपुर, दिनांक 11/9/14 /

प्रतिलिपि:–

1. कुलपति के निज सहायक को माननीय कुलपति महोदय के सूचनार्थ प्रेषित।
2. परीक्षा नियंत्रक / उप–कुलसचिव (परीक्षा/गोपनीय) बिलासपुर विश्वविद्यालय, बिलासपुर को सूचनार्थ प्रेषित ।
5. प्राचार्य, समस्त सम्बद्ध महाविद्यालय, को इस आशय के साथ प्रेषित की महाविद्यालय में केन्द्रीय अध्ययन मण्डल द्वारा अनुमोदित **"पर्यावरण अध्ययन व मानवाधिकार"** विषय का अंगीकृत पाठ्यक्रम अध्ययन–अध्यापन कराना सुनिश्चित करें ।
6. संपादक, दैनिक ..... को इस अनुरोध के साथ प्रेषित की कृपया उपरोक्त अधिसूचना को अपने लोकप्रिय दैनिक समाचार पत्र में छात्रहीत में प्रकाशित करने का कष्ट करें ।

कुलसचिव

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Part-I

SYLLABUS FOR ENVIRONMENTAL STUDIES AND HUMAN RIGHTS FOR UNDER GRADUATE

(paper code - 0828)

M.M. 75

UNIT -I THE MULTI DISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES:

Definition, Scope and Importance

Natural Resources:

Renewable and Nonrenewable Resources:

Natural resources and associated problems

(a) Forest resources: Use and over-exploitation, deforestation. Timber extraction, mining, dams and their effects on forests and tribal people and relevant forest Act.

(b) Water resources: Use and over-utilization of surface and ground water, floods drought, conflicts over water, dams benefits and problems and relevant Act.

(c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources.

(d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity.

(e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources.

(f) Land resources: Land as a resource, land degradation, man induced landslides soil erosion and desertification.

UNIT-II ECOSYSTEM

(12 Lecturer)

(a) Concept, Structure and Function of an ecosystem

- Producers, consumers and decomposers.
- Energy flow in the ecosystem
- Ecological succession.
- Food chains, food webs and ecological pyramids.
- Introduction, Types, Characteristic Features, Structure and Function of Forest, Grass, Desert and Aquatic Ecossystem.

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(b) Biodiversity and its Conservation

- Introduction - Definition: genetic, species and ecosystem diversity.
- Bio-geographical classification of India.
- Value of biodiversity: consumptive use, productive use, social, ethics, aesthetic and option values.
- Biodiversity at global, National and local levels.
- India as mega-diversity nation.
- Hot spots of biodiversity
- Threats to biodiversity: habitat loss, poaching of wildlife, man-wild life conflict.
- Endangered and endemic species of India.
- Conservation of biodiversity: In situ and Ex-situ conservation of biodiversity.

UNIT-III ENVIRONMENTAL POLLUTION

Definition **(12 Lecturer)**

(a) Causes, effect and control measures of -

- Air water, soil, marine, noise, nuclear pollution and Human population.
- Solid waste management: Causes, effects and control measures of urban and industrial wastes.
- Role of an individual in prevention of pollution.
- Disaster Management: floods, earthquake, cyclone and landslides.

(b) Environmental Management

(12 Lecturer)

- From Unsustainable to sustainable development.
- Urban problems related to energy.
- Water conservation, rain water harvesting, watershed management.
- Resettlement and rehabilitation of people, its problems and concerns.
- Environmental ethics: Issues and possible solutions.
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust.

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Wasteland reclamation.

- Environment Protection Act: Issues involved in enforcement of environmental legislation.
- Role of Information Technology in Environment and Human Health.

UNIT-IV

General background and historical perspective- Historical development and concept of Human Rights. Meaning and definition of Human Rights. Kind and Classification of Human Rights.

Protection of Human Rights under the UNO Charter. Protection of Human Rights under the Universal Declaration of Human Rights, 1948

Convention on the Elimination of all Forms of Discrimination against women

Convention on the Rights of the Child, 1989

UNIT-V

Impact of Human Rights norms in India, Human Rights under the Constitution of India, Fundamental Rights under the Constitution of India, Directive Principles of State Policy under the Constitution of India, Enforcement of Human Rights in India

Protection of Human Rights under the Human Rights Act, 1993 - National Human Rights Commission, State Human Rights Commission and Human Rights court in India.

Fundamental Duties under the Constitution of India

Reference/Books Recommended:

1. SK Kapoor- Human rights under International Law and Indian Law
2. HO Agrawal- Internation Law and Human Rights
3. एस. के. कपूर – मानव अधिकार
4. जे. एन. पान्डेय – भारत का संविधान
5. एम. डी. चतुर्वेदी – भारत का संविधान
6. J. N. Pandey - Constitutional Law of India
7. Agarwal K.C. 2001 Environmental Biology, Nidi Pub. Ltd. Bikaner
8. Bharucha Erach, the Biodiversity of India, Mapin Pub. Pvt. Ltd. Ahmedabad 380013, India, Email: mapin@icenet.net(R)

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B.A. /B.Sc. Part I

PAPER - III
PRACTICAL GEOGRAPHY
Max. Marks: 50

SECTION A

CARTOGRAPHY AND STASTISTICAL METHODS (M.M. 25)

Unit I Scale: Statement Scale , Representative Fraction (R.F.), Linear scale – Simple, Diagonal, Comparative, and Time Scales.

Unit II Contour: Methods of showing relief; Hachures, Contours; Representation of different landforms by contours.

Unit III Graph and Diagram: Line graph, Bar Diagram (Simple and Compound), Circle Diagram, Pie Diagram

Unit IV Statistical Technique: Mean, Median and Mode

SECTION B

SURVEYING - (M.M. 15)

Unit V Chain and Tape Survey. Triangulation method, Open Traverse and Closed Traverse

PRACTICAL RECORD AND VIVA VOCE (M.M. 10)

Books Recommended:

1. Davis, R.E. and Foote, F.S. (1953): Surveying, 4th edition, McGraw Hill Publication, New York
2. Jones, P.A.(1968): Fieldwork in Geography, Longmans, Green and Company Ltd., First Publication, London
3. Monkhouse, F. J. and Wilkinson, F.J. (1985): Maps and Diagrams. Methuen, London
4. Natrajan, V. (1976): Advanced Surveying, B.I. Publications., Mumbai
5. Pugh, J.C. (1975): Surveying for Field Scientists, Methuen and Company Ltd., London, First Publication.
6. Raisz, E. (1962): General Cartography. John Wiley and Sons, New York. 5th edition.
7. Sarkar, A. K. (1997): Practical Geography: A Systematic Approach. Orient Longman, Kolkata.
8. Sharma, J. P. (2001): *Prayogik Bhugol.*, Rastogi Publication, Meerut 3rd. edition.
9. Singh, R.L. and Singh, Rana P.B. (1993): Elements of Practical Geography. (Hindi and English editions). Kalyani Publishers, New Delhi,.
10. Singh, L.R. (2006): Fundamentals of Practical Geography, Sharda Pustak Bhawan, Allahabad.
11. Venkatramaiah, C. (1997): A Text Book of Surveying, Universities Press, Hyderabad.

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B.A. /B.Sc. Part II

PAPER - III
PRACTICAL GEOGRAPHY
Max. Marks: 50

SECTION A

MAP INTERPRETATION, PROJECTIONS AND STATISTICAL METHODS (M.M. 25)

Unit I Distribution Maps: Dot Map, Choropleth Map and Isopleth Map.

Unit II Map Projections: Definition and classification; Conical, Zenithal, and Cylindrical Projections.

Unit III Interpretation of Weather Maps: Use of Meteorological Instruments.

Unit IV Statistical Methods: Quartile: Mean Deviation, Standard Deviation and Quartile Deviation; Relative Variability and Co-efficient of Variation.

SECTION B

SURVEYING

Unit V Surveying: Whole Circle Bearing and Reduced Bearing, Methods of Prismatic Compass Survey. (M.M. 15)

PRACTICAL RECORD AND VIVA VOCE (M.M. 10)

Books Recommended:

1. Alvi, Z. 1995 : Statistical Geography: Methods and Applications, Rawat Pub. New Delhi: .
2. Davis, R.E. and Foote, F.S. (1953): Surveying, 4th edition, McGraw Hill Publication, New York
3. Kanetker, T.P. and Kulkarni, S.V.(1967): Surveying and Levelling, Vol I and II V.G. Prakashan, Poona.
4. Natrajan, V. (1976): Advanced Surveying, B.I. Publications., Mumbai.
5. Pal, S.K. 1999 : Statistics for Geoscientists, Concept publishing Company, New Delhi
6. Punmia, B.C.(1994): Surveying, Vol I, Laxmi Publications Private Ltd, New Delhi.
7. Raisz, E. (1962): General Cartography. John Wiley and Sons, New York. 5th edition
8. Sarkar, A. K. (1997): Practical Geography: A Systematic Approach. Orient Longman, Kolkata.
9. Sharma, J. P. (2001): *Prayogik Bhugol.*, Rastogi Publication, Meerut 3rd. edition.
10. Silk, J. 1979 : Statistical techniques in Geography, George Allen and Unwin, London
11. Singh, R.L. and Singh, Rana P.B. (1993): Elements of Practical Geography. (Hindi and English editions). Kalyani Publishers, New Delhi,.
12. Singh, L.R. (2006): Fundamentals of Practical Geography, Sharda Pustak Bhawan, Allahabad.
13. Venkatramaiah, C. (1997): A Text Book of Surveying, Universities Press, Hyderabad.

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बी.ए. / बी.एस.सी. तृतीय वर्ष
प्रश्न पत्र–तृतीय
प्रायोगिक भूगोल

अधिकतम अंक : 50

खण्ड (अ)

मनचित्र पठन एवं निर्वचन **20**

इकाई –1. बैन्ड ग्राफ, हीदर ग्राफ, क्लाइमोग्राफ, पवनारेख ।

इकाई –2. भारतीय स्थलाकृतिक मानचित्र की व्याख्या प्रकार, वर्गीकरण धरतलीय मानचित्र के प्रकार एवं विश्लेषण, राष्ट्रीय एवं अन्तराष्ट्रीय, भौतिक एवं सांस्कृतिक तत्वों के आधार पर विश्लेषण ।

इकाई –3. उपग्रह बिम्ब : प्रारम्भिक सूचनाओं की व्याख्या बिम्ब निर्वाचन : चाक्षुश विधि – भूमि उपयोग भूमि आच्छादन मानचित्रण, जी0 पी0 एस0 का उपयोग एवं अनुप्रयोग ।

खण्ड (ब)

सर्वेक्षण एवं क्षेत्रीय प्रतिवेदन **20**

इकाई –4. सर्वेक्षण , समपटल सर्वेक्षण, प्रतिच्छेदन एवं स्थिति निर्धारण ।

इकाई –5. भूगोल में क्षेत्रीय कार्य का महत्व किसी छोटे क्षेत्र का भौतिक सामाजिक आर्थिक सर्वेक्षण और रिपोर्ट तैयार करना ।

प्रायोगिक पुस्तिका और मौखिक परिक्षण परीक्षा **10**

Books Recommended:

1. Archer, J.E. and Dalton, T.H. (1968): *Field Work in Geography*. William Clowes and Sons Ltd. London and Beccles.
2. Bolton, T. and Newbury, P.A. (1968): *Geography through Fieldwork*. Blandford Press, London.
3. Campell, J. B. (2003): Introduction to Remote Sensing. 4th edition. Taylor and Francis, London.
4. Chaunial, D. D. (2004): Remote Sensing and Geographical Information System(in Hindi), Sharda Pustak Bhawan, Allahabad
5. Cracknell, A. and Ladson, H. (1990): Remote Sensing Year Book. Taylor and Francis, London.
6. Curran, P.J. (1985): Principles of Remote Sensing. Longman, London.
7. Davis, R.E. and Foote, F.S. (1953): Surveying, 4th edition, McGraw Hill Publication, New York
8. `
9. Deekshatulu, B.L. and Rajan, Y.S. (ed.) (1984): Remote Sensing. Indian Academy of Science, Bangalore.
10. Floyd, F. and Sabins, Jr. (1986): Remote Sensing: Principles and Interpretation. W.H. Freeman, New York.
11. Gautam, N.C. and Raghavswamy, V. (2004). Land Use/ Land Cover and Management Practices in India. B.S. Publication., Hyderabad.
12. Jensen, J.R. (2004): Remote Sensing of the Environment: An Earth Resource Perspective. Prentice-Hall, Englewood Cliffs, New Jersey. Indian reprint available.

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B.Sc. I (BOTANY)

PRACTICAL

Study of external (Morphorgical) and internal (microscopic/anatomical) features of representative gerera given in the theory.

1. Algae: Gloeocapsa, Scytonema, Gloeotrichia, Volvox, Oedogonium, Vaucheria, Chara, Ectocarpus, Sargassum, Batrachosperrmum
2. Gram staining
3. Fungi: Albugo, Aspergillus, Peziza, Agaricus, Puccinia, Alternaria and Cercospora
4. Bryophyta: Riccia, Marchantia, Pellia, Anthoceros, Sphagnum, Funaria
5. Pteridophyta: Lycopodium, Selaginella, Equsetum, Marsilea.
6. Gymnosperm: Cycas, Pinus, Epherda.

PRACTICAL SCHEME

TIME: 4 Hrs. **M.M. : 50**

1.	Algae/Fungi/Gram Staining	10
2.	Bryophyta/Pteridophyta	10
3.	Gymnosperm	10
4.	Spotting	10
5.	Viva-Voce	05
6.	Sessional	05

(Dr. J.N. Verma)
Proff. & Head
Govt. D.B. Girls PG College
Raipur, (C.G.)

(Dr. Rekha Pimpalgaonkar)
Proff. & Head
Govt. N PG Science College
Raipur, (C.G.)

(Dr.Ranjana Shristava)
Proff. & Head
Govt. VYTPG Science College
Raipur, (C.G.)

(Mrs. Sanchal Moghe)

(Mr. Shivakant Mishra)

(Mr Sudheer Tiwari)

Govt. Bilasa Girls College, Bilaspur

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Zoology
B.Sc. Part I 2018-19
Practical

The practical work will, in general be based on the syllabus prescribed in theory and the candidates will be required to show knowledge of the following:-

- Dissection of Earthworm, Cockroach, Palaemon and Pila
- Minor dissection—appendages of Prawn & hastate plate, mouth parts of insects, radulla of Pila.

(Alternative methods: By Clay/Thermacol/drawing/Model etc.)

- Adaptive characters of Aquatic, terrestrial, aerial and desert animals.
- Museum specimen invertebrate
- Slides- Invertebrates, frog embryology, Chick embryology and cytology,

Scheme of Practical Exam	**Time: 3hrs**
1. Major Dissection	10 Marks
2. Minor Dissection	05 Marks
3. Comments on Excersice based on Adaptation	04 Marks
4. Cytological Preparation	05 Marks
5. Spots-8 (Slides-4, Specimens-4)	16 Marks
6. Sessional	10 Marks

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NEW CURRICULUM OF B.Sc. PART I

CHEMISTRY

The new curriculam will comprise of Three theory papers of 33, 33 and 34 marks each and practical work of 50 marks. The curricuram is to be completed in 180 working days as per the UGC norms & conforming to the directives of the Govt. of Chhattisgarh.The theory papers are of 60 hrs each duration and the practical work of 180 hrs duration.

PAPER I

INORGANIC CHEMISTRY

M.M.33

UNIT-I

A. ATOMIC STRUCTURE

Bohr's theory, its limitation and atomic spectrum of hydrogen atom. General idea of de-Broglie matter-waves, Heisenberg uncertainty principle, Schrödinger wave equation, significance of Ψ and Ψ^2, radial & angular wave functions and probability distribution curves, quantum numbers, Atomic orbital and shapes of s, p, d orbitals, Aufbau and Pauli exclusion principles, Hund's Multiplicity rule, electronic configuration of the elements.

B. PERIODIC PROPERTIES

Detailed discussion of the following periodic properties of the elements, with reference to s and p-block. Trends in periodic table and applications in predicting and explaining the chemical behavior.

a) Atomic and ionic radii,
b) Ionization enthalpy,
c) Electron gain enthalpy,
d) Electronegativity, Pauling's, Mulliken's, Allred Rochow's scales.
e) Effective nuclear charge, shielding or screening effect, Slater rules, variation of effective nuclear charge in periodic table.

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UNIT-II

CHEMICAL BONDING I

Ionic bond: Ionic Solids - Ionic structures, radius ratio & co-ordination number, limitation of radius ratio rule, lattice defects, semiconductors, lattice energy Born- Haber cycle, Solvation

CHEMISTRY

PRACTICAL EXAMINATION

05 Hrs.
M.M. 50

Three experiments are to be performed

1. Inorganic Mixture Analysis, four radicals two basic & two acid (excluding insoluble, Interfering & combination of acid radicals) OR Two Titrations (Acid-Bases,Redox and Iodo/Iodimetry)

12 marks

2. Detection of functional group in the given organic compound and determine its MPt/BPt.

8 marks

O R
Crystallization of any one compound as given in the prospectus along with the determination of mixed MPt.
O R
Decolorisation of brown sugar along with sublimation of camphor/ Naphthlene.

3. Any one physical experiment that can be completed in two hours including calculations.

14 marks

4. Viva **10 marks**
5. Sessionals **06 marks**

In case of Ex-Students two marks will be added to each of the experiments

REFERENCE TEXT:

1. Mendham, J., A. I. Vogel's Quantitative Chemical Analysis 6th Ed., Pearson, 2009.
2. Ahluwalia, V. K., Dhingra, S. and Gulati, A. College practical Chemistry, University Press.
3. Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009)
4. Furniss, B.S.; Hannaford, A.J.; Smith, P.W.G.; Tatchell, A.R. Practical Organic Chemistry, 5th Ed., Pearson (2012)
5. Khosla, B. D.; Garg, V. C. & Gulati, A. Senior Practical Physical Chemistry, R. Chand & Co.: New Delhi (2011).
6. Garland, C. W.; Nibler, J. W. & Shoemaker, D. P. Experiments in Physical Chemistry 8th Ed.; McGraw-Hill: New York (2003).
7. Halpern, A. M. & McBane, G. C. Experimental Physical Chemistry 3rd Ed.; W.H. Freeman & Co.: New York (2003).

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MICROBIOLOGY

BSc-1st

Paper- I: General Microbiology & Basic Technique

UNIT-1: Fundamental, History & Developments

Introduction to major groups of microorganisms and fields of Microbiology; Historical development, Contributions of Pioneers (Louis Pasteur, Edward Jenner, Anton Von Leewenhoeck and Alexander Flemming). Beneficial and harmful microbes and its role in daily life.

UNIT-2: Basic Microbial Techniques

Methods of studying microorganism; Sterilization Techniques (Physical & Chemical Sterilization). Pure culture isolation Technique: Streaking,Waksman serial dilution and plating methods. cultivation, maintenance and preservation of pure cultures. Culture media & conditions for microbial growth. Staining technique: simple staining, Differential (gram staining), negative staining and acid fast staining.

UNIT-3: Virology & Bacteriology

Diversity of microbial world; Principle and classification of Viruses and Bacteria. Structure, Multiplication and Economic importance of viruses (TMV, Influenza virus & T_4-Phage). Structure & Functional organization of Bacteria, Cell wall of Gram Positive & Gram Negative bacteria; Economic importance of Bacteria.

UNIT-4: Mycology

General characteristics and classification of Fungi; Structure and Reproduction of fungi (*Rhizopus, Penicillium, Aspergillus, Yeast & Agaricus*). Common fungal disease of crops (Late & Early blight of potato, Smut of Rice, Tikka and Red rot of Sugarcane). Structure, reproduction and economic aspect of Lichens.

UNIT-5: Phycology & Protozoology

General characteristics and classification of Algae and Protozoa; General account & economic importance of Cyanobacteria (*Microcystis, Ocillitoria, Nostoc & Anabaena)* and Protozoa *(Amoeba, Paramoecium, Euglena and plasmodium).*

Text Books Recommended:

1. General microbiology; Vol I & II, Powar C. B. and Daginawala H. I., Himalaypub.house, Bombay.
2. A textbook of Microbiology; Dubey &Maheshwari.
3. Microbiology: An Introduction; G. Tor tora, B. Funke, C. Benjamin Cummings.
4. General Microbiology; Seventh edition by Hans G Schlegel, CambridgeUniversity Press.
5. Practical Microbiology; Dubey and Maheshwari.
6. Handbook of Microbiology; Bisen P.S., Varma K., CBS Publishers and Distributors, Delhi. General Microbiology by Brock.
7. General Microbiology by Pelzar et al.
8. Introduction on Microbial Techniques by Gunasekaran.

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Microbiology

PRACTICAL

M. M. 50

Basic information about autoclave, hot air oven, laminar air flow and other laboratory instruments
Preparation of solid/liquid culture media.
Isolation of single colonies on solid media.
Enumeration of bacterial numbers by serial dilution and plating.
Simple and differential staining.
Measurement of microorganism (micrometry) and camera Lucida drawing of isolated organism.
Determination of bacterial growth by optical density measurement.
General and specific qualitative test for carbohydrates
General and specific qualitative test for amino acids
General and specific qualitative test for lipids
Estimation of protein
Estimation of blood glucose
Assay of the activity of amylases
Assay of the activity of Phosphates

Scheme of Practical Examination

Time - 4 hours M.M. 50

1. Exercise on Microbiological methods	10
2. Exercise on Biochemical tests	10
3. Exercise on staining method	05
4. Spotting (1-5)	10
5. Viva-Voce	05
6. Sessional	10
Total	50

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B.Sc. Part-I

Paper-I

MECHANICS, OSCILLATIONS AND PROPERTIES OF MATTER

(Paper code 0793)

Unit- 1 Cartesian, Cylindrical and Spherical coordinate system, Inertial and non-inertial frames of reference, uniformly rotating frame, Coriolis force and its applications. Motion under a central force, Kepler's laws. Effect of Centrifugal and Coriolis forces due to earth's rotation, Center of mass (C.M.), Lab and C.M. frame of reference, motion of C.M. of system of particles subject to external forces, elastic, and inelastic collisions in one and two dimensions, Scattering angle in the laboratory frame of reference, Conservation of linear and angular momentum, Conservation of energy.

Unit-2 Rigid body motion, rotational motion, moments of inertia and their products, principal moments & axes, introductory idea of Euler's equations. Potential well and Periodic Oscillations, case of harmonic small oscillations, differential equation and its solution, kinetic and potential energy, examples of simple harmonic oscillations: spring and mass system, simple and compound pendulum, torsional pendulum.

Unit-3 Bifilar oscillations, Helmholtz resonator, LC circuit, vibrations of a magnet, oscillations of two masses connected by a spring. Superposition of two simple harmonic motions of the same frequency, Lissajous figures, damped harmonic oscillator, case of different frequencies. Power dissipation, quality factor, examples, driven (forced) harmonic oscillator, transient and steady states, power absorption, resonance.

Unit-4 E as an accelerating field, electron gun, case of discharge tube, linear accelerator, E as deflecting field- CRO sensitivity, Transverse B field, 180° deflection, mass spectrograph, curvatures of tracks for energy determination, principle of a cyclotron. Mutually perpendicular E and B fields: velocity selector, its resolution. Parallel E and B fields, positive ray parabolas, discovery of isotopes, elements of mass spectrography, principle of magnetic focusing lens.

Unit-5 Elasticity: Strain and stress, elastic limit, Hooke's law, Modulus of rigidity, Poisson's ratio, Bulk modulus, relation connecting different elastic- constants, twisting couple of a cylinder (solid and hallow), Bending moment, Cantilever, Young modulus by bending of beam.

Viscosity: Poiseulle's equation of liquid flow through a narrow tube, equations of continuity. Euler's equation, Bernoulli's theorem, viscous fluids, streamline and turbulent flow. Poiseulle's law, Coefficient of viscosity, Stoke's law, Surface tension and molecular interpretation of surface tension, Surface energy, Angle of contact, wetting.

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Paper-II
ELECTRICITY, MAGNETISM AND ELECTROMAGNETIC THEORY

Unit-1 Repeated integrals of a function of more than one variable, definition of a double and triple integral. Gradient of a scalar field and its geometrical interpretation, divergence and curl of a vector field, and their geometrical interpretation, line, surface and volume integrals, flux of a vector field. Gauss's divergence theorem, Green's theorem and Stoke's theorem and their physical significance. Kirchoff's law, Ideal Constant-voltage and Constant-current Sources. Thevenin theorem, Norton theorem, Superposition theorem, Reciprocity theorem and Maximum Power Transfer theorem.

Unit-2 Coulomb's law in vacuum expressed in Vector forms, calculations of E for simple distributions of charges at rest, dipole and quadrupole fields. Work done on a charge in a electrostatic field expressed as a line integral, conservative nature of the electrostatic field. Relation between Electric potential and Electric field, torque on a dipole in a uniform electric field and its energy, flux of the electric field.
Gauss's law and its application: E due to (1) an Infinite Line of Charge, (2) a Charged Cylindrical Conductor, (3) an Infinite Sheet of Charge and Two Parallel Charged Sheets, capacitors, electrostatic field energy, force per unit area of the surface of a conductor in an electric field, conducting sphere in a uniform electric field.

Unit-3 Dielectric constant, Polar and Non Polar dielectrics, Dielectrics and Gauss's Law, Dielectric Polarization, Electric Polarization vector P, Electric displacement vector D. Relation between three electric vectors, Dielectric susceptibility and permittivity, Polarizability and mechanism of Polarization, Lorentz local field, Clausius Mossotti equation, Debye equation,

Ferroelectric and Paraelectric dielectrics, Steady current, current density J, non-steady currents and continuity equation, rise and decay of current in LR, CR and LCR circuits, decay constants, AC circuits, complex numbers and their applications in solving AC circuit problems, complex impedance and reactance, series and parallel resonance, Q factor, power consumed by an a AC circuit, power factor.

Unit-4 Magnetization Current and magnetization vector M, three magnetic vectors and their relationship, Magnetic permeability and susceptibility, Diamagnetic, paramagnetic and ferromagnetic substances. B.H. Curve, cycle of magnetization and hysteresis, Hysteresis loss.

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Physics

PRACTICALS

Minimum 16 (Eight from each group)

Experiments out of the following or similar experiments of equal standard

GROUP-A

1. Study of laws of parallel and perpendicular axes for moment of inertia.
2. Moment of inertia of Fly wheel.
3. Moment of inertia of irregular bodies by inertia table.
4. Study of conservation of momentum in two dimensional oscillations.
5. Study of a compound pendulum.
6. Study of damping of a bar pendulum under various mechanics.
7. Study of oscillations under a bifilar suspension.
8. Study of modulus of rigidity by Maxwell's needle.
9. Determination of Y, k, η by Searl's apparatus.
10. To study the oscillation of a rubber band and hence to draw a potential energy curve from it.
11. Study of oscillation of a mass under different combinations of springs.
12. Study of torsion of wire (static and dynamic method).
13. Poisson's ratio of rubber tube.
14. Study of bending of a cantilever or a beam.
15. Study of flow of liquids through capillaries.
16. Determination of surface tension of a liquid.
17. Study of viscosity of a fluid by different methods.

GROUP-B

1. Use of a vibration magnetometer to study a field.
2. Study of magnetic field B due to a current.
3. Measurement of low resistance by Carey-Foster bridge.
4. Measurement of inductance using impedance at different frequencies.
5. Study of decay of currents in LR and RC circuits.
6. Response curve for LCR circuit and response frequency and quality factor.
7. Study of waveforms using cathode-ray oscilloscope.
8. Characteristics of a choke and Measurement of inductance.
9. Study of Lorentz force.
10. Study of discrete and continuous LC transmission line.
11. Elementary FORTRAN programs, Flowcharts and their interpretation.
18. To find the product of two matrices.
19. Numerical solution of equation of motion.
20. To find the roots of quadratic equation.

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B.Sc. (CS)
I year

B.Sc. PART - I

COMPUTER SCIENCE

PAPER - I

COMPUTER FUNDAMENTALS

(PAPER CODE - 08051)

Max Marks: 50

NOTE: The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.

UNIT - I Classification and Organization of Computers

History of computer, Generation of computer, Calculator vs. Computer, Digital and Analog computers and its evolution Major components of digital computers, Memory addressing capacity of CPU, Word length and processing speed of computer, Microprocessors, Single chipMicrocomputer, Large and small computers, Buses interface, Hardware, software and firmware, multi programming, multi user system, Dumb smart and intelligent terminals, Star, bus network and distributed processing, LAN parallel processing Flynn's classification of computers, Control flow and data flow computers

UNIT - II Central Processing Unit

Parts of CPU- ALU Control Unit, RegistersArchitecture of Intel 8085 microprocessor, Instructions for Intel 8085 microprocessor, Instruction Word size, Various addressing modeInterrupts,Some special Control signals, Instruction cycle, Fetch and execute operation, Timing Diagram, Instruction flow and data flow

UNIT - III Memory

Memory hierarchy, Primary andSecondary Memory, Cache memory, Virtual Memory Direct Access Storage Devices (DASD) Destructive and Non-destructive Readout, Programs and Data Structures, Memory Management Unit (MMU), PCMCIA Cards and Slots

UNIT - IV I/O Devices

I/O devices- Keyboard, Mouse, Monitor, Impact and Non-ImpactPrinters, Plotter, Scanner, other Input/output devices, Scan method of Display- Raster Scan, Vector Scan, Bit Mapped Scan, CRT Controller, I/O Port- Programmable and Non Programmable I/O ports, Inbuilt I/O ports- Parallel and Serial ports, USB, IEEE 1394, AGP, Serial data transfer schemes, Micro controller, Signal Processor, I/O processor, Arithmetic Processor

UNIT-V SOFTWARE AND PROGRAMMING TECHNIQUES

Application and System Software, Introduction, Examples, Difference etc., Introduction to Open Source Software such as Linux/Linux (Ubuntu) Libre office etc., Introduction to Machine Language, Assembly Language and High Level Languages, Programming Techniques, Stack, Subroutine, Debugging of programs, Macro, Program Design, Software development, Flow Chart, Multi programming, Multiuser, Multitasking Processor, Operating system and Utility programs, Application packages

TEXT BOOKS

1. Computer Fundamentals P. C. Sinha, BPB Publications, Sixth Edition
2. Computer Architecture and Organization, J. P. Hayes, [illegible] Edition
3. Fundamentals of Computers, V. Rajaraman, PHI, Sixth edition
4. Computers Today, Donald H. Sanders, McGraw-Hill, Third Edition
5. IBM PC [illegible] Mcgraw-Hill, Second Edition
6. UNIX Concepts and Applications, Sumitabha Das, Tata McGraw-Hill, [illegible]

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(Dr. A.K. Dwivedi)

B.Sc. PART - I
COMPUTER SCIENCE
PAPER II
PROGRAMMING IN 'C' LANGUAGE
(Paper Code - 0806)

Max Marks: 50

NOTE: The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.

UNIT-I

Fundamentals of C Programming: Overview of C: History of 'C', Structure of 'C' program. Keywords, Tokens, Data types, Constants, Literals and Variables, Operators and Expressions: Arithmetic operators, Relational operator, Logical operators, Expressions, Operator: operator precedence and associatively, Type casting, Console I/O formatting, Unformatted I/O functions: getch(), getchar, getche(), getc(), putc(), putchar().

UNIT- II

Control Constructs: If-else, conditional operators, switch and break, nested conditional branching statements, loops, do while, while, for, Nested loops, break and continue, goto and label, exit function.
Functions: Definition, function components: Function arguments, return value, function call statement, function prototype, Types of function, Scope and lifetime of variable, Call by value and call by reference, Function using arrays, function with command line argument. User defined function: maths and character functions, Recursive function.

UNIT-III

Array: Array declaration, One and Two dimensional numeric and character arrays, Multidimensional arrays.
String: String declaration, initialization, string manipulation with/without using library function.
Structure, Union and Enum - Structure: Basics, declaring structure and structure variable, typedef statement, array of structure, array within structure, Nested structure; passing structure to function, function returning structure. **Union**: basics, declaring union and union variable, **Enum**: declaring enum and enum variable.

UNIT- IV

Pointer: Definition of pointer, Pointer declaration, Using & and * operators, Void pointer, Pointer to pointer, Pointer in math expression, Pointer arithmetic, Pointer comparison, Dynamic memory allocation functions – malloc, calloc, realloc and free, Pointer vs. Array, Array of pointer, Pointer to array, Pointers to function, Function returning pointer, Passing function as Argument to function, Pointer to structure, Dynamic array of structure through pointer to structure.

UNIT-V

File Handling and Miscellaneous Features: File handling: file pointer, File accessing functions, fopen, fclose, fputc, fgetc, fprintf, fscanf, fread, fwrite,beof, fflush, rewind, fseek, ferror. File handling through command line argument. Introduction to C preprocessor #include, #define, Conditional compilation directives: #if, #else, #elif, #endif, #ifndef etc.

TEXT BOOKS:

1. Programming in ANSI C, E Balagurusamy, Tata McGraw-Hill, Third Edition.
2. Let Us C, YashwantKanetkar, Infinity Science Press, Eighth Edition.
3. Mastering C, K R Venugopal,Tata McGraw-Hill.
4. The C Programming Language, Brian W. Kernighan, Dennis M. Ritchie, Prentice Hall, Second Edition.
5. Applications Programming in ANSI C, R. Johnsonbaugh , Martin Kalin, Macmillan, Second Edition.
6. The Spirit of C, Mullish Cooper, Jaico publishing House.
7. How to solve it by Computer, R.G. Dromey, Pearson Education

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11/06/18
(Dr. A.K. Dwivedi)

11/06/18

11-06-18

11/6/18

Practical

- At least 20 Practical based on Syllabus of Paper-I and Paper-II.

11-06-2018
(Dr. Sanjay Kumar)

11/6/2018
(Dr. A.K. Dwivedi)

11/6/18
(L.K. Gavel)

11/6/18
(Dr. J. Durga Prasad Rao)

11-06-18
Hari Shankar Prasad Tandel

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ELECTRONICS LABORATORY

ELB 103P: NETWORK ANALYSIS AND ANALOG ELECTRONICS LAB

(Hardware and Circuit Simulation Software) **Max.Marks:25**

The scheme of practical examination will be as follows-

Experiment	--	**30**
Viva	–	**10**
Sessional	–	**10**
Total	–	**50**

AT LEAST 06 EXPERIMENTS FROM THE FOLLOWING BESIDES #1

1. To familiarize with basic electronic components (R, C, L, diodes, transistors), digital Multimeter, Function Generator and Oscilloscope.
2. Measurement of Amplitude, Frequency & Phase difference using Oscilloscope.
3. Verification of (a) Thevenin's theorem and (b) Norton's theorem.
4. Verification of (a) Superposition Theorem and (b) Reciprocity Theorem.
5. Verification of the Maximum Power Transfer Theorem.
6. Study of the I-V Characteristics of (a) p-n junction Diode, and (b) Zener diode.
7. Study of (a) Half wave rectifier and (b) Full wave rectifier (FWR).
8. Study the effect of (a) C- filter and (b) Zener regulator on the output of FWR.
9. Study of the I-V Characteristics of UJT and design relaxation oscillator..
10. Study of the output and transfer I-V characteristics of common source JFET.
11. Study of Fixed Bias and Voltage divider bias configuration for CE transistor.
12. Design of a Single Stage CE amplifier of given gain.
13. Study of the RC Phase Shift Oscillator.
14. Study the Colpitt`s oscillator.

Reference Books:

1. Electrical Circuits, M. Nahvi and J. Edminister, Schaum's Outline Series, Tata McGraw-Hill (2005)
2. Networks, Lines and Fields, J.D.Ryder, Prentice Hall of India.
3. J. Millman and C. C. Halkias, Integrated Electronics, Tata McGraw Hill (2001)
4. Allen Mottershead, Electronic Devices and Circuits, Goodyear Publishing Corporation.

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B.Sc.-I

BIOTECHNOLOGY

PAPER–II

CELL BIOLOGY, GENETICS AND MICROBIOLOGY

UNIT-I

1. Concept of life, Cell as a basic unit of living system and Cell theory.
2. Diversity of Cell shape and size.
3. Prokaryotic cell structure: Function and ultra structure of cell (Gram positive and Gram negative Bacteria), Plasma membrane, Flagella, Pilli, Endospore and Capsule.
4. Eukaryotic cell: Plant cell wall and Plasma membrane.

UNIT-II

1. Cytoplasm: Structure and Functions of Endoplasmic reticulum, Ribosome, Golgi complex, Lysosomes, Nucleus, Mitochondria and Chloroplast.
2. Cytoskeleton: Microtubules, Microfilaments and Intermediate filaments.
3. Cell division: Mitosis and Meiosis.
4. Programmed Cell Death.

UNIT-III

1. Mendel's Laws of Inheritance.
2. Linkage and Crossing over.
3. Chromosome variation in number and structure: Deletion, Duplication, Translocation, Inversion and Aneuploidy, Euploidy (Monoploidy and Polyploidy and its importance).

UNIT-IV

1. History, Scope and Development of Microbiology.
2. Basic techniques of Microbial Culture
3. Microbial Growth & Nutrition of Bacteria: Isolation, media sterilization- physical and chemical agents, pure culture-pour plate method, streak plate method and spread plate method.
4. General features and Economic importance of Fungi, Algae and Protozoa etc.

UNIT-V

1. Bacterial Reproduction: Conjugation, Transduction and Transformation.
2. Mycoplasma – History, Classification, Structure reproduction & Diseases.
3. Viruses – Basic features, Structure, Classification, Multiplication, Bacteriophages (Morphology, life cycle, infection and medicinal importance)

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List of Practical's

MICROBIOLOGY AND BIOCHEMICAL TECHNIQUES

(1) Laboratory rules, Tools, Equipment and Other requirements in Microbiological laboratory.

(2) Micrometry – Use of ocular & stage Micrometrer.

(3) Counting of bacteria by counting chamber, by plate count.

(4)Preparation of media and cultivation techniques:

(a) Basic liquid media (broth)
(b) Basic Solid media, (agar slants and deep tubes)
(c) Demonstration of selective and differential media
(d) Isolation and enumeration of micro organisms
(e) Isolation from air and Soil

(5)Smears and staining methods:

(a) Preparation of bacterial smear
(b) Gram Negative & Positive staining

(6)Methods of obtaining pure cultures

(a) Streak plate method
(b) Pure plate method
(c) Spread plate method
(d) Broth cultures

(7)Growth & Biochemical techniques

(a) Determination of bacterial growth curve
(b) Amylase production test
(c) Cellulose production test
(d) Estimation of Sugar in given solution
(e) Extraction and separation of lipids
(f) Estimation of proteins
(h) Mitosis and Meiosis

(8)Biostatistics:

(a) By Manual and by computer.
(b) Problems on mean, mode and median.

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SCHEME OF PRACTICAL EXAMINATION

Time – 4 hrs.

M. M.: 50

1. Experiment based on culture of micro-organisms	15 Marks
2. Bacterial growth/Staining techniques	10 Marks
3. Biochemical techniques	05 Marks
4. Bio statistics	05 Marks
5. Spotting	05 Marks
6. *Viva – Voce*	05 Marks
7. Record/Sessional	05 Marks

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PRACTICAL FOR Ist YEAR
LABORATORY-I (BCH 105)

1. Preparation of standard buffers and determination of pH of a solution
2. Qualitative tests for :
   a. Carbohydrates
   b. Proteins and amino acids
   c. Lipids
3. Determination of saponification value and iodine number of fats
4. Estimation of ascorbic acid.
5. Titration curve for amino acids and determination of pKa values
6. Verification of Beer-Lambert's law.
7. Estimation of
   i) Carbohydrate by anthrone method.
   ii) Blood glucose by the methods (a) Folin-Wu, (b) Nelson-Somogyi
8. Estimation of amino acids by ninhydrin method.
9. Isolation and assay of glycogen from rat liver.
10. i) Extraction of total lipids by Folch method
    ii) Estimation of food adulterant.
11. Estimation of DNA and RNA.
12. Separation of sugars using paper chromatography.

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Singh, JS Singh SP and Gupta SR. ***Ecology and Environmental Science and Conservation***, S. Chand Publishing, New Delhi

Sharma, PD. ***Ecology and Environment,*** Rastogi Publications, Merrut

Hopkins, WG and Huner, PA. ***Introduction to Plant Physiology,*** John Wiley and Sons.

Pandey SN and Sinha BK, ***Plant Physiology,*** Vikas Publishing, New Delhi

Taiz, L and Zeiger. E. ***Plant Physiology,*** 5th edition, Sinauer Associates Inc. M.A, USA

Srivastava, HS ***Plant Physiology and Biotechnology***, Rastogi Publications, Meerut

B.Sc. II (BOTANY)

Practical

1. Taxonomy: Detailed description and identification of locally available plants of the families as prescribed in the theory paper.
2. Economic Botany: Identification and comment on the plants and plant products belonging to different economic use categories
3. Preparation of Herbarium of local wild plants.
4. Quantitative vegetation analysis of a grassland ecosystem.
5. Anatomical characteristics of hydrophytes and xerophytes.
6. Demonstration of root pressure.
7. Demonstration of transpiration.
8. Demonstration of evolution of O_2 in photosynthesis, factors affecting of photosynthesis.
9. Comparison of R.Q. of different respiratory substrates.
10. Demonstration of fermentation.
11. Determination of BOD of a water body.
12. Demonstration of mitosis.

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PRACTICAL SCHEME

TIME: 4 Hrs. **M.M. : 50**

1.	Anatomy	08
2.	Economic Botany	04
3.	Physiology	08
4.	Ecology	10
5.	Spotting	10
6.	Viva-Voce	05
7.	Project Work/ Field Study	10

(Dr. J.N. Verma
Proff. & Head
Govt. D.B. Girls PG College
Raipur, (C.G.)

(Dr. Rekha Pimpalgaonkar)
Proff. & Head
Govt. N PG Science College
Raipur, (C.G.)

(Dr.Ranjana Shristava)
Proff. & Head
Govt. VYTPG Science College
Raipur, (C.G.)

(Mrs. Sanchal Moghe)
Govt. Bilasa Girls College, Bilaspur

(Mr. Shivakant Mishra)

(Mr Sudheer Tiwari)

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Zoology
B.Sc. Part II 2018-19
Practical

The practical work in general shall be based on the syllabus prescribed and the students will be required to show the knowledge of the following:

- Study of the representative examples of the different chordates (Classified characters).
- Dissection of various systems of scoliodon-Afferent and Efferent branchial cranial nerves, internal ear.

Alternative methods: By Clay/Thermacol/ Drawing/ Model etc.)

- Simple microscopic technique through unstained or stained permanent mount.
- Study of prepared slides histological, as per theory papers.
- Study of limb girdles and vertebrae of Frog, Varanus, Fowl and Rabbit.
- Identification of species and individual of honey bee.
- Life cycle of honey bee and silkworm.
- Exercise based on Evolution and Animal behavior.

Scheme of Practical Exam **Time: 3:30hrs**

• Major dissection (Cranial nerves/efferent branchial vessel)	10
• Exercise based on evolution	05
• Exercise based on applied zoology	05
• Exercise based on animal behavior	04
• Spotting-8 (slides-4,bones-2,specimen-2)	16
• Viva	05
• Sessional marks.	05

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NEW CURRICULUM OF B.Sc. PART II

CHEMISTRY

The new curriculum will comprise of three papers of 33, 33 and 34 marks each and practical work of 50 marks. The Curriculum is to be completed in 180 working days as per UGC norms and conforming to the directives of Govt. of Chhattisgarh. The theory papers are of 60 hrs. each duration and practical work of 180 hrs duration.

Paper – I
INORGANIC CHEMISTRY 60 Hrs., Max Marks 33

UNIT-I

CHEMISTRY OF TRANSITION SERIES ELEMENTS

Transition Elements: Position in periodic table, electronic configuration, General Characteristics, *viz.*, atomic and ionic radii, variable oxidation states, ability to form complexes, formation of coloured ions, magnetic moment μ_{so} (spin only) and μ_{eff} and catalytic behaviour. General comparative treatment of 4d and 5d elements with their 3d analogues with respect to ionic radii, oxidation states and magnetic properties.

UNIT-II

A. Oxidation and Reduction: Redox potential, electrochemical series and its applications, Principles involved in extraction of the elements.

B. COORDINATION COMPOUNDS: Werner's theory and its experimental verification, IUPAC nomenclature of coordination compounds, isomerism in coordination compounds. Stereochemistry of complexes with 4 and 6 coordination numbers. Chelates, polynuclear complexes.

UNIT-III

COORDINATION CHEMISTRY

Valence bond theory (inner and outer orbital complexes), electroneutrality principle and back bonding. Crystal field theory, Crystal field splitting and stabilization energy, measurement of 10 Dq (Δ_o), CFSE in weak and strong fields, pairing energies, factors affecting the magnitude of 10 Dq (Δ_o, Δ_t). Octahedral vs. tetrahedral coordination.

UNIT-IV

A. CHEMISTRY OF LANTHANIDE ELEMENTS

Electronic structure, oxidation states and ionic radii and lanthanide contraction, complex formation, occurrence and isolation, lanthanide compounds.

B. CHEMISTRY OF ACTINIDES

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CHEMISTRY

Paper –IV

LABORATORY COURSE

INORGANIC CHEMISTRY

Qualitative semimicro analysis of mixtures containing 5 radicals. Emphasis should be given to the understanding of the chemistry of different reactions. The following radicals are suggested:

CO_3^{2-}, NO_2^- , S^{2-}, SO_3^{2-},$S_2O_3^{2-}$, CH_3COO^-, F^- ,Cl^- , Br^- , I^- , NO_3^- , BO_3^{3-}, $C_2O_4^{2-}$, PO_4^{3-}, NH_4^+ , K^+, Pb^{2+}, Cu^{2+}, Cd^{2+}, Bi^{3+}, Sn^{2+}, Sb^{3+}, Fe^{3+}, Al^{3+}, Cr^{3+}, Zn^{2+}, Mn^{2+}, Co^{2+}, Ni^{2+}, Ba^{2+}, Sr^{2+}, Ca^{2+}, Mg^{2+}.

Mixtures should preferably contain one interfering anion, or insoluble component ($BaSO_4$, $SrSO_4$, $PbSO_4$, CaF_2 or Al_2O_3) or combination of anions e.g. CO_3^{2-} and SO_3^{2-}, NO_2^- and NO_3^-, Cl^-, Br^-, and I^-.

Volumetric analysis

(a) Determination of acetic acid in commercial vinegar using NaOH.

(b) Determination of alkali content-antacid tablet using HCl.

(c) Estimation of calcium content in chalk as calcium oxalate by permanganometry.

(d) Estimation of hardness of water by EDTA.

(e) Estimation of ferrous & ferric by dichromate method.

(f) Estimation of copper using thiosulphate.

- Principles involved in chromatographic separations. Paper chromatographic separation of following metal ions: i. Ni (II) and Co (II) ii. Fe (III) and Al (III)

ORGANIC CHEMISTRY

- Detection of elements (X, N, S).
- Qualitative analysis of unknown organic compounds containing simple functional groups (alcohols, carboxylic acids, phenols, nitro, amine, amide, and carbonyl compounds, carbohydrates)
- Preparation of Organic Compounds:
  (i) m-dinitrobenzene, (ii) Acetanilide, (iii) Bromo/Nitro-acetanilide, (iv) Oxidation of primary alcohols-Benzoic acid from benzylacohol, (v) azo dye.

PHYSICAL CHEMISTRY

Transition Temperature

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- Determination of the transition temperature of the given substance by thermometric/ dialometric method (e.g. $MnCl_2.4H_2O/SrBr_2.2H_2O$).

Thermochemistry

- Determination of heat capacity of a calorimeter for different volumes using change of enthalpy data of a known system (method of back calculation of heat capacity of calorimeter from known enthalpy of solution or enthalpy of neutralization).
- Determination of heat capacity of the calorimeter and enthalpy of neutralization of hydrochloric acid with sodium hydroxide.
- To determine the solubility of benzoic acid at different temperature and to determine ΔH of the dissolution process.
- To determine the enthalpy of neutralization of a weak acid/ weak base versus strong base/ strong acid and determine the enthalpy of ionization of the weak acid/ weak base.
- To determine the enthalpy of solution of solid calcium chloride and calculate the lattice energy of calcium chloride from its enthalpy data using Born Haber cycle.

Phase Equilibrium

- To study the effect of a solute (e.g. NaCl, Succinic acid) on the critical solution temperature of two partially miscible liquids (e.g. phenol-water system) and to determine the concentration of that solute in the given phenol-water system.
- To construct the phase diagram of two component system (e.g. diphenylamine–benzophenone) by cooling curve method.
- Distribution of acetic/ benzoic acid between water and cyclohexane.
- Study the equilibrium of at least one of the following reactions by the distribution method:

  (i) $I_2(aq) + I^- \rightarrow I^-_3(aq)^{2+}$

  (ii) $Cu^{2+}(aq) + nNH_3 \rightarrow Cu(NH_3)n$

Molecular Weight Determination

Determination of molecular weight by Rast Camphor and Landsburger method.

Note: **Experiments may be added/ deleted subject to availability of time and facilities.**

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Reference Books

1. Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009)
2. Furniss, B.S., Hannaford, A.J., Smith, P.W.G. & Tatchell, A.R. Practical Organic Chemistry, 5th Ed. Pearson (2012)
3. Ahluwalia, V.K. & Aggarwal, R. Comprehensive Practical Organic Chemistry: Preparation and Quantitative Analysis, University Press (2000). 22
4. Ahluwalia, V.K. & Dhingra, S. Comprehensive Practical Organic Chemistry: Qualitative Analysis, University Press (2000).
5. Khosla, B. D.; Garg, V. C. & Gulati, A. Senior Practical Physical Chemistry, R. Chand & Co.: New Delhi (2011). Garland, C. W.; Nibler, J. W. & Shoemaker, D. P. Experiments in Physical Chemistry 8th Ed.; McGraw-Hill: New York (2003).
6. Halpern, A. M. & McBane, G. C. Experimental Physical Chemistry 3rd Ed.; W.H. Freeman & Co.: New York

Hrs.5 PRACTICAL EXAMINATION M.M.50

Three Experiments are to be performed.

1. Inorganic – Qualitative semimicro analysis of mixtures. **12 marks**

OR

One experiment from synthesis and analysis by preparing the standard solution.

2. (a) Identification of the given organic compound & determine its M.Pt./B.Pt.

6 marks

(b) Determination of Rf value and identification of organic compounds by paper chromatography. **6 marks**

3. Any one physical experiment that can be completed in two hours including calculations.

12 marks

4. Viva **10 marks**

5. Sessional **04 marks**

In case of Ex-Students one marks will be added to each of the experiment.

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MICROBIOLOGY

BSc-2nd

Paper- I: Molecular Biology and Genetic Engineering

UNIT-1: FUNDAMENTALS OF MOLECULAR BIOLOGY
History and scope of molecular biology, concept and mechanism of heredity. DNA as genetic material- experimental evidences. DNA replication- mechanism, process and enzymes/proteins involved in replication.

UNIT-2: CENTRAL DOGMA OF PROTEIN SYNTHESIS
Transcription- initiation, elongation, termination, RNA polymerases and sigma factor. Transcription inhibitors (antibiotics, drugs). Translation- initiation, elongation and termination. Factors involved in translation. Genetic code.

UNIT-3: MUTATION AND DNA REPAIR MECHANISM
Introduction and Types of Gene mutations- Base substitution, frame shift mutation (insertion, deletion, miss-sense, nonsense mutation.) mutagens – physical and chemical. Reverse mutation in bacteria. DNA repair mechanism (mismatch repair, photo-reactivation, excision and SOS repair). Beneficial and harmful effect of mutation.

UNIT-4: GENE REGULATION
Concept of gene- Cistron, Recon, Muton. Operon Concept- lac Operon, tryptophan Operon, His Operon. Activator, Co-activator and Repressor. Introduction to Bioinformatics- Elementary genome Database.

UNIT-5: GENETIC ENGINEERING
Basic concept of Genetic Engineering, DNA modifying enzymes Restriction endonuclease, DNA ligase, terminal transferase. Vectors- pBR322, pUC19, BAC and YAC. Phage based vectors, expression of vector. Transformation – physical and chemical method. Bacterial Host. Screening of recombinant vector Blue white Screening, Colony Hybridization.

Text Books Recommended:

1. Gene Cloning by T.A. Brown.
2. General Microbiology by Power and Daganiwala.
3. Zinssers Microbiology by KJ Wolfgang, McGraw- HJill Company.
4. Microbial Genetics by RM Stanley, F David and EC John.
5. Bacteriological Techniques by FJ Baker.
6. .Molecular Biology of the Cell; *3rd Edition;* Bruce Alberts ,et.al; Garland Publishing.
7. Cell biology; C.B. Powar; Himalaya Publishing House; Fifth edition
8. Cell & Molecular Biology; Gerald Karp; Fourth edition
9. A Textbook of Microbiology; Dubey&Maheshwari; S.chand& Sons.
10. Cell biology & Genetics; P. K. Gupta
11. Introduction to Bioinformatics; T K Atwood and D J Parry-Smith; Pearson Education Ltd

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Microbiology

PRACTICAL

M. M. 50

Determination of antibiotic resistance by plating method.
Assaying of microbial enzymes; Catalase, Proteases, Peroxidases, Cellulase, Cellobioases, Amylase, Diastase.
Exercise on paper, thin layer, column chromatography.
Exercise on paper and gel electrophoresis.
determination of pH of various water and soil sample.
testing of lambert beer's law.
Determination of lamda max of dye by spectrophotometer
Isolation of resistant bacteria from soil and water sample

Scheme of Practical Examination

Time - 4 hours

	M.M. 50
1. Exercise on spectrophotometer/ pH meter	10
2. Exercise on chromatography	10
3. Exercise on genetics	05
4. Spotting (1-5)	10
5. Viva-Voce	05
6. Sessional	10
	Total 50

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B.Sc. Part-II

Paper-I

THERMODYNAMICS, KINETIC THEORY AND STATISTICAL PHYSICS

Unit-1 The laws of thermodynamics : The Zeroth law, first law of thermodynamics, internal energy as a state function, reversible and irreversible change, Carnot's cycle, carnot theorem, second law of thermodynamics. Claussius theorem inequality. Entropy, Change of entropy in simple cases (i) Isothermal expansion of an ideal gas (ii) Reversible isochoric process (iii) Free adiabatic expansion of an ideal gas. Concept of entropy, Entropy of the universe. Entropy change in reversible and irreversible processes, Entropy of Ideal gas, Entropy as a thermodynamic variable, S-T diagram, Principle of increase of entropy. The thermodynamic scale of temperature, Third law of thermodynamics, Concept of negative temperature.

Unit-2 Thermodynamic functions, Internal energy, Enthalpy, Helmholtz function and Gibb's free energy, Maxwell's thermodynamical equations and their applications, TdS equations, Energy and heat capacity equations Application of Maxwell's equation in Joule-Thomson cooling, adiabatic cooling of a system, Van der Waals gas, Clausius-Clapeyron heat equation. Blackbody spectrum, Stefan-Boltzmann law, Wien's displacement law, Rayleigh-Jean's law, Planck's quantum theory of radiation.

Unit-3 Maxwellian distribution of speeds in an ideal gas: Distribution of speeds and velocities, experimental verification, distinction between mean, rms and most probable speed values. Doppler broadening of spectral lines. Transport phenomena in gases: Molecular collisions mean free path and collision cross sections. Estimates of molecular diameter and mean free path. Transport of mass, momentum and energy and interrelationship, dependence on temperature and pressure.

Behaviour of Real Gases: Deviations from the Ideal Gas Equation. The Virial Equation. Andrew's Experiments on CO_2 Gas. Critical Constants.

Unit-4 The statistical basis of thermodynamics: Probability and thermodynamic probability, principle of equal a priori probabilities, statistical postulates. Concept of Gibb's ensemble, accessible and inaccessible states. Concept of phase space, γ phase space and μ phase space. Equilibrium before two systems in thermal contact, probability and entropy, Boltzmann entropy relation. Boltzmann canonical distribution law and its applications, law of equipartition of energy.

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Paper-II
WAVES, ACOUSTICS AND OPTICS

Unit-1 Waves in media: Speed of transverse waves on uniform string, speed of longitudinal waves in a fluid, energy density and energy transmission in waves. Waves over liquid surface: gravity waves and ripples. Group velocity and phase velocity and relationship between them. Production and detection of ultrasonic and infrasonic waves and applications.

Reflection, refraction and diffraction of sound : Acoustic impedance of a medium, percentage reflection & refraction at a boundary, impedance matching for transducers, diffraction of sound, principle of a sonar system, sound ranging.

Unit-2 Fermat's Principle of extremum path, the aplanatic points of a sphere and other applications. Cardinal points of an optical system, thick lens and lens combinations. Lagrange equation of magnification, telescopic combinations, telephoto lenses. Monochromatic aberrations and their reductions; aspherical mirrors and Schmidt corrector plates, aplanatic points, oil immersion objectives, meniscus lens.

Optical instruments: Entrance and exit pupils, need for a multiple lens eyepiece, common types of eyepieces. (Ramsdon and Hygen's eyepieces).

Unit-3 Interference of light: The principle of superpositions, two slit interference, coherence requirement for the sources, optical path retardations, Conditions for sustained interference, Theory of interference, Thin films. Newton's rings and Michelson interferometer and their applications its application for precision determinations of wavelength, wavelength difference and the width of spectral lines. Multiple beam interference in parallel film and Fabry-Perot interferometer. Rayleigh refractometer, Twyman-Green interferometer and its uses.

Unit-4 Diffraction, Types of Diffraction, Fresnel's diffraction, half-period zones, phasor diagram and integral calculus methods, the intensity distribution, Zone plates, diffraction due to straight edge, Fraunhofer diffraction due to a single slit and double slit, Diffraction at N-Parallel slit, Plane Diffraction grating, Rayleigh criterion, resolving power of grating , Prism, telescope.

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Polarized light and its mathematical representation, Production of polarized light by reflection, refraction and scattering. Polarization by double refraction and Huygen's theory, Nicol prism, Retardation plates, Production and analysis of circularly and elliptically polarized light. Optical activity and Fresnel's theory, Biquartz polarimeter.

Unit-5 Laser system: Basic properties of Lasers, coherence length and coherence time, spatial coherence of a source, Einstein's A and B coefficients, Spontaneous and induced emissions, conditions for laser action, population inversion, Types of Laser : Ruby and, He-Ne laser and. Applications of laser : Application in communication, Holography and Basics of non linear optics and Generation of Harmonic.

TEXT AND REFERENCE BOOKS:

1. A.K. Ghatak, 'Physical Optics'
2. D.P. Khandelwal, Optical and Atomic Physics' (Himalaya Publishing House, Bombay, 1988)
3. K.D. Moltev; 'Optics' (Oxford University Press)
4. Sears: 'Optics'
5. Jenkins and White: 'Fundamental of Optics' (McGraw-Hill)
6. B.B. Laud: Lasers and Non-linear Optics (Wiley Eastern 1985)
7. Smith and Thomson: 'Optics' (John Wiley and Sons)
8. Berkely Physics Courses: Vol.-III, 'Waves and Oscillations'
9. I.G. Main, 'Vibrations and Waves' (Cambridge University Press)
10. H.J. Pain: 'The Physics of Vibrations and Waves' (MacMillan 1975)
11. Text Book of Optics: B.K. Mathur
12. B.Sc. (Part III) Physics: Editor: B.P. Chandra, M.P. Hindi Granth Academy.
13. F. Smith and J.H. Thomson, Manchester Physics series: optics (John wiley, 1971)
14. Born and Wolf : 'Optics'.
15. Physical Optics: B. K. Mathur and T. P. Pandya.
16. A textbook of Optics: N. Subrahmanyam, Brijlal and M. N. Avadhanulu.
17. Geometrical and Physical Optics: Longhurst.
18. Introduction to Modern Optics: G. R. Fowels.
19. Optics: P. K. Srivastav.

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physics

PRACTICALS

Minimum 16 (Eight from each group)

Experiments out of the following or similar experiments of equal standard

1. Study of Brownian motion.
2. Study of adiabatic expansion of a gas.
3. Study of conversion of mechanical energy into heat.
4. Heating efficiency of electrical kettle with varying voltage.
5. Study of temperature dependence of total radiation.
6. Study of temperature dependence of spectral density of radiation.
7. Resistance thermometry.
8. Thermo emf thermometry.
9. Conduction of heat through poor conductors of different geometries.
10. Experimental study of probability distribution for a two-option system using a coloured dice.
11. Study of statistical distribution on nuclear disintegration data (GM counter used as a black box).
12. Speed of waves on a stretched strings.
13. Studies on torsional waves in a lumped system.
14. Study of interference with two coherent source of sound.
15. Chlandi's figures with varying excitation and loading points.
16. Measurements of sound intensities with different situations.
17. Characteristics of a microphone-loudspeakers system
18. Designing an optical viewing system.
19. Study of monochromatic defects of images.
20. Determining the principle point of a combination of lenses.
21. Study of interference of light (biprism or wedge film).
22. Study of diffraction at a straight edge or a single slit.
23. Study of F-P etalon fringes.
24. Study of diffraction grating and its resolving power.
25. Resolving power of telescope system.
26. Polarization of light by reflection; also cos-squared law.
27. Study of optical rotation for any system.
28. Study of laser as a monochromatic coherent source.
29. Study of a divergence of laser beam.
30. Calculation of days between two dates of a year.
31. To check if triangle exists and the type of a triangles.
32. To find the sum of the sine and cosines series and print out the curve.

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33. To solve simultaneous equation by elimination method.
34. To prepare a mark-list of polynomials.
35. Fitting a straight line or a simple curve
36. Convert a given integer into binary and octal systems and vice versa .
37. Inverse of a matrix.
38. Spiral array.

TEXT AND REFERENCE BOOKS

1. D.P. Khandelwal, Optics and Atomic physics (Himalaya Publishing house, Bombay 1988).
2. D.P. Khandelwal, A Laboratory Manual for Undergraduate Classes (Vani Publishing House, New Delhi).
3. S. Lipschutz and a Poe, Schaum's outline of theory and Problems of Programming with Fortran(McGraw-hill Book Company 1986).
4. C Dixon, Numerical Analysis .

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B.Sc.(CS)
II Year

COMPUTER SCIENCE

PAPER - I

COMPUTER HARDWARE

(Paper Code - 0855)

Duration 3 hours

Max.Marks 50

AIM - The emphasis in on the desing concepts & organisational details of the common PC, leaving the complicated electronics of the system of the computer Engineers.

OBJECT OF THE COURSE -

1 To introduce the overall organisation of the microcomputers.

2 To introduce the common peripheral devices used in computers.

3 To introduce the hardware components, use of micro processor and function of various chips used in microcomputer.

N.B. : Since the computer organisation study is very vast & complicated, so the study is restricted to only the description and understanding part, fence the paper setter is requested to keep this important factor in mind.

UNIT-I CLASSIFICATION AND ORGANIZATION OF COMPUTERS

Digital and analog computers and its evolution. Major components of digital computers; Memory addressing capability of CPU; word length and processing speed of computes. Microprocessors single chip microcomputers; large and small computers. Users interface Hardware software and firmware. multi programming multi user system. Dumb smart and intelligent terminals computer network and multi processing, LAN parallel processing. Flinn's classification of computers. Computer flow and data flow computers.

UNIT-II CENTRAL PROCESSING UNIT.

CPU organization, ALU control unit registers. Instructions for INTEL 8085, Instruction word size, Various addressing mode interrupts and exceptions, some special Control signals and I/O devices. Instruction cycle fetch and execute operation, time Diagram, data flow.

UNIT-III MEMORY OF COMPUTERS.

Main memory secondary memory, backup memory, cache memory; real and virtual Memory Semiconductor memory. Memory controller and magnetic memory; RAM; disks, optical disks Magnetic bubble memory; DASD, destructive and non destructive. readout. Program of data Memory and MMU.

UNIT-IV I/O DEVICES.

I/O devices of micro controller; processors. I/O devices, printer, plotter, other out put devices, I/O port serial data transfer scheme, Micro controller, signal processor, I/O processor I/O processor arithmetic processor.

UNIT-V SYSTEM SOFTWARE AND PROGRAMMING TECHNIQUE.

ML, AL, HLL, stac subroutine debugging of programs macro, micro programming, Program Design, software development, flow & chart multi programming, multiuser multi tasking Protection, operating system and utility program, application package.

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(Dr. J. Dogra)

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RECOMMENDED BOOKS :

1 Computer Fundamentals : Architecture and Organization - By B.Ram (Wilwy Eastern Ltd.)

2 Computers Today - By Donal H. Sanders

3 Computers Fundamental - By Rajaraman.

4 IBM PC - XT Clones - By Govinda Rajalu

PAPER - II

SOFTWARE

(Paper Code - 0856)

AIM - Introduction to the web-language-HTML & problem solving throgh the concept of object oriented programming.

OBJECT OF THE COURSE -

1 To introduce the internet & web related technology & learn the intricacies of web-page designing using HTML.

2 To introduce the object oriented programming concept using C++ language.

3 To introduce the problem solving methodology using the C++ programming features.

N.B. : Examiners are requested to prepare unit-wise Questions papers.

UNIT-I **HTML BASICS & WEB SITE DESIGN PRINCIPLES**

Concept of a Web Site, Web Standards, What is HTML? HTML Versions, Naming Scheme for HTML Documents , HTML document/file, HTML Editor , Explanation of the Structure of the homepage , Elements in HTML Documents ,HTML Tags, Basic HTML Tags, Comment tag in HTML, Viewing the Source of a web page, How to download the web page source? XHTML, CSS, Extensible Markup Language (XML), Extensible Style sheet language (XSL), Some tips for designing web pages, HTML Document Structure. HTML Document Structure-Head Section, Illustration of Document Structure,<BASE> Element,<ISINDEX> Element,<LINK> Element ,META, <TITLE> Element,<SCRIPT> Element ,Practical Applications, HTML Document Structure-Body Section:-Body elements and its attributes: Background; Background Color; Text; Link; Active Link (ALINK); Visited Link (VLINK); Left margin; Top margin, Organization of Elements in the BODY of the document: Text Block Elements; Text Emphasis Elements; Special Elements – Hypertext Anchors; Character-Level Elements; Character References ,Text Block Elements: HR (Horizontal Line); Hn (Headings) ; P (Paragraph); Lists; ADDRESS ; BLOCKQUOTE; TABLE; DIV (HTML 3.2 and up) ; PRE (Preformatted); FORM ,Text Emphasis Elements, Special Elements – Hypertext Anchors ,Character-Level Elements: line breaks (BR) and Images (IMG), Lists , ADDRESS Element, BLOCKQUOTE Element, TABLE Element, COMMENTS in HTML ,CHARACTER Emphasis Modes, Logical & Physical Styles, Netscape, Microsoft and Advanced Standard Elements List, FONT, BASEFONT and CENTER.

UNIT-II **IMAGE, INTERNAL AND EXTERNAL LINKING BETWEEN WEBPAGES**

Netscape, Microsoft and Advanced Standard Elements List, FONT, BASEFONT and CENTER Insertion of images using the element IMG (Attributes: SRC (Source),

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Hari Shankar Prasad Tandi

WIDTH, HEIGHT, ALT (Alternative), ALIGN),IMG (In-line Images) Element and Attributes; Illustrations of IMG Alignment, Image as Hypertext Anchor, Internal and External Linking between Web Pages Hypertext Anchors ,HREF in Anchors ,Links to a Particular Place in a Document ,NAME attribute in an Anchor ,Targeting NAME Anchors ,TITLE attribute, Practical IT Application Designing web pages links with each other, Designing Frames in HTML. Practical examples.

UNIT-III INTRODUCTION TO OOP

Advantages of OOP, The Object Oriented Approach, Characteristics of object oriented languages- Object, Classes, Inheritance, Reusability, Polymorphism and C++.

Function: Function Declaration, Calling Function, Function Defines, Passing Argument to function, Passing Constant, Passing Value, Reference Argument, returning by reference, Inline Function, Function Overloading, Default Arguments in function.

UNIT-IV OBJECT CLASSES AND INHERITANCE

Object and Class, Using the class, class constructor, class destructors, object as function argument ,copy constructor ,struct and classes , array as class member, Static Class Data, Static Member Functions, , Friend function, Friend class, operator overloading. Type of inheritance, Base class, Derive class. Access Specifier: protected. Function Overriding, member function, String, Template Function.

UNIT-V POINTERS AND VIRTUAL FUNCTION

pointers: & and * operator pointer variables, .pointer to pointer, void pointer,pointer and array, pointer and function, pointer and string, memory management, new and delete, pointer to object, this pointer Virtual Function: Virtual Function, Virtual member function, accesses with pointer,pure virtual function

File and Stream: C++ streams, C++ Manipulators, Stream class, string I/O, char I/O, Object I/O, I/O with multiple object, Disk I/O,

RECOMMENDED BOOKS :

1	Introduction to HTML	:	Kamlesh Agarwala, O.P.Vyas, Prateek A. Agrawala (Kitab Mahal Publication)
2	Let us C++	:	Y. Kanetkar B.P.B Publication
3	Programming in C++	:	E. Balaguruswami
4	Mastering in C++	:	Venu Gopal
5	Object Oriented Programming in C++	:	Lafore R, Galgotia Publications.

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(L.K. Gavel)

11.06.18
Hari Shankar Prasad Tade

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ELECTRONICS LABORATORY

The scheme of practical examination will be as follows-

Experiment	–	**30**
Viva	–	**10**
Sessional	–	**10**
Total	–	**50**

ELB 203P: COMMUNICATIONELECTRONICS LAB

(Hardware and Circuit Simulation Software) 60 Lectures
Max.Marks:25

1. To design an Amplitude Modulator using Transistor
2. To study envelope detector for demodulation of AM signal
3. To study FM - Generator and Detector circuit
4. To study AM Transmitter and Receiver
5. To study FM Transmitter and Receiver
6. To study Time Division Multiplexing (TDM)
7. To study Pulse Amplitude Modulation (PAM)
8. To study Pulse Width Modulation (PWM)
9. To study Pulse Position Modulation (PPM)
10. To study ASK, PSK and FSK modulators

Reference Books:

1. Electronic Communication systems, G. Kennedy, 1999, Tata McGraw Hill.
2. Electronic Communication system, Blake, Cengage, 5th edition.

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ELB 204P: MICROPROCESSOR ANDMICROCONTROLLER LAB(Hardware and Circuit Simulation Software)

Max.Marks:25

At least 06 experiments each from Section-A and Section-B

Section-A: Programs using 8085 Microprocessor

1. Addition and subtraction of numbers using direct addressing mode
2. Addition and subtraction of numbers using indirect addressing mode
3. Multiplication by repeated addition.
4. Division by repeated subtraction.
5. Handling of 16-bit Numbers.
6. Use of CALL and RETURN Instruction.
7. Block data handling.
8. Other programs (e.g. Parity Check, using interrupts, etc.).

Section-B: Experiments using 8051 microcontroller:

1. To find that the given numbers is prime or not.
2. To find the factorial of a number.
3. Write a program to make the two numbers equal by increasing the smallest number and decreasing the largest number.
4. Use one of the four ports of 8051 for O/P interfaced to eight LED's. Simulate binary counter (8 bit) on LED's .
5. Program to glow the first four LEDs then next four using TIMER application.
6. Program to rotate the contents of the accumulator first right and then left
7. Program to run a countdown from 9-0 in the seven segment LED display.
8. To interface seven segment LED display with 8051 microcontroller and display 'HELP' in the seven segment LED display.
9. To toggle '1234' as '1324' in the seven segment LED display.
10. Interface stepper motor with 8051 and write a program to move the motor through a given angle in clock wise or counter clockwise direction.
11. Application of embedded systems: Temperature measurement & display on LCD

Reference Books:

1. Microprocessor Architecture Programming & applications with 8085, 2002, R.S. Goankar, Prentice Hall.
2. Embedded Systems: Architecture, Programming & Design, Raj Kamal, 2008, Tata McGraw Hill
3. The 8051 Microcontroller and Embedded Systems Using Assembly and C, M.A. Mazidi, J.G. Mazidi, and R.D. McKinlay, 2nd Ed., 2007, Pearson Education India.
4. 8051 microcontrollers, Satish Shah, 2010, Oxford University Press.
5. Embedded Microcomputer systems: Real time interfacing, J.W. Valvano 2011, Cengage Learning

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B.Sc. II
BIOTECHNOLOGY

PAPER – I

MOLECULAR BIOLOGY & BIOPHYSICS

M.M. 50

UNIT-I

1. Nucleic Acid: Bases, Nucleosides and Nucleotides, DNA and RNA structure.
2. Plasmids.
3. Transposons: Repetitive elements, LINEs & SINEs, Structure of Gene.

UNIT-II

1. DNA Replication: Enzymes involved and mechanism of DNA Replication in Prokaryotes.
2. Mutation: Molecular level of Mutation, Types of Mutagens, Spontaneous and Induced Mutation.
3. DNA Repair: NER, BER and Mismatch Repair.

UNIT-III

1. Genetic Code: Features, Condon Assignment and Wobble hypothesis.
2. Transcription: Initiation, Elongation and Termination in Prokaryotes.
3. Translation: Initiation, Elongation and Termination Translation machinery in Prokaryotes. Operon-Concept of Operator, Regulator, Promoter gene, Inducer and Co-repressor.

UNIT –IV

1. Biophysics : Introduction, Scope and Application
2. Principle, Structure, Functions of the following:
   a. Microscopy b. Colorimeter and Spectroscopy c. Electrophoresis
   d. Centrifugation e. Chromatography.

UNIT –V

1. Radioisotopes techniques: Measurement of radioactivity, Ionization Chambers, Geiger Muller and Scintillation Counter.
2. Autoradiography and DNA Fingerprinting.
3. Biosensor.

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Biotechnology

List of Practical's

MOLECULAR BIOLOGY, BIOPHYSICS, RECOMBINANT DNA TECHNOLOGY AND GENOMICS

1. Isolation of DNA from Plant cell.
2. Estimation of DNA by DPA method.
3. Isolation RNA from yeast cells

Experiment based on-

4. Centrifugation
5. Spectrophotometer/Colorimeter
6. Electrophoresis
7. Paper chromatography/TLC

Experiment based on Bioinformatics -

8. Retrieve DNA /Protein sequence from Biological Data Bases (NCBI).
9. Use of tools studied

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SCHEME FOR PRACTICAL EXAMINATION

Time: 4 hrs. M.M.: 50

1. Experiment based on DNA/RNA	10 marks
2. Experiment based on Instruments	10 marks
3. Experiment based on Bioinformatics	10 marks
4. Spotting	10 marks
5. *Viva - Voce*	05 marks
6. Record / Sessional	05 marks

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BIOCHEMISTRY

PAPER - I

ENZYMOLOGY

M.M. 50

UNIT-I INTRODUCTION

History, general characteristics, nomenclature, IUB enzyme classification (rationale, over view and specific examples), significance of numbering system. Definitions with examples of holoenzyme, apoenzyme, coenzymes. cofactors, activators, inhibitors, active site (identification of groups excluded), metallo-enzymes, units of enzyme activity, specific enzymes, Isoenzymes, monomeric enzymes, oligomeric enzymes and multienzyme complexes. Enzyme specificity.

Hostorical perspective, nature of non-enzymatic and enzymatic catalysis. Measurement and expression of enzyme activity-enzyme assays. Definition of IU, Katal, enzyme turn over number and specific acitivity. Role of non-protein organic molecules and inorganic ions coenzyme, prosthetic groups. Role of vitamins as coenzymes precursors (general treatment).

UNIT-I ENZYME CATALSIS

Role of cofactors in enzyme catalysis : NAD/NADP+, FMN/FAD, coenzyme A, biocytin, cobamide, lipoamide, TPP, pyridoxal phosphate, tetrahydrofolate and metal ions with special emphasis on coenzyme functions. Acid-base catalysis, covalent, proximity and orientaton effects, strain and distortion theory. Mechanism of action of chymotrypsin, carboxypeptidase, ribonuclease and lysozyme.

UNIT-II ENZYME PURIFICATION

Methods for isolation, purification and characterization of enzymes.

UNIT-IV ENZYME KINETICS

Factors affecting enzyme activity : enzyme concentration, substrate concentration, pH and temperature. Derivation of Michaelis-Menten equation for uni-substrate reactions. Km and its significance. Line weaver-Burk plot and its limitations. Importance of K_{cat}/K_m. Bi-substrate reactions-brief introduction to sequential and ping-pong mechanism with examples.

Kinetics of zero and first order reactions. Significance and evaluation of energy of activation and free energy.

Reversible and irreversible inhibition, competitive, non-competitive and uncompetitive inhibitions. determination of K_m & V_{max} in presence and absence of inhibitor. Allosteric enzymes.

UNIT-V INDUSTRIAL AND CLINICAL APLLICATION OF ENZYME.

Immobilization of enzyme and their industrial applications. Production of glucose from starch, cellulose and dextran; use of lactase in dairy industry; production of glucose-fructose syrup from sucrose; use proteases in food, detergent and leather industry; medical application of enzymes. use of glucose oxidase in enzyme electrodes.

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Biochemistry

PAPER - II

INTERMEDIARY METABOLISM

M.M. 50

UNIT-I INTRODUCTION TO METABOLISM

General features of metabolism, experimental approaches to study metabolism; use of intact organism, bacterial mutants, tissue slices, stable and radioactive isotopes.

CARBOHYDRATE METABOLISM

Reactions and energetics of glycolysis. Alcoholic and lactic acid fermentations. Entry of fructose, galactose, mannose etc. Reactions and energetics of TCA cycle. Gluconeogenesis, glycogenesis and glycogenolysis, Reactions and physiological signifacance of pentose phosphate pathway. Regulation of glycolysis and TCA cycle. Photosynthesis, a brief review.

UNIT-II ELECTRON TRANSPORT CHAIN AND OXIDATIVE PHOSPHORYLATION

Structure of mitochondria, sequence of electron carriers, sites of ATP production, inhibitors of electron transport chain. Hypothesis of mitochondrial oxidative phosphorylation (basic concepts). Inhibitors and uncouplers of oxidative phosphorylation. Transport of reducing potentials into mitochondria.

UNIT-III LIPID METABOLISM

Introduction, hydrolysis of triacylglycerols, transport of fatty acids into mitochondria. β – oxidation of saturated fatty acids, ATP yield from fatty acid oxidation. biosynthesis of saturated and unsaturated fatty acids. Metabolism of ketone bodies, oxidation of unsaturated and odd chain fatty acids. Biosynthesis of triglycerides and important phospholipids, glycolipids, sphingolipids and cholesterol. Regulation of cholesterol metabolism.

UNIT-IV AMINO ACID METABOLISM

General reactions of amino acid metabolism : transmination, oxodative deamination and decarboxylation. Urea cycle. Degradation and biosynthesis of amino acids. Glycogenic and ketogenic amino acids.

UNIT-V NUCLEOTIDE METABOLISM

Sources of the atoms in the purine and pyrimidine molecules. Biosynthesis and degradation of purines and pyrimidines. Regulation of purine and pyrimidine biosynthesis.

PORPHYRIN METABOLISM

Biosynthesis and degradation of porphyrins. Production of bile pigments.

PRECTICAL

1. Separation of Blood Plasm and Serum
   - a Estimation of proteins from serum by biuret and lowry methods.
   - b Determination of albumin and A/G ratio in serum.
2. Estimation of bilirubin (conjugated and unconjugated) in serum.
3. i Estimation of total lipids in serum by vanillin method.

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i. Estimation of cholesterol in serum.

4. Estimation of lipoproteins in plasma.

5. Estimation of lactic acid in blood before and after exercise.

6. Estimation of blood urea nitrogen from plasma.

7. Separation and identification of amino acids by (a) paper chromatography and (b) thin-layer chromatography.

8. Separation of polar and non-polar lipids by thin-layer chromatography.

9. Estimation of SGPT and SGOT in serum.

10. a. Assay of serum alkaline phosphatase activity.
    b. Inhibition of alkaline phosphatase activity by EDTA.
    c. Effect of substrate concentration on alkaline phosphatase activity and determination of its K_m value.

11. a. Effect of temperature on enzyme activity and determination of activation energy.
    b. Effect of pH on enzyme activity and determination of optimum pH.
    c. Effect of enzyme concentration on enzyme activity.

12. a. Preparation of starch from potato and its hydrolysis by salivary amylase.
    b. Determination of achromatic point in salivary amylase.
    c. Effect of sodium chloride onamylases.

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Singh BD, ***Genetics***, Kalyani Publication

Gupta, PK, ***Cell and Molecular Biology,*** Rastogi Publications, Meerut

Singh, BD, ***Biotechnology: Expanding Horizons,*** Kalyani publications

Gupta, PK, ***Elements of Plant Biotechnology,*** Rastogi Publications, Meerut

Gupta, SN, ***Concepts of Biochemistry,*** Rastogi Publications, Meeru

Jain, JL., Jain S, Jain, N, ***Fundamentals of Biochemistry***, S Chand Publishing, New Delhi

B.Sc.-III (Botany)

Practical

1. Study of host parasite relationship pf plant diseases listed above.
2. Demonstration of preparation of Czapek's Dox medium and Potato dextrose agar medium, sterilization of culture medium and pouring.
3. Inoculation in culture tubes and petriplates.
4. Gram Staining.
5. Microscopic examination of Curd.
6. Study of plant diseases as listed in the theory paper.
7. Biochemical test of carbohydrate and protein.
8. Instrumentation techniques

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PRACTICAL SCHEME

TIME: 4 Hrs. **M.M. : 50**

1.	Plant Disease/Symptoms	10
2.	Instrumentation techniques	05
3.	Staining of Microbes	05
4.	Tissue Culture techniques	05
5.	Spotting	10
6.	Project Work/ Field Study	05
5.	Viva-Voce	05
6.	Sessional	05

(Dr. J.N. Verma) (Dr. Rekha Pimpalgaonkar) (
Dr.Ranjana Shristava)

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Govt. N PG Science College
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Govt. Bilasa Girls College, Bilaspur

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B. Sc. Part III 2018-19

Zoology

Practical

The practical work in general shall be based on syllabus prescribed in theory.
The candidates will be required to show knowledge of the following:

- Estimation of population density, percentage frequency, relative density.
- Analysis of producers and consumers in grassland.
- Detection of gram-negative and gram-positive bacteria.
- Blood group detection (A,B,AB,O)
- R. B. C. and W.B.C count
- Blood coagulation time
- Preparation of hematin crystals from blood of rat
- Observation of Drosophila, wild and mutant.
- Chromatography-Paper or gel.
- Colorimetric estimation of Protein.
- Mitosis in onion root tip.
- Biochemical detection of Carbohydrate, Protein and Lipid.
- Study of permanent slides of parasites, based on theory paper.
- Working principles of pH meter, colorimeter, centrifuge and microscope.

Scheme of marks distribution **Time: 3:30hrs**

• Hematological Experiment	08
• Ecological Experiment: Grassland Ecosystem/ Population Density/Frequency/relative density	06
• Bacterial staining	05
• Biochemical experiment	06
• Practical based on Instrumentation (Chromatography/ pH meter/microscope/centrifuge.	05
• Spotting (5 spots)	10
7 Viva	05
8. Sessional	05

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B.Sc. Part- III CHEMISTRY

PRACTICAL

Max. Marks-50

INORGANIC CHEMISTRY

Gravimetric analysis:

- Estimation of nickel (II) using Dimethylglyoxime (DMG).
- Estimation of copper as CuSCN
- Estimation of iron as Fe_2O_3 by precipitating iron as $Fe(OH)_3$.
- Estimation of Al (III) by precipitating with oxine and weighing as $Al(oxine)_3$ (aluminium oxinate).
- Estimation of Barium as $BaSO_4$

Inorganic Preparations:

- Tetraamminecopper (II) sulphate, $[Cu(NH_3)_4]SO_4.H_2O$
- Cis and trans $K[Cr(C_2O_4)_2.(H_2O)_2]$ Potassium dioxalatodiaquachromate(III)
- Tetraamminecarbonatocobalt (III) ion
- Potassium tris(oxalate)ferrate(III)/ Sodium tris(oxalate)ferrate(III)
- Cu(I) thiourea complex, Bis (2,4-pentanedionate) zinc hydrate; Double salts (Chrome alum/ Mohr's salt)

ORGANIC CHEMISTRY

1. Preparation of organic Compounds

- Acetylation of one of the following compounds: amines (aniline, o-, m-, p- toluidines and o-,m-, p-anisidine) and phenols (β-naphthol, vanillin, salicylic acid)
- Benzolyation of one of the following amines (aniline, o-, m-, p- toluidines and o-, m-, panisidine) and one of the following phenols (β-naphthol, resorcinol, p cresol) by Schotten-Baumann reaction.
- Bromination of any one of the following: a. Acetanilide by conventional methods b.Acetanilide using green approach (Bromate-bromide method)
- Nitration of any one of the following: a. Acetanilide/nitrobenzene by conventional method b. Salicylic acid by green approach (using ceric ammonium nitrate).
- Reduction of p-nitrobenzaldehyde by sodium borohydride.
- Hydrolysis of amides and esters.
- Semicarbazone of any one of the following compounds: acetone, ethyl methyl ketone, cyclohexanone, benzaldehyde.

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- Benzylisothiouronium salt of one each of water soluble and water insoluble acids (benzoic acid, oxalic acid, phenyl acetic acid and phthalic acid).
- Aldol condensation using either conventional or green method.
- Benzil-Benzilic acid rearrangement.
- Preparation of sodium polyacrylate.
- Preparation of urea formaldehyde.
- Preparation of methyl orange.

The above derivatives should be prepared using 0.5-1g of the organic compound. The solid samples must be collected and may be used for recrystallization, melting point and TLC.

2. Qualitative Analysis Analysis of an organic mixture containing two solid components using water, $NaHCO_3$, NaOH for separation and preparation of suitable derivatives.
3. Extraction of caffeine from tea leaves.
4. Analysis of Carbohydrate: aldoses and ketoses, reducing and non-reducing sugars.
5. Identification of simple organic compounds by IR spectroscopy and NMR spectroscopy. (Spectra to be provided).
6. Estimation of glycine by Sorenson's formalin method.
7. Study of the titration curve of glycine.
8. Estimation of proteins by Lowry's method.
9. Study of the action of salivary amylase on starch at optimum conditions.
10. Effect of temperature on the action of salivary amylase.

PHYSICAL CHEMISTRY

Conductometry

- Determination of cell constant
- Determination of equivalent conductance, degree of dissociation and dissociation constant of a weak acid.
- Perform the following conductometric titrations:
  - i. Strong acid vs. strong base
  - ii. Weak acid vs. strong base
  - iii. Mixture of strong acid and weak acid vs. strong base
  - iv. Strong acid vs. weak base
- To determine the strength of the given acid conductometrically using standard alkali solution.
- To determine the solubility and solubility product of a sparingly soluble electrolyte conductometrically
- To study the saponification of ethyl acetate conductometrically.

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8 Hrs. **PRACTICAL EXAMINATION** **M.M.50**

Five experiments are to be performed.

1. **Inorganic** - Two experiments to be performed. Gravimetric estimation compulsory **08 marks**. (Manipulation 3 marks)

   Anyone experiment from synthesis and analysis **04 marks**.

2. **Organic** - Two experiments to be performed. Qualitative analysis of organic mixture containing two solid components. compulsory carrying **08 marks** (03 marks for each compound and two marks for separation).

One experiment from synthesis of organic compound (Single step) **04 marks**.

3. Physical-One physical experiment **12 marks**.
4. Sessional **04 marks**.
5. Viva Voce **10 marks**.

In case of Ex-Students one mark each will be added to Gravimetric analysis and Qualitative analysis of organic mixture and two marks in Physical experiment.

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MICROBIOLOGY

BSc-3rd

Paper- I: Medical Microbiology and Immunology

UNIT-1: AIR BORNE DISEASES

Air borne diseases: Types- Tuberculosis, Pertussis, Diphtheria, Influenza, Small & Chicken pox, Mumps, Measles. Symptoms, treatment and prevention.

UNIT-2: WATER BORNE DISEASES

Concept and cause of water borne diseases; Types, Hepatitis, Dysentery, Diarrhea, Cholera, typhoid. Symptoms, treatment and prevention.

UNIT-3: CLINICAL DISEASE AND DIAGNOSIS

Clinical diseases: Diabetes, Asthma, multiple sclerosis, rheumatoid arthritis, cancer. Symptoms, Treatment and prevention.

UNIT-4: BASIC CONCEPT OF IMMUNITY

Immune system: Structure and function of the cells, tissues and organs of immune system. Types of immunity- humoral and cell-mediated, innate, acquired immunity. **Antigen- Antibody**: types, properties. Hapten, adjuvants, Immuno-globulins: Structure types, Properties and their function - Theory of antibody production.

UNIT-5: IMMUNO DISEASE DIAGNOSIS

Methods based on Ag-Ab interaction- precipitation, agglutination, ELISA, RIA, Immuno-electrophoresis, PCR based diagnosis method for infectious diseases.

Text Books Recommended:

1. Immunology: Kuby.
2. General Microbiology by Power and Daganiwala.
3. Zinssers Microbiology by K. J Wolfgang, McGraw- Hill Company.
4. Medical Microbiology; N. C. Dey and T.K. Dey, Allied agency, Calcutta.
5. Bacteriological Techniques by FJ Baker.
6. A Textbook of Microbiology; Dubey & Maheshwari; S. chand & Sons.
7. Scott's Diagnostic Microbiology by EJ Baron.

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Microbiology

PRACTICAL

M. M. 50

Isolation of bacteria from air and soil (crop fields)
Isolation of fungi from air and soil
Relationship between OD and CFU measurements.
Measurement of fungal growth by dry weight and wet weight
Study of rhizospheric and phyllospheric microbes from economically important plants.
Biodegradation study of some organic molecules
Microbial assessment of potable water.
Determination of BOD, COD and dissolved oxygen.
Determination of blood group by slide agglutination test./TLC/DLC
Determination of heamoglobin.
Determination of quality of milk by MBRT
Isolation of Rhizobium from root nodules.

Scheme of practical examination

Time 4 hour	MM- 50
1. Exercise on immunological test	10
2. Exercise on water analysis	10
3. Exercise on isolation and characterization of micro organism	05
4. Spotting (1 to 5)	10
5. Viva voce	05
6. Sessional	10
	Total- 50

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B.Sc. Part-III

Paper-I

RELATIVITY, QUANTUM MECHANICS, ATOMIC MOLECULAR AND NUCLEAR PHYSICS

Unit-1 Reference systems, inertial frames, Galilean invariance propagation of light, Michelson-Morley experiment, search for ether. Postulates for the special theory of relativity, Lorentz transformations, length contraction, time dilation, velocity addition, variation of mass with velocity, mass-energy equivalence, particle with zero rest mass.

Unit-2 Origin of the quantum theory : Failure of classical physics to explain the phenomena such as black-body spectrum, photoelectric effect, Compton effect, Wave-particle duality, uncertainty principle, de Broglie's hypothesis for matter waves, the concept of Phase and group velocities, experimental demonstration of mater waves. Davisson and Germer's experiment. Consequence of de Broglie's concepts, Bohr's complementary Principle, Bohr's correspondence principle, Bohr's atomic model, energies of a particle in a box, wave packets. Consequence of the uncertainty relation, gamma ray microscope, diffraction at a slit.

Unit-3 Quantum Mechanics: Schrodinger's equation, Statistical interpretation of wave function, Orthogonality and normalization of wave function, Probability current density, Postulatory basis of quantum mechanics, operators, expectation values, Ehrenfest's theorem, transition probabilities, applications to particle in a one and three dimensional boxes, harmonic oscillator in one dimension, reflection at a step potential, transmission across a potential barrier.

Unit-4 Spectra of hydrogen, deuteron and alkali atoms spectral terms, doublet fine structure, screening constants for alkali spectra for s, p, d and f states, selection rules. Discrete set of electronic energies of moleculers, quantisation of vibrational and rotational energies, determination of inter-nuclear distance, pure rotational and rotation vibration spectra. Dissociation limit for the ground and other electronic states, transition rules for pure vibration and electronic vibration spectra. Raman effect, Stokes and anti-Stokes lines, complimentary character of Raman and infrared spectra, experimental arrangements for Raman spectroscopy.

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Unit-5 Structure of nuclei:- Basic Properties of Nuclei: (1) Mass, (2) Radii, (3) Charge, (4) Angular Momentum, (5) Spin, (5) Magnetic Moment (μ), (6) Stability and (7) Binding Energy, Nuclear Models:- Liquid Drop Model, Mass formula, Shell Model, Types of Nuclear reactions, laws of conservation, Q-value of reactions, Interaction of Energetic particles with matter, Ionization chamber, GM Counter, Cloud Chambers, Fundamental Interactions, Classification of Elementary Particles, Particles and Antiparticles, Baryons, Hyperons, Leptons, and Mesons, Elementary Particle Quantum Numbers: Baryon Number, Lepton Number, Strangeness, Electric Charge, Hypercharge and Isospin, introductory idea of discovery of Higg's Boson.

TEXT AND REFERENCE BOOKS:

1. H.S. Mani and G.K. Metha: "Introduction to Modern Physics"" (Affiliated East-West Press, 1989).
2. A Beiser, "Prospective of Modern Physics".
3. H.E. White, Introduction to Atomic Physic".
4. Barrow, "Introduction to Molecular Physics".
5. R.P. Feynman, R.B. Leighton and M Sands, "The Feynman Lectures on Physics", Vol.III (B.I. Publications, Bombay, Delhi, Calcutta, Madras).
6. T.A. Littlefield and N Thorley, "Atomic and Nuclear Physics" (Engineering Language Book Society)
7. H.A. Enge, "Introduction to Nuclear Physics", (Addision-Wesly)
8. Eisenberg and Resnick, "Quantum Physics of Atoms, Molecules, Solids, Nuclei and Particles" (John Wiley)
9. D.P. Khandelwal, "Optics and Atomic Physics", (Himalaya Publishing House, Bombay, 1988).
10. Quarks and Leptons, F. Halzen and A.D. Martin, Wiley India, New Delhi, 1984.
11. Radiation detection and measurement, G.F. Knoll (John Wiley & Sons, 2000).
12. Theoretical Nuclear Physics, J.M. Blatt & V.F.Weisskopf (Dover Pub.Inc., 1991).

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Paper-II

SOLID STATE PHYSICS, SOLID STATE DEVICES AND ELECTRONICS

Unit-1 Amorphous and crystalline solids, Elements of symmetry, seven crystal system, Cubic lattices, Crystal planes, Miller indices, Laue's equation for X-ray diffraction, Bragg's Law, Bonding in solids, classification. Cohesive energy of solid, Madelung constant, evaluation of Parameters, Specific heat of solids, classical theory (Dulong-Petit's law), Einstein and Debye theories, Vibrational modes of one dimensional monoatomic lattice, Dispersion relation, Brillouin Zone.

Unit-2 Free electron model of a metal, Solution of one dimensional Schrödinger equation in a constant potential, Density of states, Fermi Energy, Energy bands in a solid (Kronig-Penny model without mathematical details), Difference between Metals, Insulator and Semiconductors, Hall effect, Dia, Para and Ferromagnetism, Langevin's theory of dia and para-magnetism, Curie- Weiss's Law, Qualitative description of Ferromagnetism (Magnetic domains), B-H curve and Hysteresis loss.

Unit-3 Intrinsic and extrinsic semi conductors, Concept of Fermi level, Generation and recombination of electron hole pairs in semiconductors, Mobility of electrons and holes, drift and diffusion currents, p-n junction diode, depletion width and potential barrier, junction capacitance, I-V characteristics, Tunnel diode, Zener diode, Light emitting diode, solar cell, Bipolar transistors, pnp and npn transistors, characteristics of transistors, different configurations, current amplification factor, FET and MOSFET Characteristics.

Unit-4 Half and full wave rectifier, rectifier efficiency ripple factor, Bridge rectifier, Filters, Inductor filter, L and π section filters, Zener diode, regulated power supply using zener diode, Applications of transistors, Bipolar Transistor as amplifier, h-parameter, h-parameter equivalent circuit, Transistor as power amplifier, Transistor as oscillator, principle of an oscillator and Bark Hausen's condition, requirements of an oscillator, Wein-Bridge oscillator and Hartley oscillator.

Unit-5 Digital Circuits: Difference between Analog and Digital Circuits, Binary Numbers, Decimal to Binary and Binary to Decimal Conversion, AND, OR and NOT Gates (Realization using Diodes and Transistor), NAND and NOR Gates as Universal Gates, XOR and XNOR Gate, De Morgan's Theorems, Boolean Laws, Simplification of Logic Circuit using Boolean Algebra, Digital to Analog Converter, Analog to Digital Converter.

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Physics

TEXT AND REFERENCE BOOKS:

1. Introduction to solid state physics: C. Kittel.
2. Solid State Physics: A.J. Dekkar.
3. Electronic Circuits: Mottershead.
4. Electronic Circuits: Millman and Halkias.
5. Semiconductor Devices: S.M. Sze.
6. Electronic devices: T.L. Floyd.
7. Device and Circuits: J. Millman and C. Halkias.
8. Electronic Fundamental and Applications: D. Chatopadhyay and P.C. Rakshit.
9. Electricity and Magnetism: K.K. Tiwari.

PRACTICALS

Minimum 16 (Eight from each group)

Experiments out of the following or similar experiments of equal standard

1. Determination of Planck's constant.
2. Determination of e/m by using Thomson tube.
3. Determination of e by Millikan's methods.
4. Study of spectra of hydrogen and deuterium (Rydberg constant and ratio of masses of electron proton).
5. Absorption spectrum of iodine vapour.
6. Study of alkali or alkaline earth spectra using a concave grating.
7. Study of Zeeman effect for determination of a Lande g-factor.
8. Analysis of a given band spectrum.
9. Study of Raman spectrum using laser as an excitation source.
10. Study of absorption of alpha and beta rays.
11. Study of statistics in radioactive measurement.
12. Coniometric study of crystal faces.
13. Determination of dielectric constant.
14. Hysteresis curve of transformer core.
15. Hall-probe method for measurement of magnetic field.
16. Specific resistance and energy gap of semiconductor.
17. Characteristics of transistor.
18. Characteristics of tunnel diode.
19. Study of voltage regulation system.
20. Study of regulated power supply.

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B.Sc.(CS)
III Year

COMPUTTER SCIENCE

PAPER - I

(Paper Code-0909)

COMPUTER HARDWARE PART-C

AIM : The emphasis is on the design concepts & organisational details of the common PC, leaving the complicated Electronics of the system to the computer engineers.

Objective of the Course :

1. To introduce the overall organisation of the microcomputers and operating systems.
2. To introduce the interaction of common devices used with computers with operating softwares, excluding the Assembly languages, with special reference to DOS/WINDOWS.
3. To introduce the working of hardware components, Micro-Processor and various chips used in micro-computers by operating system, without the use of electronic circuitry.
4. To introduce the use of operating systems architecture with IBM-PC & clones, excluding Assembly language, with forms an important part of hardwares.

N.B. : Since the computer organisation study is very vast & complicated, so the study is restricted only to the description and understanding part, hence the paper-setter is requested to keep this important factor in mind.

UNIT-1 : ORGANISATION OF Micro-Processor & MIRCO-COMPUTER :-

1. **Introduction & organisation of Micro-Computer :**
   - (a) Basic Components of Micro-computer : Basic Block; Prom ram memory; Data memory; I/O Ports; Clock generator; Integration of functional blocks.
   - (b) Interconnecting Components in a Micro-computer : Necessary functional block; Bussed architecture for microcomputer; memory addressing; Addressing I/O ports; comparision of I/O mapped and memory mapped I/O.
   - (c) Input Output Techniques : Non-CPU devices, Program & interrupt controlled I/O; Hardware controlled I/O or DMA.
2. **An Introduction to the various as :**
   - (a) General understanding of different μP or CPU :
     Intel 8088, 286, 386, 486, 586 Pentium, P54C, MMX P55C; Motorola 6800 & 88100 series; CYRIX & AMD CPUs.
   - (b) The Registers of CPU : (Give Example of P-8088) Register organisation of 8088, Scrach pad segment, pointer, Index and Flag, Registers.
   - (c) Memory addressing modes of P-8088 : Segment offset; Data addressing modes; Addressing for branch instructions.
   - (d) I/O Addressing with P-8088 : Memory mapped I/O & I/O mapped I/O.

UNIT-2 : SYSTEM HARDWARE ORGANISATION OF COMPUTERS :

1. **Hardware Organisation of the Personal Computer :**
   - (a) Block diagram with various parts of PC.
   - (b) The Mother Board of General P.C. : 8088 CPU; ROM & RAM; Keyboard

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& its interface; System timer/counters; Hardware interrupt vectoring; DMA controller & channels; Interfacing to audio speaker; Bus slots & facture cards.

(c) The Serial I/O ports, COM-1 & COM-2.

(d) The parallel Port for Printer.

(e) Expansion Slots for RAM.

(f) Disk Controllers : For floppy, Hard disk, CD-ROM & Cassets drives.

2. **The Video Display of PCs :**

(a) Video Monitors; Monochrome and colour.

(b) Video Display Adapters & Their Video Modes; Monochrome & colour graphics adapters.

(c) Video Control Through ANSI-SYS.

(d) Video Control Through ROM-BOIS : INT 10H.

(e) Direct Video Control; Monochrom & colour graphics adapters.

(f) Installing Customized Character Sets.

UNIT-3 : ORGANISATION OF OPERTING SYSTEM WITH SYSTEM HARDWARE :

1 **The ROM-BIOS Services :**

(a) Introduction to UNIX, ENIX, SUN, solaris, DOS & MAC with special reference to DOS & Windows, its ver., as DOS becomes more popular than others in PCs.

(b) The ROM-BIOS Diskette Services, INT 13H.

(c) The ROM-BIOS Serial Port Services, INT 14H.

(d) The ROM-BIOS Keyboard Services, INT 16H.

(e) The ROM-BIOS Printer Services, INT 17H.

(f) Miscellaneous Service Provided by the ROM-BIOS : INT 05H, INT 11H, INT 12H, INT 18H, INT 19H, INT 1AH.

2 **The fundamental of Operating System viz. DOS/WINDOWS :**

(a) The loading of DOS & Its Basic Structure ; ROM bootstrap, IO.SYS, DOS.SYS & Command..COM.

(b) The Execution of the programs under DOS ; EXEC functions, program segment prefix; Features of COM & EXE program files.

(c) Device Handling by Dos ; FDD, HDD, CON, Keyboard, PRN, AUX, CLOCK and NUL devices; Block devices; Character devices; Driver installation sequence.

(d) File Structures of DOS ;

(e) The DOS Interrupts : INT 20H-2FH

(f) The DOS functions through INT 21H; Discuss only the understanding part of various other DOS function to handle hard & softwares.

(g) Installation of windows : Important system files in windows.

UNIT-4 : ORGANIZATION & HANDLING BY OPERATING SYSTEMS :

1 **Disk and Files under DOS :**

(a) Logical Structure of a Disk : Organisation of disk for use; Boot record ; FAT

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files; disk or root directory.

(b) File Organisation on a DOS disk : Logical volumes ; Sub directories; Volume lables.

(c) Manipulating Files under DOS : File attributes ; date and time, file Access; FCB functions.

2 **Memory Allocation, Program Loading and Execution :**

(a) Memory Management under DOS : EXEC loader; Memory Management & its functions; Modifying a Program's memory allocation.

(b) Loading and Executing Programs under DOS : The EXEC function ; Memory considerations; parameter blocks; calling & returning from EXEC.

(c) Loading the program overlays through EXEC.

UNIT-5 : ORGANISATION OF HARDWARE BY OPERATING SYSTEM :

1. **Interrupt Handling through DOS :**

(a) Types of interrupts.

(b) Interrupt Vector Table in PC.

(c) Interrupt Service Routines.

(d) Special Interrupts in PC : Clock Interrupt; The -C or Break Interrupt ; DOS reserved interupt INT 28H ; Patching memory resident routines.

2. **Filters for DOS :**

(a) Filters in operating systems.

(b) Redirection of I/O under DOS.

(c) The Filters Supplied with DOS.

(d) Writing Filters to run under DOS.

3. **Handling of Various Versions of Windows O.S. :**

(a) Setup Installation

(b) Trouble shooting

(c) Networking features

Text Book :

1. Hardware and Software of Personal Computers.
   By Sanjay K. Bose. (Wiley Eastern Ltd. New Delhi).

Supporting Text Books :

1. Digital System from Gates to Mirooprocessor.
   By Sanjay K. Bose. (Wiley Eastern Ltd. New Delhi).
2. Computer Fundamentals : Architecture & Organisation.
   By B. Ram.. (Wiley Eastern Ltd. New Delhi).

Reference Books :

1. IBM PC-XT and Clones : By Govinda Rajalu.
2. Microprocessor and interfacing : By Douglas Hall.
3. Insight the IBM-PC : Peter Norton.
4. Micriprocessor System : 8086/8088 family architecture, programming & design : By Liu and Gibson.

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PAPER - II

(Paper Code-0910)

Atm : To introduce DBMS and RDBMS using Back-end tool and Front-end tool.

Object of the Course :

1. To introduce Data BAse Management System concepts.
2. To introduce the Relational Database Management System and Relational Database Design.
3. To introduce the RDBMS software and utility of query language.
4. To introduce basic concept of GUI Programming and database connectivity using Visual Basic.

UNIT-1 : CONCEPT OF D.B.M.S. AND DATA MODELS

(a) Introduction to DBMS :- Purpose of Data base systems, views of data, Data Modeling Database Languages, Transaction management, Storage Management, Database Administrator and User, Database System Structure.

(b) E-R Model : Basic concepts, Constraints, Keys, Mapping Constaint, E-R Diagram, Weak and Strong Entity sets, E-R Database Schema, Reduction of an E-R Schema to Table.

UNIT-2. : RELATIONAL DATABASE MANAGEMENT SYSTEM

(a) Relational Model : Structure of Relational Database, Relational Algebra, Domain Relational Calculus, Extended Relational- Algebra Operation, Modification of database, Views.

(b) Relational Database Design : Pitfalls in Relational Database Desing, Decomposition Functional Dependencies, Normalization : 1NF, 2NF, BCNF, 3NF, 4NF, 5NF.

UNIT-3 : INTRODUCTION TO RDBMS SOFTWARE - ORACLE

(a) Introduction : Introduction to personal and Enterprises Oracle, Data Types, Commercial Query Language, SQL, SQL*PLUS.

(b) DDL and DML : Creating Table, Specifying Integrity Constraint, Modifying Existing Table, Dropping Table, Inserting Deleting and Updating Rows in as Table, Where Clause, Operators, ORDER BY, GROUP Function, SQL Function, JOIN, Set Operation, SQL Sub Queries. Views : What is Views, Create, Drop and Retrieving data from views.

(c) Security : Management of Roles, Changing Password, Granting Roles & Privilege, with drawing privileges.

(d) PL/SQL : Block Structure in PL/SQL, Variable and constants, Running PL/SQL in the SQL*PLUS, Data base Access with PL/SQL. Exception Handling, Record Data type in PL/SQL, Triggers in PL/SQL.

UNIT-4 : G.U.I. PROGRAMMING

(a) Introduction to Visual Basic : Event Driven Programming, IDE, Introduction to Object, Controlling Objects, Models and Events, Working with Forms, MDI Form Working with standard Controls.

(b) Overview of Variables, Declaring, Scope, Arrays, User defined data types, Constants, Working with procedures : Function, Subroutine, and Property.

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Working with Data, Time, Format, String, and Math's Function. Controlling Program Execution: Comparison and Logical Operators, If...Then statements, Select Case Statement, Looping Structures, Exiting a loop. Error Trapping and Debugging.

(d) File Organization : Saving data to file, Sequential and Random access file, the desing and coding.

UNIT-5 : V DATA BASE PROGRAMMING IN VB

(a) Introduction :- Concept of DAO, RDO, ADO, input validation : field & form level validation, ADO object model : the ADO object Hierarchy, the connection object, the command object, record set object, parameter object, field object, record object, stream object, Error object, parameter object.

(b) Using Bound control to Present ADO data : Using the ADO data control, ADO data control properties, binding simple controls : Data list, data combo, Data Grid, Data Form Wizard : single form wizard, Grid form, master/Detail form. Programming the ADO data control : Refresh method, Event, Hierarchical flex Grid control.

(c) Data Environment & Data Report : Creating connection, Using command object in the data Environment, Data Environment option and operation, Binding Form to the data Environment, ADO Events in the Data report, Print Preview, Print, Export, Data report in code : Data reports Events, Binding data reports Directly.

REFERENCE BOOKS :

1 Data Base System Concept : By Hery F. Korth, Tata McGraw Hill

2 Fundamental of Data Base System Concept : Nawathe & Elmasri (Pearson educations)

3 Oracle Complete Reference : By Oracle Press

4 Introduction to OOPS & VB : By V.K. Jain, Vikas Publishing House

5 Database Programming VB 6 : By B.P.B. Publication

PRACTICALS :

1 **Practicals on Oracle :**

At least 20 practicals covering the SQL, PL/SQL, Triggers, Views.

2 **Practicals on Visual Basic :**

At least 20 pracricals on VB that covering basic and data controls components.

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21. Study of lissajous figures using CRO.
22. Study of VTVM.
23. Study of RC and TC coupled amplifiers.
24. Study of AF and RF oscillators.
25. Find roots of f(x) = 0 by using Newton-Raphson Method.
26. Find root of f(x) = 0 by using secant method.
27. Integration by Simpson rule.
28. To find the value of V at
29. String manipulations.
30. Towers of Hanoi (Non-recursive).
31. Finding first four perfect numbers.
32. Quadratic interpolation using Newton's forward-difference formula of degree two.

TEXT AND REFERENCE BOOKS:

1. B.G. Strechman, Solid state electronics devices II edition (Prentice-Hall of India New Delhi 1986)
2. W.D. Stanley, Electronics devices, circuits and applications (Prentice-Hall new jersey, USA 1988).
3. S. Lipschutz and A Poe; Schaum's outline of theory and problems of programming with Fortran (Mc Graw-Hill Book Co. Singapore, 1986).
4. C Dixon, Numerical Analysis.

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ELECTRONICS LABORATORY

The scheme of practical examination will be as follows-

Experiment	--	**30**
Viva	--	**10**
Sessional	--	**10**
Total	--	**50**

ELB 303P: INDUSTRIAL ELECTRONICS & PCB Design LAB **MM-25**
(Hardware and Circuit Simulation Software)
Max.Marks:25

1. Study of I-V characteristics of DIAC
2. Study of I-V characteristics of a TRIAC
3. Study of I-V characteristics of a SCR
4. SCR as a half wave and full wave rectifiers with R and RL loads
5. DC motor control using SCR.
6. DC motor control using TRIAC.
7. AC voltage controller using TRIAC with UJT triggering.
8. Study of parallel and bridge inverter.
9. Design of snubber circuit
10. Study of chopper circuits

Design and Fabrication of Printed Circuit Boards

1. Design automation, Design Rule Checking; Exporting Drill andGerber Files; Drills; Footprints and Libraries Adding and Editing Pins, copper clad laminatesmaterials of copper clad laminates, properties of laminates (electrical & physical),
2. Study of soldering techniques. Film master preparation, Image transfer, photo printing, Screen Printing, Plating techniques etching techniques,
3. Study of Mechanical Machining operations,Lead cutting and Soldering Techniques, Testing and quality controls.
4. Study ofLead cutting and Soldering Techniques, Testing and quality controls.

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BIOTECHNOLOGY

List of Practical's

PLANT, ENVIRONMENTAL, INDUSTRIAL AND MEDICAL BIOTECHNOLOGY

1. Preparation of Tissue culture media.
2. Sterilization of plant material.
3. Seed Germination, Root, Shoot and Callus Culture.
4. Determination of total dissolved solids of water.
5. Determination of DO, BOD, COD of water.
6. Determination of Coliform by MPN Test.
7. Production of Enzymes/Antibiotics/Acids.
8. Effect of Biopesticides on microorganism
9. Antigen Antibody interaction- Determination of Blood Group and Rh factor.
10. Widal Test
11. VDRL Test.
12. ELISA Test.
13. Perform of Immuno-diffusion

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SCHEME FOR PRACTICAL EXAMINATION

Time: 4 hrs. **MM-50**

1. Experiment based on Paper - I	
(i) Plant tissue culture	08 marks
(ii) Environment / Industrial	07marks
2. Experiment based on Paper - II	15 marks
3. Spots	10marks
4. *Viva-voce*	05marks
5. Sessional/ Record	05marks

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BIOCHEMISTRY

PAPER - I

MOLECULAR BIOLOGY

UNIT-I BASIC CONCEPTS OF GENETIC INFORMATION

a Nucleic acids as genetic information carriers, experimental evidence e.g. bacterial genetic transformation, Hershey - Chase Experiment, TMV reconstitution rexperiment.

b Central dogma of molecular genetics - current version, reverse transcription and retroviruses.

c Primary structure of nucleic acids and their properties, silent features of eukaryotic, prokaryotic and viral genome; highly repetitive, moderately repretitive and unique DNA sequences.

d Basic concepts about the secondary structures of nucleic acids, 5' 3' direction antiparallel strands, base composition, base equivalence, bae pairing and base stacking in DNA molecule. and buoyant density and their.

UNIT-II STRUCTURAL LAVELS OF NUCLEIC ACIDS AND SEQUENCING

a Scondary and tertiary structure of DNA : Watson and Crick model, A.B. and Z types of DNA major and minor grooves, chirality of DNA, tertiary structure of DNA.

b Structure and properties of RNA; Classes of RNA secondary and tertiary structures.

c Nucleic acid hybridization : Cot T_m value and satellite DNA.

d Sequencing : Restriction and modification system; sequencing of DNA and RNA.

UNIT-III a DNA REPLICATION

DNA replication in prokaryotes - conservative, semi conservative and dispersive types, experimental evidence for semi conservative replication. DNA polymerases, other enzymes and protein factors involved in replication. Mechanism of replication. Inhibitors of DNA replication.

b TRANSCRIPTION

Transcription in prokaryotes RNA polymerase, promoters, initiation, elongation and termination of RNA synthesis, inhibitors of transcription. Reverse transcriptase, post transcriptional processing of RNA in eukaryotes.

UNIT-IV TRANSLATION AND REGULATION OF GENE EXPRESSION

a Genetic code : Basic feature of genetic code, biological significance of degeneracy. Wobble hypothesis, gene within genes and overlapping genes.

b Mechanism of translation : Ribosome tructure, A and P sites, charged tRNA, f-mat-tRNA initiator codon, Shine Dalgarno consensus sequence (AGGA), formation of 70S initiation complex, role of EF-Tu, EF-Ts, EF G and GTP, nonsense codons and release factors RF 1 and RF 2.

c Regulation of gene Expression in prokaryotes : Enzyme induction and repression,

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Bio-Chemisty

PRACTICAL FOR IIIrd YEAR

LABORATORY - III (BCH 305)

1. Estimation of DNA by diphenylamine method.
2. Effect of temperature on the viscosity of DNA using Ostwald's Viscometer.
3. Extraction of RNA and its estimation by Orcinol method.
4. Estimation of hemoglobin by measuring total iron in blood.
5. Estimation of calcium and phosphorus in serum & urine.
6. Estimation of creatine and creatinine in urine.
7. Estimation of immunoglobulins by precipitation with saturated ammonium sulphate.
8. Denaturation fo enzyme, studies on DNA.
9. a Separation of proteins by column chromatography.
   b Determination of proteins by dye binding assay.
10. Separation of proteins by SDS-polyacrylamide gel electrophoresis.

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b. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.

c. Apart from Question No. 1, rest of the paper shall consist of five units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 15 marks.

10. The Year wise Structure & plan of the programme shall be as follows :

SCHEME OF EXAMINATION BCA PART-I

Paper no.	Title of Paper/s	Maximum Marks		Maximum Marks	Minimum Passing Marks
		Theory	Practical		
1.	आधार पाठ्यक्रम–हिन्दी भाषा	75	--	75	26
2.	Foundation Course- English Language	75	--	75	26
3.	Environmental Studies & Human Rights **(Additional & Compulsory)**	75	25	100	33
4.	Discrete Mathematics	100	--	100	33
5.	Computer Fundamental and Concepts of Software	100	--	100	33
6.	PC Software Packages and Programming in C	100	--	100	33
7.	Data Structure	100	--	100	33
8.	Lab-1 Software Packages Lab	--	75	75	25
9.	Lab-2 Programming lab in C	--	75	75	25
	Total Marks	**650**	**150**	**800**	

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LAB-I
SOFTWARE PACKAGES LAB

The lab exercise should be based on MS Windows 7 or higher version and MS Office 2007 or higher version and comprises the theoretical paper as well as practical paper.

Section-A

WINDOWS 7 : Basic Elements of WINDOWS, My Computer, Sharing Devices, Windows Explorer, Accessories: Entertainment, Communication, System Tools, Paint Brush, Calculator, Calendar, Clock, Note Pad, Word Pad Etc., Control Panel, Changing Color and Theme, Changing the Desktop Background, Screen Saver, Adjusting Display Settings, Adjusting Sound, Adjusting the Mouse, Changing the Date and Time.

Section-B

Introduction to MS Word: Menus, Shortcuts, Document types; Working with Documents: Opening Files – New & Existing, Saving Files, Formatting page and Setting Margins, Converting files to different formats- Importing, Exporting, Sending files to others, Editing text documents- Inserting, Deleting, Cut, Copy, paste, Undo, Redo, Find, Search, Replace, Using Tool bars, Ruler- Using Icons, Using help; Formatting Documents: Setting Font Styles, Setting Paragraph style, Setting Page Style, Setting Document Styles, Creating Tables, Drawing, Tools, Printing Documents.

Section-C

Introduction to MS Power Point: Opening new Presentation, Different presentation templates, Setting backgrounds, Selecting presentation layouts, Creating a presentation, Formatting a presentation-Adding style, Color, gradient fills, Arranging objects, Adding Header & Footer, Slide Background, Slide layout, Inserting pictures, movies, tables.

Section-D

Introduction to MS Excel: Introduction: Spreadsheet & its Applications, Opening spreadsheet, Menus & Toolbars & icons, Shortcuts, Working with Spreadsheets-Opening a File, Saving Files, Setting Margins, Converting files to different formats- Importing, Exporting and Sending files to others, Spreadsheet addressing, Entering and Editing Data, Computing data- Setting Formula, Finding total in a column or row, Mathematical operations, Formulas, Formatting Spreadsheets & Printing worksheet.

Section-E:

Introduction MS Access: Database concepts: Tables, Queries, Forms, Reports, Opening & Saving database files: Creating Tables, Table Design, Indexing, Entering data, Importing data, Creating Queries: SQL statements, Setting relationship, Creating Forms: GUI, Form, Creating & printing reports.

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LAB-II
PROGRAMMING LAB IN C

1. Program to find area and circumference of circle.
2. Program to find the simple interest.
3. Program to convert temperature from degree centigrade to Fahrenheit.
4. Program to calculate sum of 5 subjects & find percentage.
5. Program to show swap of two no's without using third variable.
6. Program to reverse a given number.
7. Program to print a table of any number.
8. Program to find greatest in 3 numbers.
9. Program to show the use of conditional operator.
10. Program to find that entered year is leap year or not.
11. Program to find whether given no is even or odd.
12. Program to shift inputed data by two bits to the left.
13. Program to use switch statement. Display Monday to Sunday.
14. Program to display arithmetic operator using switch case.
15. Program to display first 10 natural no & their sum.
16. Program to print Fibonacci series up to 100.
17. Program to find GCD & HCF of given Numbers using Recursion.
18. Program to find whether given no is a prime no or not.
19. Program to display sum of series 1+1/2+1/3+.....+1/n.
20. Program to display series and find sum of 1+3+5+.....+n.
21. Program to use bitwise AND operator between the two integers.
22. Program to add two number using pointer.
23. Program to find sum, subtraction, multiplication & transpose of matrices.
24. Program to reverse a number using pointer.
25. Program to show input and output of a string.
26. Program to find square of a number using functions.
27. Program to swap two numbers using functions.
28. Program to find factorial of a number using functions.
29. Program to show table of a number using functions.
30. Program to show call by value.
31. Program to show call by reference.
32. Program to find largest of two numbers using functions.
33. Program to find factorial of a number using recursion.
34. Program to find whether a string is palindrome or not.

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The break-up of marks for second Year's Practical will be as under :			
Sr. No.	Argument	Maximum Marks	Minimum Passing Marks
1.	Lab Record	15	
2.	Viva-voce	20	
3.	Program Development and Execution	40	
Total Marks		75	25

SCHEME OF EXAMINATION

Paper no.	Title of Paper/s	Maximum Marks		Maximum Marks	Minimum Passing Marks
		Theory	Practical		
1.	आधार पाठ्यक्रम–हिन्दी भाषा	75	--	75	26
2.	Foundation Course- English Language	75	--	75	26
3.	Operating System	100	--	100	33
4.	Digital Electronics and Microprocessor	100	--	100	33
5.	Computer Networks and Cyber Technology	100	--	100	33
6.	Object Oriented Programming Using C++	100	--	100	33
7.	Computer Graphics and Multimedia	100	--	100	33
8.	Lab-1 Programming Lab Using C++	--	75	75	25
9.	Lab- 2 Multimedia Lab	--	75	75	25
	Total Marks	**650**	**150**	**800**	

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LAB-I
PROGRAMMING LAB USING C++

List of Sample Problems/Experiments:

1. Write a C++ program to find the sum of individual digits of a positive integer.
2. A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1.Subsequent terms are found by adding the preceding two terms in the sequence.Write a C++ program to generate the first n terms of the sequence.
3. Write a C++ program to generate all the prime numbers between 1 and n , where n is a value supplied by the user.
4. Write C++ programs that use both recursive and non-recursive functions
   a. To find the factorial of a given integer. b. To find the GCD of two given integers.
   c. To find the nth Fibonacci number.
5. Write a C++ program that uses a recursive function for solving Towers of Hanoi problem.
6. Write a C++ program to find both the largest and smallest number in a list of integers.
7. Write a C++ program to implement the matrix ADT using a class. The operations supported by this ADT are:
   a)Reading a matrix. c) Addition of matrices.
   b)Printing a matrix. d) Subtraction of matrices.
   e)Multiplication of matrices.

Note: Practical must be as per syllabus of theoretical paper.

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LAB-II
MULTIMEDIA LAB

Series of Practical Curriculums

Photoshop:

1. (i) Handling different file formats and interchanging them, changing the resolution, color, grayscales and size of the images
(ii) Using brushes and creating multicolor real life images
2. Cropping, rotating, overlapping, superimposing, pasting photos on a page
3. Creation of a single image from selected portions of many
4. Developing a commercial brochure with background tints
5. Creating an image with multi-layers of images and texts.
6. Applying masks and filtering on images

7. CorelDRAW X4 Part 1

- Getting Started with CorelDRAW
- Starting CorelDRAW
- Working with Command Bars
- Working with Layers
- Examining a Master Page
- Creating a Master Layer
- Working with Layers
- Using Brush Tools and Adding Objects
- Working with Interactive Tools
- Using Advanced Techniques for Text Manipulation
- Working with Paragraph Text
- The PowerClip Feature and the Envelope Tool
- Creating Bulleted Lists
- Working with Vector and Bitmap Graphics
- Converting Vector Objects to Bitmaps
- Working with Bitmap Graphics
- Introduction to CorelTRACE
- Advanced Output Options
- Preparing a Document For Printing
- Other Printing Options

The break-up of marks for Fourth Year's Practical will be as under :			
Sr. No.	Argument	Maximum Marks	Minimum Passing Marks
1.	Lab Record	15	
2.	Viva-voce	20	
3.	Program Development and Execution	40	
Total Marks		75	25

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SCHEME OF EXAMINATION

Paper no.	Title of Paper/s	Maximum Marks		Maximum Marks	Minimum Passing Marks
		Theory	Practical		
1.	आधार पाठ्यक्रम–हिन्दी भाषा	75	--	75	26
2.	Foundation Course- English Language	75	--	75	26
3.	Computer Organization and Architecture	100	--	100	33
4.	Software Engineering	100	--	100	33
5.	Database Design and RDBMS (Oracle)	100	--	100	33
6.	Web Technology	100	--	100	33
7.	Numerical Analysis	100	--	100	33
8.	Lab-1 RDBMS & Web Technology	--	75	75	25
9.	Lab-2 Minor Project	--	75	75	25
	Total Marks	**650**	**150**	**800**	
	Grand Total Marks of BCA- I, II & III			**2400**	

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LAB-I
RDBMS & WEB TECHNOLOGY
Practical as per syllabi of theoretical paper.

The break-up of marks for Third Year Practical will be as under :			
Sr. No.	Argument	Maximum Marks	Minimum Passing Marks
1.	Lab Record	15	
2.	Viva-voce	20	
3.	Program Development and Execution	40	
	Total Marks	75	25

BCA PART-III
LAB-II
Minor Project

The break-up of marks for Project will be as under :			
Sr. No.	Argument	Maximum Marks	Minimum Passing Marks
1.	Project Report	25	
2.	Viva-voce/ Presentation	25	
3.	Project Execution	50	
	Total Marks	100	50

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SCHEME OF EXAMINATION FOR ONE YEAR DCA PROGRAMME
w.e.f. Session 2017-18

Paper No.	Title of the Paper/s	Term End Examination Maximum marks	Total Maximum Marks	Minimum Passing Marks in Term End Examination
I	Fundamentals of Computers	100	100	33
II	Windows & PC Packages	100	100	33
III	Print Technology and Desktop Publishing	100	100	33
IV	Internet and Web Technology	100	100	33
V	Programming in C	100	100	33
VI	Introduction to Operating System	100	100	33
VII	LAB-I PC Package and DTP Lab	100	100	33
VIII	LAB-II Programming in C Lab	100	100	33
		Total Marks	**800**	

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PAPER-VII
LAB-I
PC PACKAGE AND DTP LAB

Note: - Practical should cover syllabus of respected theoretical papers.

The break-up of marks for Practical will be as under :			
Sr. No.	Argument	Maximum Marks	Minimum Passing Marks
1.	Lab Record	20	
2.	Viva-voce	30	
3.	Program Development and Execution	50	
	Total Marks	100	33

PAPER-VIII
LAB-II
PROGRAMMING IN C LAB

Note: - Practical should cover syllabus of respected theoretical papers.

The break-up of marks for Practical will be as under :			
Sr. No.	Argument	Maximum Marks	Minimum Passing Marks
1.	Lab Record	20	
2.	Viva-voce	30	
3.	Program Development and Execution	50	
	Total Marks	100	33

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प्रपत्र

विषय / संकाय / प्रश्न–पत्र का नाम– **B.Com.(Computer Application)**

कमांक	कक्षा का नाम	वर्तमान पाठ्यक्रम	नवीन संशोधित पाठ्यक्रम	नवीन संशोधित पाठ्यक्रम का औचित्य
1.	1st Year	COMPUTER FUNDAMENTALS AND OFFICE AUTOMATION	COMPUTER FUNDAMENTAL	Updation Required
2.	1st Year	COMPUTERIZED FINANCIAL ACCOUNTING	PC SOFTWARE AND MULTIMEDIA	Updation Required
3.	1st Year	PRACTICAL	PRACTICAL	Updation Required
4.	2nd Year	INTERNET APPLICATION & E-COMMERCE	INTERNET APPLICATION & E-COMMERCE	No Change
5.	2nd Year	RELATIONAL DATABASE MANAGEMENT SYSTEM	RELATIONAL DATABASE MANAGEMENT SYSTEM	No Change
6.	2nd Year	PRACTICAL	PRACTICAL	No Change
7.	3rd Year	PROGRAMMING IN VISUAL BASIC	PROGRAMMING IN VISUAL BASIC	No Change
8.	3rd Year	SYSTEM ANALYSIS, DESING & MIS	SYSTEM ANALYSIS, DESING & MIS	No Change
9.	3rd Year	PRACTICAL	PRACTICAL	No Change

केन्द्रीय अध्ययन मंडल के अध्यक्ष एवं सदस्यों का हस्ताक्षर

S.N.	Name	Designation/University/College	Signature with Date
1.	Dr. Sanjay Kumar	Head, S.o.S. in Computer Science & I.T., Pt. R.S. University, Raipur	11-06-2018
2.	Mr. Hari Shankar Prasad Tonde	Head, Dept. of Computer Science, Sarguja University, Ambikapur	11-06-18
3.	Dr. Anuj Kumar Dwivedi	Head, Dept. of Computer Science, Govt. V.B.S.D. Girls College, Jashpur Nagar, Jashpur	11/6/2018
4.	Mr. L.K. Gavel	Head, Dept. of Computer Science, Govt. G.S.G. P.G. College Balod	11/06/18
5.	Dr. J. Durga Prasad Rao	Head, Dept. of Computer Science, Shri Sankracharya Mahavidyalaya, Bhilai	11/6/18

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Practical

- At least 20 Practical based on Syllabus of Paper-I and Paper-II.

11-06-2018
(Dr. Sanjay Kumar)

11/6/2018
(Dr. A.K. Dwivedi)

11/6/18
(L.K. Sahel)

11/6/18
(Dr. J. Durga Prasad Rao)

11-06-18
Hari Shanker Prasad Tandel

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B. Com II year
(Computer Application)

COMPUTER APPLICATION

MARKS DISTRIBUTION

Theory Paper	Paper - I	Total Marks - 50
	Paper - II	Total Marks - 50

Every unit of theory paper will consists of 10 marks.

Practical Paper	Total Marks - 50

Practical Marks Distribution :

Viva	- 10
Internal	- 15
Practical	- 25
Total Marks	- 150

Practical Test will consist of 3 Hrs.

Syllabus of B.Com.-II (Computer Application)

PAPER - I

INTERNET APPLICATION & E-COMMERCE

(Paper Code-1139)

UNIT - I Introduction to HTML

Introduction to Internet & World Wide Web

Internet - Indian and the Internet, Profile of Indian Surfer, History of the Internet, Indian Internet History, Technological Foundation of Internet, Application in Internet Environment, Movement of files/data between two computers, TCP/IP, IP Addresses, Domain Name System, Domain Name Services, allocation of second level domains in India, Internet & India.

World Wide Web (WWW) - WWW consortium browsing and Information retrieval, exploring the WWW, address : URL.

UNIT - II

Introduction to HTML & Designing Web Page

Concept to Website, Web standards, What is HTML, HTML documents / file, HTML Editor, Explanation of the structure of Homepage, Elements in HTML Documents, HTML Elements, HTML Tags & Basic HTML Tags, viewing the source of web page & downloading the web page source, Extensible HTML, CSS, XML, XSL.

HTML Document Structure - Head Section

Illustration of Document Structure, Mark-up elements within the Head : BASE, ISINDEX, LINK, META, TITLE, SCRIPT.

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11-06-2018
(Dr. Sanjay Sharma)

11/6/18
(Dr. A.K. Dewangan)

11/06/18
(L.K. Sahu)

11.06.18
Hari Shankar Prasad Tande

11/6/18
(Dr. J. Durga Rao)

UNIT - V

(a) **Security** : Management of Roles, Changing Password, Granting Roles & Privilege, with drawing privileges.

(b) **PL/SQL** : Block Structure in PL/SQL, Variable and constants, Running PL/SQL in the SQL*PLUS, Data base Access with PL/SQL, Exception Handling, Record Data type in PL/SQL, Triggers in PL/SQL.

SUGGESTED BOOKS :

1 Data base system : Korth & Siberschatz.

2 An Introduction to Data base System : C.J. Date

PAPER - III

PRACTICAL EXERCISES BASED ON PAPER I & II

Practicals to be done :

1 Creating simple Web-pages using html.

2 Designing *business web-sites* using HTML features (e.g. html forms)

[Each student should study the existing *business web-sites* and do atleast 05 exercises to create business websites using various html features]

3 Should perform various queries using SQL.

[Each student should create ER diagrams for various business scenario, and convert it into tables, using any RDBMS Software (i.e. Oracle / Access)

4 Practical using various aspects of Oracle.

[At least 10 practical-exercises covering the contents of paper-II]

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11/06/18 (L.K. Gavel)

11-06-18 Hari Shankar Prasad Pande

11/6/18 (Dr. J. Jagan Pandey)

11-06-2018 (Dr. Sanjay Kumar)

UNIT-IV **Introduction to MIS & Other Subsystem-**

Evolution of MIS, Need of MIS, Definition & Benefits of MIS, Characteristic, Role component of Information system, data base as a future of MIS, Decision making, logic of Management Information system. Structure of MIS.

UNIT-V **Information System Concept -**

Difference between Transaction Processing. System (TPS) and Management Information System, How MIS works, MIS and Information Resource Management, Quality information Building Blocks for the information system, information system concept, Other system characteristic (Open & Closed System), difference between MIS & Strategic System, Adaptive system, Business function information system.

BOOK REFERENCE :

1. System Analysis and Design - Elias M. Awad.
2. System Analysis and Design - Alan Dennis & Barbara Haley Wixo.
3. Management Information systems - C.S.V. Murthy, Himalaya Publication House.

PAPER - III

PRACTICAL EXERCISES BASED ON PAPER I & II

Practicals to be done -

1. At least 25 practical - exercises covering the contents of paper - I (e.g. Designing calculator, sorting of elements, Generating Fibbonacci series)
2. Design the Project on one of the following - Application Software / Website Design/ Accounting software / Inventory control System / System Software & other (e.g. Library Management System, Medical management, Stock Management, Hotel Management, Website for your institute / Website of any Organization)
3. The Project Report cover the following topic - Objective, Hardware & Software Requirements, Analysis, Design, Coding, input forms, testing, Reports, Future enhancement of s/w
4. Practical exam is based on the Project Demonstration & report.

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11/06/18 (L.K. Gavel)

11.06.18 Hari Shankar Prasad Tande

11/6/18 (Dr J. Durga Pd.)

11-06-2018 (Dr. Sanjay Kumar)

YEAR WISE PLAN
PGDCA

S.N.	Subject Name	End Semester Examination Maximum Marks	End Semester Examination Minimum Passing Marks
1.	Fundamentals of Computer and Information Technology	100	40
2.	PC- Packages and Computerized Accounting System	100	40
3.	Data Communication and Computer Network	100	40
4.	Programming using 'C' & C++	100	40
5.	Relational Database Management System (Oracle)	100	40
6.	System Analysis & Design	100	40
7.	PC Package and Tally ERP Lab	50	17
8.	C,C++ and Oracle Lab	50	17
9.	Project	100	40

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PC Package & Tally ERP Lab

Note: Practical should be as per syllabus of theoretical papers.

C, C++ & Oracle Lab

Note: Practical should be as per syllabus of theoretical papers.

PROJECT

Note:

01. It is compulsory, that students would have group of maximum of two students and project should be done under Government sectors/ Public Sector/ Pvt. Limited S/W Company/ Software Technology park of India/ ISO 9001 certified company etc.
02. The students should not make any project under local or private institutions.
03. The students should make project themselves and project will not be copy of other project.

Steps for Live Project

01. Getting customer's requirements
02. Designs, database and business logics.
03. Developing software application project.
04. Testing and implementing the project.
05. Troubleshooting the project application after implementation.

The break-up of marks for Practical will be as under :			
Sr. No.	**Argument**	**Maximum Marks**	**Minimum Passing Marks**
1.	Lab Record	10	
2.	Viva-voce	20	
3.	Program Development & Execution	20	
Total Marks		50	17

The break-up of marks for Practical will be as under :			
Sr. No.	**Argument**	**Maximum Marks**	**Minimum Passing Marks**
1.	Project Report	25	
2.	Viva-voce/ Presentation	25	
3.	Project Execution	50	
Total Marks		100	40

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YEAR WISE PLAN
PGDCA

S.N.	Subject Name	End Semester Examination Maximum Marks	End Semester Examination Minimum Passing Marks
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6.	System Analysis & Design	100	40
7.	PC Package and Tally ERP Lab	50	17
8.	C,C++ and Oracle Lab	50	17
9.	Project	100	40

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PC Package & Tally ERP Lab
Note: Practical should be as per syllabus of theoretical papers.

C, C++ & Oracle Lab
Note: Practical should be as per syllabus of theoretical papers.

PROJECT

Note:

01. It is compulsory, that students would have group of maximum of two students and project should be done under Government sectors/ Public Sector/ Pvt. Limited S/W Company/ Software Technology park of India/ ISO 9001 certified company etc.
02. The students should not make any project under local or private institutions.
03. The students should make project themselves and project will not be copy of other project.

Steps for Live Project

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The break-up of marks for Practical will be as under :			
Sr. No.	**Argument**	**Maximum Marks**	**Minimum Passing Marks**
1.	Lab Record	10	
2.	Viva-voce	20	
3.	Program Development & Execution	20	
Total Marks		50	17

The break-up of marks for Practical will be as under :			
Sr. No.	**Argument**	**Maximum Marks**	**Minimum Passing Marks**
1.	Project Report	25	
2.	Viva-voce/ Presentation	25	
3.	Project Execution	50	
Total Marks		100	40

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Books Recommended

1. Manual of Foreign Exchange H.E Evitt.
2. A Text book on Foreign Exchange P.Einziti.
3. Foreign Exchange Arthmtic V.V. Keshkamat.
4. Principles and Arithmetic of Foreign Exchange O.S. Ramamurty.
5. Finance of Foreign Trade and Foreign Exchange V.V.Venkatraman
6. Foreign Exchange and Introduction .V.V. Keshkamat.
7. Finance of Foreign Trade and Foreign Exchange G S. Lall.
8. Finance of Foreign trade and Foreign Exchange B.C.Ajmera.

Procedure of Internal evaluation for the students of Diploma course of Banking.

1. Internal evaluation would be a countinuous process which may take the form of graidings for class participation and home assigment Each candidate will be required,to (i) Submit two howme assignment in the form of two papers concerning each subject and (ii) Participate in class discussion and seminars.On the basis of this grading the teacher concerned would prepare the subject wise award lists.
2. The Papers submitted by the students will be returned to the dodidates after evaluation .if the papers are not found upto the standard The students if he so desires, will be advised to resubmit the paper on the lines suggested by the teacher and the papers then will be finally as sessed.
3. The award list,as finalised by the head of the department of commerce of the institute would be forwarded to the University , through the principal of the institute,ordinarily by the 31st March.
4. Distribution of marks between examination and internal assessment will be 75/25.
5. The marks of Internal assessment obtained by student will be carried over towards his subsequent examination in which he appears as ex student if he has obtained more than 48% marks in each internal evaluations

COURSE DETAILS FOR

P/G DIPLOMA IN BUSINESS MANAGEMENT

PAPER -1	MANAGEMENT CONCEPTS AND ORGANISATIONAL BEHAVIOUR
PAPER -2	PORTFOLIO - MANAGEMENT AND TOTAL QUALITY MANAGEMENT
PAPER - 3	HUMAN RESOURCE MANAGEMENT
PAPER - 4	PRODUCTION AND OPERATION MANAGEMENT
PAPER - 5	MARKETING RESEARCH AND CONSUMER BEHAVIOUR

Students will have to visit any industry and prepare a report under the guidence of their mead of the department The "Viva-Voce" will be held immeddiately after or before the annual Examination.

A.	Theory Paper (5 Paper)	- 500 Marks
B.	Industrial visit report	- 100 Marks
C.	Viva - Voce	- 100 Marks
D.	Internal Marks for Class activities	- 100 Marks

All students have to give three internal written tests for each theory Paper Each test will Carry 25 Marks and minimum Passing Marks will be .....12 for each test. Average of best of the three written papers will be count for annual result of internal evalution

- An external examiner will be appointed to conduct the viva-voce by University.
- The report of the Industrial visit will be valued by External Examiner.

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SEMESTER SYLLABUS

M.A. GEOGRAPHY

SCHEME OF EXAMINATION & DISTRIBUTION OF MARKS

SEMESTER – I

Paper No.	Title of the Paper(s)	Internal Assessment	Term End Exam	Total Marks
1.	Geomorphology	20	80	100
2.	Climatology	20	80	100
3.	Evolution of Geographical thoughts	20	80	100
4.	Geography of India	20	80	100
Prac-1	Instrumental Survey	-	-	100
			Total	500

SEMESTER – II

Paper No.	Title of the Paper(s)	Internal Assessment	Term End Exam	Total Marks
1.	Applied Geomorphology	20	80	100
2.	Oceanography	20	80	100
3.	Geographical Methodology	20	80	100
4.	Geography of Chhattisgarh	20	80	100
Prac-1	Cartography	-	-	100
			Total	500

SEMESTER – III

Paper No.	Title of the Paper(s)	Internal Assessment	Term End Exam	Total Marks
1.	Rural Settlement Geography	20	80	100
2.	Resource Geography	20	80	100
3.	Regional Planning & Development	20	80	100
4.	Population Geography with special reference of world	20	80	100
Prac-1	Statistical Technique & field survey			100
			Total	500

SEMESTER – IV

Paper No.	Title of the Paper(s)	Internal Assessment	Term End Exam	Total Marks
1.	Population Geography with special reference of India	20	80	100
2.	Urban Geography	20	80	100
3.	Agricultural Geography	20	80	100
4.	Resource Conservation & Management	20	80	100
Prac-1	Advanced Cartography	-	-	100
			Total	500

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SEMESTER SYLLABUS

M.A. GEOGRAPHY

M.A. I SEMESTER PRACTICAL
INSTRUMENTAL SURVEY

1. surveying- importance of instrumental surveying and application -survey instruments.
2. **Prismatic Compass-**

   Method of prism pass surveying: Radiation, inter section and traverse, correction of bearing, Elimination the closing error, Bow ditch method.
3. **Plane table-**

   Plan preparation, methods of plane table surveying - radiation, inter section, traverse & resection method.
4. **Dumpy level:-**

   Meaning of the terms used in leveling Method of leveling:- simple leveling, differential leveling. Profile.
5. **Theodolite:-**Meaning of terms used in theodolite surveying, measurement of horizontal distance & vertical height, accessible and non accessible method, digital surveying equipment- Electronic Distance measurement (EDM) instruments, total station, global positioning system (GPS).

SUGGESTED READINGS-

1.. Monk house, F.J. & H.R. Wilkinson : Map and Diagrams, methouen, London.

2. Singh, L. R. : Practical Geography.

3. शर्मा, जे.पी., :प्रायोगिक भूगोल

4.चौहान, पी.आर. : प्रयोगात्मक भूगोल

5.यादव, हीरालाल, प्रायोगिक भूगोल

6.चंद्रकारपी. सर्वेक्षण विधि तंत्र, एस. शारदा पब्लिकेशन, बिलासपुर

7.SarkarAashish Practical Geography

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SEMESTER SYLLABUS

M.A. GEOGRAPHY

M.A. Geography Semester I shall consist the following papers :

1. The M.A. Semester -1 examination in Geography shall consist of 500 marks.
2. The theory papers shall be of three hours duration.
3. Candidates will be required to pass separately in theory and practical examination.
4. a) In the practical examination the following shall be allotment of time and marks.

i)	Practical Record	20% Marks
ii)	Survey (up to six hours)	70% Marks
iii)	Viva on i and ii	10% Marks

b) The external and internal examiners shall jointly submit marks.

c) All the candidates shall present at the time of the practical examination their practical record regularly signed by the teachers concerned.

PRINCIPAL

M.A. GEOGRAPHY
SEMESTER-II

PRACTICAL

OBEJECTIVES:

To apprise the student with latest trends in the development of cartography as a tool in mapping thematic and quantitative data to facilitate spatial analysis and synthesis. To enhance the skill of the students in field of survey and to understand the basic

1. Principles of Map making & concept of Cartography
2. Topographical information: International Series, South East Asia Series, Indexing, Classification and interpretation of topographical sheets, profiles
3. Morphometric Analysis: Hypsometric curve, Altimetry cursive, Histogram, Clinograph, Slope Analysis, Wentworth's Method, smith method.
4. Graphs and diagrams: Triangular Diagram, Ergo graph. Rainfall dispersion diagram Proportional circle, Spheres and cubes diagram.
5. Map Projection construction of world map projection.

SUGGESTED READINGS-

1.. Monk house, F.J. & H.R. Wilkinson : Map and Diagrams, methouen, London.
2. Singh, L. R. : Practical Geography.
3. शर्मा, जे.पी., :प्रायोगिक भूगोल
4.चौहान, पी.आर. : प्रयोगात्मक भूगोल
5.यादव, हीरालाल,प्रायोगिक भूगोल
6.चंद्रकारपी. सर्वेक्षणविधि तंत्र, एस. शारदा पब्लिकेशन, बिलासपुर
7.सरकारआशीष, प्रायोगिकभूगोल,

M.A. Geography Semester-II shall consist the following papers :

1. The M.A. Semester - II examination in Geography shall consist of 500 marks.
2. The theory papers shall be of three hours duration.
3. Candidates will be required to pass separately in theory and practical examination.
4. a) In the practical examination the following shall be allotment of time and marks.

i)	Lab work (up to three hours)	70% Marks
ii)	Practical Record	20% Marks
iii)	Viva	10%Marks

b) The external and internal examiners shall jointly submit marks.

c) All the candidates shall present at the time of the practical examination their practical record regularly signed by the teachers concerned.

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M.A. GEOGRAPHY
SEMESTER-III

STATISTICAL TECHNIQUE AND FIELD SURVEY

1. Statist :Correlation, Probability, Hypothesis testing, chi test, f test meak center, Nearest neighbor Analysis
2. Project work - Micro region basis physical, socio-economic survey about project report in 50 pages
3. Excursion

SUGGESTED READINGS-

1.. Monk house, F.J. & H.R. Wilkinson : Map and Diagrams, methouen, London.
2. Singh, L. R. : Practical Geography.
3. शर्मा, जे.पी., :प्रायोगिक भूगोल
4. चौहान, पी.आर. : प्रयोगात्मक भूगोल
5. यादव, हीरालाल, प्रायोगिक भूगोल
6. चंद्रकारपी, सर्वेक्षणविधि तंत्र, एस. शारदा पब्लिकेशन, बिलासपुर
7. सरकार आशीष, प्रायोगिक भूगोल.

M.A. Geography Semester-III shall consist the following papers :

1. The M.A. Semester - III examination in Geography shall consist of 500 marks.
2. The theory papers shall be of three hours duration.
3. Candidates will be required to pass separately in theory and practical examination.
4. a) In the practical examination the following shall be allotment of time and marks.

i)	Lab work (up to two hours)	30% Marks
ii)	Project Report	40% + 10% Marks
iii)	Excursion	10 % Marks
iv)	Viva on i and III	10 % marks

b) The external and internal examiners shall jointly submit marks.

c) All the candidates shall present at the time of the practical examination their practical record regularly signed by the teachers concerned.

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SEMESTER SYLLABUS

M.A. GEOGRAPHY

M.A. GEOGRAPHY
SEMESTER - IV

ADVANCE CORTOGRAPHY

1. **Themalic maps :**
   Choropleth, Isopleth, Dot method, flow map-
2. **Geological Maps:**
   Basic definition, Interpretation Conformable series and unconformable series
3. **Remote sensing:**
   Fundamental of Remote sensing, Components of Image Interpretation
4. **GIS :**
   An overview of GIS Software, Elements of GIS
5. **Computer Cartography :**
   Advantages of computer cartography, Creation of Graphs and Maps.

SUGGESTED READING :

1- American Society of Photogrammetry : Manual of Remote Sensing, ASP, Falls Church V.A., 1983.

2- Barett E.G. and L.F. Curits : Fundamentals of Remote sensing and AIR photo Interpretation on, Memillan, New York, 1992.

3- Compbell J. : Introduction of Remote Sensing, Guilford, New York, 1989.

4- Curran, Paul J. : Principles of Remote Sensing, Longman, London 1985.

5- Burrought P.A. Principles of Geographic Information systems of Land Reson Assessment Oxford University Press, New York 1986.

6- चैनियाल, देवीदत्त रू सुदूरसंवेदन एवं भौगोलिक सूचना प्रणाली

M.A, Geography Semester-IV shall consist the following papers :

1. The M.A. Semester - IV examination in Geography shall consist of 500 marks.
2. The theory papers shall be of three hours duration.
3. Candidates will be required to pass separately in theory and practical examination.
4. a) In the practical examination the following shall be allotment of time and marks.

i)	Lab work (up to three hours) (Lab work 25% and viva 5%)	70% Marks
ii)	Practical Record	20% Marks
iii)	Viva	10% Marks

b) The external and internal examiners shall jointly submit marks.

c) All the candidates shall present at the time of the practical examination their practical record regularly signed by the teachers concerned.

PRINCIPAL

	General Insurance			

SCHEME OF EXAMINATION & DISTRIBUTION OF MARKS

महत्वपूर्ण नोटः–

1. एम.कॉम प्रथम, द्वितीय तथा तृतीय सेमेस्टर में सभी प्रश्न–पत्र अनिवार्य होंगे। उक्त परीक्षा में वैकल्पिक प्रश्न–पत्र चयन की व्यवस्था नहीं होगी।
2. एम.कॉम चतुर्थ सेमेस्टर में विशिष्टीकरण समूह (A),(B) या (C) में से किसी भी एक वैकल्पिक समूह का चयन कर उस समूह के सभी चार प्रश्न–पत्र अनिवार्य रूप से लेने होंगे।
3. एम.कॉम. चतुर्थ सेमेस्टर में उपरोक्त विशिष्टीकरण समूह के अतिरिक्त 50 अंक की मौखिक परीक्षा तथा 50 अंक का परियोजना प्रतिवेदन (अधिकतम 50 पृष्ठों का) तैयार करना अनिवार्य होगा। यह प्रतिवेदन वाणिज्य या प्रबंध विषय से संबंधित होगा।
4. सभी प्रश्न–पत्रों में लिखित परीक्षा 80 अंकों की तथा 20 अंकों की आंतरिक मूल्यांकन परीक्षा होगी।
5. आंतरिक परीक्षा एवं बाह्य परीक्षा में प्रश्न पत्रवार न्यूनतम उत्तीर्णांक 36 प्रतिशत होगा। जो विश्वविद्यालयीन अध्यादेश के प्रावधानों के अनुसार होगा।

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(छत्तीसगढ़)

सेमेस्टर पाठ्यक्रम

M.Sc. ZOOLOGY

SCHEME OF EXAMINATION & DISTRIBUTION OF MARKS

SEMESTER - I

Paper No.	Title of the Paper	Marks	
		External	Internal
I	Invertebrate structure and function, Minor Phyla	80	20
II	Animal Behaviour	80	20
III	Quantitative Biology	80	20
IV	Ecology and environmental physiology	80	20
	M.Sc. Zoology Lab Course I	100	
	M.Sc. Zoology Lab Course II	100	

SEMESTER - II

Paper No.	Title of the Paper	Marks	
		External	Internal
I	General & comparative endocrinology of vertebrates	80	20
II	Gamete biology and reproductive physiology in human beings	80	20
III	Molecular cell biology	80	20
IV	Tools and techniques for biology	80	20
	M.Sc. Zoology Lab Course I	100	
	M.Sc. Zoology Lab Course II	100	

SEMESTER - III

Paper No.	Title of the Paper	Marks	
		External	Internal
I	Comparative anatomy of vertebrates	80	20
II	Biosystematics, taxonomy & biodiversity	80	20
III	Immunology and developmental biology	80	20
IV	Population genetics & evolution	80	20
	M.Sc. Zoology Lab Course I	100	
	M.Sc. Zoology Lab Course II	100	

SEMESTER - IV

Paper No	Title of Paper	Marks	
		External	Internal
I	General physiology and neurophysiology (*compulsory*)	80	20
II	Biochemistry and metabolic regulation and cell function (*compulsory*)	80	20
Optional Group-I			

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III	Fish(Ichthyology) structure and function	80	20
IV	Applied Fisheries	80	20
Optional Group-II			
III	Cell biology	80	20
IV	Cellular organization and molecular organization	80	20
Optional Group-III			
III	Entomology	80	20
IV	Applied Entomology	80	20
Optional Group-IV			
III	Wildlife conservation	80	20
IV	Environment and biodiversity conservation	80	20
	M.Sc. Zoology Lab Course I	100	
	M.Sc. Zoology Lab Course II	100	

Student has choice to opt. For any one group out of four optional groups.(Paper III and IV in semester four)

Each theory paper will have 5 questions of equal marks. First question will be compulsory encompassing all the five units without any internal choice, whereas rest questions will be unit wise with internal choice.

Internal Assessment shall comprise of two parts- Ten marks for test and ten marks for seminar/ assignment /presentation.

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SEMESTER-I
LAB-COURSE I

Time-06 Hours
Max. Marks-100

Invertebrates

1. Study of non-chordates through museum specimen
2. Study of permanent slides of non-chordates
3. Dissection of representative types (invertebrates)
4. Squilla, Mytilus, Sepia, Aplysia, Echinus

5. Mounting-

Permanent and suitable stained micro-preparation
Earthworm-nerve ring, ovary, spermathecal, nephridia
Cockroach-mouth parts , salivary glands, trachea
Prawn appendages, statocyst
Protozoan- rhizopods, flagellates and ciliates (fresh water forms) prolozoon ullase
Porifera-spicule sand gemmules of fresh water sponges
Crustaceans and rotifers
Larval forms of the free living invertebrates

Animal behaviour-

6. Experiments related to Animal Behaviour

Feeding behaviour in house fly
Life cycle of Lac insect and honey bee (chart/model/material)
Study of structural organization of the bee hive
Learning behaviour-
Conditioned and unconditioned reflex

7. Projects-

a)Visit to study the management of following->
Fish farm, dairy farm, poultry farm, sericulture and apiculture
b) Study of Invertebrate local fauna
c) Any other relevant topic

Student should prepare a report and submit

Note-

1. Use of animal for dissection and practical work is subject to the conditions that they are not banned under the wildlife protection act
2. External features and anatomy should be studied by digital techniques and the alternatives. Wherever live animals is studies it should be either pest or colourable species without paining them

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M.Sc. ZOOLOGY

SEMESTER-I
LAB-COURSE I

Time-06 Hours
Max. Marks-100

Distribution of marks in practical exam

1. Spotting (1-10)-invertebrates	(20)
2. Mounting	(10)
3. Dissection (virtual)	(10)
4. Exercises based on behaviour (Two exercises)	(30)
5. Viva	(10)
6. Sessional	(20)
Total =	100

M.SC. SEMESTER I
LAB-COURSE II

Quantitative Biology

1. Collection methods of different types of data
2. Data analysis- tabulation
3. Different graphical and diagrammatic methods of data presentation
4. Calculation of central tendencies based on given data
5. Application of parametric and non-parametric tests
6. ANOVA
7. Study of model types
8. Exercises based on regression
9. Exercise based on correlation

Ecology and Environmental Physiology

10. Study of animals showing adaptation to different environments
11. Soil analysis physical and chemical composition of soil
12. Effect of physical exercise on blood pressure
13. Exercise based on blood glucose level
14. Carbonates and nitrates from soil sample
15. Determination of free CO_2 and salinity in pond

Note-

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M.Sc. ZOOLOGY

M.SC. SEMESTER I
LAB-COURSE II

Time-06 Hours
Max. Marks-100

Distribution of marks in practical exam

1. Exercises based on biostatics (Three)	(30)
2. Exercises based Soil and Water analysis (Two)	(20)
3. Exercises based on Physiology (Two)	(20)
4. Viva	(10)
5. Sessional	(20)
Total =	100

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1. Introduction to instrumental analysis-Robert Braun , McGraw Hill Publication
2. A biologist guide to principles and techniques of practical biochemistry-K, Wilson and K.HGoulding EBS Edn.
3. Clark and Swizer, Experimental Biochemistry, Freeman, 2000
4. Locquin and Langeron, Handbook of Microscopy, Butterwaths, 1983
5. Boyer, Modern Experimental Biochemistry, Benjamin, 1993

SEMESTER-II
LAB-COURSE I

General & comparative endocrinology of vertebrates

1. Dissection of various endocrine glands of vertebrates (Fishes, Amphibians, Reptiles, Birds, Mammals, any available animals/ Virtual)
2. Dissection of various endocrine glands of insects (Cockroach/any other insect, any available animals/ Virtual)
3. Study of microscopic slides of endocrine and related structures
   - T.S. Pituitary,T.S. of Thyroid,T.S. of Parathyroid,T.S. of Adrenal,T.S. of Testes,T.S. of Ovary, T.S. Thymus,T.S. of Kidney, T.S. of Heart, T.S. of Stomach,T.S. of Intestine
4. Effect of epinephrine on chromatophores of fishes
5. Biochemical estimation of cholesterol content in adrenal tissue, glycogen in uterine tissue
6. Microtomy block preparation, section cutting, stretching and straining Gamete biology and reproductive physiology in human beings
7. Study of Estrous cycle in mouse or rat
8. Preparation on Blastodisc of hen's egg
9. Formation of egg window in chicken egg
10. Collection of developmental stages of eggs of Lymnea or any gastropod
11. Collection of developmental stages of insects/ fishes
12. Study of development stages of frog through slides and whole mounts.
13. Study of development stages of chick through slides and whole mounts.
14. Slide preparation (earthworm ovary, amphibian, reptiles, birds and mammals testes & ovary)

Note-

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2. External features and anatomy should be studied by digital techniques and the alternatives. Wherever live animals is studies it should be either pest or culturable species without paining them

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SEMESTER-II
LAB-COURSE I

Time-06 Hours
Max. Marks-100

Distribution of marks in practical exam.

1. Dissection of Endocrine glands /virtual	(10)
2. Spotting (Endocrine glands& Embryology)	(20)
3. Cytological preparation/preparation of estrogen cycle	(10)
4. Microtomy	(20)
5. Preparation of egg window and Blastodisc	(10)
6. Viva	(10)
7. Sessional	(20)
Total =	100

SEMESTER-II
Lab-course II

Molecular cell biology
1. Study of Prokaryotic and Eukaryotic cells
2. Study of permanent slides -Mitosis, Meiosis and cell organelles
3. Temporary squash preparation to show mitosis and meiosis
4. Preparation of giant chromosomes, barr bodies
5. Histological study of cancer cells

Tools and techniques for biology
6. Use of balance Ph meter, colorimeter, centrifuge spectrophotometer, camera Lucida etc.
7. Molecular separation by Chromatography, Electrophoresis
8. Media preparation
9. Cell culture
10. Colorimetric estimation of glucose, protein, RNA, DNA
11. Absorption spectrum of any coloured solution
12. Histochemical techniques

Note-
1. Use of animal for dissection and practical work is subject to the conditions that they are not banned under the wildlife protection act

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2. External features and anatomy should be studied by digital techniques and the alternatives. Wherever live animals is studies it should be either pest or culturable species without paining them

SEMESTER-II
LAB-COURSE II

Time-06 Hours
Max. Marks-100

Distribution of marks in practical exam.

1. Spotting (mitosis and meiosis, Tools & Techniques)	(20)
2. Exercise based on cell Biology	(10)
3. Chromatography	(20)
4. Colorimetric estimation	(10)
5. Application of different instruments	(10)
6. Viva	(10)
7. Sessional	(20)
Total =	100

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M.Sc. Semester III

Zoology Practical
Lab-course I

(Comparative Anatomy)

1. Dissection of animals :- Amphioxus, Scoliodon, Electric ray, Sting ray, Calotis, Bird head, Rat (Subject to availability of material) / study through alternative methods of dissection.
2. Micro preparation of suitable and available material.
3. Study of the representative examples of different classes of Chordates.
4. Study of permanent slides showing whole mount or section as per Theory syllabus, including embryological slides of Frog and Chick.
5. Osteology of Amphibia, Reptile, Bird, Mammal.
6. Study of animal diversity by field trip and excursion, Extension activity to spread health awareness. Students have to submit project report.

Biosystematics, taxonomy & Biodiversity

1. Study of biodiversity among various invertebrates and vertebrates (Listing of all the animals found in and around your house and also try to find out their Zoological names)
2. Collection of various insect species
3. Visits to a local animal park or zoo to identify and study the captive fauna and preparation of report
4. Study of adaptive characteristics of various invertebrates and vertebrates in different climate
5. Taxonomic key formation and conversion
6. Study of biodiversity in grassland and pond water by using Shannon - Weiner index .

M.Sc. Semester III

Zoology Practical

Lab-course I

Time-06 Hours

Max. Marks-100

Distribution of marks in practical exam.

1. Dissection of Vertebrate (virtual/other method) (10)
2. Spotting 1 to 10 (20)
3. Micro preparation (10)

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4. Exercises related to Taxonomy. (Three) (30)

5. Viva (10)
6. Sessional (20)

Total = 100

M.Sc. Semester III

Zoology Practical

Lab-course II

Immunology and developmental Biology

1. Dissection of Primary and secondary immune organ from mice
a. Preparation of single suspension from bone marrow
b. Cell counting and vigility testing of the spleenocytes prepared
2. Preparation and study of phagocytosis by spleenic peritoneal macrophase.
3. Raising polyclonal antibody in mice, serum collecton and estimating antibody titre in serum by following method-
a. Ouchterlony (double diffusion) assay for antigen-antibody specificity and titre.
b. ELISA
4. Antibody purification from the serum collected from immunized mice, affinity purification chromatography
5. Blood group testing A, B, O, AB AND Rh factor
6. Indused Breeding in Frog
7. Culture of chick Embryo in Vitro
8. Study of chick embryos by vital staiting
9. The Technique for the whole mount preparation of chick embryo
10. Demonstration of Cell death
11. Study of Mitosis (a) Techniques for chromosomes preparation (b) Preparation of Meiotic chromosomes for Grosshopper testies (c) Auto Rediography

Population Genetics and Evolution

a. i. An experiment related to quantitative genetics, genotypic frequencies in light of hardy weinberg law
ii. ABO blood group data
b. Numeric exercise related to-
i. Natural selection
ii. Changing gene frequency
Chromosomal Polymorphism

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M.Sc. Semester III
Zoology Practical

Lab-course II **Hours**
Time-06
Max. Marks-100
Distribution of marks in practical exam.

1. **Dissection showing primary and secondary immune organ of mice virtual / other method** **(10)**
2. **Exercise related to immune response** (20)
3. **Exercise related to developmental biology/ Preparation of egg window and Blastodisc** **(10)**
4. **Exercises related to quantitative genetics / hardy Weinberg law** **(20)**
5. **Exercise related to natural selection** **(10)**
6. **Viva** **(10)**
7. **Sessional** **(20)**

Total = 100

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M.Sc. ZOOLOGY

BILASPUR UNIVERSITY, BILASPUR

M.Sc. Semester IV

Zoology Practical
Lab-course I

A. Practical based on Paper I and Paper II as per Theory

1. Estimation of Protein by the Biuret, Lowry, Brad ford and Eosine-a comparasion
2. Determination of N-terminal Amino acids by the Sangers reagent (FDND)
3. Paper chromatographic separation of Amino acids
4. Quantitative estimation of Protein, carbohydrate, Mucosaccharide, Lipids and Enzyme (Bromphenol blue, PAS, Alcian blue, aldehyde fucsin, Acetylcholinestrase technique)
5. Identification of hypothalamic nuclei histological, hystochemical and Immunocytochemical method
6. Isolation and characterization of Pituitary cell
7. Estimation of MAC, MCH and MCHC
8. Total count of WBC and RBC
9. Differetial count of WBC
10. Haemoglobin estimation and PCV estimation or ESR estimation
11. Quantitative estimation of blood serum by Colorimetry (I) Blood Urea (II) Blood glucose (III) Blood Calcium (IV) Blood Creatine (V) Blood cholesterol (VI) Blood Protein (VII) Blood Albumin
12. Blood clotting time
13. ECG Recording
14. Blood Pressure estimation
15. EEG

M.Sc. Semester IV

Zoology Practical

Lab-course I
Time-06
Max. Marks-100

	Hours
Distribution of marks in practical exam.	
1. Estimation of Protein	(10)
2. estimations of, carbohydrate, Mucosaccharide, Lipids and Enzyme (two exercises)	(20)
3. Exercise based on histochemical and Immuno-cytochemical method	(10)
Exercises based on haematology. (two exercises)	(20)

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BILASPUR UNIVERSITY, BILASPUR

M.Sc. Semester IV

Zoology Practical
Lab-course II

Practical (Special Paper – Group II Cytology)

1. Examination of different cell types in Vertebrate tissue
2. Contrast Microscopy
3. Photomichrography
4. Study of permanent cytological preparation
5. Squash preparation of chromosomes and preparing karyotype
6. Preparation of Giant Chromosomes and demonstration of puffs
7. Golgi material and Mitochondrial preparation
8. Demonstration of Barr body and drum stick
9. Histochemical demonstration of RNA DNA phospholipid and enzyme
10. Microbial culture media preparation and microbial growth
11. Molecular separation by chromatography and Electrophorasis

M.Sc. Semester IV

Zoology Practical

Lab-course II

Time-06 Hours

Max. Marks-100

Distribution of marks in practical exam.

1. Spotting (1to 10) (20)
2. Exercise based on cytological preparation (10)
3. Exercise based on histochemical preparation (10)
4. Molecular separation by chromatography and Electrophorasis (20)
5. Exercise based on microbiology/ karyotype study (10)

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6. Viva	(10)
7. Sessional	(20)

Total = 100

BILASPUR UNIVERSITY, BILASPUR

M.Sc. Semester IV

Zoology Practical
Lab-course II

Practical (Special Paper – Group III Entomology)

1. Collection, Preservationand classification of the insects of order :- Thysaneura, Collembola, Orthoptera, Hemiptera, Lepidoptera, Mallophaga, Diptera, Hymenoptera and Coleoptera
2. Dissectionof Grasshopper, Cockroach, Cricket, wasp, and honey bee, with special reference to their Nervous system, Salivary gland, Endocrine gland, Sting apparatus, of honey bee, reproductive organs of Grasshopper and cockroach.
3. Whole mounts of small insects eg Collembola, Thysaneura, bedbug, louse, stored grain pests
4. Whole mount of different types of legs, antennae, wings, mouth parts, salivary glands and scales
5. Microtomy of Insect materials
6. Simple experiment on Insect Physiology
7. Identification of common insect pests
8. Collection of life cycle of the pest of any economic crop

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M.Sc. Semester IV

Zoology Practical

Lab-course II

Time-06 **Hours**

Max. Marks-100

Distribution of marks in practical exam.

1. Dissection of Available insect pests /Virtual		**(10)**
2. Spotting (1 to 10)	**(20)**	
3. Micropreparation	**(10)**	
4. Experiment based on insect physiology (10)		
5. Identification of common insect pests		**(10)**
6. Project Report and field visit		**(10)**
7. Viva	**(10)**	
8. Sessional	**(20)**	

Total = 100

BILASPUR UNIVERSITY, BILASPUR

M.Sc. Semester IV

Zoology Practical
Lab-course II

Exercises based on paper III – Wild life conservation
Exercises based on paper IV - **Environment and biodiversity conservation**

M.Sc. Semester IV

Zoology Practical

Lab-course II

Time-06 **Hours**

Max. Marks-100

Distribution of marks in practical exam.

1. paper III – Wild life conservation	**(35)**
2. Environment and biodiversity conservation	**(35)**
3. Viva	**(10)**

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SEMESTER-I
LAB-COURSE I

Time-06 Hours
Max. Marks-100

Invertebrates

1. Study of non-chordates through museum specimen
2. Study of permanent slides of non-chordates
3. Dissection of representative types (invertebrates)
4. Squilla, Mytilus, Sepia, Aplysia, Echinus

5. Mounting-

Permanent and suitable stained micro-preparation
Earthworm-nerve ring, ovary, spermathecal, nephridia
Cockroach-mouth parts , salivary glands, trachea
Prawn appendages, statocyst
Protozoan- rhizopods, flagellates and ciliates (fresh water forms) prolozoon ullase
Porifera-spicule sand gemmules of fresh water sponges
Crustaceans and rotifers
Larval forms of the free living invertebrates

Animal behaviour-

6. Experiments related to Animal Behaviour

Feeding behaviour in house fly
Life cycle of Lac insect and honey bee (chart/model/material)
Study of structural organization of the bee hive
Learning behaviour-
Conditioned and unconditioned reflex

7. Projects-

a)Visit to study the management of following->
Fish farm, dairy farm, poultry farm, sericulture and apiculture
b) Study of Invertebrate local fauna
c) Any other relevant topic

Student should prepare a report and submit

Note-

1. Use of animal for dissection and practical work is subject to the conditions that they are not banned under the wildlife protection act
2. External features and anatomy should be studied by digital techniques and the alternatives. Wherever live animals is studies it should be either pest or colourable species without paining them

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SEMESTER SYLLABUS

M.Sc. MICROBIOLOGY

Scheme and Courses of Studies

SEM.	Paper	COURSES Title of the Paper			MARKS Paper wise	Internal Assessment	Univ. Exam. Marks*
First	First (MB-101)	General Microbiology and Bacterology			100	20	80
	Second (MB-102)	Virology			100	20	80
	Third (MB-103)	Phycology, Mycology and Proto-zoology			100	20	80
	Fourth (MB-104)	Biochemistry			100	20	80
	Lab. Course-	Concern with paper - I & II			100	Sessional	100
	Lab. Course-	Concern with paper - III & IV			100	Sessional	100
Second	First (MB-201)	Bioinstrumentation & Biochemical techniques			100	20	80
	Second (MB-202)	Cell biology and Microbial physiology			100	20	80
	Third (MB-203)	Microbial genetics and Molecular Biology			100	20	80
	Fourth (MB-204)	Environmental & Agriculture Microbiology			100	20	80
	Lab. Course-201	Concern with paper - I & II			100	Sessional	100
	Lab. Course-202	Concern with paper - III & IV			100	Sessional	100
Third	First (MB-301)	Immunology			100	20	80
	Second (MB-302)	Medical & Veterinary Microbiology			100	20	80
	Third (MB-303)	Biostatics & Bioinformatics			100	20	80
	Fourth (MB-304)	Enzymology and Industrial Microbiology			100	20	80
	Lab. Course-301	Concern with paper - I & II			100	Sessional	100
	Lab. Course-302	Concern with paper - III & IV			100	Sessional	100
Fourth	First (MB-401)	Plant pathology & Disease management	OR	PROJECT WORK **(External)	100	20	80
	Second (MB-402)	Food Microbiology			100	20	80
	Third (MB-403)	Microbial ecology & Forest microbiology			100	20	80
	Lab. Course-402	Project work (minor) at local level				Project Report-	60
	Fourth (MB-404)	Computer Fundamentals and Research			100	20	80

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SEMESTER SYLLABUS

M.Sc. MICROBIOLOGY

FIRST SEMESTER

Lab Course - 101

(GENERAL MICROBIOLOGY, BACTERIOLOGY AND VIROLOGY)

Total Marks: 100
Internal assessment Marks: 20
Term end Exam Marks: 80

1. **Preparation of Glassware:** Various techniques of cleaning (discarding & washing) and sterilization of glassware for microbiological laboratory.
2. **Preparation of Culture Media:** Different types of nutrient media as per nutritional need, dehydrated, selective and differential media for autotrophic & heterotrophic microbes.
3. **Pure culture Techniques:** Preparation of slants, stab culture, sub-culturing, types of streaking.
4. **Staining Techniques:** Gram Staining, negative staining, acid-fast staining, endospore, capsule.
5. **Isolation, Identification and characterization of bacteria:** Cultural characteristics of bacteria (autotrophic & heterotrophic), using selective and differential media. Growth on NA, Blood agar, Chocolate agar, DCA, Maconkey's, EMB and Sabouraud's agar. Study of nutritional needs of bacterial growth (growth in the presence of different carbon source, N source).
6. **Biochemical tests for Identification of bacteria:** IMViC, catalase, oxidase, mannitol motility test, gelatin test, urease, TSI test, coagulase, nitrate reduction. Production of acid and gas from glucose, arabinose, inositol, lactose, maltose, mannitol, rhamnose, sucrose, xylose, fructose, starch hydrolysis, casein hydrolysis, assessment of effect of metals on microbial growth.
7. **Determination of growth of bacteria:** Growth curve and generation time.
8. **Pathological examination:** Plant diseases caused by Viruses as mentioned in course of studies (a case study of any one disease).

Scheme of examination:

Lab performances	60 marks	
Spotting	20 marks	
Internal assessment -		
Oral evaluation	10 marks	
Sessional	10 marks	
Total	100 marks	Provided period- 06 hr.

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SEMESTER SYLLABUS
M.Sc. MICROBIOLOGY

FIRST SEMESTER
Lab. Course - 102
(PHYCOLOGY, MYCOLOGY, PROTOZOLOGY AND BIOCHEMISTRY)

Total Marks: 100
Internal assessment Marks: 20
Term end Exam Marks: 80

1. Isolation and identification of algae from soil and water. Isolation and identification of cyanobacteria, extraction and separation of algal pigments.
2. Isolation and identification of fungi from different substrates (saprophytic, parasitic, coprophilous, keratinophilic).
3. Study of environmental requirements of fungi (pH, temperature) by linear growth and biomass.
4. Assessment of the effect of antifungal agents (antibiotics/ chemicals/ plant extracts) on isolated fungal samples.
5. Extraction and separation of amino acid and mycotoxin (aflatoxins) by paper chromatography.
6. Identification and characterization of protozoans as mentioned in course of studies (a case study of any one disease).
7. Pathological examination: Human diseases caused by protozoans as mentioned in course of studies (a case study of any one disease).
8. Colorimetric/ spectrophotometric estimations of proteins, pigments, DNA/ RNA and sugars.
9. Study of enzyme kinetics and enzyme activity: Isolation of amylase producing microorganisms from the environment, estimation of amylase activity and determining its Km and Vmax, effect of environmental conditions (temperature, pH and substrate concentration) on the activity of amylase.
10. Estimation of enzyme activity: Phosphatase and catalase.
11. Separation of isolated phospholipids by thin layer chromatography and hemoglobin by gel filtrations.

Scheme of Examination:		
Lab performances	60 marks	
Spotting	20 marks	
Internal assessment: -		
Oral evaluation	10 marks	
Sessional	10 marks	
Total	100 marks	Provided period- 06 hrs

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SEMESTER SYLLABUS
M.Sc. MICROBIOLOGY

SECOND SEMESTER
Lab. Course - 201
(BIOINSTRUMENTATION, BIOCHEMICAL TECHNIQUES, CELL BIOLOGY AND MICROBIAL PHYSIOLOGY)

Total Marks: 100
Internal assessment Marks: 20
Term end Exam Marks: 80

1. Studies on pH titration curves of amino acids/ acetic acid and determination of pKa values and Handerson-Hasselbach equation.
2. Separation of bacterial lipids/amino acids/ sugars/ organic acids by TLC or paper chromatography.
3. Separation of serum proteins by horizontal submarine gel electrophoresis.
4. Paper electrophoresis and separation of haemoglobin or blue dextran by gel filtration.
5. Separation of bacterial DNA by agarose gel electrophoresis.
6. Preparation of mitotic plate by carmine squashing method and phase identification.
7. Preparation of Karyotype of metaphase plate.
8. Preparation of Meiotic plate and determination of phases.
9. Computation of Chaisma frequency and determination of phases
10. Micrometry and Camera Lucida drawings
11. Isolation and cultivation of autotrophic microbes.
12. To study the effect of salt concentration on bacterial growth by turbidometry method.
13. Determination of thermal death point (TDP) of an organism.
14. UV absorption of proteins, DNA and RNA.

Scheme of Examination:

Lab performances	60 marks
Spotting	20 marks
Internal Assessment:	
Oral evaluation	10 marks
Sessional	10 marks
Total	100 marks

Provided period- 06 hrs

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SEMESTER SYLLABUS
M.Sc. MICROBIOLOGY

SECOND SEMESTER

Lab. Course - 202

(MICROBIAL GENETICS, MOLECULAR BIOLOGY, ENVIRONMENTAL MICROBIOLOGY & AGRICULTURE MICROBIOLOGY)

Total Marks: 100
Internal assessment Marks: 20
Term end Exam Marks: 80

1. Transformation of *E. Coli*, preparation of competent cells.
2. Conjugation in *E. Coli* by using plate method.
3. Isolation of plasmid DNA from *E. Coli*.
4. Isolation of DNA from plant cell (onion / Mustard).
5. Isolation of microorganisms from different habitats: soil, water and air.
6. Potability test and ability of water (MPN and HS).
7. Physical, chemical and microbial analysis of water: pH, COD, BOD, total and dissolved solids.
8. Study of usefulness and safety of microbial aerosol by air sampling devices.
9. Study of microbial pollution in industrial wastes and effluents.
10. Production of ammonia from organic compounds (ammonification).
11. Biosynthesis of ammonia to nitrate (nitrification).
12. Determination of nitrate reductase.
13. Characterization of different soils for detection of various microbial enzymes: amylase, lipase, protease and catalase.
14. Morphological characterization of cyanobacteria, separation and determination of cyanobacterial pigments.

Scheme of examination

Lab performances	60 marks
Spotting	20 marks
Internal Assessment:	
Oral evaluation	10 marks
Sessional	10 marks
Total	100 marks Provided period: 06 hrs

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THIRD SEMESTER
Lab. Course – 301
(IMMUNOLOGY, MEDICAL AND VETERINARY MICROBIOLOGY)

Total Marks: 100
Internal assessment Marks: 20
Term end Exam Marks: 80

1. Determination of Blood groups and Rh typing.
2. Widal (slide) test for Typhoid by antigen- antibody reaction.
3. Pregnancy testing through commercially available method.
4. Rheumatoid Arthritis test (RA) by antigen- antibody reaction.
5. RPR (Rapid Plasma Reagin) test for syphilis.
6. Detection of specific antigen by using ELISA technique.
7. Separation and characterization of lymphocytes from blood and demonstration of lymphocytes Population.
8. Study of antigen and antibody reaction by immuno-diffusion.
9. Different staining techniques Acid fast staining, Giemsa staining and Leishmann staining.
10. Special staining methods to demonstrate granules, capsule and spores.
11. Isolation of pathogen from clinical samples- pus, blood and urine.
12. Isolation and identification of medically pathogenic bacteria and fungi:

Bacteria: *Staphylococcus aureus, Escherichia coli, Proteus vulgaris, Proteus mirabilis, Salmonella typhi, Salmonella paratyphi, Shigella dysenteriae* and *Shigella felexneri.*

Fungi: *Candida albicans, Microsporum* and *Trichophyton.*

13. Antibiotic sensitivity testing by disc diffusion method.

Scheme of examination

Lab performances	60 marks	
Spotting	20 marks	
Internal Assessment:		
Oral evaluation	10 marks	
Sessional	10 marks	
Total	100 marks	Provided period- 06 hrs

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SEMESTER SYLLABUS
M.Sc. MICROBIOLOGY

THIRD SEMESTER
Lab. Course - 302
(BIOSTATISTICS, BIOINFORMATICS, ENZYMOLOGY AND INDUSTRIAL MICROBIOLOGY)

Total Marks: 100
Internal assessment Marks: 20
Term end Exam Marks: 80

1. Determination of Statistical averages / Central Tendencies: a) Arithmetic mean b) Median c) Mode.
2. Determination of measures of dispersion a) Mean Deviation b) Standard Deviation c) Standard Error d) Coefficient of Variation.
3. Test of significance – Application of a) Chi-Square test b) T-test c) ANOVA
4. Studies of public domain, databases for nucleic acid and protein sequences and determination of Protein structure, Protein Data Base (PDB), genome sequence analysis.
5. Determination of Kinetic constant of Amylase activity, Vmax, Km.
6. Effect of pH and Temperature on Amylase activity.
7. Effect of Inhibitor on Amylase activity.
8. Determination of Proteins, DNA and RNA concentration by Spectrophotometer.
9. Production of Protease by microorganism.
10. Demonstration of production of Ethanol by Yeast.
11. Isolation of antibiotic producing microorganism from soil.

Scheme of examination

Lab performances	60 marks	
Spotting	20 marks	
Internal Assessment:		
Oral evaluation	10 marks	
Sessional	10 marks	
Total	100 marks	Provided period- 06 hrs

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SEMESTER SYLLABUS

M.Sc. MICROBIOLOGY

Scheme and Courses of Studies

Sem.	Paper	COURSES: Title of the Paper			MARKS: Paper wise	Internal Assessment	Univ. Exam. Marks*
First	First (MB-101)	General Microbiology and Bacteriology			100	20	80
	Second (MB-102)	Virology			100	20	80
	Third (MB-103)	Phycology, Mycology and Proto-zoology			100	20	80
	Fourth (MB-104)	Biochemistry			100	20	80
	Lab. Course-101	Concern with paper - I & II			100	Sessional	100
	Lab. Course-102	Concern with paper - III & IV			100	Sessional	100
Second	First (MB-201)	Bioinstrumentation & Biochemical techniques			100	20	80
	Second (MB-202)	Cell biology and Microbial physiology			100	20	80
	Third (MB-203)	Microbial genetics and Molecular Biology			100	20	80
	Fourth (MB-204)	Environmental & Agriculture Microbiology			100	20	80
	Lab. Course-201	Concern with paper - I & II			100	Sessional	100
	Lab. Course-202	Concern with paper - III & IV			100	Sessional	100
Third	First (MB-301)	Immunology			100	20	80
	Second (MB-302)	Medical & Veterinary Microbiology			100	20	80
	Third (MB-303)	Biostatics & Bioinformatics			100	20	80
	Fourth (MB-304)	Enzymology and Industrial Microbiology			100	20	80
	Lab. Course-301	Concern with paper - I & II			100	Sessional	100
	Lab. Course-302	Concern with paper - III & IV			100	Sessional	100
Fourth	First (MB-401)	Plant pathology & Disease management			100	20	80
	Second (MB-402)	Food Microbiology			100	20	80
	Third (MB-403)	Microbial ecology & Forest microbiology			100	20	80
	Lab. Course-402	Project work (minor) at local level	OR	PROJECT WORK **(External)		Project Report-	60
	Fourth (MB-404)	Computer Fundamentals and Research			100	20	80

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SEMESTER SYLLABUS

M.Sc. BOTANY

SCHEME OF EXAMINATION & DISTRIBUTION OF MARKS

SEMESTER - I

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Biology & Diversity of Virus Bacteria & Fungi	Theory	20	80	100
2.	Biology &Diversity Of Algae, Bryophytes And Pteridophytes	Theory	20	80	100
3.	Cell And Molecular Biology of Plants	Theory	20	80	100
4.	Taxonomy Of Angiosperms	Theory	20	80	100
Lab-1	Based On Paper I&II	Practical	-	-	100
Lab-2	Based On Paper III&IV	Practical	-	-	100
				Total	**600**

SEMESTER - II

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Cytology ,Genetics And Cytogenetics	Theory	20	80	100
2.	Biology & Diversity Of Gymnosperm species	Theory	20	80	100
3.	Plant Physiology	Theory	20	80	100
4.	Plant Biochemistry And Bioenergetics	Theory	20	80	100
Lab-1	Based On Paper I&II	Practical	-	-	100
Lab-2	Based On Paper III&IV	Practical	-	-	100
				Total	**600**

SEMESTER - III

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Plant Development	Theory	20	80	100
2.	Plant Reproduction	Theory	20	80	100
3.	Plant Ecology	Theory	20	80	100
4.	Elective Paper (A) Plant Pathology - I (B) Weed Biology- I	Theory	20	80	100
Lab-1	Based On Paper I&II	Practical	-	-	100
Lab-2	Based On Paper III&IV	Practical	-	-	100
				Total	**600**

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SEMESTER - IV

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Plant cell, Tissue and organ culture	Theory	20	80	100
2.	Plant Resource Utilization And Conservation	Theory	20	80	100
3.	Genetic Engineering Of Plant And Microbes &Biostatics	Theory	20	80	100
4.	Elective Paper (A) Plant Pathology –II (B) Weed Biology- II	Theory	20	80	100
Lab-1	Based On Paper I&II	Practical	-	-	100
Lab-2	Based On Paper III&IV	Practical	-	-	100
				Total	600
				GRAND TOTAL	2400

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SEMESTER- I
PAPER - IV
TAXONOMY OF ANGIOSPERMS

UNIT -1

Origin of Intra- Population Variation: Population & the environment, ecads & ecotypes, evolution & differentiation of species – various models.

The Species Concept: Taxonomic hierarchy ,species ,genus family & other categories , principles used in assessing relationship ,delimitations of taxa & attribution of rank salient feature of the international code of botanical nomenclature and salient features of Melbourne code

UNIT -2

Taxonomic Evidence: Morphology, anatomy, embryology, cytology, photochemistry, genome analysis & nucleic acid hybridization.

Taxonomy Tools: Herbarium, floras, histological photochemical cytology serological biochemical & molecular techniques, computers & GIS.

UNIT -3

System of Angiosperm Classification: Phonetic versus phylogenetic systems, cladistics taxonomy, relative merits & demerits of major system of classification, relevance of taxonomy to conservation, sustainable utilization of bio resource & ecosystem research.

UNIT -4

Concept of Phytogeography: Endemism, hot spots and hottest hot spots, plant exploration, invasion & introduction, local plant diversity and its socio-economic importance.

Suggested Readings:

1. Cole, A.J. ((1969) Numerical Taxonomy. academic Press London.
2. Devis ,P. H. And Heywood, V.H (1973) Principle of Angiosperm Taxonomy .Robert E. Kreiger .Pub. Co. New York.
3. Grant, V. (1971) plant Speciation .Columbia Univ.Press, New York.
4. Grant, W.F. (1984) Plant Biosystematics .Academic Press. London.
5. Heslop- Harrison, J/ (1976) Plant Taxonomy .English Language Book Assoc .and Edward Pub. Ltd. U.K.
6. Stace ,C.A. (1989)Plant Taxonomy and Biosystematic Edward Arnold Ltd.London .
7. Takhtajan, A.L. (1997) Diversity and classification of flowering plant Columbiauniv.Press.New York.
8. Woodland, D.W. (1991) Contemporary Plant Systematic. Prentice Hall new Jersey.
9. Sharma, A.K. and Sharma, R.(2007) Taxonomy .PragatiPrakashan Meerut .

Suggested Laboratory Exercise:

1. Description of specimen from representative locally available families .

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2. Description of species based on various specimen to study Intraspecific various variation ,a collective exercise.
3. Field trip within and around the campus, comppation of field notes and preparation of herbarium sheets of such plant wild or cultivated as are abundant .
4. Training in using floras and herbaria for identification of Specimen described in the class.
5. Comparison of different species of genus and different genera of a family to Calculate Similarity Coefficient and Preparation of Dendrograms
6. Demonstration of the Utility of Secondary metabolites in the taxonomy of some appropriated genera.
7. Description of various species of a genus, study of key characters and preparation of keys at generic level.
8. Location of keys and use of key at family level

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Suggested Laboratory Exercise:

1. Demonstration of plasmolysis and deplasmolysis in plant cell .
2. Demonstration of transpiration.
3. Measurement of transpiration rate photometer.
4. Study of inter-relationship between transpiration and absorption and by T/A apparatus.
5. Extraction of chloroplast pigment from green leaves.
6. Separation of chloroplast pigment through paper chromatography.
7. Separation of chloroplast pigment through solvent method.
8. Preparation of absorption spectrum of chlorophyll -a
9. Determination of chlorophyll a/ chlorophyll-b ratio in C_3 and C_4 plants.
10. Extraction of seed proteins depending upon solubility.
11. Fractionation of proteins using gel filtration chromatography using sephadex G-100 or sephadex G-200 .
12. Principal of colorimetry spectrometry and fluorimerty

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4. Kumar , H.D. (1986) Modern Concept of Ecology . Vikas Publishing House Privet Ltd New Delhi .
5. Hill M.K.(1997) Understanding Environmental Pollution . Cambridge Uni. Press, , Cambridge UK.
6. Odum ,E.P. (1971) Fundamental of Ecology .,Saunders ,Philadelphia
7. Odum ,E.P. (1983) Basic Ecology .,Saunders ,Philadelphia
8.

Suggested Laboratory Exercise

1. To calculate mean , variance ,standard deviation ,standard error ,coefficient of variation and use of t-test for comparing ecological data .
2. To determine minimum size and number of quadrates required for reliable estimate of biomass in Grassland ecosystem.
3. To study of frequency, abundance and density of dominant plants in the local ecosystem by quadrate method.
4. To determine gross and net productivity by light and dark bottle method.
5. To determine soil moisture content, porosity and bulk density of soil collected from different location.
6. To determine percent organic carbon and organic matter in soil of grass land cropland and forests.
7. To determine the water holding capacity of various soil.

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SEMESTER-IV

PAPER I

PLANT CELL, TUSSE AND ORGAN CULTURE

UNIT -1

Biotechnology: Basic concept, principal and scope

Plant cell And Tissue Culture: General introduction, history, scope, concept of cellular differentiation, tot potency.

UNIT -2

Organogenesis and Adventive Embryogenesis: Fundamental aspects morphogenesis somatic embryogenesis and androgenizes, mechanism, techniques and utility.

Somatic Hybridization: Protoplast isolation fusion and culture hybrid selection and regeneration, possibilities achievements and limitations of protoplast research.

UNIT -3

Application of Plant Tissue Culture: Clonal propagation, artificial seed, production of hybrids and soma clones and production of secondary metabolites /natural products, cryopreservation and germ plasma storage.

UNIT -4

Biostatistics: Definition and importance of Biostatistics scope, Measurement of central tendencies –mean mode and median.

Suggested Reading :

1. Bhojwani, S.S. and Razdan ,N.K. (1996) plant Tissue Culture : Theory and Practice Elservier Science Publishers New York ,USA.
2. Collin H.A. and Edwards ,S. (1998) plant cell Culture Bios .Scientific Publishers Oxford ,U.K.
3. Kartha ,K.K. (1985) Cryopreservation of plant cells and Organs CRC Press ,Boca Raton ,Florida USA.
4. Vasil, I.K. and Thorbe ,T.A.(1994) Plant cell and tissue culture . Kluwer Academic Publishers ,Netherlands.
5. Smith R.H. (200) Plant Tissue Culture : Techniques and Experiment ,Academic Ness ,New York.

Suggested Laboratory Exercise :

1. Preparation of Tissue culture (ms) medium .
2. Study technique s of tissue culture : sterilization of glass wares and plant materials transfer of explants on culture media ,incubation .
3. Isolation of plant protoplast by mechanical and enzymatic method.
4. Counting of protoplast in the suspension by haemocytometer method.

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5. Effect of physical (example, temperature) and chemical (e.g. osmoticum) .factors on protoplast yield .
6. Demonstration of protoplast fusion employing PEG.
7. Initiation of organogenesis and embryogenesis using appropriate explants.

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Suggested Laboratory Exercise

1. Preparation of liquid and solid culture media for bacteria culture.
2. Study of growth characteristics of E .coli using plating and turbido metric method.
3. Isolation of total DNA from E. Coli by lysozyme lysis method and its quantification by spectrophotometric method .
4. Isolation of plasmid DNA from E. Coli by alkaline lysis method and its quantification by spectrophotometric method.
5. Restriction digestion of plasmid and genomic DNA and estimation of size of various DNA fragments.
6. Isolation of Rhizobium from root nodules of leguminous plants
7. Isolation of Agrobacterium tumifaciens form tumours of dicot plants.

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SEMESTER SYLLABUS

M.Sc. BOTANY

SEMESTER-IV

PAPER IV

ELECTIVE –I (B)

WEED BIOLOGY

UNIT -1

Germination, Establishment and Growth – Light Requirement for germination, Seedlongevity AndMortality. Pattern of emergence, The Safe -Site Concept.

UNIT -2

Management of Weeds- Type of weed control: Prevention, Suppression and Eradication; physical, chemical and Biological control of weeds .concept of Integrated Weed Management

UNIT -3

Classification of Herbicides Selective and non - selective herbicides, contact and Trans located herbicides. Mode of Action of Herbicides. Application method of Herbicides and Precautions.

UNIT -4

Chemistry of some importance herbicides: Phenoxy acid as 2, 4-D, Pendimethalin Butachlor and Nitro fen. Critical Period for weed control,Aquatic weed management .Plant Environment and Herbicides interactions. Weed Thresholds and management.

PRACTICALS –

Exercises involving

- The study of different factors of the percentage germination of some important weed seeds.
- Measurement of seedling growth of weed plant.
- Study of a weed plant using different growth parameters.
- Measurement of effect of density on Mortality of a weed plant.
- Measurement of effect of density on competition.
- Calculation of Competition Index.

Suggested Books –

1. V.S. Rao , Principles of Weed Science – Oxford & IBH Publishing Pvt. Co. Ltd. New Delhi
2. O. P. Gupta, Modern Weed Management – AgrobiosIndia, Jodhpur.
3. N.C. Joshi, Researchco Publication Delhi.
4. Ashton &Crafts, Mode of Action of Herbicides – Wiley Interscience Publication New York.
5. U.S. Shree Ramulu –Chemistry of Herbicides – Oxford & IBH Publishing Co. Ltd. New Delhi.
6. Majid, F.Z. Aquatic Weed: Utility and Development .Agrobotanica, Bikaner, India.

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SEMESTER SYLLABUS

M.Sc. CHEMISTRY

SCHEME OF EXAMINATION & DISTRIBUTION OF MARKS

SEMESTER - I

Paper No.	Title of the Paper (s)	Internal Assessment	Term End Exam	Practical	Total Marks
1.	Inorganic Chemistry	20	80		100
2.	Organic Chemistry, Stereochemistry & Pericyclic Reaction	20	80		100
3.	Physical Chemistry- I	20	80		100
4.	Spectroscopy And Mathematics/Biology For Chemists	20	80		100
LAB-I	Organic Chemistry				100
LAB-II	Analytical Chemistry				100
				TOTAL	600

SEMESTER - II

Paper No.	Title of the Paper (s)	Internal Assessment	Term End Exam	Practical	Total Marks
1.	Inorganic Chemistry	20	80		100
2.	Organic Chemistry	20	80		100
3.	Physical Chemistry	20	80		100
4.	Spectroscopy, Diffraction Methods & Computer For Chemists	20	80		100
LAB-I	Inorganic Chemistry				100
LAB-II	Physical Chemistry				100
				TOTAL	600

SEMESTER - III

Paper No.	Title of the Paper (s)	Internal Assessment	Term End Exam	Practical	Total Marks
COMPULSORY FOR GROUP A, B & C					
1.	Applications Of Spectroscopy	20	80		100
2.	Chemistry Of Bio-Inorganic & Bio-Organic	20	80		100
LAB-I	General (Compulsory)			200	200
OPTIONAL GROUP-A INORGANIC					
3.	Organotrasition Metal Chemistry	20	80		100
4.	Photo inorganic Chemistry	20	80		100
OPTIONAL GROUP- B ORGANIC					
3.	Physical Organic Chemistry	20	80		100
4.	Chemistry Of Heterocyclic Compounds	20	80		100
OPTIONAL GROUP-C PHYSICAL					
3.	Chemistry Of Materials	20	80		100
4.	Advanced Quantum Chemistry	20	80		100
				TOTAL	600

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SEMESTER - IV

Paper No.	Title of the Paper (s)	Internal Assessment	Term End Exam	Practical	Total Marks
COMPULSORY FOR GROUP A, B & C					
1.	Photochemistry & Solid State Chemistry	20	80		100
2.	Bio-Physical & Environmental Chemistry	20	80		100
OPTIONAL GROUP-A INORGANIC					
3.	Bioinorganic Chemistry & Supra-Molecular Chemistry	20	80		100
4.	Analytical Chemistry	20	80		100
LAB-I	Special			200	200
OPTIONAL GROUP- B ORGANIC					
3.	Medicinal Chemistry	20	80		100
4.	Chemistry Of Natural Product	20	80		100
LAB-II	Special			200	200
OPTIONAL GROUP-C PHYSICAL					
3.	Liquid States	20	80		100
4.	Computation Chemistry	20	80		100
LAB-I	Special			200	200
				TOTAL	600
				GRAND TOTAL	2400

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SEMESTER I
LABORATORY COURSE - I
ORGANIC CHEMISTRY

1. Qualitative Analysis:-

Separation, Purification and Identification of compounds of Binary Mixture, T.L.C. and Column chromatography. I.R. Spectra may be used for functional group identification of compound by suitable derivatives preparation and determination of their melting points.

2. Organic Synthesis:-

1. Bromination - Prepration of p-Bromo Aniline from Acetanilide.
2. Nitration - Prepration of p-Nitro Aniline from Acetanilide
3. Hoffman Bromide Reaction. Prepration of Anthranilic Acid from Pthallic anhydride.
4. Aldol Condensation - Dibenzal acetone from Bazaldelyde.
5. Sandmeyer Reaction -
   - o-Chloro Benzoic Acid from Anthranilic Acid.
   - p- Chloro toluene from Toludine.

6. Friedal Craft Reaction - □ -Benzoyl.Propionic Acid from Succinic Anhydride and Benzene.
7. Oxidation - Adipic Acid by Chromic Acid oxidation of cyclohexanol.
7. Diazotization:-
   - Preparation of methyl orange from Sulphanilic Acid.
   - Phenyl Azo- □. Naphthol from Aniline.
8. Preparation of Acridone from N- Phenyl anthranilic acid.
9. Grignard's reaction: Synthesis of tripheny lmethanol from Benzoic acid.

Note: Two stage preparation. Preparation of pure and crystalline compound based on any two of above principals with conformation of melting point.

3. Quantitative Analysis:-

1. Determination of the percentage or number of Hydroxyl group in an organic compound by Acetylation method.
2. Estimation of Amines/Phenols using Bromate - Bromide Solution / or Acetylation method.
3. Determination of equivalent- weight of carboxylic compound.
4. Estimation of carboxyl group by tritration / silver salt-method.
5. Estimation of Carbonyl group by Hydrazone method.
6. Estimation of Glycine by titration.

Instruction to Practical Examiners in Chemistry Semester –I

1. The Board of Examiners; one external and one internal for each branch will meet to decide the exercises and other matter in connection with the conduct of practical examinations

S. No.	Lab. Course (branch)	Max. Marks	Duration
1.	I- Organic Chemistry	100	5 hrs.
2.	II- Analytical Chemistry	100	5 hrs.

2. The distribution of marks is as under. Marks of Ex-students are given in parentheses.

(a) Qualitative Analysis of mixture containing two Organic compounds	30 (40) marks
(b) Preparation	10 (15) marks
(c) Estimation	20 (25) marks
(d) Viva voice	20 (20) marks
(c) Sessional	20 (-) marks
	Total-100 (100) marks

As far as possible all the exercises as laid down in the syllabus are set. The scale of marking will be determined by examiners in accordance with the nature of exercises.

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SEMESTER I
LABORATORY COURSE II
ANALYTICAL CHEMISTRY
SECTION- A
INSTRUMENTATION AND COMPUTERS

1. Error Analysis & Statistical data Analysis:-
   Errors, types of errors, Minimization of Error, Statistical treatment for error analysis, standard deviation, Relative standard deviation, Linear least square. Calibration of volumetric apparatus burrettes pipette, standard flask, weight box etc.
2. Volumetric Analysis:-
   Basic Principles, determination of I_2 and saponification values of oil sample determination of DO, COD, BOD, Hardness of water samples.
3. Chromatography:-
   Separation of Cations and anions by (A) Paper Chromatography, (B) Column Chromatography.

SECTION- B

4. pH Metry / Potentiomety / Conductometry titration :-
   Determination of strength of acid etc.
5. Flame Photometry / AAS/FIA/Colorimetry :-
   Determination of Cations / anions and metal Ions eg. Na^+, K^+, Ca^{2+}, $SO4^{2-}$ NO_2, Fe, Mo, Ni ,Cu, Zn etc.
6. Spectro Photometry :-
   Verification of Beer - Lambert Law, Molar Absorptivity calculation, Plotting graph to obtain □max etc. effect of pH in aqueous coloured system. Determination of metal ions eg. Fe, Cu, Zn, Pb etc
7. Nephelometry / Turbidimetry :- Determination of chlorine, sulphate phosphate turbidity etc.
8. Application of Computer in Chemistry:- As Specified in Theory paper in section II (A).

For Lab. Course –II (Analytical Chemistry):

(a)Two practical exercise (one from each section) (at least one of these will be based on instrumental analysis)	60 (80) marks
(b) Viva voice	20 (20) marks
(c) Sessional	20 (-) marks
Total-	100 (100) marks

As far as possible all the exercises as laid down in the syllabus are set. The scale of marking will be determined by examiners in accordance with the nature of exercises. Sessional marks will be awarded by External Examiner in consultation with the internal Examiner

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SEMESTER-II
LABORATORY – COURSE I
INORGANIC CHEMISTRY

Note- Students is accepted to complete all exercises.

1. Qualitative analysis of mixture containing eight radical including some less common metal ions among the following by common method (Preferably semi-micro method)

Group-A

Basic Radicals : - {Ag, Pb, Hg, Cu, Cd, Bi, As, Sb, Sn, Fe, Al, Cr, Zn, Mn, co, Ni, Ba, Sr, Ca, Mg, Na, K, NH_4 ,}

Acid Radicals: - {CO_3, SO_4, SO_3, NO_3, F, Cl, Br, I, NO_2, BO_3, C_2O_4, PO_4}

Group– B

Basic Radicals: - {Ce, Th, Zr, W, Te, Ti, Mo, U, V, Be, Li, Au, Pt.}

Acid Radicals :-{SiO_4, Thiosulphate, Ferrocynide, Ferricyanide, Chromate, Arsenite , Arsenate, Permanganate }

Note – The mixture to be analysed by the students must contain at least one basic and one acid radical from Group B.

2. **Quantitative Analysis:-**
Involving two of the following in ores, alloys or mixture in solution- one by volumetric and other by gravimetric method Ag, Cu, Fe, Cr, Mn, Ni, Zn, Ca, Mg, Chloride, Sulphate.

3. **Estimation of:-**
(A) Phosphoric acid in Commercial ortho phosphoric acid.
(B) Boric Acid in Borax.
(C) Ammonium Ion in Ammonium Salt.
(D) MnO_2 in pyrolusite
(E) Available Chlorine in bleaching powder.
(F) H_2O_2 in commercial sample.

Students are expected to perform at least three exercises From above during laboratory work.

4. Preparation of selected Inorganic compounds and study of their properties by various method including IR, Electronic Spectra, Mossbaur, ESR. Spectra+ Magnetic susceptibility etc.
(i) $V\theta(acac)_2$
(ii) cis $K[Cr(C_2O_4)_2(H_2O)_2]$, trans $K[Cr(C_2O_4)_2(H_2O)_2].2H_2O$
(iii) $[Co(NH_3)_6]Cl_3$
(iv) $Na[Cr(NH_3)_2(SCN)_4]$
(v) $Mn(acac)_3$
(vi) $K_3[Fe(C_2O_4)_3]$
(vii) Prussian Blue Turnbull's Blue.
(viii) $[Co(NH_3)_6][Co(NO_2)_6]$
(ix) $Hg[Co(SCN)_4]$
(x) $[Ni(NH_3)_4]Cl_2$, $[Ni(NH_3)_4]Cl_2$
(xi) $Ni(DMG)_2$(xii)$[Cu(NH_3)_4]SO_4$
(xii) $K_3[Cr(C_2O_4)_3].3H_2O$
(xiii) $[Cu(NH_3)_4]SO_4$

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SEMESTER-II
LABORATORY COURSE- II
PHYSICAL CHEMISTRY

1. **Adsorption:-**
   a. Verification of Freundlich's Adsorption Isotherm.
   b. To study surface tension – concentration relationship for solutions. (Gibbs equation).
2. **Phase Equilibria:**
   a. Determination of congruent composition and temperature of binary system e.g. diphenylamine – benzophenone system.
   b. Determination of glass transition temperature of given salt e. g. $CaCl_2$ conductometrically.
   c. To construct the phase diagram for three component system e. g. chloroform, acetic acid and water.
3. **Chemical Kinetics**
   a. Hydrolysis of an ester/ ionic reactions.
   b. Determination of the velocity constant of hydrolysis of an ester. Determination of effect of (a)change of temperatures, (b)change of concentration of reactants and catalyst and(c)ionic strength of the media on the velocity constant of media.
   c. Determination of the rate constant for the oxidation of iodide ions by hydrogen peroxide
   d. Determination of the primary salt effect on the kinetics of ionic reaction and testing of the Bronsted relationship (iodide ions oxidized by persulphate ion).
4. **Conductometry**
   a. Determination of solubility of sparingly soluble salt (eg, $PbSO_4$, $BaSO_4$) Conductometrically.
   b. Determination of the strength of strong and weak acids in a given mixture conductometrically.
   c. Determination of dissociation constant of weak electrolyte by conductometer.
   d. Determination of velocity constant, Order of reaction and energy of activation for saponification of ethyl acetate by sodium hydroxide.
5. **pH Metry/Potentiometry**
   a. Determination of the strength of strong and weak acid in a given mixture using pH meter/potentiometer.
   b. Determination of dissociation constant of weak acid by pH meter.
   c. Determination of concentration of acid in given buffer solution by pH meter.
   d. Determination of strength of halides in a mixture potentiometrically.
   e. Determination of the valency of mercurous ions potentiometrically.
   f. Determination of the strength of strong acid, weak acids in a given mixture using a potentiometer/ pH meter.
   g. Determination of temperature dependence of EMF of a cell.
   h. Determination of the formation constant of silver- ammonia complex and stoichiometry of the complex potentiometrically.
   i. Determination of activity and activity coefficient of electrolytes.
   j. Determination of thermodynamic constant. $\Delta G, \Delta S$ and ΔH for the reaction by e.m.f. method. $Zn + H_2SO_4 = ZnSO_4 + H_2$
   k. Determination of the dissociation constant of monobasic / dibasic acid
6. **Polarimetry:-**
   Determination of rate constant for hydrolysis/inversion of sugar using a polarimeter. Enzyme kinetic – inversion of sucrose.

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SEMESTER-IV
GROUP-B
LABORATORY COURSE (SPECIAL)
ORGANIC CHEMISTRY

200 marks

Note: Laboratory course with Group 'B' will be of 12 hrs duration spread over two days. The examinee will have to perform three experiments. These experiments will be of 40 marks each. 40 marks each will be allotted for viva-voce and Sessional work.

Qualitative Analysis

Separation, Purification and identification of the components of a mixture of binary organic compounds & mixture of three organic compounds.

Multi-step synthesis of Organic compounds (Three stage preparations. Preparation of pure crystalline product. By using any two following principals Conformation by melting point determination.)-

The exercises should illustrate the use of organic reagents and may involve purification of the products by chromatographic techniques.

1. Photochemical reaction: Benzophenone- Benzopinacol- Benzpinacolone.
2. Beckmann rearrangement: Benzanilide from benzene, Benzene- benzophenone ,oxime- Benzanilide.
3. Benzilic acid rearrangement : Benzilic acid from benzoin, (Benzoin- Benzil- Benzilic acid)
4. Synthesis of heterocyclic compounds, Skraup synthesis: Preparation of quinoline from aniline, Skraup synthesis: Preparation of 2 phenyl-indole from phenyl hydrazine.
5. Sandmeyer Reaction: Preparation of o chlorobenzoic acid from anthranilic acid.
6. Ultman reaction - Preparation of N-Phenyl anthranilic acid from o-chlorobenzoic acid.
7. Preparation of Acridone from N-Phenyl anthranilic acid.
8. Prepration of p nitro aniline
9. Prepration of p bromo aniline
10. Prepration of methyl orange from aniline via sulphanilic acid.

Extraction of Organic compounds from Natural sources-

1. Isolation of caffeine from tea leaves
2. Isolation of casein from milk
3. Isolation of lactose from milk
4. Isolation of nicotine dipicrate from tobacco
5. Isolation of piperine from black pepper
6. Isolation of lycopene from tomatoes
7. Isolation of b-carotene from carrots.

Paper Chromatography

Separation and identification of the sugars, dyes and amino acids present in the given mixture of sugars, dyes and amino acids by paper chromatography and determination of RF values.

Spectroscopy:

Identification of organic compounds by the analysis of their spectral data (UV. IR. PMR, CMR & M) Spectrophotometric (UV/VIS) Estimations of

1. Amino acids
2. Proteins
3. Carbohydrates
4. Aspiri

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SEMESTER-IV
GROUP-B
LABORATORY COURSE (SPECIAL)
PHYSICIAL CHEMISTRY

1. Study of kinetics of exchange between ethyl iodide and the iodide ion.
2. Determination of the solubility product of lead iodide.
3. Determination of the dissociation constant of barium nitrate.
4. Determination of relative strength of the acids by studying the hydrolysis of an ester.
5. Study the hydrolysis of methyl acetate catalysed by HCl and equimolar urea hydrochloride and hence the degree of hydrolysis of the salt.
6. Investigate the inversion of can-sugar in presence of an acid. Determine also the energy of activation of the reaction.
7. Study in inversion of can-sugar in presence of HCL and H_2SO_4 and hence determine the relative strength of the acids.
8. Study the kinetics of hydrolysis of ethyl acetate by NaOH at two temperatures by conductance measurement, and hence the energy of activation of the reaction.
9. Study the kinetics of hydrolysis of tertiary amyl iodide, and determine the order and energy of activation of the reaction.
10. Investigate the reaction between H_2O_2 and HI.
11. Study the kinetics of decomposition of benzene diazonium chloride at different temperatures.
12. Study the kinetics of reaction between $K_2S_2O_8$ and KI.
    (a) Determine and rat constant and order of reaction.
    (b) Study of influence of ionic strength on the rate constant.
13. Investigate the kinetics of autocatalytic reaction between KMno4 and Oxalic acid.
14. Determination of order of reaction between bromic acid and hydrobromic acids.
15. Determination of concentration f iodine in a given sample (KI) by isotope dilution technique.
16. Determination of effect of-
    (a) Change of temperature,
    (b) Change of concentration.
    (c) Ionic strength of the media on the velocity constant of hydrolysis of an ester.
17. Determination of the primary salt effect on the kinetics of ionic reactions and testing of the Bronsted relationship (iodide ion is oxidised by persulphate ion.)
18. Investigate the adsorption of oxalic acid from aqueous solution by activated charcoal and verify Frenndlish and Langmuir's adospriton isotherms.
19. Determine adsoption isotherms of acetic acid from aqueous solution by charcoal.

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SEMESTER SYLLABUS

M.Sc. PHYSICS

SCHEME OF EXAMINATION & DISTRIBUTION OF MARKS

SEMESTER I

Paper No.	Title of the Paper	Internal Assessment	Term End Exam	Total Marks
1.	Mathematical Methods-I	20	80	100
2.	Classical Mechanics	20	80	100
3.	Numerical Methods and C Programming	20	80	100
4.	Electronics-I	20	80	100
LAB I	General	-	-	100
LAB II	Computer Programming	-	-	100
			TOTAL	600

SEMESTER II

Paper No.	Title of the Paper	Internal Assessment	Term End Exam	Total Marks
1.	Mathematical Methods-II	20	80	100
2.	Quantum Mechanics-I	20	80	100
3.	Electrodynamics	20	80	100
4.	Electronics-II	20	80	100
LAB I	Electronics (Devices)	-	-	100
LAB II	Electronics (Circuits) Power supply, Amplifier, Oscillators, Modulation, Detection etc.	-	-	100
			TOTAL	600

SEMESTER III

Paper No.	Title of the Paper	Internal Assessment	Term End Exam	Total Marks
1.	Quantum Mechanics II	20	80	100
2.	Statistical Mechanics	20	80	100
3.	Condensed Matter Physics I	20	80	100
4.	Electronics III	20	80	100
LAB I	Condensed Matter Physics	-	-	100
LAB II	Digital Electronics	-	-	100
			TOTAL	600

SEMESTER IV

Paper No.	Title of the Paper	Internal Assessment	Term End Exam	Total Marks
1.	Condensed Matter Physics II	20	80	100
2.	Nuclear Physics	20	80	100
3.	Atomic and Molecular physics	20	80	100
4.	Electronics IV	20	80	100
5.	Project	-	-	200
			TOTAL	600
			GRAND TOTAL	2400

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SEMESTER SYLLABUS

M.Sc. PHYSICS

SCHEME OF EXAMINATION & DISTRIBUTION OF MARKS

SEMESTER I

Paper No.	Title of the Paper	Internal Assessment	Term End Exam	Total Marks
1.	Mathematical Methods-I	20	80	100
2.	Classical Mechanics	20	80	100
3.	Numerical Methods and C Programming	20	80	100
4.	Electronics-I	20	80	100
LAB I	General	-	-	100
LAB II	Computer Programming	-	-	100
			TOTAL	600

SEMESTER II

Paper No.	Title of the Paper	Internal Assessment	Term End Exam	Total Marks
1.	Mathematical Methods-II	20	80	100
2.	Quantum Mechanics-I	20	80	100
3.	Electrodynamics	20	80	100
4.	Electronics-II	20	80	100
LAB I	Electronics (Devices)	-	-	100
LAB II	Electronics (Circuits) Power supply, Amplifier, Oscillators, Modulation, Detection etc.	-	-	100
			TOTAL	600

SEMESTER III

Paper No.	Title of the Paper	Internal Assessment	Term End Exam	Total Marks
1.	Quantum Mechanics II	20	80	100
2.	Statistical Mechanics	20	80	100
3.	Condensed Matter Physics I	20	80	100
4.	Electronics III	20	80	100
LAB I	Condensed Matter Physics	-	-	100
LAB II	Digital Electronics	-	-	100
			TOTAL	600

SEMESTER IV

Paper No.	Title of the Paper	Internal Assessment	Term End Exam	Total Marks
1.	Condensed Matter Physics II	20	80	100
2.	Nuclear Physics	20	80	100
3.	Atomic and Molecular physics	20	80	100
4.	Electronics IV	20	80	100
5.	Project	-	-	200
			TOTAL	600
			GRAND TOTAL	2400

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सेमेस्टर पाठ्यक्रम

M.Sc. COMPUTER SCIENCE

SCHEME OF EXAMINATION & DISTRIBUTION OF MARKS

SEMESTER - I

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Digital Electronics and Microprocessor	Theory	20	80	100
2.	Advance Computer Network	Theory	20	80	100
3.	OOPs using JAVA	Theory	20	80	100
4.	Advanced Operating System	Theory	20	80	100
Lab-1	Digital Electronics	Practical	-	-	100
Lab-2	Java Programming	Practical	-	-	100

SEMESTER - II

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Analysis and Design of Algorithm	Theory	20	80	100
2.	Relational Database Management System (RDBMS)	Theory	20	80	100
3.	Data Structure using C++	Theory	20	80	100
4.	Software Engineering	Theory	20	80	100
Lab-1	RDBMS	Practical	-	-	100
Lab-2	Data Structure using C++	Practical	-	-	100

SEMESTER - III

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Theory of computation and compiler design	Theory	20	80	100
2.	artificial intelligence and expert system	Theory	20	80	100
3.	soft computing techniques	Theory	20	80	100
4.	.net technology	Theory	20	80	100
Lab-1	MAT LAB	Practical	-	-	100
Lab-2	Programming through .NET	Practical	-	-	100

SEMESTER - IV

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Advanced Trends And Technology In Computer Science	Theory	20	80	100
2.	ELECTIVE - I Data Mining and Data Warehousing ELECTIVE - II Computer Graphics and Multimedia ELECTIVE - III Embedded System ELECTIVE-IV Network Security & Cryptography	Theory	20	80	100
3.	Major Project		-	-	400

Note: Internal assessment of 20 marks will consist of two parts -

1. Unit Test (10 Marks): Two tests will be conducted and average of these tests will be the marks of Unit Test.
2. Seminar/Assignment (10 Marks): To be conducted by the Department concerned.

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UNIT–V

Advance Topics of Operating System

Embedded Operating Systems, eCos, Tiny OS, Computer Security Concepts, Threats, Attacks, and Assets, Intruders, Malicious Software Overview, Viruses, Worm, Authentication, Access Control, Intrusion Detection, Malware Defense, Dealing With Buffer Overflow Attacks, Distributed Process Management, Process Migration, Distributed Global States, Distributed Mutual Exclusion, Distributed Deadlock.

Text Books:

1. Operating System Concepts, Silbersachatz and Galvin, Pearson Education Pub.
2. Operating Systems, Madnick E., Donovan J., Tata McGraw Hill,
3. Operating Systems, A. S. Tannenbaum, PHI

Reference Books:

1. Operating Systems Internals and Design Principle, William Stallings, Prentice Hall Publishers
2. Operating Systems- AConcept-Based Approach, Dhananjay M. Dhamdhere, McGraw-Hill

SEMESTER-I

LAB 1: DIGITAL ELECTRONICS

SEMESTER-I

LAB 2: JAVA PROGRAMMING

LAB Detail

Break-up of marks for External Practical Examination			
S. No.	Argument	Maximum Marks	Minimum Passing Marks
1	Lab Record	20	36
1.	Viva-voce	40	
2.	Program Development and Execution	40	
	Total Marks	100	36

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SEMESTER-II
LAB 1: RDBMS

SEMESTER-II
LAB 2: DATA STRUCTURE

Break-up of marks for External Practical Examination			
S. No.	Argument	Maximum Marks	Minimum Passing Marks
1	Lab Record	20	36
1.	Viva-voce	40	
2.	Program Development and Execution	40	
	Total Marks	100	36

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SEMESTER-III
LAB-1
MAT LAB

LAB-2
PROGRAMMING THROUGH .NET

The break-up of marks for Practical will be as under :

Sr. No.	Argument	Maximum Marks	Minimum Passing Marks
1.	Lab Record	20	
2.	Viva-voce	40	
3.	Program Development and Execution	40	
	Total Marks	100	36

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SEMESTER - IV
MAJOR PROJECT

Note:

1. It is compulsory, that students would have group of maximum of two students and project should be done under Government Sectors/ Public Sector / Pvt. LTD. S/W Company.
2. The students should not make any project under local or private institutions.
3. The students should make project themselves and project will not be copy of other project.

Steps for Live Project

1. Getting customer's requirements
2. Preparing designs, database and business logics
3. Developing software application project
4. Testing and implementing the project
5. Troubleshooting the project application after implementation

The break-up of marks for fourth semester's Major Project will be as under:

Sr. No.	Argument	Maximum Passing Marks	Minimum Passing Marks
1.	Project Record	100	
2.	Viva-voce	100	
3.	Program Development and Execution	200	
Total Marks		400	144

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SEMESTER - IV

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Advanced Trends And Technology In Computer Science	Theory	20	80	100
2.	ELECTIVE - I Data Mining and Data Warehousing ELECTIVE - II Computer Graphics and Multimedia ELECTIVE - III Embedded System ELECTIVE-IV Network Security & Cryptography	Theory	20	80	100
3.	Major Project		-	-	400

Note: Internal assessment of 20 marks will consist of two parts -

1. Unit Test (10 Marks): Two tests will be conducted and average of these tests will be the marks of Unit Test.
2. Seminar/Assignment (10 Marks): To be conducted by the Department concerned.

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SEMESTER - IV
MAJOR PROJECT

Note:

1. It is compulsory, that students would have group of maximum of two students and project should be done under Government Sectors/ Public Sector / Pvt. LTD. S/W Company.
2. The students should not make any project under local or private institutions.
3. The students should make project themselves and project will not be copy of other project.

Steps for Live Project

1. Getting customer's requirements
2. Preparing designs, database and business logics
3. Developing software application project
4. Testing and implementing the project
5. Troubleshooting the project application after implementation

The break-up of marks for fourth semester's Major Project will be as under:

Sr. No.	Argument	Maximum Passing Marks	Minimum Passing Marks
1.	Project Record	100	
2.	Viva-voce	100	
3.	Program Development and Execution	200	
Total Marks		400	144

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2017-18

D.P. Vipra College

Old High Court Road, Bilaspur

Chhattisgarh, India 495001

Part-I

SYLLABUS FOR ENVIRONMENTAL STUDIES AND HUMAN RIGHTS FOR UNDER GRADUATE

'इन्वाहरमेंटल साईसेस' के पाठ्यक्रम को स्नातक स्तर भाग–एक की कक्षाओं में विश्वविद्यालय अनुदान आयोग के निर्देशानुसार अनिवार्य रूप से शिक्षा सत्र 2003–2004 (परीक्षा 2004) से प्रभावशील किया गया है । स्वशासी महाविद्यालयों द्वारा भी अनिवार्य रूप से अंगीकृत किया जाएगा ।

भाग 1, 2 एवं 3 में से किसी भी वर्ष में पर्यावरण प्रश्न –पत्र उत्तीर्ण करना अनिवार्य है । तभी उपाधि प्रदाय योग्य होगी ।

पाठ्यक्रम 100 अंकों का होगा, जिसमें से 75 अंक सैद्धांतिक प्रश्नों पर होगें एवं 25 अंक क्षेत्रीय कार्य (Field Work) पर्यावरण पर होगें ।

सैद्धांतिक प्रश्नों पर अंक –75 (सभी प्रश्न इकाई आधार पर रहेगें जिसमें आंतरिक विकल्प रहेगा)

(अ) लघु प्रश्नोंत्तर – 25 अंक

(ब) निबंधात्मक – 50 अंक

Field Work – 25 अंकों का मूल्याकन आतरिक मूल्यांकन पद्धति से कर विश्वविद्यालय को प्रेषित किया जावेगा । अभिलेखों की प्रायोगिक उत्तर पुस्तिकाओं के समान संबंधित महाविद्यालयों द्वारा सुरक्षित रखेगें ।

उपरोक्त पाठ्यक्रम से संबंधित परीक्षा का आयोजन वार्षिक परीक्षा के साथ किया जाएगा ।

पर्यावरण विज्ञान विषय अनिवार्य विषय है, जिसमें अनुत्तीर्ण होने पर स्नातक स्तर भाग–एक के छात्र/छात्राओं को एक अन्य विषय के साथ पूरक की पात्रता होगी । पर्यावरण विज्ञान के सैद्धांतिक एवं फील्ड वर्क में संयुक्त रूप से 33% (तैतींस प्रतिशत) अंक उत्तीर्ण होने के लिए अनिवार्य होंगे ।

स्नातक स्तर भाग–एक के समस्त नियमित/भूतपूर्व/अमहाविद्यालयीन छात्र/छात्राओं को अपना फील्ड वर्क सैद्धांतिक परीक्षा की समाप्ति के पश्चात् 10 (दस) दिनों के भीतर संबंधित महाविद्यालय/परीक्षा केन्द्र में जमा करेंगे एवं महाविद्यालय के प्राचार्य/केन्द्र अधिक्षक, परीक्षकों की नियुक्ति के लिए अधिकृत रहेंगे तथा फील्ड वर्क जमा होने के सात दिनों के भीतर प्राप्त अंक विश्वविद्यालय को भेजेंगे ।

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कृपया पर्यावरण विज्ञान व मानवाधिकार
का पाठ्यक्रम अनुमोदनार्थ प्रस्तुत है।

Dr R.G.
11/11/13

1. Prof A.K. Gupta
2. Prof C.L. Patel
3. Dr. R. Prasad

11.11.13

11-11-13

बिलासपुर विश्वविद्यालय, बिलासपुर (छ.ग.)

पुराना हाईकोर्ट भवन, बिलासपुर (छ.ग.) 495001,
फोन : 07752-220031, फैक्स 07752-260294, ई-मेल : bilaspuruniversity.2012@gmail.com,
वेबसाईट : www.bilaspuruniversity.ac.in

क्र. 1186 /अका./2014

बिलासपुर दिनांक 11/9/14

अधिसूचना

बिलासपुर विश्वविद्यालय से सम्बद्ध समस्त महाविद्यालय को सूचित किया जाता है कि केन्द्रीय अध्ययन मण्डल द्वारा अनुमोदित पर्यावरण अध्ययन के संशोधित पाठ्यक्रम "पर्यावरण अध्ययन व मानवाधिकार" स्नातक स्तर पर शिक्षा सत्र 2014-15 से प्रभावशील होगा । (अनुमोदित पाठ्यक्रम संलग्न)

आदेशानुसार,

कुलसचिव

पृ.क्रमांक 1187 /अका./2014

बिलासपुर, दिनांक 11/9/14 /

प्रतिलिपि:-

1. कुलपति के निज सहायक को माननीय कुलपति महोदय के सूचनार्थ प्रेषित।
2. परीक्षा नियंत्रक / उप-कुलसचिव (परीक्षा/गोपनीय) बिलासपुर विश्वविद्यालय, बिलासपुर को सूचनार्थ प्रेषित ।
5. प्राचार्य, समस्त सम्बद्ध महाविद्यालय, को इस आशय के साथ प्रेषित की महाविद्यालय में केन्द्रीय अध्ययन मण्डल द्वारा अनुमोदित **"पर्यावरण अध्ययन व मानवाधिकार"** विषय का अंगीकृत पाठ्यक्रम अध्ययन-अध्यापन कराना सुनिश्चित करें ।
6. संपादक, दैनिक ..... को इस अनुरोध के साथ प्रेषित की कृपया उपरोक्त अधिसूचना को अपने लोकप्रिय दैनिक समाचार पत्र में छात्रहीत में प्रकाशित करने का कष्ट करें ।

कुलसचिव

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Part-I

SYLLABUS FOR ENVIRONMENTAL STUDIES AND HUMAN RIGHTS FOR UNDER GRADUATE

(paper code - 0828)

M.M. 75

UNIT -I THE MULTI DISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES:

Definition, Scope and Importance

Natural Resources:

Renewable and Nonrenewable Resources:

Natural resources and associated problems

(a) Forest resources: Use and over-exploitation, deforestation, Timber extraction, mining, dams and their effects on forests and tribal people and relevant forest Act.

(b) Water resources: Use and over-utilization of surface and ground water, floods drought, conflicts over water, dams benefits and problems and relevant Act.

(c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources.

(d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity.

(e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources.

(f) Land resources: Land as a resource, land degradation, man induced landslides soil erosion and desertification.

UNIT-II ECOSYSTEM

(12 Lecturer)

(a) Concept, Structure and Function of an ecosystem

- Producers, consumers and decomposers.
- Energy flow in the ecosystem
- Ecological succession.
- Food chains, food webs and ecological pyramids.
- Introduction, Types, Characteristic Features, Structure and Function of Forest, Grass, Desert and Aquatic Ecossystem.

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(b) Biodiversity and its Conservation

- Introduction - Definition: genetic, species and ecosystem diversity.
- Bio-geographical classification of India.
- Value of biodiversity: consumptive use, productive use, social, ethics, aesthetic and option values.
- Biodiversity at global, National and local levels.
- India as mega-diversity nation.
- Hot spots of biodiversity
- Threats to biodiversity: habitat loss, poaching of wildlife, man-wild life conflict.
- Endangered and endemic species of India.
- Conservation of biodiversity: In situ and Ex-situ conservation of biodiversity.

UNIT-III ENVIRONMENTAL POLLUTION

Definition **(12 Lecturer)**

(a) Causes, effect and control measures of -

- Air water, soil, marine, noise, nuclear pollution and Human population.
- Solid waste management: Causes, effects and control measures of urban and industrial wastes.
- Role of an individual in prevention of pollution.
- Disaster Management: floods, earthquake, cyclone and landslides.

(b) Environmental Management

(12 Lecturer)

- From Unsustainable to sustainable development.
- Urban problems related to energy.
- Water conservation, rain water harvesting, watershed management.
- Resettlement and rehabilitation of people, its problems and concerns.
- Environmental ethics: Issues and possible solutions.
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust.

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Wasteland reclamation.

- Environment Protection Act: Issues involved in enforcement of environmental legislation.

- Role of Information Technology in Environment and Human Health.

UNIT-IV

General background and historical perspective- Historical development and concept of Human Rights. Meaning and definition of Human Rights. Kind and Classification of Human Rights.

Protection of Human Rights under the UNO Charter. Protection of Human Rights under the Universal Declaration of Human Rights, 1948

Convention on the Elimination of all Forms of Discrimination against women

Convention on the Rights of the Child, 1989

UNIT-V

Impact of Human Rights norms in India, Human Rights under the Constitution of India, Fundamental Rights under the Constitution of India, Directive Principles of State Policy under the Constitution of India, Enforcement of Human Rights in India

Protection of Human Rights under the Human Rights Act, 1993 - National Human Rights Commission, State Human Rights Commission and Human Rights court in India.

Fundamental Duties under the Constitution of India

Reference/Books Recommended:

1. SK Kapoor- Human rights under International Law and Indian Law
2. HO Agrawal- Internation Law and Human Rights
3. एस. के. कपूर – मानव अधिकार
4. जे. एन. पान्डेय – भारत का संविधान
5. एम. डी. चतुर्वेदी – भारत का संविधान
6. J. N. Pandey - Constitutional Law of India
7. Agarwal K.C. 2001 Environmental Biology, Nidi Pub. Ltd. Bikaner
8. Bharucha Erach, the Biodiversity of India, Mapin Pub. Pvt. Ltd. Ahmedabad 380013, India, Email: mapin@icenet.net(R)

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B.A. /B.Sc. Part I

PAPER - III
PRACTICAL GEOGRAPHY
Max. Marks: 50

SECTION A

CARTOGRAPHY AND STASTISTICAL METHODS (M.M. 25)

Unit I Scale: Statement Scale , Representative Fraction (R.F.), Linear scale – Simple, Diagonal, Comparative, and Time Scales.

Unit II Contour: Methods of showing relief; Hachures, Contours; Representation of different landforms by contours.

Unit III Graph and Diagram: Line graph, Bar Diagram (Simple and Compound), Circle Diagram, Pie Diagram

Unit IV Statistical Technique: Mean, Median and Mode

SECTION B

SURVEYING - (M.M. 15)

Unit V Chain and Tape Survey. Triangulation method, Open Traverse and Closed Traverse

PRACTICAL RECORD AND VIVA VOCE (M.M. 10)

Books Recommended:

1. Davis, R.E. and Foote, F.S. (1953): Surveying, 4th edition, McGraw Hill Publication, New York
2. Jones, P.A.(1968): Fieldwork in Geography, Longmans, Green and Company Ltd., First Publication, London
3. Monkhouse, F. J. and Wilkinson, F.J. (1985): Maps and Diagrams. Methuen, London
4. Natrajan, V. (1976): Advanced Surveying, B.I. Publications., Mumbai
5. Pugh, J.C. (1975): Surveying for Field Scientists, Methuen and Company Ltd., London, First Publication.
6. Raisz, E. (1962): General Cartography. John Wiley and Sons, New York. 5th edition.
7. Sarkar, A. K. (1997): Practical Geography: A Systematic Approach. Orient Longman, Kolkata.
8. Sharma, J. P. (2001): *Prayogik Bhugol.,* Rastogi Publication, Meerut 3rd. edition.
9. Singh, R.L. and Singh, Rana P.B. (1993): Elements of Practical Geography. (Hindi and English editions). Kalyani Publishers, New Delhi,.
10. Singh, L.R. (2006): Fundamentals of Practical Geography, Sharda Pustak Bhawan, Allahabad.
11. Venkatramaiah, C. (1997): A Text Book of Surveying, Universities Press, Hyderabad.

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B.A. /B.Sc. Part II

PAPER - III

PRACTICAL GEOGRAPHY

Max. Marks: 50

SECTION A

MAP INTERPRETATION, PROJECTIONS AND STATISTICAL METHODS (M.M. 25)

Unit I Distribution Maps: Dot Map, Choropleth Map and Isopleth Map.

Unit II Map Projections: Definition and classification; Conical, Zenithal, and Cylindrical Projections.

Unit III Interpretation of Weather Maps: Use of Meteorological Instruments.

Unit IV Statistical Methods: Quartile: Mean Deviation, Standard Deviation and Quartile Deviation; Relative Variability and Co-efficient of Variation.

SECTION B

SURVEYING (M.M. 15)

Unit V Surveying: Whole Circle Bearing and Reduced Bearing, Methods of Prismatic Compass Survey.

PRACTICAL RECORD AND VIVA VOCE (M.M. 10)

Books Recommended:

1. Alvi, Z. 1995 : Statistical Geography: Methods and Applications, Rawat Pub. New Delhi: .
2. Davis, R.E. and Foote, F.S. (1953): Surveying, 4th edition, McGraw Hill Publication, New York
3. Kanetker, T.P. and Kulkarni, S.V.(1967): Surveying and Levelling, Vol I and II V.G. Prakashan, Poona.
4. Natrajan, V. (1976): Advanced Surveying, B.I. Publications., Mumbai.
5. Pal, S.K. 1999 : Statistics for Geoscientists, Concept publishing Company, New Delhi
6. Punmia, B.C.(1994): Surveying, Vol I, Laxmi Publications Private Ltd, New Delhi.
7. Raisz, E. (1962): General Cartography. John Wiley and Sons, New York. 5th edition
8. Sarkar, A. K. (1997): Practical Geography: A Systematic Approach. Orient Longman, Kolkata.
9. Sharma, J. P. (2001): *Prayogik Bhugol.*, Rastogi Publication, Meerut 3rd. edition.
10. Silk, J. 1979 : Statistical techniques in Geography, George Allen and Unwin, London
11. Singh, R.L. and Singh, Rana P.B. (1993): Elements of Practical Geography. (Hindi and English editions). Kalyani Publishers, New Delhi,.
12. Singh, L.R. (2006): Fundamentals of Practical Geography, Sharda Pustak Bhawan, Allahabad.
13. Venkatramaiah, C. (1997): A Text Book of Surveying, Universities Press, Hyderabad.

PRINCIPAL
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बी.ए. / बी.एस.सी. तृतीय वर्ष
प्रश्न पत्र–तृतीय
प्रायोगिक भूगोल

अधिकतम अंक : 50

खण्ड (अ)

मनचित्र पठन एवं निर्वचन **20**

इकाई –1. बैन्ड ग्राफ, हीदर ग्राफ, क्लाइमोग्राफ, पवनारेख ।

इकाई –2. भारतीय स्थलाकृतिक मानचित्र की व्याख्या प्रकार, वर्गीकरण धरतलीय मानचित्र के प्रकार एवं विष्लेषण, राष्ट्रीय एवं अन्तराष्ट्रीय, भौतिक एवं सांस्कृतिक तत्वों के आधार पर विष्लेषण ।

इकाई –3. उपग्रह बिम्ब : प्रारम्भिक सूचनाओं की व्याख्या बिम्ब निर्वाचन : चाक्षुश विधि – भूमि उपयोग भूमि आच्छादन मानचित्रण, जी0 पी0 एस0 का उपयोग एवं अनुप्रयोग ।

खण्ड (ब)

सर्वेक्षण एवं क्षेत्रीय प्रतिवेदन **20**

इकाई –4. सर्वेक्षण , समपटल सर्वेक्षण, प्रतिच्छेदन एवं स्थिति निर्धारण ।

इकाई –5. भूगोल में क्षेत्रीय कार्य का महत्व किसी छोटे क्षेत्र का भौतिक सामाजिक आर्थिक सर्वेक्षण और रिपोर्ट तैयार करना ।

प्रायोगिक पुस्तिका और मौखिक परिक्षण परीक्षा **10**

Books Recommended:

1. Archer, J.E. and Dalton, T.H. (1968): *Field Work in Geography*. William Clowes and Sons Ltd. London and Beccles.
2. Bolton, T. and Newbury, P.A. (1968): *Geography through Fieldwork*. Blandford Press, London.
3. Campell, J. B. (2003): Introduction to Remote Sensing. 4th edition. Taylor and Francis, London.
4. Chaunial, D. D. (2004): Remote Sensing and Geographical Information System(in Hindi), Sharda Pustak Bhawan, Allahabad
5. Cracknell, A. and Ladson, H. (1990): Remote Sensing Year Book. Taylor and Francis, London.
6. Curran, P.J. (1985): Principles of Remote Sensing. Longman, London.
7. Davis, R.E. and Foote, F.S. (1953): Surveying, 4th edition, McGraw Hill Publication, New York
8.
9. Deekshatulu, B.L. and Rajan, Y.S. (ed.) (1984): Remote Sensing. Indian Academy of Science, Bangalore.
10. Floyd, F. and Sabins, Jr. (1986): Remote Sensing: Principles and Interpretation. W.H. Freeman, New York.
11. Gautam, N.C. and Raghavswamy, V. (2004). Land Use/ Land Cover and Management Practices in India. B.S. Publication., Hyderabad.
12. Jensen, J.R. (2004): Remote Sensing of the Environment: An Earth Resource Perspective. Prentice-Hall, Englewood Cliffs, New Jersey. Indian reprint available.

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B.Sc. I (BOTANY)

PRACTICAL

Study of external (Morphorgical) and internal (microscopic/anatomical) features of representative gerera given in the theory.

1. Algae: Gloeocapsa, Scytonema, Gloeotrichia, Volvox, Oedogonium, Vaucheria, Chara, Ectocarpus, Sargassum, Batrachosperrmum
2. Gram staining
3. Fungi: Albugo, Aspergillus, Peziza, Agaricus, Puccinia, Alternaria and Cercospora
4. Bryophyta: Riccia, Marchantia, Pellia, Anthoceros, Sphagnum, Funaria
5. Pteridophyta: Lycopodium, Selaginella, Equsetum, Marsilea.
6. Gymnosperm: Cycas, Pinus, Epherda.

PRACTICAL SCHEME

TIME: 4 Hrs. **M.M. : 50**

1.	Algae/Fungi/Gram Staining	10
2.	Bryophyta/Pteridophyta	10
3.	Gymnosperm	10
4.	Spotting	10
5.	Viva-Voce	05
6.	Sessional	05

(Dr. J.N. Verma)
Proff. & Head
Govt. D.B. Girls PG College
Raipur, (C.G.)

(Dr. Rekha Pimpalgaonkar)
Proff. & Head
Govt. N PG Science College
Raipur, (C.G.)

(Dr.Ranjana Shristava)
Proff. & Head
Govt. VYTPG Science College
Raipur, (C.G.)

(Mrs. Sanchal Moghe)
Govt. Bilasa Girls College, Bilaspur

(Mr. Shivakant Mishra)

(Mr Sudheer Tiwari)

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Bilaspur (C.G.)

Zoology
B.Sc. Part I 2018-19
Practical

The practical work will, in general be based on the syllabus prescribed in theory and the candidates will be required to show knowledge of the following:-

- Dissection of Earthworm, Cockroach, Palaemon and Pila
- Minor dissection—appendages of Prawn & hastate plate, mouth parts of insects, radulla of Pila.

(Alternative methods: By Clay/Thermacol/drawing/Model etc.)

- Adaptive characters of Aquatic, terrestrial, aerial and desert animals.
- Museum specimen invertebrate
- Slides- Invertebrates, frog embryology, Chick embryology and cytology,

Scheme of Practical Exam	**Time: 3hrs**
1. Major Dissection	10 Marks
2. Minor Dissection	05 Marks
3. Comments on Excersice based on Adaptation	04 Marks
4. Cytological Preparation	05 Marks
5. Spots-8 (Slides-4, Specimens-4)	16 Marks
6. Sessional	10 Marks

PRINCIPAL
D.P. Vipra College
Bilaspur (C.G.)

NEW CURRICULUM OF B.Sc. PART I

CHEMISTRY

The new currlculam will comprisc of Three theory papers of 33, 33 and 34 marks each and practical work of 50 marks. The curricuram is to be completed in 180 working days as per the UGC norms & conforming to the directives of the Govt. of Chhattisgarh.The theory papers are of 60 hrs each duration and the practical work of 180 hrs duration.

PAPER I

INORGANIC CHEMISTRY

M.M.33

UNIT-I

A. ATOMIC STRUCTURE

Bohr's theory, its limitation and atomic spectrum of hydrogen atom. General idea of de-Broglie matter-waves, Heisenberg uncertainty principle, Schrödinger wave equation, significance of Ψ and Ψ^2, radial & angular wave functions and probability distribution curves, quantum numbers, Atomic orbital and shapes of s, p, d orbitals, Aufbau and Pauli exclusion principles, Hund's Multiplicity rule, electronic configuration of the elements.

B. PERIODIC PROPERTIES

Detailed discussion of the following periodic properties of the elements, with reference to s and p-block. Trends in periodic table and applications in predicting and explaining the chemical behavior.

a) Atomic and ionic radii,
b) Ionization enthalpy,
c) Electron gain enthalpy,
d) Electronegativity, Pauling's, Mulliken's, Allred Rochow's scales.
e) Effective nuclear charge, shielding or screening effect, Slater rules, variation of effective nuclear charge in periodic table.

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UNIT-II

CHEMICAL BONDING I

Ionic bond: Ionic Solids - Ionic structures, radius ratio & co-ordination number, limitation of radius ratio rule, lattice defects, semiconductors, lattice energy Born- Haber cycle, Solvation

CHEMISTRY

PRACTICAL EXAMINATION

05 Hrs.
M.M. 50

Three experiments are to be performed

1. Inorganic Mixture Analysis, four radicals two basic & two acid (excluding insoluble, Interfering & combination of acid radicals) OR Two Titrations (Acid-Bases,Redox and Iodo/Iodimetry)

12 marks

2. Detection of functional group in the given organic compound and determine its MPt/BPt.

8 marks

O R
Crystallization of any one compound as given in the prospectus along with the determination of mixed MPt.
O R
Decolorisation of brown sugar along with sublimation of camphor/ Naphthlene.

3. Any one physical experiment that can be completed in two hours including calculations.

14 marks

4. Viva **10 marks**
5. Sessionals **06 marks**

In case of Ex-Students two marks will be added to each of the experiments

REFERENCE TEXT:

1. Mendham, J., A. I. Vogel's Quantitative Chemical Analysis 6th Ed., Pearson, 2009.
2. Ahluwalia, V. K., Dhingra, S. and Gulati, A. College practical Chemistry, University Press.
3. Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009)
4. Furniss, B.S.; Hannaford, A.J.; Smith, P.W.G.; Tatchell, A.R. Practical Organic Chemistry, 5th Ed., Pearson (2012)
5. Khosla, B. D.; Garg, V. C. & Gulati, A. Senior Practical Physical Chemistry, R. Chand & Co.: New Delhi (2011).
6. Garland, C. W.; Nibler, J. W. & Shoemaker, D. P. Experiments in Physical Chemistry 8th Ed.; McGraw-Hill: New York (2003).
7. Halpern, A. M. & McBane, G. C. Experimental Physical Chemistry 3rd Ed.; W.H. Freeman & Co.: New York (2003).

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MICROBIOLOGY

BSc-1st

Paper- I: General Microbiology & Basic Technique

UNIT-1: Fundamental, History & Developments

Introduction to major groups of microorganisms and fields of Microbiology; Historical development, Contributions of Pioneers (Louis Pasteur, Edward Jenner, Anton Von Leewenhoeck and Alexander Flemming). Beneficial and harmful microbes and its role in daily life.

UNIT-2: Basic Microbial Techniques

Methods of studying microorganism; Sterilization Techniques (Physical & Chemical Sterilization). Pure culture isolation Technique: Streaking,Waksman serial dilution and plating methods. cultivation, maintenance and preservation of pure cultures. Culture media & conditions for microbial growth. Staining technique: simple staining, Differential (gram staining), negative staining and acid fast staining.

UNIT-3: Virology & Bacteriology

Diversity of microbial world; Principle and classification of Viruses and Bacteria. Structure, Multiplication and Economic importance of viruses (TMV, Influenza virus & T_4-Phage). Structure & Functional organization of Bacteria, Cell wall of Gram Positive & Gram Negative bacteria; Economic importance of Bacteria.

UNIT-4: Mycology

General characteristics and classification of Fungi; Structure and Reproduction of fungi (*Rhizopus, Penicillium, Aspergillus, Yeast & Agaricus*). Common fungal disease of crops (Late & Early blight of potato, Smut of Rice, Tikka and Red rot of Sugarcane). Structure, reproduction and economic aspect of Lichens.

UNIT-5: Phycology & Protozoology

General characteristics and classification of Algae and Protozoa; General account & economic importance of Cyanobacteria (*Microcystis, Ocillitoria, Nostoc & Anabaena)* and Protozoa *(Amoeba, Paramoecium, Euglena and plasmodium).*

Text Books Recommended:

1. General microbiology; Vol I & II, Powar C. B. and Daginawala H. I., Himalaypub.house, Bombay.
2. A textbook of Microbiology; Dubey &Maheshwari.
3. Microbiology: An Introduction; G. Tor tora, B. Funke, C. Benjamin Cummings.
4. General Microbiology; Seventh edition by Hans G Schlegel, CambridgeUniversity Press.
5. Practical Microbiology; Dubey and Maheshwari.
6. Handbook of Microbiology; Bisen P.S., Varma K., CBS Publishers and Distributors, Delhi. General Microbiology by Brock.
7. General Microbiology by Pelzar et al.
8. Introduction on Microbial Techniques by Gunasekaran.

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Microbiology

PRACTICAL

M. M. 50

Basic information about autoclave, hot air oven, laminar air flow and other laboratory instruments
Preparation of solid/liquid culture media.
Isolation of single colonies on solid media.
Enumeration of bacterial numbers by serial dilution and plating.
Simple and differential staining.
Measurement of microorganism (micrometry) and camera Lucida drawing of isolated organism.
Determination of bacterial growth by optical density measurement.
General and specific qualitative test for carbohydrates
General and specific qualitative test for amino acids
General and specific qualitative test for lipids
Estimation of protein
Estimation of blood glucose
Assay of the activity of amylases
Assay of the activity of Phosphates

Scheme of Practical Examination

Time - 4 hours

	M.M. 50
1. Exercise on Microbiological methods	10
2. Exercise on Biochemical tests	10
3. Exercise on staining method	05
4. Spotting (1-5)	10
5. Viva-Voce	05
6. Sessional	10
	Total 50

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B.Sc. Part-I

Paper-I

MECHANICS, OSCILLATIONS AND PROPERTIES OF MATTER

(Paper code 0793)

Unit- 1 Cartesian, Cylindrical and Spherical coordinate system, Inertial and non-inertial frames of reference, uniformly rotating frame, Coriolis force and its applications. Motion under a central force, Kepler's laws. Effect of Centrifugal and Coriolis forces due to earth's rotation, Center of mass (C.M.), Lab and C.M. frame of reference, motion of C.M. of system of particles subject to external forces, elastic, and inelastic collisions in one and two dimensions, Scattering angle in the laboratory frame of reference, Conservation of linear and angular momentum, Conservation of energy.

Unit-2 Rigid body motion, rotational motion, moments of inertia and their products, principal moments & axes, introductory idea of Euler's equations. Potential well and Periodic Oscillations, case of harmonic small oscillations, differential equation and its solution, kinetic and potential energy, examples of simple harmonic oscillations: spring and mass system, simple and compound pendulum, torsional pendulum.

Unit-3 Bifilar oscillations, Helmholtz resonator, LC circuit, vibrations of a magnet, oscillations of two masses connected by a spring. Superposition of two simple harmonic motions of the same frequency, Lissajous figures, damped harmonic oscillator, case of different frequencies. Power dissipation, quality factor, examples, driven (forced) harmonic oscillator, transient and steady states, power absorption, resonance.

Unit-4 E as an accelerating field, electron gun, case of discharge tube, linear accelerator, E as deflecting field- CRO sensitivity, Transverse B field, 180° deflection, mass spectrograph, curvatures of tracks for energy determination, principle of a cyclotron. Mutually perpendicular E and B fields: velocity selector, its resolution. Parallel E and B fields, positive ray parabolas, discovery of isotopes, elements of mass spectrography, principle of magnetic focusing lens.

Unit-5 Elasticity: Strain and stress, elastic limit, Hooke's law, Modulus of rigidity, Poisson's ratio, Bulk modulus, relation connecting different elastic- constants, twisting couple of a cylinder (solid and hallow), Bending moment, Cantilever, Young modulus by bending of beam.

Viscosity: Poiseulle's equation of liquid flow through a narrow tube, equations of continuity. Euler's equation, Bernoulli's theorem, viscous fluids, streamline and turbulent flow. Poiseulle's law, Coefficient of viscosity, Stoke's law, Surface tension and molecular interpretation of surface tension, Surface energy, Angle of contact, wetting.

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Paper-II
ELECTRICITY, MAGNETISM AND ELECTROMAGNETIC THEORY

Unit-1 Repeated integrals of a function of more than one variable, definition of a double and triple integral. Gradient of a scalar field and its geometrical interpretation, divergence and curl of a vector field, and their geometrical interpretation, line, surface and volume integrals, flux of a vector field. Gauss's divergence theorem, Green's theorem and Stoke's theorem and their physical significance. Kirchoff's law, Ideal Constant-voltage and Constant-current Sources. Thevenin theorem, Norton theorem, Superposition theorem, Reciprocity theorem and Maximum Power Transfer theorem.

Unit-2 Coulomb's law in vacuum expressed in Vector forms, calculations of E for simple distributions of charges at rest, dipole and quadrupole fields. Work done on a charge in a electrostatic field expressed as a line integral, conservative nature of the electrostatic field. Relation between Electric potential and Electric field, torque on a dipole in a uniform electric field and its energy, flux of the electric field.
Gauss's law and its application: E due to (1) an Infinite Line of Charge, (2) a Charged Cylindrical Conductor, (3) an Infinite Sheet of Charge and Two Parallel Charged Sheets, capacitors, electrostatic field energy, force per unit area of the surface of a conductor in an electric field, conducting sphere in a uniform electric field.

Unit-3 Dielectric constant, Polar and Non Polar dielectrics, Dielectrics and Gauss's Law, Dielectric Polarization, Electric Polarization vector P, Electric displacement vector D. Relation between three electric vectors, Dielectric susceptibility and permittivity, Polarizability and mechanism of Polarization, Lorentz local field, Clausius Mossotti equation, Debye equation,

Ferroelectric and Paraelectric dielectrics, Steady current, current density J, non-steady currents and continuity equation, rise and decay of current in LR, CR and LCR circuits, decay constants, AC circuits, complex numbers and their applications in solving AC circuit problems, complex impedance and reactance, series and parallel resonance, Q factor, power consumed by an a AC circuit, power factor.

Unit-4 Magnetization Current and magnetization vector M, three magnetic vectors and their relationship, Magnetic permeability and susceptibility, Diamagnetic, paramagnetic and ferromagnetic substances. B.H. Curve, cycle of magnetization and hysteresis, Hysteresis loss.

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Physics

PRACTICALS

Minimum 16 (Eight from each group)

Experiments out of the following or similar experiments of equal standard

GROUP-A

1. Study of laws of parallel and perpendicular axes for moment of inertia.
2. Moment of inertia of Fly wheel.
3. Moment of inertia of irregular bodies by inertia table.
4. Study of conservation of momentum in two dimensional oscillations.
5. Study of a compound pendulum.
6. Study of damping of a bar pendulum under various mechanics.
7. Study of oscillations under a bifilar suspension.
8. Study of modulus of rigidity by Maxwell's needle.
9. Determination of Y, k, η by Searl's apparatus.
10. To study the oscillation of a rubber band and hence to draw a potential energy curve from it.
11. Study of oscillation of a mass under different combinations of springs.
12. Study of torsion of wire (static and dynamic method).
13. Poisson's ratio of rubber tube.
14. Study of bending of a cantilever or a beam.
15. Study of flow of liquids through capillaries.
16. Determination of surface tension of a liquid.
17. Study of viscosity of a fluid by different methods.

GROUP-B

1. Use of a vibration magnetometer to study a field.
2. Study of magnetic field B due to a current.
3. Measurement of low resistance by Carey-Foster bridge.
4. Measurement of inductance using impedance at different frequencies.
5. Study of decay of currents in LR and RC circuits.
6. Response curve for LCR circuit and response frequency and quality factor.
7. Study of waveforms using cathode-ray oscilloscope.
8. Characteristics of a choke and Measurement of inductance.
9. Study of Lorentz force.
10. Study of discrete and continuous LC transmission line.
11. Elementary FORTRAN programs, Flowcharts and their interpretation.
18. To find the product of two matrices.
19. Numerical solution of equation of motion.
20. To find the roots of quadratic equation.

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Bilaspur (C.G.)

B.Sc. (CS)
I Year

B.Sc. PART - I

COMPUTER SCIENCE

PAPER - I

COMPUTER FUNDAMENTAL

(PAPER CODE - 08025)

Max Marks: 60

NOTE: The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.

UNIT - I Classification and Organization of Computers

History of computer, Generation of computer, Calculator vs. Computer, Digital and Analog computers and its evolution, Major components of digital computers, Memory addressing capability of CPU, Word length and processing speed of computer, Microprocessors, Single chipMicrocomputer, Large and small computers, Users interface, Hardware, software and firmware, multi programming multi user system, Dumb smart and intelligent terminals, computer network and distributed processing, LAN parallel processing Flynn's classification of computers, Control flow and data flow computers

UNIT - II Central Processing Unit

Parts of CPU- ALU, Control Unit, RegistersArchitecture of Intel 8085 microprocessor, Instructions for Intel 8085 microprocessor, Instruction Word size, Various addressing mode,Interrupts,some special Control signals, Instruction cycle, fetch and execute operation, Timing Diagram, Instruction flow and data flow

UNIT - III Memory

Memory hierarchy, Primary andSecondary Memory, Cache memory, Virtual Memory, Direct Access Storage Devices (DASD), Destructive and Nondestructive Readout, Program and data Memory, Memory Management Unit (MMU), PCMCIA Cards and Slot

UNIT - IV I/O Devices

I/O devices- Keyboard, Mouse, Monitor, Impact and Non-ImpactPrinters, Plotter, Scanner, other input/output devices, Scan method of Display- Raster Scan, Vector Scan, Bit Mapped Scan, CRT Controller, I/O Port- Programmable and Non Programmable I/O ports, Inbuilt I/O ports, Parallel and Serial ports, USB, IEEE 1394, AGP, Serial data transfer scheme, Micro controller, Signal Processor, I/O processor, Arithmetic Processor

UNIT-V SOFTWARE AND PROGRAMMING TECHNIQUES

Application and System Software, Introduction, Example, Difference etc., Introduction to Open Source Software such as Unix/Linux (Ubuntu), Libre office etc., Introduction to Machine Language, Assembly Language and High Level Language, Programming Techniques, Stack, Subroutine, Debugging of programs, Macro, Program Design, Software development, Flow Chart, Multi programming, Multiuser, Multitasking, Protection, Operating System and Utility programs, Application packages

TEXT BOOKS

1. Computer Fundamentals P. K. Sinha, BPB Publication, Fourth Edition
2. Computer Fundamentals: Architecture and Organization, [illegible]
3. Fundamentals of Computers, V. Rajaraman, PHI, Sixth Edition
4. Computing Fundamentals, Donald H. Sanders, McGraw-Hill, Third Edition
5. IBM PC [illegible] McGraw-Hill, Second Edition
6. DOS Concepts and [illegible] Tony McGrew, [illegible]

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11/6/18 (Dr. A.K. Dwivedi)

B.Sc. PART - I
COMPUTER SCIENCE
PAPER II
PROGRAMMING IN 'C' LANGUAGE
(Paper Code - 0806)

Max Marks: 50

NOTE: The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.

UNIT-I

Fundamentals of C Programming: Overview of C: History of 'C', Structure of 'C' program. Keywords, Tokens, Data types, Constants, Literals and Variables, Operators and Expressions: Arithmetic operators, Relational operator, Logical operators, Expressions, Operator: operator precedence and associatively, Type casting, Console I/O formatting, Unformatted I/O functions: getch(), getchar, getche(), gete(), putc(), putchar().

UNIT- II

Control Constructs: If-else, conditional operators, switch and break, nested conditional branching statements, loops: do while, while, for, Nested loops, break and continue, goto and label, exit function.

Functions: Definition, function components: Function arguments, return value, function call statement, function prototype, Types of function, Scope and lifetime of variable, Call by value and call by reference. Function using arrays, function with command line argument. User defined function: maths and character functions, Recursive function.

UNIT-III

Array: Array declaration, One and Two dimensional numeric and character arrays, Multidimensional arrays.

String: String declaration, initialization, string manipulation with/without using library function.

Structure, Union and Enum - Structure: Basics, declaring structure and structure variable, typedef statement, array of structure, array within structure, Nested structure; passing structure to function, function returning structure. **Union**: basics, declaring union and union variable, **Enum**: declaring enum and enum variable.

UNIT- IV

Pointer: Definition of pointer, Pointer declaration, Using & and * operators, Void pointer, Pointer to pointer, Pointer in math expression, Pointer arithmetic, Pointer comparison, Dynamic memory allocation functions – malloc, calloc, realloc and free, Pointer vs. Array, Array of pointer, Pointer to array, Pointers to function, Function returning pointer, Passing function as Argument to function, Pointer to structure, Dynamic array of structure through pointer to structure.

UNIT-V

File Handling and Miscellaneous Features: File handling: file pointer, File accessing functions, fopen, fclose, fputc, fgetc, fprintf, fscanf, fread, fwrite,beof, fflush, rewind, fseek, ferror. File handling through command line argument. Introduction to C preprocessor #include, #define, Conditional compilation directives: #if, #else, #elif, #endif, #ifndef etc.

TEXT BOOKS:

1. Programming in ANSI C, E Balagurusamy, Tata McGraw-Hill, Third Edition.
2. Let Us C, YashwantKanetkar, Infinity Science Press, Eighth Edition
3. Mastering C, K R Venugopal, Tata McGraw-Hill.
4. The C Programming Language, Brian W. Kernighan, Dennis M. Ritchie, Prentice Hall, Second Edition.
5. Applications Programming in ANSI C, R. Johnsonbaugh , Martin Kalin, Macmillan, Second Edition.
6. The Spirit of C, Mullish Cooper, Jaico publishing House.
7. How to solve it by Computer, R.G. Dromey, Pearson Education

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11/06/18
(Dr. A.K. Dwivedi)

11/06/18

11-06-18

11/6/18

Practical

- At least 20 Practical based on Syllabus of Paper-I and Paper-II.

11-06-2018
(Dr. Sanjay Kumar)

11/6/2018
(Dr. A.K. Dwivedi)

11/6/18
(L.K. Gavel)

11/6/18
(Dr. J. Durga Prasad Rao)

11-06-18
Hari Shankar Prasad Pande

PRINCIPAL
Vipra College
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ELECTRONICS LABORATORY

ELB 103P: NETWORK ANALYSIS AND ANALOG ELECTRONICS LAB

(Hardware and Circuit Simulation Software) **Max.Marks:25**

The scheme of practical examination will be as follows-

Experiment	--	**30**
Viva	--	**10**
Sessional	--	**10**
Total	--	**50**

AT LEAST 06 EXPERIMENTS FROM THE FOLLOWING BESIDES #1

1. To familiarize with basic electronic components (R, C, L, diodes, transistors), digital Multimeter, Function Generator and Oscilloscope.
2. Measurement of Amplitude, Frequency & Phase difference using Oscilloscope.
3. Verification of (a) Thevenin's theorem and (b) Norton's theorem.
4. Verification of (a) Superposition Theorem and (b) Reciprocity Theorem.
5. Verification of the Maximum Power Transfer Theorem.
6. Study of the I-V Characteristics of (a) p-n junction Diode, and (b) Zener diode.
7. Study of (a) Half wave rectifier and (b) Full wave rectifier (FWR).
8. Study the effect of (a) C- filter and (b) Zener regulator on the output of FWR.
9. Study of the I-V Characteristics of UJT and design relaxation oscillator..
10. Study of the output and transfer I-V characteristics of common source JFET.
11. Study of Fixed Bias and Voltage divider bias configuration for CE transistor.
12. Design of a Single Stage CE amplifier of given gain.
13. Study of the RC Phase Shift Oscillator.
14. Study the Colpitt`s oscillator.

Reference Books:

1. Electrical Circuits, M. Nahvi and J. Edminister, Schaum's Outline Series, Tata McGraw-Hill (2005)
2. Networks, Lines and Fields, J.D.Ryder, Prentice Hall of India.
3. J. Millman and C. C. Halkias, Integrated Electronics, Tata McGraw Hill (2001)
4. Allen Mottershead, Electronic Devices and Circuits, Goodyear Publishing Corporation.

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B.Sc.-I

BIOTECHNOLOGY

PAPER–II

CELL BIOLOGY, GENETICS AND MICROBIOLOGY

UNIT-I

1. Concept of life, Cell as a basic unit of living system and Cell theory.
2. Diversity of Cell shape and size.
3. Prokaryotic cell structure: Function and ultra structure of cell (Gram positive and Gram negative Bacteria), Plasma membrane, Flagella, Pilli, Endospore and Capsule.
4. Eukaryotic cell: Plant cell wall and Plasma membrane.

UNIT-II

1. Cytoplasm: Structure and Functions of Endoplasmic reticulum, Ribosome, Golgi complex, Lysosomes, Nucleus, Mitochondria and Chloroplast.
2. Cytoskeleton: Microtubules, Microfilaments and Intermediate filaments.
3. Cell division: Mitosis and Meiosis.
4. Programmed Cell Death.

UNIT-III

1. Mendel's Laws of Inheritance.
2. Linkage and Crossing over.
3. Chromosome variation in number and structure: Deletion, Duplication, Translocation, Inversion and Aneuploidy, Euploidy (Monoploidy and Polyploidy and its importance).

UNIT-IV

1. History, Scope and Development of Microbiology.
2. Basic techniques of Microbial Culture
3. Microbial Growth & Nutrition of Bacteria: Isolation, media sterilization- physical and chemical agents, pure culture-pour plate method, streak plate method and spread plate method.
4. General features and Economic importance of Fungi, Algae and Protozoa etc.

UNIT-V

1. Bacterial Reproduction: Conjugation, Transduction and Transformation.
2. Mycoplasma – History, Classification, Structure reproduction & Diseases.
3. Viruses – Basic features, Structure, Classification, Multiplication, Bacteriophages (Morphology, life cycle, infection and medicinal importance)

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List of Practical's

MICROBIOLOGY AND BIOCHEMICAL TECHNIQUES

(1) Laboratory rules, Tools, Equipment and Other requirements in Microbiological laboratory.

(2) Micrometry – Use of ocular & stage Micrometrer.

(3) Counting of bacteria by counting chamber, by plate count.

(4)Preparation of media and cultivation techniques:
- (a) Basic liquid media (broth)
- (b) Basic Solid media, (agar slants and deep tubes)
- (c) Demonstration of selective and differential media
- (d) Isolation and enumeration of micro organisms
- (e) Isolation from air and Soil

(5)Smears and staining methods:
- (a) Preparation of bacterial smear
- (b) Gram Negative & Positive staining

(6)Methods of obtaining pure cultures
- (a) Streak plate method
- (b) Pure plate method
- (c) Spread plate method
- (d) Broth cultures

(7)Growth & Biochemical techniques
- (a) Determination of bacterial growth curve
- (b) Amylase production test
- (c) Cellulose production test
- (d) Estimation of Sugar in given solution
- (e) Extraction and separation of lipids
- (f) Estimation of proteins
- (h) Mitosis and Meiosis

(8)Biostatistics:
- (a) By Manual and by computer.
- (b) Problems on mean, mode and median.

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SCHEME OF PRACTICAL EXAMINATION

Time – 4 hrs. **M. M.: 50**

1. Experiment based on culture of micro-organisms	15 Marks
2. Bacterial growth/Staining techniques	10 Marks
3. Biochemical techniques	05 Marks
4. Bio statistics	05 Marks
5. Spotting	05 Marks
6. *Viva – Voce*	05 Marks
7. Record/Sessional	05 Marks

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PRACTICAL FOR Ist YEAR
LABORATORY-I (BCH 105)

1. Preparation of standard buffers and determination of pH of a solution
2. Qualitative tests for :
   a. Carbohydrates
   b. Proteins and amino acids
   c. Lipids
3. Determination of saponification value and iodine number of fats
4. Estimation of ascorbic acid.
5. Titration curve for amino acids and determination of pKa values
6. Verification of Beer-Lambert's law.
7. Estimation of
   i) Carbohydrate by anthrone method.
   ii) Blood glucose by the methods (a) Folin-Wu, (b) Nelson-Somogyi
8. Estimation of amino acids by ninhydrin method.
9. Isolation and assay of glycogen from rat liver.
10. i) Extraction of total lipids by Folch method
    ii) Estimation of food adulterant.
11. Estimation of DNA and RNA.
12. Separation of sugars using paper chromatography.

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Singh, JS Singh SP and Gupta SR. ***Ecology and Environmental Science and Conservation***, S. Chand Publishing, New Delhi

Sharma, PD. ***Ecology and Environment,*** Rastogi Publications, Merrut

Hopkins, WG and Huner, PA. ***Introduction to Plant Physiology,*** John Wiley and Sons.

Pandey SN and Sinha BK, ***Plant Physiology,*** Vikas Publishing, New Delhi

Taiz, L and Zeiger. E. ***Plant Physiology,*** 5th edition, Sinauer Associates Inc. M.A, USA

Srivastava, HS ***Plant Physiology and Biotechnology***, Rastogi Publications, Meerut

B.Sc. II (BOTANY)

Practical

1. Taxonomy: Detailed description and identification of locally available plants of the families as prescribed in the theory paper.
2. Economic Botany: Identification and comment on the plants and plant products belonging to different economic use categories
3. Preparation of Herbarium of local wild plants.
4. Quantitative vegetation analysis of a grassland ecosystem.
5. Anatomical characteristics of hydrophytes and xerophytes.
6. Demonstration of root pressure.
7. Demonstration of transpiration.
8. Demonstration of evolution of O_2 in photosynthesis, factors affecting of photosynthesis.
9. Comparison of R.Q. of different respiratory substrates.
10. Demonstration of fermentation.
11. Determination of BOD of a water body.
12. Demonstration of mitosis.

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PRACTICAL SCHEME

TIME: 4 Hrs. **M.M. : 50**

1.	Anatomy	08
2.	Economic Botany	04
3.	Physiology	08
4.	Ecology	10
5.	Spotting	10
6.	Viva-Voce	05
7.	Project Work/ Field Study	10

(Dr. J.N. Verma
Proff. & Head
Govt. D.B. Girls PG College
Raipur, (C.G.)

(Dr. Rekha Pimpalgaonkar)
Proff. & Head
Govt. N PG Science College
Raipur, (C.G.)

(Dr.Ranjana Shristava)
Proff. & Head
Govt. VYTPG Science College
Raipur, (C.G.)

(Mrs. Sanchal Moghe)
Govt. Bilasa Girls College, Bilaspur

(Mr. Shivakant Mishra)

(Mr Sudheer Tiwari)

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Zoology
B.Sc. Part II 2018-19
Practical

The practical work in general shall be based on the syllabus prescribed and the students will be required to show the knowledge of the following:

- Study of the representative examples of the different chordates (Classified characters).
- Dissection of various systems of scoliodon-Afferent and Efferent branchial cranial nerves, internal ear.

Alternative methods: By Clay/Thermacol/ Drawing/ Model etc.)

- Simple microscopic technique through unstained or stained permanent mount.
- Study of prepared slides histological, as per theory papers.
- Study of limb girdles and vertebrae of Frog, Varanus, Fowl and Rabbit.
- Identification of species and individual of honey bee.
- Life cycle of honey bee and silkworm.
- Exercise based on Evolution and Animal behavior.

Scheme of Practical Exam **Time: 3:30hrs**

• Major dissection (Cranial nerves/efferent branchial vessel)	10
• Exercise based on evolution	05
• Exercise based on applied zoology	05
• Exercise based on animal behavior	04
• Spotting-8 (slides-4,bones-2,specimen-2)	16
• Viva	05
• Sessional marks.	05

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NEW CURRICULUM OF B.Sc. PART II

CHEMISTRY

The new curriculum will comprise of three papers of 33, 33 and 34 marks each and practical work of 50 marks. The Curriculum is to be completed in 180 working days as per UGC norms and conforming to the directives of Govt. of Chhattisgarh. The theory papers are of 60 hrs. each duration and practical work of 180 hrs duration.

Paper – I
INORGANIC CHEMISTRY

60 Hrs., Max Marks 33

UNIT-I

CHEMISTRY OF TRANSITION SERIES ELEMENTS

Transition Elements: Position in periodic table, electronic configuration, General Characteristics, *viz.*, atomic and ionic radii, variable oxidation states, ability to form complexes, formation of coloured ions, magnetic moment μ_{so} (spin only) and μ_{eff} and catalytic behaviour. General comparative treatment of 4d and 5d elements with their 3d analogues with respect to ionic radii, oxidation states and magnetic properties.

UNIT-II

A. Oxidation and Reduction: Redox potential, electrochemical series and its applications, Principles involved in extraction of the elements.

B. COORDINATION COMPOUNDS: Werner's theory and its experimental verification, IUPAC nomenclature of coordination compounds, isomerism in coordination compounds. Stereochemistry of complexes with 4 and 6 coordination numbers. Chelates, polynuclear complexes.

UNIT-III

COORDINATION CHEMISTRY

Valence bond theory (inner and outer orbital complexes), electroneutrality principle and back bonding. Crystal field theory, Crystal field splitting and stabilization energy, measurement of 10 Dq (Δ_o), CFSE in weak and strong fields, pairing energies, factors affecting the magnitude of 10 Dq (Δ_o, Δ_t). Octahedral vs. tetrahedral coordination.

UNIT-IV

A. CHEMISTRY OF LANTHANIDE ELEMENTS

Electronic structure, oxidation states and ionic radii and lanthanide contraction, complex formation, occurrence and isolation, lanthanide compounds.

B. CHEMISTRY OF ACTINIDES

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CHEMISTRY

Paper –IV

LABORATORY COURSE

INORGANIC CHEMISTRY

Qualitative semimicro analysis of mixtures containing 5 radicals. Emphasis should be given to the understanding of the chemistry of different reactions. The following radicals are suggested:

CO_3^{2-}, NO_2^- , S^{2-}, SO_3^{2-},$S_2O_3^{2-}$, CH_3COO^-, F^- ,Cl^- , Br^- , I^- , NO_3^- , BO_3^{3-}, $C_2O_4^{2-}$, PO_4^{3-}, NH_4^+ , K^+, Pb^{2+}, Cu^{2+}, Cd^{2+}, Bi^{3+}, Sn^{2+}, Sb^{3+}, Fe^{3+}, Al^{3+}, Cr^{3+}, Zn^{2+}, Mn^{2+}, Co^{2+}, Ni^{2+}, Ba^{2+}, Sr^{2+}, Ca^{2+}, Mg^{2+}.

Mixtures should preferably contain one interfering anion, or insoluble component ($BaSO_4$, $SrSO_4$, $PbSO_4$, CaF_2 or Al_2O_3) or combination of anions e.g. CO_3^{2-} and SO_3^{2-}, NO_2^- and NO_3^-, Cl^-, Br^-, and I^-.

Volumetric analysis

(a) Determination of acetic acid in commercial vinegar using NaOH.

(b) Determination of alkali content-antacid tablet using HCl.

(c) Estimation of calcium content in chalk as calcium oxalate by permanganometry.

(d) Estimation of hardness of water by EDTA.

(e) Estimation of ferrous & ferric by dichromate method.

(f) Estimation of copper using thiosulphate.

- Principles involved in chromatographic separations. Paper chromatographic separation of following metal ions: i. Ni (II) and Co (II) ii. Fe (III) and Al (III)

ORGANIC CHEMISTRY

- Detection of elements (X, N, S).
- Qualitative analysis of unknown organic compounds containing simple functional groups (alcohols, carboxylic acids, phenols, nitro, amine, amide, and carbonyl compounds, carbohydrates)
- Preparation of Organic Compounds:
  (i) m-dinitrobenzene, (ii) Acetanilide, (iii) Bromo/Nitro-acetanilide, (iv) Oxidation of primary alcohols-Benzoic acid from benzylacohol, (v) azo dye.

PHYSICAL CHEMISTRY

Transition Temperature

PRINCIPAL

- Determination of the transition temperature of the given substance by thermometric/ dialometric method (e.g. $MnCl_2.4H_2O/SrBr_2.2H_2O$).

Thermochemistry

- Determination of heat capacity of a calorimeter for different volumes using change of enthalpy data of a known system (method of back calculation of heat capacity of calorimeter from known enthalpy of solution or enthalpy of neutralization).
- Determination of heat capacity of the calorimeter and enthalpy of neutralization of hydrochloric acid with sodium hydroxide.
- To determine the solubility of benzoic acid at different temperature and to determine ΔH of the dissolution process.
- To determine the enthalpy of neutralization of a weak acid/ weak base versus strong base/ strong acid and determine the enthalpy of ionization of the weak acid/ weak base.
- To determine the enthalpy of solution of solid calcium chloride and calculate the lattice energy of calcium chloride from its enthalpy data using Born Haber cycle.

Phase Equilibrium

- To study the effect of a solute (e.g. NaCl, Succinic acid) on the critical solution temperature of two partially miscible liquids (e.g. phenol-water system) and to determine the concentration of that solute in the given phenol-water system.
- To construct the phase diagram of two component system (e.g. diphenylamine–benzophenone) by cooling curve method.
- Distribution of acetic/ benzoic acid between water and cyclohexane.
- Study the equilibrium of at least one of the following reactions by the distribution method:

  (i) $I_2(aq) + I^- \rightarrow I^-_3(aq)^{2+}$

  (ii) $Cu^{2+}(aq) + nNH_3 \rightarrow Cu(NH_3)n$

Molecular Weight Determination

Determination of molecular weight by Rast Camphor and Landsburger method.

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Note: **Experiments may be added/ deleted subject to availability of time and facilities.**

Reference Books

1. Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009)
2. Furniss, B.S., Hannaford, A.J., Smith, P.W.G. & Tatchell, A.R. Practical Organic Chemistry, 5th Ed. Pearson (2012)
3. Ahluwalia, V.K. & Aggarwal, R. Comprehensive Practical Organic Chemistry: Preparation and Quantitative Analysis, University Press (2000). 22
4. Ahluwalia, V.K. & Dhingra, S. Comprehensive Practical Organic Chemistry: Qualitative Analysis, University Press (2000).
5. Khosla, B. D.; Garg, V. C. & Gulati, A. Senior Practical Physical Chemistry, R. Chand & Co.: New Delhi (2011). Garland, C. W.; Nibler, J. W. & Shoemaker, D. P. Experiments in Physical Chemistry 8th Ed.; McGraw-Hill: New York (2003).
6. Halpern, A. M. & McBane, G. C. Experimental Physical Chemistry 3rd Ed.; W.H. Freeman & Co.: New York

Hrs.5 PRACTICAL EXAMINATION M.M.50

Three Experiments are to be performed.

1. Inorganic – Qualitative semimicro analysis of mixtures. **12 marks**

OR

One experiment from synthesis and analysis by preparing the standard solution.

2. (a) Identification of the given organic compound & determine its M.Pt./B.Pt. **6 marks**

(b) Determination of Rf value and identification of organic compounds by paper chromatography. **6 marks**

3. Any one physical experiment that can be completed in two hours including calculations. **12 marks**

4. Viva **10 marks**

5. Sessional **04 marks**

In case of Ex-Students one marks will be added to each of the experiment.

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MICROBIOLOGY

BSc-2nd

Paper- I: Molecular Biology and Genetic Engineering

UNIT-1: FUNDAMENTALS OF MOLECULAR BIOLOGY

History and scope of molecular biology, concept and mechanism of heredity. DNA as genetic material- experimental evidences. DNA replication- mechanism, process and enzymes/proteins involved in replication.

UNIT-2: CENTRAL DOGMA OF PROTEIN SYNTHESIS

Transcription- initiation, elongation, termination, RNA polymerases and sigma factor. Transcription inhibitors (antibiotics, drugs). Translation- initiation, elongation and termination. Factors involved in translation. Genetic code.

UNIT-3: MUTATION AND DNA REPAIR MECHANISM

Introduction and Types of Gene mutations- Base substitution, frame shift mutation (insertion, deletion, miss-sense, nonsense mutation.) Mutagens – physical and chemical. Reverse mutation in bacteria. DNA repair mechanism (mismatch repair, photo-reactivation, excision and SOS repair). Beneficial and harmful effect of mutation.

UNIT-4: GENE REGULATION

Concept of gene- Cistron, Recon, Muton. Operon Concept- lac Operon, tryptophan Operon, His Operon. Activator, Co-activator and Repressor. Introduction to Bioinformatics- Elementary genome Database.

UNIT-5: GENETIC ENGINEERING

Basic concept of Genetic Engineering, DNA modifying enzymes Restriction endonuclease, DNA ligase, terminal transferase. Vectors- pBR322, pUC19, BAC and YAC. Phage based vectors, expression of vector. Transformation – physical and chemical method. Bacterial Host. Screening of recombinant vector Blue white Screening, Colony Hybridization.

Text Books Recommended:

1. Gene Cloning by T.A. Brown.
2. General Microbiology by Power and Daganiwala.
3. Zinssers Microbiology by KJ Wolfgang, McGraw- HJill Company.
4. Microbial Genetics by RM Stanley, F David and EC John.
5. Bacteriological Techniques by FJ Baker.
6. .Molecular Biology of the Cell; *3rd Edition;* Bruce Alberts ,et.al; Garland Publishing.
7. Cell biology; C.B. Powar; Himalaya Publishing House; Fifth edition
8. Cell & Molecular Biology; Gerald Karp; Fourth edition
9. A Textbook of Microbiology; Dubey&Maheshwari; S.chand& Sons.
10. Cell biology & Genetics; P. K. Gupta
11. Introduction to Bioinformatics; T K Atwood and D J Parry-Smith; Pearson Education Ltd

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Microbiology

PRACTICAL

M. M. 50

Determination of antibiotic resistance by plating method.
Assaying of microbial enzymes; Catalase, Proteases, Peroxidases, Cellulase, Cellobioases, Amylase, Diastase.
Exercise on paper, thin layer, column chromatography.
Exercise on paper and gel electrophoresis.
determination of pH of various water and soil sample.
testing of lambert beer's law.
Determination of lamda max of dye by spectrophotometer
Isolation of resistant bacteria from soil and water sample

Scheme of Practical Examination

Time - 4 hours M.M. 50

1. Exercise on spectrophotometer/ pH meter	10
2. Exercise on chromatography	10
3. Exercise on genetics	05
4. Spotting (1-5)	10
5. Viva-Voce	05
6. Sessional	10
	Total 50

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B.Sc. Part-II

Paper-I

THERMODYNAMICS, KINETIC THEORY AND STATISTICAL PHYSICS

Unit-1 The laws of thermodynamics : The Zeroth law, first law of thermodynamics, internal energy as a state function, reversible and irreversible change, Carnot's cycle, carnot theorem, second law of thermodynamics. Claussius theorem inequality. Entropy, Change of entropy in simple cases (i) Isothermal expansion of an ideal gas (ii) Reversible isochoric process (iii) Free adiabatic expansion of an ideal gas. Concept of entropy, Entropy of the universe. Entropy change in reversible and irreversible processes, Entropy of Ideal gas, Entropy as a thermodynamic variable, S-T diagram, Principle of increase of entropy. The thermodynamic scale of temperature, Third law of thermodynamics, Concept of negative temperature.

Unit-2 Thermodynamic functions, Internal energy, Enthalpy, Helmholtz function and Gibb's free energy, Maxwell's thermodynamical equations and their applications, TdS equations, Energy and heat capacity equations Application of Maxwell's equation in Joule-Thomson cooling, adiabatic cooling of a system, Van der Waals gas, Clausius-Clapeyron heat equation. Blackbody spectrum, Stefan-Boltzmann law, Wien's displacement law, Rayleigh-Jean's law, Planck's quantum theory of radiation.

Unit-3 Maxwellian distribution of speeds in an ideal gas: Distribution of speeds and velocities, experimental verification, distinction between mean, rms and most probable speed values. Doppler broadening of spectral lines. Transport phenomena in gases: Molecular collisions mean free path and collision cross sections. Estimates of molecular diameter and mean free path. Transport of mass, momentum and energy and interrelationship, dependence on temperature and pressure.

Behaviour of Real Gases: Deviations from the Ideal Gas Equation. The Virial Equation. Andrew's Experiments on CO_2 Gas. Critical Constants.

Unit-4 The statistical basis of thermodynamics: Probability and thermodynamic probability, principle of equal a priori probabilities, statistical postulates. Concept of Gibb's ensemble, accessible and inaccessible states. Concept of phase space, γ phase space and μ phase space. Equilibrium before two systems in thermal contact, probability and entropy, Boltzmann entropy relation. Boltzmann canonical distribution law and its applications, law of equipartition of energy.

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Paper-II
WAVES, ACOUSTICS AND OPTICS

Unit-1 Waves in media: Speed of transverse waves on uniform string, speed of longitudinal waves in a fluid, energy density and energy transmission in waves. Waves over liquid surface: gravity waves and ripples. Group velocity and phase velocity and relationship between them. Production and detection of ultrasonic and infrasonic waves and applications.

Reflection, refraction and diffraction of sound : Acoustic impedance of a medium, percentage reflection & refraction at a boundary, impedance matching for transducers, diffraction of sound, principle of a sonar system, sound ranging.

Unit-2 Fermat's Principle of extremum path, the aplanatic points of a sphere and other applications. Cardinal points of an optical system, thick lens and lens combinations. Lagrange equation of magnification, telescopic combinations, telephoto lenses. Monochromatic aberrations and their reductions; aspherical mirrors and Schmidt corrector plates, aplanatic points, oil immersion objectives, meniscus lens.

Optical instruments: Entrance and exit pupils, need for a multiple lens eyepiece, common types of eyepieces. (Ramsdon and Hygen's eyepieces).

Unit-3 Interference of light: The principle of superpositions, two slit interference, coherence requirement for the sources, optical path retardations, Conditions for sustained interference, Theory of interference, Thin films. Newton's rings and Michelson interferometer and their applications its application for precision determinations of wavelength, wavelength difference and the width of spectral lines. Multiple beam interference in parallel film and Fabry-Perot interferometer. Rayleigh refractometer, Twyman-Green interferometer and its uses.

Unit-4 Diffraction, Types of Diffraction, Fresnel's diffraction, half-period zones, phasor diagram and integral calculus methods, the intensity distribution, Zone plates, diffraction due to straight edge, Fraunhofer diffraction due to a single slit and double slit, Diffraction at N-Parallel slit, Plane Diffraction grating, Rayleigh criterion, resolving power of grating , Prism, telescope.

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Polarized light and its mathematical representation, Production of polarized light by reflection, refraction and scattering. Polarization by double refraction and Huygen's theory, Nicol prism, Retardation plates, Production and analysis of circularly and elliptically polarized light. Optical activity and Fresnel's theory, Biquartz polarimeter.

Unit-5 Laser system: Basic properties of Lasers, coherence length and coherence time, spatial coherence of a source, Einstein's A and B coefficients, Spontaneous and induced emissions, conditions for laser action, population inversion, Types of Laser : Ruby and, He-Ne laser and. Applications of laser : Application in communication, Holography and Basics of non linear optics and Generation of Harmonic.

TEXT AND REFERENCE BOOKS:

1. A.K. Ghatak, 'Physical Optics'
2. D.P. Khandelwal, Optical and Atomic Physics' (Himalaya Publishing House, Bombay, 1988)
3. K.D. Moltev; 'Optics' (Oxford University Press)
4. Sears: 'Optics'
5. Jenkins and White: 'Fundamental of Optics' (McGraw-Hill)
6. B.B. Laud: Lasers and Non-linear Optics (Wiley Eastern 1985)
7. Smith and Thomson: 'Optics' (John Wiley and Sons)
8. Berkely Physics Courses: Vol.-III, 'Waves and Oscillations'
9. I.G. Main, 'Vibrations and Waves' (Cambridge University Press)
10. H.J. Pain: 'The Physics of Vibrations and Waves' (MacMillan 1975)
11. Text Book of Optics: B.K. Mathur
12. B.Sc. (Part III) Physics: Editor: B.P. Chandra, M.P. Hindi Granth Academy.
13. F. Smith and J.H. Thomson, Manchester Physics series: optics (John wiley, 1971)
14. Born and Wolf : 'Optics'.
15. Physical Optics: B. K. Mathur and T. P. Pandya.
16. A textbook of Optics: N. Subrahmanyam, Brijlal and M. N. Avadhanulu.
17. Geometrical and Physical Optics: Longhurst.
18. Introduction to Modern Optics: G. R. Fowels.
19. Optics: P. K. Srivastav.

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Physics

PRACTICALS

Minimum 16 (Eight from each group)

Experiments out of the following or similar experiments of equal standard

1. Study of Brownian motion.
2. Study of adiabatic expansion of a gas.
3. Study of conversion of mechanical energy into heat.
4. Heating efficiency of electrical kettle with varying voltage.
5. Study of temperature dependence of total radiation.
6. Study of temperature dependence of spectral density of radiation.
7. Resistance thermometry.
8. Thermo emf thermometry.
9. Conduction of heat through poor conductors of different geometries.
10. Experimental study of probability distribution for a two-option system using a coloured dice.
11. Study of statistical distribution on nuclear disintegration data (GM counter used as a black box).
12. Speed of waves on a stretched strings.
13. Studies on torsional waves in a lumped system.
14. Study of interference with two coherent source of sound.
15. Chlandi's figures with varying excitation and loading points.
16. Measurements of sound intensities with different situations.
17. Characteristics of a microphone-loudspeakers system
18. Designing an optical viewing system.
19. Study of monochromatic defects of images.
20. Determining the principle point of a combination of lenses.
21. Study of interference of light (biprism or wedge film).
22. Study of diffraction at a straight edge or a single slit.
23. Study of F-P etalon fringes.
24. Study of diffraction grating and its resolving power.
25. Resolving power of telescope system.
26. Polarization of light by reflection; also cos-squared law.
27. Study of optical rotation for any system.
28. Study of laser as a monochromatic coherent source.
29. Study of a divergence of laser beam.
30. Calculation of days between two dates of a year.
31. To check if triangle exists and the type of a triangles.
32. To find the sum of the sine and cosines series and print out the curve.

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33. To solve simultaneous equation by elimination method.
34. To prepare a mark-list of polynomials.
35. Fitting a straight line or a simple curve
36. Convert a given integer into binary and octal systems and vice versa .
37. Inverse of a matrix.
38. Spiral array.

TEXT AND REFERENCE BOOKS

1. D.P. Khandelwal, Optics and Atomic physics (Himalaya Publishing house, Bombay 1988).
2. D.P. Khandelwal, A Laboratory Manual for Undergraduate Classes (Vani Publishing House, New Delhi).
3. S. Lipschutz and a Poe, Schaum's outline of theory and Problems of Programming with Fortran(McGraw-hill Book Company 1986).
4. C Dixon, Numerical Analysis .

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B.Sc.(CS)
II Year

COMPUTER SCIENCE

PAPER - I

COMPUTER HARDWARE

(Paper Code - 0655)

Max.Marks 50

Duration 3 hours

AIM - The emphasis in on the desing concepts & organisational details of the common PC, leaving the complicated electronics of the system of the computer Engineers.

OBJECT OF THE COURSE -

1. To introduce the overall organisation of the microcomputers.
2. To introduce the common peripheral devices used in computers.
3. To introduce the hardware components, use of micro processor and function of various chips used in microcomputer.

N.B. : Since the computer organisation study is very vast & complicated, so the study is restricted to only the description and understanding part, fence the paper setter is requested to keep this important factor in mind.

UNIT-I CLASSIFICATION AND ORGANIZATION OF COMPUTERS

Digital and analog computers and its evolution. Major components of digital computers; Memory addressing capability of CPU; word length and processing speed of computes. Microprocessors single chip microcomputers; large and small computers. Users interface Hardware software and firmware. multi programming multi user system. Dumb smart and intelligent terminals computer network and multi processing, LAN parallel processing. Flinn's classification of computers. Computer flow and data flow computers.

UNIT-II CENTRAL PROCESSING UNIT.

CPU organization, ALU control unit registers. Instructions for INTEL 8085, Instruction word size, Various addressing mode interrupts and exceptions, some special Control signals and I/O devices. Instruction cycle fetch and execute operation, time Diagram, data flow.

UNIT-III MEMORY OF COMPUTERS.

Main memory secondary memory, backup memory, cache memory; real and virtual Memory Semiconductor memory. Memory controller and magnetic memory; RAM; disks, optical disks Magnetic bubble memory; DASD, destructive and non destructive. readout. Program of data Memory and MMU.

UNIT-IV I/O DEVICES.

I/O devices of micro controller; processors. I/O devices, printer, plotter, other out put devices, I/O port serial data transfer scheme, Micro controller, signal processor, I/O processor I/O processor arithmetic processor.

UNIT-V SYSTEM SOFTWARE AND PROGRAMMING TECHNIQUE.

ML, AL, HLL, stac subroutine debugging of programs macro, micro programming, Program Design, software development, flow & chart multi programming, multiuser, multi tasking Protection, operating system and utility program, application package.

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(Dr. J. Durga)

11.06.18

RECOMMENDED BOOKS :

1 Computer Fundamentals : Architecture and Organization - By B.Ram (Wilwy Bastem Ltd.)

2 Computers Today - By Donal H. Sanders

3 Computers Fundamental - By Rajaraman.

4 IBM PC - XT Clones - By Govinda Rajalu

PAPER - II

SOFTWARE

(Paper Code - 0856)

AIM - Introduction to the web-language-HTML & problem solving throgh the concept of object oriented programming.

OBJECT OF THE COURSE -

1 To introduce the internet & web related technology & learn the intricacies of web-page designing using HTML.

2 To introduce the object oriented programming concept using C++ language.

3 To introduce the problem solving methodology using the C++ programming features.

N.B. : Examiners are requested to prepare unit-wise Questions papers.

UNIT-I HTML BASICS & WEB SITE DESIGN PRINCIPLES

Concept of a Web Site, Web Standards, What is HTML? HTML Versions, Naming Scheme for HTML Documents , HTML document/file, HTML Editor , Explanation of the Structure of the homepage , Elements in HTML Documents ,HTML Tags, Basic HTML Tags, Comment tag in HTML, Viewing the Source of a web page, How to download the web page source? XHTML, CSS, Extensible Markup Language (XML), Extensible Style sheet language (XSL), Some tips for designing web pages, HTML Document Structure. HTML Document Structure-Head Section, Illustration of Document Structure,<BASE> Element,<ISINDEX> Element,<LINK> Element ,META, <TITLE> Element,<SCRIPT> Element ,Practical Applications, HTML Document Structure-Body Section:-Body elements and its attributes: Background; Background Color; Text; Link; Active Link (ALINK); Visited Link (VLINK); Left margin; Top margin, Organization of Elements in the BODY of the document: Text Block Elements; Text Emphasis Elements; Special Elements – Hypertext Anchors; Character-Level Elements; Character References ,Text Block Elements: HR (Horizontal Line); Hn (Headings) ; P (Paragraph); Lists; ADDRESS ; BLOCKQUOTE; TABLE; DIV (HTML 3.2 and up) ; PRE (Preformatted); FORM ,Text Emphasis Elements, Special Elements – Hypertext Anchors ,Character-Level Elements: line breaks (BR) and Images (IMG), Lists , ADDRESS Element, BLOCKQUOTE Element, TABLE Element, COMMENTS in HTML ,CHARACTER Emphasis Modes, Logical & Physical Styles, Netscape, Microsoft and Advanced Standard Elements List, FONT, BASEFONT and CENTER.

UNIT-II IMAGE, INTERNAL AND EXTERNAL LINKING BETWEEN WEBPAGES

Netscape, Microsoft and Advanced Standard Elements List, FONT, BASEFONT and CENTER Insertion of images using the element IMG (Attributes: SRC (Source),

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WIDTH, HEIGHT, ALT (Alternative), ALIGN), IMG (In-line Images) Element and Attributes; Illustrations of IMG Alignment, Image as Hypertext Anchor, Internal and External Linking between Web Pages Hypertext Anchors ,HREF in Anchors ,Links to a Particular Place in a Document ,NAME attribute in an Anchor ,Targeting NAME Anchors ,TITLE attribute, Practical IT Application Designing web pages links with each other, Designing Frames in HTML. Practical examples.

UNIT-III INTRODUCTION TO OOP

Advantages of OOP, The Object Oriented Approach, Characteristics of object oriented languages- Object, Classes, Inheritance, Reusability, Polymorphism and C++.

Function: Function Declaration, Calling Function, Function Defines, Passing Argument to function, Passing Constant, Passing Value, Reference Argument, returning by reference, Inline Function, Function Overloading, Default Arguments in function.

UNIT-IV OBJECT CLASSES AND INHERITANCE

Object and Class, Using the class, class constructor, class destructors, object as function argument ,copy constructor ,struct and classes , array as class member, Static Class Data, Static Member Functions, , Friend function, Friend class, operator overloading. Type of inheritance, Base class, Derive class. Access Specifier: protected. Function Overriding, member function, String, Template Function.

UNIT-V POINTERS AND VIRTUAL FUNCTION

pointers: & and * operator pointer variables, .pointer to pointer, void pointer,pointer and array, pointer and function, pointer and string, memory management, new and delete, pointer to object, this pointer Virtual Function: Virtual Function, Virtual member function, accesses with pointer,pure virtual function

File and Stream: C++ streams, C++ Manipulators, Stream class, string I/O, char I/O, Object I/O, I/O with multiple object, Disk I/O,

RECOMMENDED BOOKS :

1	Introduction to HTML	:	Kamlesh Agarwala, O.P.Vyas, Prateek A. Agrawala (Kitab Mahal Publication)
2	Let us C++	:	Y. Kanetkar B.P.B Publication
3	Programming in C++	:	E. Balaguruswami
4	Mastering in C++	:	Venu Gopal
5	Object Oriented Programming in C++	:	Lafore R, Galgotia Publications.

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(L.K. Gavel)

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Hari Shankar Prasad Tade

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ELECTRONICS LABORATORY

The scheme of practical examination will be as follows-

Experiment	--	**30**
Viva	--	**10**
Sessional	--	**10**
Total	--	**50**

ELB 203P: COMMUNICATIONELECTRONICS LAB

(Hardware and Circuit Simulation Software) 60 Lectures
Max.Marks:25

1. To design an Amplitude Modulator using Transistor
2. To study envelope detector for demodulation of AM signal
3. To study FM - Generator and Detector circuit
4. To study AM Transmitter and Receiver
5. To study FM Transmitter and Receiver
6. To study Time Division Multiplexing (TDM)
7. To study Pulse Amplitude Modulation (PAM)
8. To study Pulse Width Modulation (PWM)
9. To study Pulse Position Modulation (PPM)
10. To study ASK, PSK and FSK modulators

Reference Books:

1. Electronic Communication systems, G. Kennedy, 1999, Tata McGraw Hill.
2. Electronic Communication system, Blake, Cengage, 5th edition.

ELB 204P: MICROPROCESSOR ANDMICROCONTROLLER LAB(Hardware and Circuit Simulation Software)

Max.Marks:25

At least 06 experiments each from Section-A and Section-B

Section-A: Programs using 8085 Microprocessor

1. Addition and subtraction of numbers using direct addressing mode
2. Addition and subtraction of numbers using indirect addressing mode
3. Multiplication by repeated addition.
4. Division by repeated subtraction.
5. Handling of 16-bit Numbers.
6. Use of CALL and RETURN Instruction.
7. Block data handling.
8. Other programs (e.g. Parity Check, using interrupts, etc.).

Section-B: Experiments using 8051 microcontroller:

1. To find that the given numbers is prime or not.
2. To find the factorial of a number.
3. Write a program to make the two numbers equal by increasing the smallest number and decreasing the largest number.
4. Use one of the four ports of 8051 for O/P interfaced to eight LED's. Simulate binary counter (8 bit) on LED's .
5. Program to glow the first four LEDs then next four using TIMER application.
6. Program to rotate the contents of the accumulator first right and then left
7. Program to run a countdown from 9-0 in the seven segment LED display.
8. To interface seven segment LED display with 8051 microcontroller and display 'HELP' in the seven segment LED display.
9. To toggle '1234' as '1324' in the seven segment LED display.
10. Interface stepper motor with 8051 and write a program to move the motor through a given angle in clock wise or counter clockwise direction.
11. Application of embedded systems: Temperature measurement & display on LCD

Reference Books:

1. Microprocessor Architecture Programming & applications with 8085, 2002, R.S. Goankar, Prentice Hall.
2. Embedded Systems: Architecture, Programming & Design, Raj Kamal, 2008, Tata McGraw Hill
3. The 8051 Microcontroller and Embedded Systems Using Assembly and C, M.A. Mazidi, J.G. Mazidi, and R.D. McKinlay, 2nd Ed., 2007, Pearson Education India.
4. 8051 microcontrollers, Satish Shah, 2010, Oxford University Press.
5. Embedded Microcomputer systems: Real time interfacing, J.W. Valvano 2011, Cengage Learning

B.Sc. II

BIOTECHNOLOGY

PAPER – I

MOLECULAR BIOLOGY & BIOPHYSICS

M.M. 50

UNIT-I

1. Nucleic Acid: Bases, Nucleosides and Nucleotides, DNA and RNA structure.
2. Plasmids.
3. Transposons: Repetitive elements, LINEs & SINEs, Structure of Gene.

UNIT-II

1. DNA Replication: Enzymes involved and mechanism of DNA Replication in Prokaryotes.
2. Mutation: Molecular level of Mutation, Types of Mutagens, Spontaneous and Induced Mutation.
3. DNA Repair: NER, BER and Mismatch Repair.

UNIT-III

1. Genetic Code: Features, Condon Assignment and Wobble hypothesis.
2. Transcription: Initiation, Elongation and Termination in Prokaryotes.
3. Translation: Initiation, Elongation and Termination Translation machinery in Prokaryotes. Operon-Concept of Operator, Regulator, Promoter gene, Inducer and Co-repressor.

UNIT –IV

1. Biophysics : Introduction, Scope and Application
2. Principle, Structure, Functions of the following:
   a. Microscopy b. Colorimeter and Spectroscopy c. Electrophoresis
   d. Centrifugation e. Chromatography.

UNIT –V

1. Radioisotopes techniques: Measurement of radioactivity, Ionization Chambers, Geiger Muller and Scintillation Counter.
2. Autoradiography and DNA Fingerprinting.
3. Biosensor.

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Biotechnology

List of Practical's

MOLECULAR BIOLOGY, BIOPHYSICS, RECOMBINANT DNA TECHNOLOGY AND GENOMICS

1. Isolation of DNA from Plant cell.
2. Estimation of DNA by DPA method.
3. Isolation RNA from yeast cells

Experiment based on-

4. Centrifugation
5. Spectrophotometer/Colorimeter
6. Electrophoresis
7. Paper chromatography/TLC

Experiment based on Bioinformatics -

8. Retrieve DNA /Protein sequence from Biological Data Bases (NCBI).
9. Use of tools studied

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SCHEME FOR PRACTICAL EXAMINATION

Time: 4 hrs. M.M.: 50

1. Experiment based on DNA/RNA	10 marks
2. Experiment based on Instruments	10 marks
3. Experiment based on Bioinformatics	10 marks
4. Spotting	10 marks
5. *Viva - Voce*	05 marks
6. Record / Sessional	05 marks

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BIOCHEMISTRY

PAPER - I

ENZYMOLOGY

M.M. 50

UNIT-I INTRODUCTION

History, general characteristics, nomenclature, IUB enzyme classification (rationale, over view and specific examples), significance of numbering system. Definitions with examples of holoenzyme, apoenzyme, coenzymes. cofactors, activators, inhibitors, active site (identification of groups excluded), metallo-enzymes, units of enzyme activity, specific enzymes, Isoenzymes, monomeric enzymes, oligomeric enzymes and multienzyme complexes. Enzyme specificity.

Hostorical perspective, nature of non-enzymatic and enzymatic catalysis. Measurement and expression of enzyme activity-enzyme assays. Definition of IU, Katal, enzyme turn over number and specific acitivity. Role of non-protein organic molecules and inorganic ions coenzyme, prosthetic groups. Role of vitamins as coenzymes precursors (general treatment).

UNIT-I ENZYME CATALSIS

Role of cofactors in enzyme catalysis : NAD/NADP+, FMN/FAD, coenzyme A, biocytin, cobamide, lipoamide, TPP, pyridoxal phosphate, tetrahydrofolate and metal ions with special emphasis on coenzyme functions. Acid-base catalysis, covalent, proximity and orientaton effects, strain and distortion theory. Mechanism of action of chymotrypsin, carboxypeptidase, ribonuclease and lysozyme.

UNIT-II ENZYME PURIFICATION

Methods for isolation, purification and characterization of enzymes.

UNIT-IV ENZYME KINETICS

Factors affecting enzyme activity : enzyme concentration, substrate concentration, pH and temperature. Derivation of Michaelis-Menten equation for uni-substrate reactions. Km and its significance. Line weaver-Burk plot and its limitations. Importance of K_{ca}/K_m. Bi-substrate reactions-brief introduction to sequential and ping-pong mechanism with examples.

Kinetics of zero and first order reactions. Significance and evaluation of energy of activation and free energy.

Reversible and irreversible inhibition, competitive, non-competitive and uncompetitive inhibitions. determination of K_m & V_{max} in presence and absence of inhibitor. Allosteric enzymes.

UNIT-V INDUSTRIAL AND CLINICAL APLLICATION OF ENZYME.

Immobilization of enzyme and their industrial applications. Production of glucose from starch, cellulose and dextran; use of lactase in dairy industry; production of glucose-fructose syrup from sucrose; use proteases in food, detergent and leather industry; medical application of enzymes. use of glucose oxidase in enzyme electrodes.

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Biochemistry

PAPER - II

INTERMEDIARY METABOLISM

M.M. 50

UNIT-I INTRODUCTION TO METABOLISM

General features of metabolism, experimental approaches to study metabolism; use of intact organism, becterial mutants, tissue slices, stable and radioactive isotopes.

CARBOHYDRATE METABOLISM

Reactions and energetics of glycolysis. Alcoholic and lactic acid fermentations. Entry of fructose, galactose, mannose etc. Reactions and energetics of TCA cycle. Gluconeogenesis, glycogenesis and glycogenolysis, Reactions and physiological signifacance of pentose phosphate pathway. Regulation of glycolysis and TCA cycle. Photosynthesis, a brief review.

UNIT-II ELECTRON TRANSPORT CHAIN AND OXIDATIVE PHOSPHORYLATION

Structure of mitochondria, sequence of electron carriers, sites of ATP production, inhibitors of electron transport chain. Hypothesis of mitochondrial oxidative phosphorylation (basic concepts). Inhibitors and uncouplers of oxidative phosphorylation. Transport of reducing potentials into mitochondria.

UNIT-III LIPID METABOLISM

Introduction, hydrolysis of triacylglycerols, transport of fatty acids into mitochondria. β – oxidation of saturated fatty acids, ATP yield from fatty acid oxidation. biosynthesis of saturated and unsaturated fatty acids. Metabolism of ketone bodies, oxidation of unsaturated and odd chain fatty acids. Biosynthesis of triglycerides and important phospholipids, glycolipids, sphingolipids and cholesterol. Regulation of cholesterol metabolism.

UNIT-IV AMINO ACID METABOLISM

General reactions of amino acid metabolism : transmination, oxodative deamination and decarboxylation. Urea cycle. Degradation and biosynthesis of amino acids. Glycogenic and ketogenic amino acids.

UNIT-V NUCLEOTIDE METABOLISM

Sources of the atoms in the purine and pyrimidine molecules. Biosynthesis and degradation of purines and pyrimidines. Regulation of purine and pyrimidine biosynthesis.

PORPHYRIN METABOLISM

Biosynthesis and degradation of porphyrins. Production of bile pigments.

PRECTICAL

1 Separation of Blood Plasm and Serum

a Estimation of proteins from serum by biuret and lowry methods.

b Determination of albumin and A/G ratio in serum.

2 Estimation of bilirubin (conjugated and unconjugated) in serum.

3 i Estimation of total lipids in serum by vanillin method.

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i. Estimation of cholesterol in serum.

4. Estimation of lipoproteins in plasma.

5. Estimation of lactic acid in blood before and after exercise.

6. Estimation of blood urea nitrogen from plasma.

7. Separation and identification of amino acids by (a) paper chromatography and (b) thin-layer chromatography.

8. Separation of polar and non-polar lipids by thin-layer chromatography.

9. Estimation of SGPT and SGOT in serum.

10. a. Assay of serum alkaline phosphatase activity.
    b. Inhibition of alkaline phosphatase activity by EDTA.
    c. Effect of substrate concentration on alkaline phosphatase activity and determination of its K_m value.

11. a. Effect of temperature on enzyme activity and determination of activation energy.
    b. Effect of pH on enzyme activity and determination of optimum pH.
    c. Effect of enzyme concentration on enzyme activity.

12. a. Preparation of starch from potato and its hydrolysis by salivary amylase.
    b. Determination of achromatic point in salivary amylase.
    c. Effect of sodium chloride onamylases.

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Singh BD, ***Genetics***, Kalyani Publication

Gupta, PK, ***Cell and Molecular Biology,*** Rastogi Publications, Meerut

Singh, BD, ***Biotechnology: Expanding Horizons,*** Kalyani publications

Gupta, PK, ***Elements of Plant Biotechnology,*** Rastogi Publications, Meerut

Gupta, SN, ***Concepts of Biochemistry,*** Rastogi Publications, Meeru

Jain, JL., Jain S, Jain, N, ***Fundamentals of Biochemistry***, S Chand Publishing, New Delhi

B.Sc.-III (Botany)

Practical

1. Study of host parasite relationship pf plant diseases listed above.
2. Demonstration of preparation of Czapek's Dox medium and Potato dextrose agar medium, sterilization of culture medium and pouring.
3. Inoculation in culture tubes and petriplates.
4. Gram Staining.
5. Microscopic examination of Curd.
6. Study of plant diseases as listed in the theory paper.
7. Biochemical test of carbohydrate and protein.
8. Instrumentation techniques

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PRACTICAL SCHEME

TIME: 4 Hrs. **M.M. : 50**

1.	Plant Disease/Symptoms	10
2.	Instrumentation techniques	05
3.	Staining of Microbes	05
4.	Tissue Culture techniques	05
5.	Spotting	10
6.	Project Work/ Field Study	05
5.	Viva-Voce	05
6.	Sessional	05

(Dr. J.N. Verma) (Dr. Rekha Pimpalgaonkar) (
Dr.Ranjana Shristava)

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Proff. & Head
Govt. N PG Science College
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Govt. Bilasa Girls College, Bilaspur

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B. Sc. Part III 2018-19

Zoology

Practical

The practical work in general shall be based on syllabus prescribed in theory.
The candidates will be required to show knowledge of the following:

- Estimation of population density, percentage frequency, relative density.
- Analysis of producers and consumers in grassland.
- Detection of gram-negative and gram-positive bacteria.
- Blood group detection (A,B,AB,O)
- R. B. C. and W.B.C count
- Blood coagulation time
- Preparation of hematin crystals from blood of rat
- Observation of Drosophila, wild and mutant.
- Chromatography-Paper or gel.
- Colorimetric estimation of Protein.
- Mitosis in onion root tip.
- Biochemical detection of Carbohydrate, Protein and Lipid.
- Study of permanent slides of parasites, based on theory paper.
- Working principles of pH meter, colorimeter, centrifuge and microscope.

Scheme of marks distribution **Time: 3:30hrs**

• Hematological Experiment	08
• Ecological Experiment: Grassland Ecosystem/ Population Density/Frequency/relative density	06
• Bacterial staining	05
• Biochemical experiment	06
• Practical based on Instrumentation (Chromatography/ pH meter/microscope/centrifuge.	05
• Spotting (5 spots)	10
7 Viva	05
8. Sessional	05

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CHEMISTRY

B.Sc. Part- III

PRACTICAL

Max. Marks-50

INORGANIC CHEMISTRY

Gravimetric analysis:

- Estimation of nickel (II) using Dimethylglyoxime (DMG).
- Estimation of copper as CuSCN
- Estimation of iron as Fe_2O_3 by precipitating iron as $Fe(OH)_3$.
- Estimation of Al (III) by precipitating with oxine and weighing as $Al(oxine)_3$ (aluminium oxinate).
- Estimation of Barium as $BaSO_4$

Inorganic Preparations:

- Tetraamminecopper (II) sulphate, $[Cu(NH_3)_4]SO_4.H_2O$
- Cis and trans $K[Cr(C_2O_4)_2.(H_2O)_2]$ Potassium dioxalatodiaquachromate(III)
- Tetraamminecarbonatocobalt (III) ion
- Potassium tris(oxalate)ferrate(III)/ Sodium tris(oxalate)ferrate(III)
- Cu(I) thiourea complex, Bis (2,4-pentanedionate) zinc hydrate; Double salts (Chrome alum/ Mohr's salt)

ORGANIC CHEMISTRY

1. Preparation of organic Compounds

- Acetylation of one of the following compounds: amines (aniline, o-, m-, p- toluidines and o-,m-, p-anisidine) and phenols (β-naphthol, vanillin, salicylic acid)
- Benzolyation of one of the following amines (aniline, o-, m-, p- toluidines and o-, m-, panisidine) and one of the following phenols (β-naphthol, resorcinol, p cresol) by Schotten-Baumann reaction.
- Bromination of any one of the following: a. Acetanilide by conventional methods b.Acetanilide using green approach (Bromate-bromide method)
- Nitration of any one of the following: a. Acetanilide/nitrobenzene by conventional method b. Salicylic acid by green approach (using ceric ammonium nitrate).
- Reduction of p-nitrobenzaldehyde by sodium borohydride.
- Hydrolysis of amides and esters.
- Semicarbazone of any one of the following compounds: acetone, ethyl methyl ketone, cyclohexanone, benzaldehyde.

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- Benzylisothiouronium salt of one each of water soluble and water insoluble acids (benzoic acid, oxalic acid, phenyl acetic acid and phthalic acid).
- Aldol condensation using either conventional or green method.
- Benzil-Benzilic acid rearrangement.
- Preparation of sodium polyacrylate.
- Preparation of urea formaldehyde.
- Preparation of methyl orange.

The above derivatives should be prepared using 0.5-1g of the organic compound. The solid samples must be collected and may be used for recrystallization, melting point and TLC.

2. Qualitative Analysis Analysis of an organic mixture containing two solid components using water, $NaHCO_3$, NaOH for separation and preparation of suitable derivatives.
3. Extraction of caffeine from tea leaves.
4. Analysis of Carbohydrate: aldoses and ketoses, reducing and non-reducing sugars.
5. Identification of simple organic compounds by IR spectroscopy and NMR spectroscopy. (Spectra to be provided).
6. Estimation of glycine by Sorenson's formalin method.
7. Study of the titration curve of glycine.
8. Estimation of proteins by Lowry's method.
9. Study of the action of salivary amylase on starch at optimum conditions.
10. Effect of temperature on the action of salivary amylase.

PHYSICAL CHEMISTRY

Conductometry

- Determination of cell constant
- Determination of equivalent conductance, degree of dissociation and dissociation constant of a weak acid.
- Perform the following conductometric titrations:
  - i. Strong acid vs. strong base
  - ii. Weak acid vs. strong base
  - iii. Mixture of strong acid and weak acid vs. strong base
  - iv. Strong acid vs. weak base
- To determine the strength of the given acid conductometrically using standard alkali solution.
- To determine the solubility and solubility product of a sparingly soluble electrolyte conductometrically
- To study the saponification of ethyl acetate conductometrically.

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8 Hrs. **PRACTICAL EXAMINATION** **M.M.50**

Five experiments are to be performed.

1. **Inorganic** - Two experiments to be performed. Gravimetric estimation compulsory **08 marks**. (Manipulation 3 marks)

   Anyone experiment from synthesis and analysis **04 marks**.

2. **Organic** - Two experiments to be performed. Qualitative analysis of organic mixture containing two solid components. compulsory carrying **08 marks** (03 marks for each compound and two marks for separation).

One experiment from synthesis of organic compound (Single step) **04 marks**.

3. Physical-One physical experiment **12 marks**.
4. Sessional **04 marks**.
5. Viva Voce **10 marks**.

In case of Ex-Students one mark each will be added to Gravimetric analysis and Qualitative analysis of organic mixture and two marks in Physical experiment.

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MICROBIOLOGY

BSc-3rd

Paper- I: Medical Microbiology and Immunology

UNIT-1: AIR BORNE DISEASES

Air borne diseases: Types- Tuberculosis, Pertussis, Diphtheria, Influenza, Small & Chicken pox, Mumps, Measles. Symptoms, treatment and prevention.

UNIT-2: WATER BORNE DISEASES

Concept and cause of water borne diseases; Types, Hepatitis, Dysentery, Diarrhea, Cholera, typhoid. Symptoms, treatment and prevention.

UNIT-3: CLINICAL DISEASE AND DIAGNOSIS

Clinical diseases: Diabetes, Asthma, multiple sclerosis, rheumatoid arthritis, cancer. Symptoms, Treatment and prevention.

UNIT-4: BASIC CONCEPT OF IMMUNITY

Immune system: Structure and function of the cells, tissues and organs of immune system. Types of immunity- humoral and cell-mediated, innate, acquired immunity. **Antigen- Antibody**: types, properties. Hapten, adjuvants, Immuno-globulins: Structure types, Properties and their function - Theory of antibody production.

UNIT-5: IMMUNO DISEASE DIAGNOSIS

Methods based on Ag-Ab interaction- precipitation, agglutination, ELISA, RIA, Immuno-electrophoresis, PCR based diagnosis method for infectious diseases.

Text Books Recommended:

1. Immunology: Kuby.
2. General Microbiology by Power and Daganiwala.
3. Zinssers Microbiology by K. J Wolfgang, McGraw- Hill Company.
4. Medical Microbiology; N. C. Dey and T.K. Dey, Allied agency, Calcutta.
5. Bacteriological Techniques by FJ Baker.
6. A Textbook of Microbiology; Dubey & Maheshwari; S. chand & Sons.
7. Scott's Diagnostic Microbiology by EJ Baron.

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Microbiology

PRACTICAL

M. M. 50

Isolation of bacteria from air and soil (crop fields)
Isolation of fungi from air and soil
Relationship between OD and CFU measurements.
Measurement of fungal growth by dry weight and wet weight
Study of rhizospheric and phyllospheric microbes from economically important plants.
Biodegradation study of some organic molecules
Microbial assessment of potable water.
Determination of BOD, COD and dissolved oxygen.
Determination of blood group by slide agglutination test./TLC/DLC
Determination of heamoglobin.
Determination of quality of milk by MBRT
Isolation of Rhizobium from root nodules.

Scheme of practical examination

Time 4 hour MM- 50

1. Exercise on immunological test	10
2. Exercise on water analysis	10
3. Exercise on isolation and characterization of micro organism	05
4. Spotting (1 to 5)	10
5. Viva voce	05
6. Sessional	10
	Total- 50

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B.Sc. Part-III

Paper-I

RELATIVITY, QUANTUM MECHANICS, ATOMIC MOLECULAR AND NUCLEAR PHYSICS

Unit-1 Reference systems, inertial frames, Galilean invariance propagation of light, Michelson-Morley experiment, search for ether. Postulates for the special theory of relativity, Lorentz transformations, length contraction, time dilation, velocity addition, variation of mass with velocity, mass-energy equivalence, particle with zero rest mass.

Unit-2 Origin of the quantum theory : Failure of classical physics to explain the phenomena such as black-body spectrum, photoelectric effect, Compton effect, Wave-particle duality, uncertainty principle, de Broglie's hypothesis for matter waves, the concept of Phase and group velocities, experimental demonstration of mater waves. Davisson and Germer's experiment. Consequence of de Broglie's concepts, Bohr's complementary Principle, Bohr's correspondence principle, Bohr's atomic model, energies of a particle in a box, wave packets. Consequence of the uncertainty relation, gamma ray microscope, diffraction at a slit.

Unit-3 Quantum Mechanics: Schrodinger's equation, Statistical interpretation of wave function, Orthogonality and normalization of wave function, Probability current density, Postulatory basis of quantum mechanics, operators, expectation values, Ehrenfest's theorem, transition probabilities, applications to particle in a one and three dimensional boxes, harmonic oscillator in one dimension, reflection at a step potential, transmission across a potential barrier.

Unit-4 Spectra of hydrogen, deuteron and alkali atoms spectral terms, doublet fine structure, screening constants for alkali spectra for s, p, d and f states, selection rules. Discrete set of electronic energies of moleculers, quantisation of vibrational and rotational energies, determination of inter-nuclear distance, pure rotational and rotation vibration spectra. Dissociation limit for the ground and other electronic states, transition rules for pure vibration and electronic vibration spectra. Raman effect, Stokes and anti-Stokes lines, complimentary character of Raman and infrared spectra, experimental arrangements for Raman spectroscopy.

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Unit-5 Structure of nuclei:- Basic Properties of Nuclei: (1) Mass, (2) Radii, (3) Charge, (4) Angular Momentum, (5) Spin, (5) Magnetic Moment (μ), (6) Stability and (7) Binding Energy, Nuclear Models:- Liquid Drop Model, Mass formula, Shell Model, Types of Nuclear reactions, laws of conservation, Q-value of reactions, Interaction of Energetic particles with matter, Ionization chamber, GM Counter, Cloud Chambers, Fundamental Interactions, Classification of Elementary Particles, Particles and Antiparticles, Baryons, Hyperons, Leptons, and Mesons, Elementary Particle Quantum Numbers: Baryon Number, Lepton Number, Strangeness, Electric Charge, Hypercharge and Isospin, introductory idea of discovery of Higg's Boson.

TEXT AND REFERENCE BOOKS:

1. H.S. Mani and G.K. Metha: "Introduction to Modern Physics"" (Affiliated East-West Press, 1989).
2. A Beiser, "Prospective of Modern Physics".
3. H.E. White, Introduction to Atomic Physic".
4. Barrow, "Introduction to Molecular Physics".
5. R.P. Feynman, R.B. Leighton and M Sands, "The Feynman Lectures on Physics", Vol.III (B.I. Publications, Bombay, Delhi, Calcutta, Madras).
6. T.A. Littlefield and N Thorley, "Atomic and Nuclear Physics" (Engineering Language Book Society)
7. H.A. Enge, "Introduction to Nuclear Physics", (Addision-Wesly)
8. Eisenberg and Resnick, "Quantum Physics of Atoms, Molecules, Solids, Nuclei and Particles" (John Wiley)
9. D.P. Khandelwal, "Optics and Atomic Physics", (Himalaya Publishing House, Bombay, 1988).
10. Quarks and Leptons, F. Halzen and A.D. Martin, Wiley India, New Delhi, 1984.
11. Radiation detection and measurement, G.F. Knoll (John Wiley & Sons, 2000).
12. Theoretical Nuclear Physics, J.M. Blatt & V.F.Weisskopf (Dover Pub.Inc., 1991).

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Paper-II

SOLID STATE PHYSICS, SOLID STATE DEVICES AND ELECTRONICS

Unit-1 Amorphous and crystalline solids, Elements of symmetry, seven crystal system, Cubic lattices, Crystal planes, Miller indices, Laue's equation for X-ray diffraction, Bragg's Law, Bonding in solids, classification. Cohesive energy of solid, Madelung constant, evaluation of Parameters, Specific heat of solids, classical theory (Dulong-Petit's law), Einstein and Debye theories, Vibrational modes of one dimensional monoatomic lattice, Dispersion relation, Brillouin Zone.

Unit-2 Free electron model of a metal, Solution of one dimensional Schrödinger equation in a constant potential, Density of states, Fermi Energy, Energy bands in a solid (Kronig-Penny model without mathematical details), Difference between Metals, Insulator and Semiconductors, Hall effect, Dia, Para and Ferromagnetism, Langevin's theory of dia and para-magnetism, Curie- Weiss's Law, Qualitative description of Ferromagnetism (Magnetic domains), B-H curve and Hysteresis loss.

Unit-3 Intrinsic and extrinsic semi conductors, Concept of Fermi level, Generation and recombination of electron hole pairs in semiconductors, Mobility of electrons and holes, drift and diffusion currents, p-n junction diode, depletion width and potential barrier, junction capacitance, I-V characteristics, Tunnel diode, Zener diode, Light emitting diode, solar cell, Bipolar transistors, pnp and npn transistors, characteristics of transistors, different configurations, current amplification factor, FET and MOSFET Characteristics.

Unit-4 Half and full wave rectifier, rectifier efficiency ripple factor, Bridge rectifier, Filters, Inductor filter, L and π section filters, Zener diode, regulated power supply using zener diode, Applications of transistors, Bipolar Transistor as amplifier, h-parameter, h-parameter equivalent circuit, Transistor as power amplifier, Transistor as oscillator, principle of an oscillator and Bark Hausen's condition, requirements of an oscillator, Wein-Bridge oscillator and Hartley oscillator.

Unit-5 Digital Circuits: Difference between Analog and Digital Circuits, Binary Numbers, Decimal to Binary and Binary to Decimal Conversion, AND, OR and NOT Gates (Realization using Diodes and Transistor), NAND and NOR Gates as Universal Gates, XOR and XNOR Gate, De Morgan's Theorems, Boolean Laws, Simplification of Logic Circuit using Boolean Algebra, Digital to Analog Converter, Analog to Digital Converter.

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Physics

TEXT AND REFERENCE BOOKS:

1. Introduction to solid state physics: C. Kittel.
2. Solid State Physics: A.J. Dekkar.
3. Electronic Circuits: Mottershead.
4. Electronic Circuits: Millman and Halkias.
5. Semiconductor Devices: S.M. Sze.
6. Electronic devices: T.L. Floyd.
7. Device and Circuits: J. Millman and C. Halkias.
8. Electronic Fundamental and Applications: D. Chatopadhyay and P.C. Rakshit.
9. Electricity and Magnetism: K.K. Tiwari.

PRACTICALS

Minimum 16 (Eight from each group)

Experiments out of the following or similar experiments of equal standard

1. Determination of Planck's constant.
2. Determination of e/m by using Thomson tube.
3. Determination of e by Millikan's methods.
4. Study of spectra of hydrogen and deuterium (Rydberg constant and ratio of masses of electron proton).
5. Absorption spectrum of iodine vapour.
6. Study of alkali or alkaline earth spectra using a concave grating.
7. Study of Zeeman effect for determination of a Lande g-factor.
8. Analysis of a given band spectrum.
9. Study of Raman spectrum using laser as an excitation source.
10. Study of absorption of alpha and beta rays.
11. Study of statistics in radioactive measurement.
12. Coniometric study of crystal faces.
13. Determination of dielectric constant.
14. Hysteresis curve of transformer core.
15. Hall-probe method for measurement of magnetic field.
16. Specific resistance and energy gap of semiconductor.
17. Characteristics of transistor.
18. Characteristics of tunnel diode.
19. Study of voltage regulation system.
20. Study of regulated power supply.

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B.Sc.(CS)
III Year

COMPUTTER SCIENCE

PAPER - I

(Paper Code-0909)

COMPUTER HARDWARE PART-C

AIM : The emphasis is on the design concepts & organisational details of the common PC, leaving the complicated Electronics of the system to the computer engineers.

Objective of the Course :

1. To introduce the overall organisation of the microcomputers and operating systems.
2. To introduce the interaction of common devices used with computers with operating softwares, excluding the Assembly languages, with special reference to DOS/WINDOWS.
3. To introduce the working of hardware components, Micro-Processor and various chips used in micro-computers by operating system, without the use of electronic circuitry.
4. To introduce the use of operating systems architecture with IBM-PC & clones, excluding Assembly language, with forms an important part of hardwares.

N.B. : Since the computer organisation study is very vast & complicated, so the study is restricted only to the description and understanding part, hence the paper-setter is requested to keep this important factor in mind.

UNIT-1 : ORGANISATION OF Micro-Processor & MIRCO-COMPUTER :-

1. **Introduction & organisation of Micro-Computer :**
   - (a) Basic Components of Micro-computer : Basic Block; Prom ram memory; Data memory; I/O Ports; Clock generator; Integration of functional blocks.
   - (b) Interconnecting Components in a Micro-computer : Necessary functional block; Bussed architecture for microcomputer; memory addressing; Addressing I/O ports; comparision of I/O mapped and memory mapped I/O.
   - (c) Input Output Techniques : Non-CPU devices, Program & interrupt controlled I/O; Hardware controlled I/O or DMA.
2. **An Introduction to the various as :**
   - (a) General understanding of different µP or CPU :
     Intel 8088, 286, 386, 486, 586 Pentium, P54C, MMX P55C; Motorola 6800 & 88100 series; CYRIX & AMD CPUs.
   - (b) The Registers of CPU : (Give Example of P-8088) Register organisation of 8088, Scrach pad segment, pointer, Index and Flag, Registers.
   - (c) Memory addressing modes of P-8088 : Segment offset; Data addressing modes; Addressing for branch instructions.
   - (d) I/O Addressing with P-8088 : Memory mapped I/O & I/O mapped I/O.

UNIT-2 : SYSTEM HARDWARE ORGANISATION OF COMPUTERS :

1. **Hardware Organisation of the Personal Computer :**
   - (a) Block diagram with various parts of PC.
   - (b) The Mother Board of General P.C. : 8088 CPU; ROM & RAM; Keyboard

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& its interface; System timer/counters; Hardware interrupt vectoring; DMA controller & channels; Interfacing to audio speaker; Bus slots & facture cards.

(c) The Serial I/O ports, COM-1 & COM-2.

(d) The parallel Port for Printer.

(e) Expansion Slots for RAM.

(f) Disk Controllers : For floppy, Hard disk, CD-ROM & Cassets drives.

2. **The Video Display of PCs :**

(a) Video Monitors; Monochrome and colour.

(b) Video Display Adapters & Their Video Modes; Monochrome & colour graphics adapters.

(c) Video Control Through ANSI-SYS.

(d) Video Control Through ROM-BOIS : INT 10H.

(e) Direct Video Control; Monochrom & colour graphics adapters.

(f) Installing Customized Character Sets.

UNIT-3 : ORGANISATION OF OPERTING SYSTEM WITH SYSTEM HARDWARE :

1 **The ROM-BIOS Services :**

(a) Introduction to UNIX, ENIX, SUN, solaris, DOS & MAC with special reference to DOS & Windows, its ver., as DOS becomes more popular than others in PCs.

(b) The ROM-BIOS Diskette Services, INT 13H.

(c) The ROM-BIOS Serial Port Services, INT 14H.

(d) The ROM-BIOS Keyboard Services, INT 16H.

(e) The ROM-BIOS Printer Services, INT 17H.

(f) Miscellaneous Service Provided by the ROM-BIOS : INT 05H, INT 11H, INT 12H, INT 18H, INT 19H, INT 1AH.

2 **The fundamental of Operating System viz. DOS/WINDOWS :**

(a) The loading of DOS & Its Basic Structure ; ROM bootstrap, IO.SYS, DOS.SYS & Command..COM.

(b) The Execution of the programs under DOS ; EXEC functions, program segment prefix; Features of COM & EXE program files.

(c) Device Handling by Dos ; FDD, HDD, CON, Keyboard, PRN, AUX, CLOCK and NUL devices; Block devices; Character devices; Driver installation sequence.

(d) File Structures of DOS ;

(e) The DOS Interrupts : INT 20H-2FH

(f) The DOS functions through INT 21H; Discuss only the understanding part of various other DOS function to handle hard & softwares.

(g) Installation of windows : Important system files in windows.

UNIT-4 : ORGANIZATION & HANDLING BY OPERATING SYSTEMS :

1 **Disk and Files under DOS :**

(a) Logical Structure of a Disk : Organisation of disk for use; Boot record ; FAT

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files; disk or root directory.

(b) File Organisation on a DOS disk : Logical volumes ; Sub directories; Volume lables.

(c) Manipulating Files under DOS : File attributes ; date and time, file Access; FCB functions.

2 **Memory Allocation, Program Loading and Execution :**

(a) Memory Management under DOS : EXEC loader; Memory Management & its functions; Modifying a Program's memory allocation.

(b) Loading and Executing Programs under DOS : The EXEC function ; Memory considerations; parameter blocks; calling & returning from EXEC.

(c) Loading the program overlays through EXEC.

UNIT-5 : ORGANISATION OF HARDWARE BY OPERATING SYSTEM :

1 **Interrupt Handling through DOS :**

(a) Types of interrupts.

(b) Interrupt Vector Table in PC.

(c) Interrupt Service Routines.

(d) Special Interrupts in PC : Clock Interrupt; The -C or Break Interrupt ; DOS reserved interupt INT 28H ; Patching memory resident routines.

2. **Filters for DOS :**

(a) Filters in operating systems.

(b) Redirection of I/O under DOS.

(c) The Filters Supplied with DOS.

(d) Writing Filters to run under DOS.

3. **Handling of Various Versions of Windows O.S. :**

(a) Setup Installation

(b) Trouble shooting

(c) Networking features

Text Book :

1 Hardware and Software of Personal Computers.
By Sanjay K. Bose. (Wiley Eastern Ltd. New Delhi).

Supporting Text Books :

1 Digital System from Gates to Microprocessor.
By Sanjay K. Bose. (Wiley Eastern Ltd. New Delhi).

4 Computer Fundamentals : Architecture & Organisation.
By B. Ram.. (Wiley Eastern Ltd. New Delhi).

Reference Books :

1 IBM PC-XT and Clones : By Govinda Rajalu.

2 Microprocessor and interfacing : By Douglas Hall.

3 Insight the IBM-PC : Peter Norton.

4 Micriprocessor System : 8086/8088 family architecture, programming & design : By Liu and Gibson.

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PAPER - II

(Paper Code-0910)

Atm : To introduce DBMS and RDBMS using Back-end tool and Front-end tool.

Object of the Course :

1. To introduce Data BAse Management System concepts.
2. To introduce the Relational Database Management System and Relational Database Design.
3. To introduce the RDBMS software and utility of query language.
4. To introduce basic concept of GUI Programming and database connectivity using Visual Basic.

UNIT-1 : CONCEPT OF D.B.M.S. AND DATA MODELS

(a) Introduction to DBMS :- Purpose of Data base systems, Views of data, Data Modeling Database Languages, Transaction management, Storage Management, Database Administrator and User, Database System Structure.

(b) E-R Model : Basic concepts, Constraints, Keys, Mapping Constaint, E-R Diagram, Weak and Strong Entity sets, E-R Database Schema, Reduction of an E-R Schema to Table.

UNIT-2. : RELATIONAL DATABASE MANAGEMENT SYSTEM

(a) Relational Model : Structure of Relational Database, Relational Algebra, Domain Relational Calculus, Extended Relational- Algebra Operation, Modification of database, Views.

(b) Relational Database Design : Pitfalls in Relational Database Desing, Decomposition Functional Dependencies, Normalization : 1NF, 2NF, BCNF, 3NF, 4NF, 5NF.

UNIT-3 : INTRODUCTION TO RDBMS SOFTWARE - ORACLE

(a) Introduction : Introduction to personal and Enterprises Oracle, Data Types, Commercial Query Language, SQL, SQL*PLUS.

(b) DDL and DML : Creating Table, Specifying Integrity Constraint, Modifying Existing Table, Dropping Table, Inserting Deleting and Updating Rows in as Table, Where Clause, Operators, ORDER BY, GROUP Function, SQL Function, JOIN, Set Operation, SQL Sub Queries. Views : What is Views, Create, Drop and Retrieving data from views.

(c) Security : Management of Roles, Changing Passward, Granting Roles & Privilege, with drawing privileges.

(d) PL/SQL : Block Structure in PL/SQL, Variable and constants, Running PL/SQL in the SQL*PLUS, Data base Access with PL/SQL, Exception Handling, Record Data type in PL/SQL, Triggers in PL/SQL.

UNIT-4 : G.U.I. PROGRAMMING

(a) Introduction to Visual Basic : Event Driven Programming, IDE, Introduction to Object, Controlling Objects, Models and Events, Working with Forms, MDI Form Working with standard Controls.

(b) Overview of Variables, Declaring, Scope, Arrays, User defined data types, Constants, Working with procedures : Function, Subroutine, and Property.

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Working with Data, Time, Format, String, and Math's Function. Controlling Program Execution: Comparison and Logical Operators, If...Then statements, Select Case Statement, Looping Structures, Exiting a loop. Error Trapping and Debugging.

(c) File Organization : Saving data to file. Sequential and Random access file, the desing and coding.

UNIT-5 : V DATA BASE PROGRAMMING IN VB

(a) Introduction :- Concept of DAO, RDO, ADO, input validation : field & form level validation, ADO object model : the ADO object Hierarchy, the connection object, the command object, record set object, parameter object, field object, record object, stream object, Error object, parameter object.

(b) Using Bound control to Present ADO data : Using the ADO data control, ADO data control properties, binding simple controls : Data list, data combo, Data Grid, Data Form Wizard : single form wizard, Grid form, master/Detail form. Programming the ADO data control : Refresh method, Event, Hierarchical flex Grid control.

(c) Data Environment & Data Report : Creating connection, Using command object in the data Environment, Data Environment option and operation, Binding Form to the data Environment, ADO Events in the Data report, Print Preview, Print, Export, Data report in code : Data reports Events, Binding data reports Directly.

REFERENCE BOOKS :

1 Data Base System Concept : By Hery F. Korth. Tata McGraw Hill

2 Fundamental of Data Base System Concept : Nawathe & Elmasri (Pearson educations)

3 Oracle Complete Reference : By Oracle Press

4 Introduction to OOPS & VB : By V.K. Jain, Vikas Publishing House

5 Database Programming VB 6 : By B.P.B. Publication

PRACTICALS :

1 **Practicals on Oracle :**

At least 20 practicals covering the SQL, PL/SQL, Triggers, Views.

2 **Practicals on Visual Basic :**

At least 20 pracricals on VB that covering basic and data controls components.

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21. Study of lissajous figures using CRO.
22. Study of VTVM.
23. Study of RC and TC coupled amplifiers.
24. Study of AF and RF oscillators.
25. Find roots of f(x) = 0 by using Newton-Raphson Method.
26. Find root of f(x) = 0 by using secant method.
27. Integration by Simpson rule.
28. To find the value of V at
29. String manipulations.
30. Towers of Hanoi (Non-recursive).
31. Finding first four perfect numbers.
32. Quadratic interpolation using Newton's forward-difference formula of degree two.

TEXT AND REFERENCE BOOKS:

1. B.G. Strechman, Solid state electronics devices II edition (Prentice-Hall of India New Delhi 1986)
2. W.D. Stanley, Electronics devices, circuits and applications (Prentice-Hall new jersey, USA 1988).
3. S. Lipschutz and A Poe; Schaum's outline of theory and problems of programming with Fortran (Mc Graw-Hill Book Co. Singapore, 1986).
4. C Dixon, Numerical Analysis.

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ELECTRONICS LABORATORY

The scheme of practical examination will be as follows-

Experiment	--	**30**
Viva	--	**10**
Sessional	--	**10**
Total	--	**50**

ELB 303P: INDUSTRIAL ELECTRONICS & PCB Design LAB **MM-25**
(Hardware and Circuit Simulation Software)
Max.Marks:25

1. Study of I-V characteristics of DIAC
2. Study of I-V characteristics of a TRIAC
3. Study of I-V characteristics of a SCR
4. SCR as a half wave and full wave rectifiers with R and RL loads
5. DC motor control using SCR.
6. DC motor control using TRIAC.
7. AC voltage controller using TRIAC with UJT triggering.
8. Study of parallel and bridge inverter.
9. Design of snubber circuit
10. Study of chopper circuits

Design and Fabrication of Printed Circuit Boards

1. Design automation, Design Rule Checking; Exporting Drill andGerber Files; Drills; Footprints and Libraries Adding and Editing Pins, copper clad laminatesmaterials of copper clad laminates, properties of laminates (electrical & physical),
2. Study of soldering techniques. Film master preparation, Image transfer, photo printing, Screen Printing, Plating techniques etching techniques,
3. Study of Mechanical Machining operations,Lead cutting and Soldering Techniques, Testing and quality controls.
4. Study ofLead cutting and Soldering Techniques, Testing and quality controls.

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BIOTECHNOLOGY

List of Practical's

PLANT, ENVIRONMENTAL, INDUSTRIAL AND MEDICAL BIOTECHNOLOGY

1. Preparation of Tissue culture media.
2. Sterilization of plant material.
3. Seed Germination, Root, Shoot and Callus Culture
4. Determination of total dissolved solids of water.
5. Determination of DO, BOD, COD of water.
6. Determination of Coliform by MPN Test.
7. Production of Enzymes/Antibiotics/Acids.
8. Effect of Biopesticides on microorganism
9. Antigen Antibody interaction- Determination of Blood Group and Rh factor.
10. Widal Test
11. VDRL Test.
12. ELISA Test.
13. Perform of Immuno-diffusion

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SCHEME FOR PRACTICAL EXAMINATION

Time: 4 hrs. **MM-50**

1. Experiment based on Paper - I	
(i) Plant tissue culture	08 marks
(ii) Environment / Industrial	07marks
2. Experiment based on Paper - II	15 marks
3. Spots	10marks
4. *Viva-voce*	05marks
5. Sessional/ Record	05marks

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BIOCHEMISTRY

PAPER - I

MOLECULAR BIOLOGY

UNIT-I BASIC CONCEPTS OF GENETIC INFORMATION

a Nucleic acids as genetic information carriers, experimental evidence e.g. bacterial genetic transformation, Hershey - Chase Experiment, TMV reconstitution rexperiment.

b Central dogma of molecular genetics - current version, reverse transcription and retroviruses.

c Primary structure of nucleic acids and their properties, silent features of eukaryotic, prokaryotic and viral genome; highly repetitive, moderately repretitive and unique DNA sequences.

d Basic concepts about the secondary structures of nucleic acids, 5' 3' direction antiparallel strands, base composition, base equivalence, bae pairing and base stacking in DNA molecule. and buoyant density and their.

UNIT-II STRUCTURAL LAVELS OF NUCLEIC ACIDS AND SEQUENCING

a Scondary and tertiary structure of DNA : Watson and Crick model, A.B. and Z types of DNA major and minor grooves, chirality of DNA, tertiary structure of DNA.

b Structure and properties of RNA; Classes of RNA secondary and tertiary structures.

c Nucleic acid hybridization : Cot T_m value and satellite DNA.

d Sequencing : Restriction and modification system; sequencing of DNA and RNA.

UNIT-III a DNA REPLICATION

DNA replication in prokaryotes - conservative, semi conservative and dispersive types, experimental evidence for semi conservative replication. DNA polymerases, other enzymes and protein factors involved in replication. Mechanism of replication. Inhibitors of DNA replication.

b TRANSCRIPTION

Transcription in prokaryotes RNA polymerase, promoters, initiation, elongation and termination of RNA synthesis, inhibitors of transcription. Reverse transcriptase, post transcriptional processing of RNA in eukaryotes.

UNIT-IV TRANSLATION AND REGULATION OF GENE EXPRESSION

a Genetic code : Basic feature of genetic code, biological significance of degeneracy. Wobble hypothesis, gene within genes and overlapping genes.

b Mechanism of translation : Ribosome tructure, A and P sites, charged tRNA, f-mat-tRNA initiator codon, Shine Dalgarno consensus sequence (AGGA), formation of 70S initiation complex, role of EF-Tu, EF-Ts, EF G and GTP, nonsense codons and release factors RF 1 and RF 2.

c Regulation of gene Expression in prokaryotes : Enzyme induction and repression,

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Bio-Chemistry

PRACTICAL FOR IIIrd YEAR

LABORATORY - III (BCH 305)

1. Estimation of DNA by diphenylamine method.
2. Effect of temperature on the viscosity of DNA using Ostwald's Viscometer.
3. Extraction of RNA and its estimation by Orcinol method.
4. Estimation of hemoglobin by measuring total iron in blood.
5. Estimation of calcium and phosphorus in serum & urine.
6. Estimation of creatine and creatinine in urine.
7. Estimation of immunoglobulins by precipitation with saturated ammonium sulphate.
8. Denaturation fo enzyme, studies on DNA.
9. a Separation of proteins by column chromatography.
   b Determination of proteins by dye binding assay.
10. Separation of proteins by SDS-polyacrylamide gel electrophoresis.

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b. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.

c. Apart from Question No. 1, rest of the paper shall consist of five units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 15 marks.

10. The Year wise Structure & plan of the programme shall be as follows :

SCHEME OF EXAMINATION BCA PART-I

Paper no.	Title of Paper/s	Maximum Marks		Maximum Marks	Minimum Passing Marks
		Theory	Practical		
1.	आधार पाठ्यक्रम–हिन्दी भाषा	75	--	75	26
2.	Foundation Course- English Language	75	--	75	26
3.	Environmental Studies & Human Rights **(Additional & Compulsory)**	75	25	100	33
4.	Discrete Mathematics	100	--	100	33
5.	Computer Fundamental and Concepts of Software	100	--	100	33
6.	PC Software Packages and Programming in C	100	--	100	33
7.	Data Structure	100	--	100	33
8.	Lab-1 Software Packages Lab	--	75	75	25
9.	Lab-2 Programming lab in C	--	75	75	25
	Total Marks	**650**	**150**	**800**	

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LAB-I
SOFTWARE PACKAGES LAB

The lab exercise should be based on MS Windows 7 or higher version and MS Office 2007 or higher version and comprises the theoretical paper as well as practical paper.

Section-A

WINDOWS 7 : Basic Elements of WINDOWS, My Computer, Sharing Devices, Windows Explorer, Accessories: Entertainment, Communication, System Tools, Paint Brush, Calculator, Calendar, Clock, Note Pad, Word Pad Etc., Control Panel, Changing Color and Theme, Changing the Desktop Background, Screen Saver, Adjusting Display Settings, Adjusting Sound, Adjusting the Mouse, Changing the Date and Time.

Section-B

Introduction to MS Word: Menus, Shortcuts, Document types; Working with Documents: Opening Files – New & Existing, Saving Files, Formatting page and Setting Margins, Converting files to different formats- Importing, Exporting, Sending files to others, Editing text documents- Inserting, Deleting, Cut, Copy, paste, Undo, Redo, Find, Search, Replace, Using Tool bars, Ruler- Using Icons, Using help; Formatting Documents: Setting Font Styles, Setting Paragraph style, Setting Page Style, Setting Document Styles, Creating Tables, Drawing, Tools, Printing Documents.

Section-C

Introduction to MS Power Point: Opening new Presentation, Different presentation templates, Setting backgrounds, Selecting presentation layouts, Creating a presentation, Formatting a presentation-Adding style, Color, gradient fills, Arranging objects, Adding Header & Footer, Slide Background, Slide layout, Inserting pictures, movies, tables.

Section-D

Introduction to MS Excel: Introduction: Spreadsheet & its Applications, Opening spreadsheet, Menus & Toolbars & icons, Shortcuts, Working with Spreadsheets-Opening a File, Saving Files, Setting Margins, Converting files to different formats- Importing, Exporting and Sending files to others, Spreadsheet addressing, Entering and Editing Data, Computing data- Setting Formula, Finding total in a column or row, Mathematical operations, Formulas, Formatting Spreadsheets & Printing worksheet.

Section-E:

Introduction MS Access: Database concepts: Tables, Queries, Forms, Reports, Opening & Saving database files: Creating Tables, Table Design, Indexing, Entering data, Importing data, Creating Queries: SQL statements, Setting relationship, Creating Forms: GUI, Form, Creating & printing reports.

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LAB-II
PROGRAMMING LAB IN C

1. Program to find area and circumference of circle.
2. Program to find the simple interest.
3. Program to convert temperature from degree centigrade to Fahrenheit.
4. Program to calculate sum of 5 subjects & find percentage.
5. Program to show swap of two no's without using third variable.
6. Program to reverse a given number.
7. Program to print a table of any number.
8. Program to find greatest in 3 numbers.
9. Program to show the use of conditional operator.
10. Program to find that entered year is leap year or not.
11. Program to find whether given no is even or odd.
12. Program to shift inputed data by two bits to the left.
13. Program to use switch statement. Display Monday to Sunday.
14. Program to display arithmetic operator using switch case.
15. Program to display first 10 natural no & their sum.
16. Program to print Fibonacci series up to 100.
17. Program to find GCD & HCF of given Numbers using Recursion.
18. Program to find whether given no is a prime no or not.
19. Program to display sum of series 1+1/2+1/3+.....+1/n.
20. Program to display series and find sum of 1+3+5+.....+n.
21. Program to use bitwise AND operator between the two integers.
22. Program to add two number using pointer.
23. Program to find sum, subtraction, multiplication & transpose of matrices.
24. Program to reverse a number using pointer.
25. Program to show input and output of a string.
26. Program to find square of a number using functions.
27. Program to swap two numbers using functions.
28. Program to find factorial of a number using functions.
29. Program to show table of a number using functions.
30. Program to show call by value.
31. Program to show call by reference.
32. Program to find largest of two numbers using functions.
33. Program to find factorial of a number using recursion.
34. Program to find whether a string is palindrome or not.

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The break-up of marks for second Year's Practical will be as under :			
Sr. No.	Argument	Maximum Marks	Minimum Passing Marks
1.	Lab Record	15	
2.	Viva-voce	20	
3.	Program Development and Execution	40	
Total Marks		75	25

SCHEME OF EXAMINATION

Paper no.	Title of Paper/s	Maximum Marks		Maximum Marks	Minimum Passing Marks
		Theory	Practical		
1.	आधार पाठ्यक्रम–हिन्दी भाषा	75	--	75	26
2.	Foundation Course- English Language	75	--	75	26
3.	Operating System	100	--	100	33
4.	Digital Electronics and Microprocessor	100	--	100	33
5.	Computer Networks and Cyber Technology	100	--	100	33
6.	Object Oriented Programming Using C++	100	--	100	33
7.	Computer Graphics and Multimedia	100	--	100	33
8.	Lab-1 Programming Lab Using C++	--	75	75	25
9.	Lab- 2 Multimedia Lab	--	75	75	25
	Total Marks	**650**	**150**	**800**	

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LAB-I
PROGRAMMING LAB USING C++

List of Sample Problems/Experiments:

1. Write a C++ program to find the sum of individual digits of a positive integer.
2. A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1.Subsequent terms are found by adding the preceding two terms in the sequence.Write a C++ program to generate the first n terms of the sequence.
3. Write a C++ program to generate all the prime numbers between 1 and n , where n is a value supplied by the user.
4. Write C++ programs that use both recursive and non-recursive functions
   a. To find the factorial of a given integer. b. To find the GCD of two given integers.
   c. To find the nth Fibonacci number.
5. Write a C++ program that uses a recursive function for solving Towers of Hanoi problem.
6. Write a C++ program to find both the largest and smallest number in a list of integers.
7. Write a C++ program to implement the matrix ADT using a class. The operations supported by this ADT are:
   a)Reading a matrix. c) Addition of matrices.
   b)Printing a matrix. d) Subtraction of matrices.
   e)Multiplication of matrices.

Note: Practical must be as per syllabus of theoretical paper.

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LAB-II
MULTIMEDIA LAB

Series of Practical Curriculums

Photoshop:

1. (i) Handling different file formats and interchanging them, changing the resolution, color, grayscales and size of the images
(ii) Using brushes and creating multicolor real life images
2. Cropping, rotating, overlapping, superimposing, pasting photos on a page
3. Creation of a single image from selected portions of many
4. Developing a commercial brochure with background tints
5. Creating an image with multi-layers of images and texts.
6. Applying masks and filtering on images

7. CorelDRAW X4 Part 1

- Getting Started with CorelDRAW
- Starting CorelDRAW
- Working with Command Bars
- Working with Layers
- Examining a Master Page
- Creating a Master Layer
- Working with Layers
- Using Brush Tools and Adding Objects
- Working with Interactive Tools
- Using Advanced Techniques for Text Manipulation
- Working with Paragraph Text
- The PowerClip Feature and the Envelope Tool
- Creating Bulleted Lists
- Working with Vector and Bitmap Graphics
- Converting Vector Objects to Bitmaps
- Working with Bitmap Graphics
- Introduction to CorelTRACE
- Advanced Output Options
- Preparing a Document For Printing
- Other Printing Options

The break-up of marks for Fourth Year's Practical will be as under :			
Sr. No.	Argument	Maximum Marks	Minimum Passing Marks
1.	Lab Record	15	
2.	Viva-voce	20	
3.	Program Development and Execution	40	
Total Marks		75	25

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SCHEME OF EXAMINATION

Paper no.	Title of Paper/s	Maximum Marks		Maximum Marks	Minimum Passing Marks
		Theory	Practical		
1.	आधार पाठ्यक्रम–हिन्दी भाषा	75	--	75	26
2.	Foundation Course- English Language	75	--	75	26
3.	Computer Organization and Architecture	100	--	100	33
4.	Software Engineering	100	--	100	33
5.	Database Design and RDBMS (Oracle)	100	--	100	33
6.	Web Technology	100	--	100	33
7.	Numerical Analysis	100	--	100	33
8.	Lab-1 RDBMS & Web Technology	--	75	75	25
9.	Lab-2 Minor Project	--	75	75	25
	Total Marks	**650**	**150**	**800**	
	Grand Total Marks of BCA- I, II & III			**2400**	

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LAB-I
RDBMS & WEB TECHNOLOGY
Practical as per syllabi of theoretical paper.

The break-up of marks for Third Year Practical will be as under :			
Sr. No.	Argument	Maximum Marks	Minimum Passing Marks
1.	Lab Record	15	
2.	Viva-voce	20	
3.	Program Development and Execution	40	
	Total Marks	75	25

BCA PART-III
LAB-II
Minor Project

The break-up of marks for Project will be as under :			
Sr. No.	Argument	Maximum Marks	Minimum Passing Marks
1.	Project Report	25	
2.	Viva-voce/ Presentation	25	
3.	Project Execution	50	
Total Marks		100	50

SCHEME OF EXAMINATION FOR ONE YEAR DCA PROGRAMME
w.e.f. Session 2017-18

Paper No.	Title of the Paper/s	Term End Examination Maximum marks	Total Maximum Marks	Minimum Passing Marks in Term End Examination
I	Fundamentals of Computers	100	100	33
II	Windows & PC Packages	100	100	33
III	Print Technology and Desktop Publishing	100	100	33
IV	Internet and Web Technology	100	100	33
V	Programming in C	100	100	33
VI	Introduction to Operating System	100	100	33
VII	LAB-I PC Package and DTP Lab	100	100	33
VIII	LAB-II Programming in C Lab	100	100	33
		Total Marks	**800**	

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PAPER-VII
LAB-I
PC PACKAGE AND DTP LAB

Note: - Practical should cover syllabus of respected theoretical papers.

The break-up of marks for Practical will be as under :			
Sr. No.	Argument	Maximum Marks	Minimum Passing Marks
1.	Lab Record	20	
2.	Viva-voce	30	
3.	Program Development and Execution	50	
	Total Marks	100	33

PAPER-VIII
LAB-II
PROGRAMMING IN C LAB

Note: - Practical should cover syllabus of respected theoretical papers.

The break-up of marks for Practical will be as under :			
Sr. No.	Argument	Maximum Marks	Minimum Passing Marks
1.	Lab Record	20	
2.	Viva-voce	30	
3.	Program Development and Execution	50	
	Total Marks	100	33

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प्रपत्र

विषय / संकाय / प्रश्न–पत्र का नाम– **B.Com.(Computer Application)**

कमांक	कक्षा का नाम	वर्तमान पाठ्यक्रम	नवीन संशोधित पाठ्यक्रम	नवीन संशोधित पाठ्यक्रम का औचित्य
1.	1st Year	COMPUTER FUNDAMENTALS AND OFFICE AUTOMATION	COMPUTER FUNDAMENTAL	Updation Required
2.	1st Year	COMPUTERIZED FINANCIAL ACCOUNTING	PC SOFTWARE AND MULTIMEDIA	Updation Required
3.	1st Year	PRACTICAL	PRACTICAL	Updation Required
4.	2nd Year	INTERNET APPLICATION & E-COMMERCE	INTERNET APPLICATION & E-COMMERCE	No Change
5.	2nd Year	RELATIONAL DATABASE MANAGEMENT SYSTEM	RELATIONAL DATABASE MANAGEMENT SYSTEM	No Change
6.	2nd Year	PRACTICAL	PRACTICAL	No Change
7.	3rd Year	PROGRAMMING IN VISUAL BASIC	PROGRAMMING IN VISUAL BASIC	No Change
8.	3rd Year	SYSTEM ANALYSIS, DESING & MIS	SYSTEM ANALYSIS, DESING & MIS	No Change
9.	3rd Year	PRACTICAL	PRACTICAL	No Change

केन्द्रीय अध्ययन मंडल के अध्यक्ष एवं सदस्यों का हस्ताक्षर

S.N.	Name	Designation/University/College	Signature with Date
1.	Dr. Sanjay Kumar	Head, S.o.S. in Computer Science & I.T., Pt. R.S. University, Raipur	11-06-2018
2.	Mr. Hari Shankar Prasad Tonde	Head, Dept. of Computer Science, Sarguja University, Ambikapur	11-06-18
3.	Dr. Anuj Kumar Dwivedi	Head, Dept. of Computer Science, Govt. V.B.S.D. Girls College, Jashpur Nagar, Jashpur	11/6/2018
4.	Mr. L.K. Gavel	Head, Dept. of Computer Science, Govt. G.S.G. P.G. College Balod	11/06/18
5.	Dr. J. Durga Prasad Rao	Head, Dept. of Computer Science, Shri Sankracharya Mahavidyalaya, Bhilai	11/6/18

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Practical

- At least 20 Practical based on Syllabus of Paper-I and Paper-II.

11-06-2018
(Dr. Sanjay Kumar)

11/6/2018
(Dr. A.K. Dwivedi)

11/6/18
(L.K. Gavel)

11/6/18
(Dr. J. Durga Prasad Rao)

11-06-18
Hari Shankar Prasad Tandel

B. Com II year
(Computer Application)

COMPUTER APPLICATION

MARKS DISTRIBUTION

Theory Paper — Paper - I — Total Marks - 50

Paper - II — Total Marks - 50

Every unit of theory paper will consists of 10 marks.

Practical Paper — Total Marks - 50

Practical Marks Distribution :

Viva	- 10
Internal	- 15
Practical	- 25
Total Marks	- 150

Practical Test will consist of 3 Hrs.

Syllabus of B.Com.-II (Computer Application)

PAPER - I

INTERNET APPLICATION & E-COMMERCE

(Paper Code-1139)

UNIT - I Introduction to HTML

Introduction to Internet & World Wide Web

Internet - Indian and the Internet, Profile of Indian Surfer, History of the Internet, Indian Internet History, Technological Foundation of Internet, Application in Internet Environment, Movement of files/data between two computers, TCP/IP, IP Addresses, Domain Name System, Domain Name Services, allocation of second level domains in India, Internet & India.

World Wide Web (WWW) - WWW consortium browsing and Information retrieval, exploring the WWW, address : URL.

UNIT - II

Introduction to HTML & Designing Web Page

Concept to Website, Web standards, What is HTML, HTML documents / file, HTML Editor, Explanation of the structure of Homepage, Elements in HTML Documents, HTML Elements, HTML Tags & Basic HTML Tags, viewing the source of web page & downloading the web page source, Extensible HTML, CSS, XML, XSL.

HTML Document Structure - Head Section

Illustration of Document Structure, Mark-up elements within the Head : BASE, ISINDEX, LINK, META, TITLE, SCRIPT.

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11-06-2018 (Dr. A.K. Dwivedi) (L.K. Gavel) Hari Shankar Prasad Tande (Dr. J. Dayal)

UNIT - V

(a) **Security** : Management of Roles, Changing Password, Granting Roles & Privilege, with drawing privileges.

(b) **PL/SQL** : Block Structure in PL/SQL, Variable and constants, Running PL/SQL in the SQL*PLUS, Data base Access with PL/SQL, Exception Handling, Record Data type in PL/SQL, Triggers in PL/SQL.

SUGGESTED BOOKS :

1 Data base system : Korth & Siberschatz.

2 An Introduction to Data base System : C.J. Date

PAPER - III

PRACTICAL EXERCISES BASED ON PAPER I & II

Practicals to be done :

1 Creating simple Web-pages using html.

2 Designing *business web-sites* using HTML features (e.g. html forms)

[Each student should study the existing *business web-sites* and do atleast 05 exercises to create business websites using various html features]

3 Should perform various queries using SQL.

[Each student should create ER diagrams for various business scenario, and convert it into tables, using any RDBMS Software (i.e. Oracle / Access)

4 Practical using various aspects of Oracle.

[At least 10 practical-exercises covering the contents of paper-II]

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11/06/18 (C.K. Gavel)

11-06-18 Hari Chandan Prasad Pande

11/6/18 (Dr. J. Durga Prasad)

11-06-2018 (Dr. Sanjay Kumar)

UNIT-IV Introduction to MIS & Other Subsystem-

Evolution of MIS, Need of MIS, Definition & Benefits of MIS, Characteristic, Role component of Information system, data base as a future of MIS, Decision making, logic of Management Information system. Structure of MIS.

UNIT-V Information System Concept -

Difference between Transaction Processing System (TPS) and Management Information System, How MIS works, MIS and Information Resource Management, Quality information Building Blocks for the information system, information system concept, Other system characteristic (Open & Closed System), difference between MIS & Strategic System, Adaptive system, Business function information system.

BOOK REFERENCE :

1. System Analysis and Design - Elias M. Awad.
2. System Analysis and Design - Alan Dennis & Barbara Haley Wixo.
3. Management Information systems - C.S.V. Murthy, Himalaya Publication House.

PAPER - III

PRACTICAL EXERCISES BASED ON PAPER I & II

Practicals to be done -

1. At least 20 practical - exercises covering the contents of paper - I (e.g. Designing calculator, sorting of elements, Generating Fibbonacci series)
2. Design the Project on one of the following - Application Software / Website Design/ Accounting software / Inventory control System / System Software & other (e.g. Library Management System, Medical management, Stock Management, Hotel Management, Website for your institute / Website of any Organization)
3. The Project Report cover the following topic - Objective, Hardware & Software Requirements, Analysis, Design, Coding, input forms, testing, Reports, Future enhancement of s/w.
4. Practical exam is based on the Project Demonstration & report.

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- - - - - - - -

11-06-2018
(Dr. Sanjay Kumar)

11/6/18
(Dr. A.K. Dwivedi)

11/06/18
(L.K. Gauri)

11.06.18
Hari Shankar Prasad Tande

11/6/18
(Dr. J. Durga Rao)

YEAR WISE PLAN
PGDCA

S.N.	Subject Name	End Semester Examination Maximum Marks	End Semester Examination Minimum Passing Marks
1.	Fundamentals of Computer and Information Technology	100	40
2.	PC- Packages and Computerized Accounting System	100	40
3.	Data Communication and Computer Network	100	40
4.	Programming using 'C' & C++	100	40
5.	Relational Database Management System (Oracle)	100	40
6.	System Analysis & Design	100	40
7.	PC Package and Tally ERP Lab	50	17
8.	C,C++ and Oracle Lab	50	17
9.	Project	100	40

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PC Package & Tally ERP Lab

Note: Practical should be as per syllabus of theoretical papers.

C, C++ & Oracle Lab

Note: Practical should be as per syllabus of theoretical papers.

PROJECT

Note:

01. It is compulsory, that students would have group of maximum of two students and project should be done under Government sectors/ Public Sector/ Pvt. Limited S/W Company/ Software Technology park of India/ ISO 9001 certified company etc.
02. The students should not make any project under local or private institutions.
03. The students should make project themselves and project will not be copy of other project.

Steps for Live Project

01. Getting customer's requirements
02. Designs, database and business logics.
03. Developing software application project.
04. Testing and implementing the project.
05. Troubleshooting the project application after implementation.

The break-up of marks for Practical will be as under :			
Sr. No.	**Argument**	**Maximum Marks**	**Minimum Passing Marks**
1.	Lab Record	10	
2.	Viva-voce	20	
3.	Program Development & Execution	20	
Total Marks		50	17

The break-up of marks for Practical will be as under :			
Sr. No.	**Argument**	**Maximum Marks**	**Minimum Passing Marks**
1.	Project Report	25	
2.	Viva-voce/ Presentation	25	
3.	Project Execution	50	
Total Marks		100	40

PRINCIPAL

YEAR WISE PLAN
PGDCA

S.N.	Subject Name	End Semester Examination Maximum Marks	End Semester Examination Minimum Passing Marks
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8.	C,C++ and Oracle Lab	50	17
9.	Project	100	40

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PC Package & Tally ERP Lab
Note: Practical should be as per syllabus of theoretical papers.

C, C++ & Oracle Lab
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PROJECT

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The break-up of marks for Practical will be as under :			
Sr. No.	**Argument**	**Maximum Marks**	**Minimum Passing Marks**
1.	Project Report	25	
2.	Viva-voce/ Presentation	25	
3.	Project Execution	50	
Total Marks		100	40

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Books Recommonded

1. Manual of Foreign Exchange H.E Evitt.
2. A Text book on Foreign Exchange P.Einzlti.
3. Foreign Exchange Arthmtic V.V. Keshkamat.
4. Principles and Arithmetic of Foreign Exchange O.S. Ramamurty.
5. Finance of Foreign Trade and Foreign Exchange V.V.Venkatraman
6. Foreign Exchange and Introduction .V.V. Keshkamat.
7. Finance of Foreign Trade and Foreign Exchange G S. Lall.
8. Finance of Foreign trade and Foreign Exchange B.C.Ajmera.

Procedure of Internal evaluation for the students of Diploma course of Banking.

1. Internal evaluation would be a countinuous process which may take the form of graidings for class participation and home assigement Each candidate will be required to (i) Submit two howme assignment in the form of two papers concerning each subject and (ii) Participate in class discussion and seminars.On the basis of this grading the teacher concerned would prepare the subject wise award lists.
2. The Papers submitted by the students will be returned to the dodidates after evaluation .if the papers are not found upto the standard The students if he so desires, will be advised to resubmit the paper on the lines suggested by the teacher and the papers then will be finally as sessed.
3. The award list as finalised by the head of the department of commerce of the institute would be forwarded to the Universily , through the principal of the institute.ordinarily by the 31st March.
4. Distribution of marks between examination and internal assessment will be 75/25.
5. The marks of Internal assessment obtained by student will be carried over towards his subsequent examination in which he appears as ex student if he has obtained more than 48% marks in each internal evaluations.

COURSE DETAILS FOR

P/G DIPLOMA IN BUSINESS MANAGEMENT

PAPER -1	MANAGEMENT CONCEPTS AND ORGANISATIONAL BEHAVIOUR
PAPER -2	PORTFOLIO - MANAGEMENT AND TOTAL QUALITY MANAGEMENT
PAPER - 3	HUMAN RESOURCE MANAGEMENT
PAPER - 4	PRODUCTION AND OPERATION MANAGEMENT
PAPER - 5	MARKETING RESEARCH AND CONSUMER BEHAVIOUR

Students will have to visit any industry and prepare a report under the guidence of their mead of the department The "Viva-Voce" will be held immeddiately after or before the annual Examination.

A.	Theory Paper (5 Paper)	- 500 Marks
B.	Industrial visit report	- 100 Marks
C.	Viva - Voce	- 100 Marks
D.	Internal Marks for Class activities	- 100 Marks

All students have to give three internal written tests for each theory Paper Each test will Carry 25 Marks and minimum Passing Marks will be .....12 for each test. Average of best of the three written papers will be count for annual result of internal evalution

- An external examiner will be appointed to conduct the viva-voce by University.
- The report of the Industrial visit will be valued by External Examiner.

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SEMESTER SYLLABUS

M.A. GEOGRAPHY

SCHEME OF EXAMINATION & DISTRIBUTION OF MARKS

SEMESTER – I

Paper No.	Title of the Paper(s)	Internal Assessment	Term End Exam	Total Marks
1.	Geomorphology	20	80	100
2.	Climatology	20	80	100
3.	Evolution of Geographical thoughts	20	80	100
4.	Geography of India	20	80	100
Prac-1	Instrumental Survey	-	-	100
			Total	500

SEMESTER – II

Paper No.	Title of the Paper(s)	Internal Assessment	Term End Exam	Total Marks
1.	Applied Geomorphology	20	80	100
2.	Oceanography	20	80	100
3.	Geographical Methodology	20	80	100
4.	Geography of Chhattisgarh	20	80	100
Prac-1	Cartography	-	-	100
			Total	500

SEMESTER – III

Paper No.	Title of the Paper(s)	Internal Assessment	Term End Exam	Total Marks
1.	Rural Settlement Geography	20	80	100
2.	Resource Geography	20	80	100
3.	Regional Planning & Development	20	80	100
4.	Population Geography with special reference of world	20	80	100
Prac-1	Statistical Technique & field survey			100
			Total	500

SEMESTER – IV

Paper No.	Title of the Paper(s)	Internal Assessment	Term End Exam	Total Marks
1.	Population Geography with special reference of India	20	80	100
2.	Urban Geography	20	80	100
3.	Agricultural Geography	20	80	100
4.	Resource Conservation & Management	20	80	100
Prac-1	Advanced Cartography	-	-	100
			Total	500

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ATAL BIHARI VAJPAYEE VISHWAVIDYALAYA BILASPUR (C.G.)

SEMESTER SYLLABUS

M.A. GEOGRAPHY

M.A. I SEMESTER PRACTICAL
INSTRUMENTAL SURVEY

1. surveying- importance of instrumental surveying and application -survey instruments.
2. **Prismatic Compass-**

   Method of prism pass surveying: Radiation, inter section and traverse, correction of bearing, Elimination the closing error, Bow ditch method.
3. **Plane table-**

   Plan preparation, methods of plane table surveying - radiation, inter section, traverse & resection method.
4. **Dumpy level:-**

   Meaning of the terms used in leveling Method of leveling:- simple leveling, differential leveling. Profile.
5. **Theodolite:-**Meaning of terms used in theodolite surveying, measurement of horizontal distance & vertical height, accessible and non accessible method, digital surveying equipment- Electronic Distance measurement (EDM) instruments, total station, global positioning system (GPS).

SUGGESTED READINGS-

1.. Monk house, F.J. & H.R. Wilkinson : Map and Diagrams, methouen, London.

2. Singh, L. R. : Practical Geography.

3. शर्मा, जे.पी., :प्रायोगिक भूगोल

4.चौहान, पी.आर. : प्रयोगात्मक भूगोल

5.यादव, हीरालाल, प्रायोगिक भूगोल

6.चंद्रकारपी. सर्वेक्षण विधि तंत्र, एस. शारदा पब्लिकेशन, बिलासपुर

7.SarkarAashish Practical Geography

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ATAL BIHARI VAJPAYEE VISHWAVIDYALAYA BILASPUR (C.G.)

SEMESTER SYLLABUS

M.A. GEOGRAPHY

M.A. Geography Semester I shall consist the following papers :

1. The M.A. Semester -I examination in Geography shall consist of 500 marks.
2. The theory papers shall be of three hours duration.
3. Candidates will be required to pass separately in theory and practical examination.
4. a) In the practical examination the following shall be allotment of time and marks.

i)	Practical Record	20% Marks
ii)	Survey (up to six hours)	70% Marks
iii)	Viva on i and ii	10% Marks

b) The external and internal examiners shall jointly submit marks.

c) All the candidates shall present at the time of the practical examination their practical record regularly signed by the teachers concerned.

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ATAL BIHARI VAJPAYEE VISHWAVIDYALAYA BILASPUR (C.G.)

SEMESTER SYLLABUS

M.A. GEOGRAPHY

M.A. GEOGRAPHY
SEMESTER-II

PRACTICAL

OBEJECTIVES:

To apprise the student with latest trends in the development of cartography as a tool in mapping thematic and quantitative data to facilitate spatial analysis and synthesis. To enhance the skill of the students in field of survey and to understand the basic

1. Principles of Map making & concept of Cartography
2. Topographical information: International Series, South East Asia Series, Indexing, Classification and interpretation of topographical sheets, profiles
3. Morphometric Analysis: Hypsometric curve, Altimetry cursive, Histogram, Clinograph, Slope Analysis, Wentworth's Method, smith method.
4. Graphs and diagrams: Triangular Diagram, Ergo graph. Rainfall dispersion diagram Proportional circle, Spheres and cubes diagram.
5. Map Projection construction of world map projection.

SUGGESTED READINGS-

1.. Monk house, F.J. & H.R. Wilkinson : Map and Diagrams, methouen, London.

2. Singh, L. R. : Practical Geography.

3. शर्मा, जे.पी., :प्रायोगिक भूगोल

4.चौहान, पी.आर. : प्रयोगात्मक भूगोल

5.यादव, हीरालाल,प्रायोगिक भूगोल

6.चंद्रकारपी. सर्वेक्षणविधि तंत्र, एस. शारदा पब्लिकेशन, बिलासपुर

7.सरकारआशीष, प्रायोगिकभूगोल,

M.A. Geography Semester-II shall consist the following papers :

1. The M.A. Semester - II examination in Geography shall consist of 500 marks.
2. The theory papers shall be of three hours duration.
3. Candidates will be required to pass separately in theory and practical examination.
4. a) In the practical examination the following shall be allotment of time and marks.

i)	Lab work (up to three hours)	70% Marks
ii)	Practical Record	20% Marks
iii)	Viva	10%Marks

b) The external and internal examiners shall jointly submit marks.

c) All the candidates shall present at the time of the practical examination their practical record regularly signed by the teachers concerned.

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SEMESTER SYLLABUS

M.A. GEOGRAPHY

M.A. GEOGRAPHY
SEMESTER-III

STATISTICAL TECHNIQUE AND FIELD SURVEY

1. **Statist** :Correlation, Probability, Hypothesis testing, chi test, f test meak center, Nearest neighbor Analysis
2. Project work - Micro region basis physical, socio-economic survey about project report in 50 pages
3. Excursion

SUGGESTED READINGS-

1.. Monk house, F.J. & H.R. Wilkinson : Map and Diagrams, methouen, London.
2. Singh, L. R. : Practical Geography.
3. शर्मा, जे.पी., :प्रायोमिक भूगोल
4. चौहान, पी.आर. : प्रयोगात्मक भूगोल
5. यादव, हीरालाल, प्रायोगिक भूगोल
6. चंद्रकारपी, सर्वेक्षणविधि तंत्र, एस. शारदा पब्लिकेशन, बिलासपुर
7. सरकार आशीष, प्रायोगिक भूगोल,

M.A. Geography Semester-III shall consist the following papers :

1. The M.A. Semester - III examination in Geography shall consist of 500 marks.
2. The theory papers shall be of three hours duration.
3. Candidates will be required to pass separately in theory and practical examination.
4. a) In the practical examination the following shall be allotment of time and marks.

i)	Lab work (up to two hours)	30% Marks
ii)	Project Report	40% + 10% Marks
iii)	Excursion	10 % Marks
iv)	Viva on i and III	10 % marks

b) The external and internal examiners shall jointly submit marks.

c) All the candidates shall present at the time of the practical examination their practical record regularly signed by the teachers concerned.

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SEMESTER SYLLABUS

M.A. GEOGRAPHY

M.A. GEOGRAPHY
SEMESTER - IV

ADVANCE CORTOGRAPHY

1. **Themalic maps :**
   Choropleth, Isopleth, Dot method, flow map-
2. **Geological Maps:**
   Basic definition, Interpretation Conformable series and unconformable series
3. **Remote sensing:**
   Fundamental of Remote sensing, Components of Image Interpretation
4. **GIS :**
   An overview of GIS Software, Elements of GIS
5. **Computer Cartography :**
   Advantages of computer cartography, Creation of Graphs and Maps.

SUGGESTED READING :

1- American Society of Photogrammetry : Manual of Remote Sensing, ASP, Falls Church V.A., 1983.

2- Barett E.G. and L.F. Curits : Fundamentals of Remote sensing and AIR photo Interpretation on, Memillan, New York, 1992.

3- Compbell J. : Introduction of Remote Sensing, Guilford, New York, 1989.

4- Curran, Paul J. : Principles of Remote Sensing, Longman, London 1985.

5- Burrought P.A. Principles of Geographic Information systems of Land Reson Assessment Oxford University Press, New York 1986.

6- चैनियाल, देवीदत्त रू सुदूरसंवेदन एवं भौगोलिक सूचना प्रणाली

M.A, Geography Semester-IV shall consist the following papers :

1. The M.A. Semester - IV examination in Geography shall consist of 500 marks.
2. The theory papers shall be of three hours duration.
3. Candidates will be required to pass separately in theory and practical examination.
4. a) In the practical examination the following shall be allotment of time and marks.

i)	Lab work (up to three hours) (Lab work 25% and viva 5%)	70% Marks
ii)	Practical Record	20% Marks
iii)	Viva	10% Marks

b) The external and internal examiners shall jointly submit marks.

c) All the candidates shall present at the time of the practical examination their practical record regularly signed by the teachers concerned.

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	General Insurance			

SCHEME OF EXAMINATION & DISTRIBUTION OF MARKS

महत्वपूर्ण नोटः–

1. एम.कॉम प्रथम, द्वितीय तथा तृतीय सेमेस्टर में सभी प्रश्न–पत्र अनिवार्य होंगे। उक्त परीक्षा में वैकल्पिक प्रश्न–पत्र चयन की व्यवस्था नहीं होगी।
2. एम.कॉम चतुर्थ सेमेस्टर में विशिष्टीकरण समूह (A),(B) या (C) में से किसी भी एक वैकल्पिक समूह का चयन कर उस समूह के सभी चार प्रश्न–पत्र अनिवार्य रूप से लेने होंगे।
3. एम.कॉम. चतुर्थ सेमेस्टर में उपरोक्त विशिष्टीकरण समूह के अतिरिक्त 50 अंक की मौखिक परीक्षा तथा 50 अंक का परियोजना प्रतिवेदन (अधिकतम 50 पृष्ठों का) तैयार करना अनिवार्य होगा। यह प्रतिवेदन वाणिज्य या प्रबंध विषय से संबंधित होगा।
4. सभी प्रश्न–पत्रों में लिखित परीक्षा 80 अंकों की तथा 20 अंकों की आंतरिक मूल्यांकन परीक्षा होगी।
5. आंतरिक परीक्षा एवं बाह्य परीक्षा में प्रश्न पत्रवार न्यूनतम उत्तीर्णांक 36 प्रतिशत होगा। जो विश्वविद्यालयीन अध्यादेश के प्रावधानों के अनुसार होगा।

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सेमेस्टर पाठ्यक्रम

M.Sc. ZOOLOGY

SCHEME OF EXAMINATION & DISTRIBUTION OF MARKS

SEMESTER - I

Paper No.	Title of the Paper	Marks	
		External	Internal
I	Invertebrate structure and function, Minor Phyla	80	20
II	Animal Behaviour	80	20
III	Quantitative Biology	80	20
IV	Ecology and environmental physiology	80	20
	M.Sc. Zoology Lab Course I	100	
	M.Sc. Zoology Lab Course II	100	

SEMESTER - II

Paper No.	Title of the Paper	Marks	
		External	Internal
I	General & comparative endocrinology of vertebrates	80	20
II	Gamete biology and reproductive physiology in human beings	80	20
III	Molecular cell biology	80	20
IV	Tools and techniques for biology	80	20
	M.Sc. Zoology Lab Course I	100	
	M.Sc. Zoology Lab Course II	100	

SEMESTER - III

Paper No.	Title of the Paper	Marks	
		External	Internal
I	Comparative anatomy of vertebrates	80	20
II	Biosystematics, taxonomy & biodiversity	80	20
III	Immunology and developmental biology	80	20
IV	Population genetics & evolution	80	20
	M.Sc. Zoology Lab Course I	100	
	M.Sc. Zoology Lab Course II	100	

SEMESTER - IV

Paper No	Title of Paper	Marks	
		External	Internal
I	General physiology and neurophysiology (*compulsory*)	80	20
II	Biochemistry and metabolic regulation and cell function (*compulsory*)	80	20
Optional Group-I			

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III	Fish(Ichthyology) structure and function	80	20
IV	Applied Fisheries	80	20
Optional Group-II			
III	Cell biology	80	20
IV	Cellular organization and molecular organization	80	20
Optional Group-III			
III	Entomology	80	20
IV	Applied Entomology	80	20
Optional Group-IV			
III	Wildlife conservation	80	20
IV	Environment and biodiversity conservation	80	20
	M.Sc. Zoology Lab Course I	100	
	M.Sc. Zoology Lab Course II	100	

Student has choice to opt. For any one group out of four optional groups.(Paper III and IV in semester four)

Each theory paper will have 5 questions of equal marks. First question will be compulsory encompassing all the five units without any internal choice, whereas rest questions will be unit wise with internal choice.

Internal Assessment shall comprise of two parts- Ten marks for test and ten marks for seminar/ assignment /presentation.

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SEMESTER-I
LAB-COURSE I

Time-06 Hours
Max. Marks-100

Invertebrates

1. Study of non-chordates through museum specimen
2. Study of permanent slides of non-chordates
3. Dissection of representative types (invertebrates)
4. Squilla, Mytilus, Sepia, Aplysia, Echinus

5. Mounting-

Permanent and suitable stained micro-preparation
Earthworm-nerve ring, ovary, spermathecal, nephridia
Cockroach-mouth parts , salivary glands, trachea
Prawn appendages, statocyst
Protozoan- rhizopods, flagellates and ciliates (fresh water forms) prolozoon ullase
Porifera-spicule sand gemmules of fresh water sponges
Crustaceans and rotifers
Larval forms of the free living invertebrates

Animal behaviour-

6. Experiments related to Animal Behaviour

Feeding behaviour in house fly
Life cycle of Lac insect and honey bee (chart/model/material)
Study of structural organization of the bee hive
Learning behaviour-
Conditioned and unconditioned reflex

7. Projects-

a)Visit to study the management of following->
Fish farm, dairy farm, poultry farm, sericulture and apiculture
b) Study of Invertebrate local fauna
c) Any other relevant topic

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Student should prepare a report and submit

Note-

1. Use of animal for dissection and practical work is subject to the conditions that they are not banned under the wildlife protection act
2. External features and anatomy should be studied by digital techniques and the alternatives. Wherever live animals is studies it should be either pest or colourable species without paining them

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(छत्तीसगढ़)
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M.Sc. ZOOLOGY

SEMESTER-I
LAB-COURSE I

Time-06 Hours
Max. Marks-100

Distribution of marks in practical exam

1. Spotting (1-10)-invertebrates	(20)
2. Mounting	(10)
3. Dissection (virtual)	(10)
4. Exercises based on behaviour (Two exercises)	(30)
5. Viva	(10)
6. Sessional	(20)
Total =	100

M.SC. SEMESTER I
LAB-COURSE II

Quantitative Biology

1. Collection methods of different types of data
2. Data analysis- tabulation
3. Different graphical and diagrammatic methods of data presentation
4. Calculation of central tendencies based on given data
5. Application of parametric and non-parametric tests
6. ANOVA
7. Study of model types
8. Exercises based on regression
9. Exercise based on correlation

Ecology and Environmental Physiology

10. Study of animals showing adaptation to different environments
11. Soil analysis physical and chemical composition of soil
12. Effect of physical exercise on blood pressure
13. Exercise based on blood glucose level
14. Carbonates and nitrates from soil sample
15. Determination of free CO_2 and salinity in pond

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M.SC. SEMESTER I

LAB-COURSE II

Time-06 Hours
Max. Marks-100

Distribution of marks in practical exam

1. Exercises based on biostatics (Three)	(30)
2. Exercises based Soil and Water analysis (Two)	(20)
3. Exercises based on Physiology (Two)	(20)
4. Viva	(10)
5. Sessional	(20)
Total =	100

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1. Introduction to instrumental analysis-Robert Braun , McGraw Hill Publication
2. A biologist guide to principles and techniques of practical biochemistry-K, Wilson and K.H.Goulding EBS Edn.
3. Clark and Swizer, Experimental Biochemistry, Freeman, 2000
4. Locquin and Langeron, Handbook of Microscopy, Butterwaths, 1983
5. Boyer, Modern Experimental Biochemistry, Benjamin, 1993

SEMESTER-II
LAB-COURSE I

General & comparative endocrinology of vertebrates

1. Dissection of various endocrine glands of vertebrates (Fishes, Amphibians, Reptiles, Birds, Mammals, any available animals/ Virtual)
2. Dissection of various endocrine glands of insects (Cockroach/any other insect, any available animals/ Virtual)
3. Study of histo-pathologic slides of endocrine and related structures
   - T.S. Pituitary, T.S. of Thyroid, T.S. of Parathyroid, T.S. of Adrenal, T.S. of Testes, T.S. of Ovary, T.S. Thymus, T.S. of Kidney, T.S. of Heart, T.S. of Stomach, T.S. of Intestine
4. Effect of epinephrine on chromatophores of fishes
5. Biochemical estimation of cholesterol content in adrenal tissue, glycogen in uterine tissue
6. Microtomy-block preparation, section cutting, stretching and straining
7. Gamete biology and reproductive physiology in human beings
8. Study of Estrous cycle in mouse or rat
9. Preparation on Blastodisc of hen's egg
10. Formation of egg window in chicken egg
11. Collection of developmental stages of eggs of Lymnea or any gastropod
12. Collection of developmental stages of insects/ fishes
13. Study of development stages of frog through slides and whole mounts.
14. Study of development stages of chick through slides and whole mounts.
15. Slide preparation (earthworm ovary, amphibian, reptiles, birds and mammals testes & ovary.)

Note-

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SEMESTER-II
LAB-COURSE I

Time-06 Hours
Max. Marks-100

Distribution of marks in practical exam.

1. Dissection of Endocrine glands /virtual	(10)
2. Spotting (Endocrine glands& Embryology)	(20)
3. Cytological preparation/preparation of estrogen cycle	(10)
4. Microtomy	(20)
5. Preparation of egg window and Blastodisc	(10)
6. Viva	(10)
7. Sessional	(20)
Total =	100

SEMESTER-II
Lab-course II

Molecular cell biology
1. Study of Prokaryotic and Eukaryotic cells
2. Study of permanent slides -Mitosis, Meiosis and cell organelles
3. Temporary squash preparation to show mitosis and meiosis
4. Preparation of giant chromosomes, barr bodies
5. Histological study of cancer cells

Tools and techniques for biology
6. Use of balance Ph meter, colorimeter, centrifuge spectrophotometer, camera Lucida etc.
7. Molecular separation by Chromatography, Electrophoresis
8. Media preparation
9. Cell culture
10. Colorimetric estimation of glucose, protein, RNA, DNA
11. Absorption spectrum of any coloured solution
12. Histochemical techniques

Note-
1. Use of animal for dissection and practical work is subject to the conditions that they are not banned under the wildlife protection act

2. External features and anatomy should be studied by digital techniques and the alternatives. Wherever live animals is studies it should be either pest or culturable species without paining them

SEMESTER-II
LAB-COURSE II

Time-06 Hours
Max. Marks-100

Distribution of marks in practical exam.

1. Spotting (mitosis and meiosis, Tools & Techniques)	(20)
2. Exercise based on cell Biology	(10)
3. Chromatography	(20)
4. Colorimetric estimation	(10)
5. Application of different instruments	(10)
6. Viva	(10)
7. Sessional	(20)
Total =	100

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M.Sc. Semester III

Zoology Practical
Lab-course I

(Comparative Anatomy)

1. Dissection of animals :- Amphioxus, Scoliodon, Electric ray, Sting ray, Calotis, Bird head, Rat (Subject to availability of material) / study through alternative methods of dissection.
2. Micro preparation of suitable and available material.
3. Study of the representative examples of different classes of Chordates.
4. Study of permanent slides showing whole mount or section as per Theory syllabus, including embryological slides of Frog and Chick.
5. Osteology of Amphibia, Reptile, Bird, Mammal.
6. Study of animal diversity by field trip and excursion, Extension activity to spread health awareness. Students have to submit project report.

Biosystematics, taxonomy & Biodiversity

1. Study of biodiversity among various invertebrates and vertebrates (Listing of all the animals found in and around your house and also try to find out their Zoological names)
2. Collection of various insect species
3. Visits to a local animal park or zoo to identify and study the captive fauna and preparation of report
4. Study of adaptive characteristics of various invertebrates and vertebrates in different climate
5. Taxonomic key formation and conversion
6. Study of biodiversity in grassland and pond water by using Shannon - Weiner index .

M.Sc. Semester III

Zoology Practical

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Lab-course I

Time-06 Hours

Max. Marks-100

Distribution of marks in practical exam.

1. Dissection of Vertebrate (virtual/other method) (10)
2. Spotting 1 to 10 (20)
3. Micro preparation (10)

4. Exercises related to Taxonomy. (Three) (30)

5. Viva (10)
6. Sessional (20)

Total = 100

M.Sc. Semester III

Zoology Practical

Lab-course II

Immunology and developmental Biology

1. Dissection of Primary and secondary immune organ from mice
a. Preparation of single suspension from bone marrow
b. Cell counting and vigbility testing of the spleenocytes prepared
2. Preparation and study of phagocytosis by spleenic peritoneal macrophase.
3. Raising polyclonal antibody in mice, serum collecton and estimating antibody titre in serum by following method-
a. Ouchterlony (double diffusion) assay for antigen-antibody specificity and titre.
b. ELISA
4. Antibody purification from the serum collected from immunized mice, affinity purification chromatography
5. Blood group testing A, B ,O ,AB AND Rh factor
6. Indused Breeding in Frog
7. Culture of chick Embryo in Vitro
8. Study of chick embryos by vital staiting
9. The Technique for the whole mount preparation of chick embryo
10. Demonstration of Cell death
11. Study of Mitosis (a) Techniques for chromosomes preparation (b) Preparation of Meiotic chromosomes for Grosshopper testies (c) Auto Rediography

Population Genetics and Evolution

a. i. An experiment related to quantitative genetics, genotypic frequencies in light of hardy weinberg law
ii. ABO blood group data
b. Numeric exercise related to-
i. Natural selection
ii. Changing gene frequency
Chromosomal Polymorphism

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M.Sc. Semester III

Zoology Practical

Lab-course II

Time-06 **Hours**

Max. Marks-100

Distribution of marks in practical exam.

1. **Dissection showing primary and secondary immune organ of mice virtual / other method (10)**
2. **Exercise related to immune response** (20)
3. **Exercise related to developmental biology/ Preparation of egg window and Blastodisc (10)**
4. **Exercises related to quantitative genetics / hardy Weinberg law** **(20)**
5. **Exercise related to natural selection (10)**
6. **Viva** **(10)**
7. **Sessional** **(20)**

Total = 100

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M.Sc. ZOOLOGY

BILASPUR UNIVERSITY, BILASPUR

M.Sc. Semester IV

Zoology Practical
Lab-course I

A. Practical based on Paper I and Paper II as per Theory

1. Estimation of Protein by the Biuret, Lowry, Brad ford and Eosine-a comparasion
2. Determination of N-terminal Amino acids by the Sangers reagent (FDND)
3. Paper chromatographic separation of Amino acids
4. Quantitative estimation of Protein, carbohydrate, Mucosaccharide, Lipids and Enzyme (Bromphenol blue, PAS, Alcian blue, aldehyde fucsin, Acetylcholinestrase technique)
5. Identification of hypothalamic nuclei histological, hystochemical and Immunocytochemical method
6. Isolation and characterization of Pituitary cell
7. Estimation of MAC, MCH and MCHC
8. Total count of WBC and RBC
9. Differetial count of WBC
10. Haemoglobin estimation and PCV estimation or ESR estimation
11. Quantitative estimation of blood serum by Colorimetry (I) Blood Urea (II) Blood glucose (III) Blood Calcium (IV) Blood Creatine (V) Blood cholesterol (VI) Blood Protein (VII) Blood Albumin
12. Blood clotting time
13. ECG Recording
14. Blood Pressure estimation
15. EEG

M.Sc. Semester IV

Zoology Practical

Lab-course I

Time-06 Hours

Max. Marks-100

Distribution of marks in practical exam.

1. Estimation of Protein	(10)
2. estimations of, carbohydrate, Mucosaccharide, Lipids and Enzyme (two exercises)	(20)
3. Exercise based on histochemical and Immuno-cytochemical method	(10)
Exercises based on haematology. (two exercises)	(20)

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M.Sc. Semester IV

Zoology Practical
Lab-course II

Practical (Special Paper – Group II Cytology)

1. Examination of different cell types in Vertebrate tissue
2. Contrast Microscopy
3. Photomichrography
4. Study of permanent cytological preparation
5. Squash preparation of chromosomes and preparing karyotype
6. Preparation of Giant Chromosomes and demonstration of puffs
7. Golgi material and Mitochondrial preparation
8. Demonstration of Barr body and drum stick
9. Histochemical demonstration of RNA DNA phospholipid and enzyme
10. Microbial culture media preparation and microbial growth
11. Molecular separation by chromatography and Electrophorasis

M.Sc. Semester IV

Zoology Practical

Lab-course II **Hours**
Time-06
Max. Marks-100

Distribution of marks in practical exam.

1. Spotting (1to 10) (20)
2. Exercise based on cytological preparation (10)
3. Exercise based on histochemical preparation (10)
4. Molecular separation by chromatography and Electrophorasis (20)
5. Exercise based on microbiology/ karyotype study (10)

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6. Viva	(10)
7. Sessional	(20)

Total = 100

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M.Sc. Semester IV

Zoology Practical
Lab-course II

Practical (Special Paper – Group III Entomology)

1. Collection, Preservationand classification of the insects of order :- Thysaneura, Collembola, Orthoptera, Hemiptera, Lepidoptera, Mallophaga, Diptera, Hymenoptera and Coleoptera
2. Dissectionof Grasshopper, Cockroach, Cricket, wasp, and honey bee, with special reference to their Nervous system, Salivary gland, Endocrine gland, Sting apparatus, of honey bee, reproductive organs of Grasshopper and cockroach.
3. Whole mounts of small insects eg Collembola, Thysaneura, bedbug, louse, stored grain pests
4. Whole mount of different types of legs, antennae, wings, mouth parts, salivary glands and scales
5. Microtomy of Insect materials
6. Simple experiment on Insect Physiology
7. Identification of common insect pests
8. Collection of life cycle of the pest of any economic crop

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M.Sc. Semester IV

Zoology Practical

Lab-course II

Time-06

Max. Marks-100

Distribution of marks in practical exam.

		Hours
1. Dissection of Available insect pests /Virtual		(10)
2. Spotting (1 to 10)	(20)	
3. Micropreparation	(10)	
4. Experiment based on insect physiology (10)		
5. Identification of common insect pests		(10)
6. Project Report and field visit		(10)
7. Viva	(10)	
8. Sessional	(20)	

Total = 100

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M.Sc. Semester IV

Zoology Practical

Lab-course II

Exercises based on paper III – Wild life conservation

Exercises based on paper IV - Environment and biodiversity conservation

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M.Sc. Semester IV

Zoology Practical

Lab-course II

Time-06

Max. Marks-100

Distribution of marks in practical exam.

		Hours
1. paper III – Wild life conservation		(35)
2. Environment and biodiversity conservation		(35)
3. Viva	(10)	

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SEMESTER-I
LAB-COURSE I

Time-06 Hours
Max. Marks-100

Invertebrates

1. Study of non-chordates through museum specimen
2. Study of permanent slides of non-chordates
3. Dissection of representative types (invertebrates)
4. Squilla, Mytilus, Sepia, Aplysia, Echinus

5. Mounting-

Permanent and suitable stained micro-preparation
Earthworm-nerve ring, ovary, spermathecal, nephridia
Cockroach-mouth parts , salivary glands, trachea
Prawn appendages, statocyst
Protozoan- rhizopods, flagellates and ciliates (fresh water forms) prolozoon ullase
Porifera-spicule sand gemmules of fresh water sponges
Crustaceans and rotifers
Larval forms of the free living invertebrates

Animal behaviour-

6. Experiments related to Animal Behaviour

Feeding behaviour in house fly
Life cycle of Lac insect and honey bee (chart/model/material)
Study of structural organization of the bee hive
Learning behaviour-
Conditioned and unconditioned reflex

7. Projects-

a)Visit to study the management of following->
Fish farm, dairy farm, poultry farm, sericulture and apiculture
b) Study of Invertebrate local fauna
c) Any other relevant topic

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Student should prepare a report and submit

Note-

1. Use of animal for dissection and practical work is subject to the conditions that they are not banned under the wildlife protection act
2. External features and anatomy should be studied by digital techniques and the alternatives. Wherever live animals is studies it should be either pest or colourable species without paining them

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SEMESTER SYLLABUS
M.Sc. MICROBIOLOGY

Scheme and Courses of Studies

SEM.	COURSES		MARKS		
	Paper	Title of the Paper	Paper wise	Internal Assessment	Univ. Exam. Marks*
First	First (MB-101)	General Microbiology and Bacterology	100	20	80
	Second (MB-102)	Virology	100	20	80
	Third (MB-103)	Phycology, Mycology and Proto-zoology	100	20	80
	Fourth (MB-104)	Biochemistry	100	20	80
	Lab. Course-	Concern with paper - I & II	100	Sessional	100
	Lab. Course-	Concern with paper - III & IV	100	Sessional	100
Second	First (MB-201)	Bioinstrumentation & Biochemical techniques	100	20	80
	Second (MB-202)	Cell biology and Microbial physiology	100	20	80
	Third (MB-203)	Microbial genetics and Molecular Biology	100	20	80
	Fourth (MB-204)	Environmental & Agriculture Microbiology	100	20	80
	Lab. Course-	Concern with paper - I & II	100	Sessional	100
	Lab. Course-	Concern with paper - III & IV	100	Sessional	100
Third	First (MB-301)	Immunology	100	20	80
	Second (MB-302)	Medical & Veterinary Microbiology	100	20	80
	Third (MB-303)	Biostatics & Bioinformatics	100	20	80
	Fourth (MB-304)	Enzymology and Industrial Microbiology	100	20	80
	Lab. Course-301	Concern with paper - I & II	100	Sessional	100
	Lab. Course-302	Concern with paper - III & IV	100	Sessional	100
Fourth	First (MB-401)	Plant pathology & Disease management	100	20	80
	Second (MB-402)	Food Microbiology	100	20	80
	Third (MB-403)	Microbial ecology & Forest microbiology	100	20	80
	Lab. Course-402	Project work (minor) at local level OR PROJECT WORK **(External)		Project Report-	60
	Fourth (MB-404)	Computer Fundamentals and Research	100	20	80

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FIRST SEMESTER
Lab Course - 101
(GENERAL MICROBIOLOGY, BACTERIOLOGY AND VIROLOGY)

Total Marks: 100
Internal assessment Marks: 20
Term end Exam Marks: 80

1. **Preparation of Glassware:** Various techniques of cleaning (discarding & washing) and sterilization of glassware for microbiological laboratory.
2. **Preparation of Culture Media:** Different types of nutrient media as per nutritional need, dehydrated, selective and differential media for autotrophic & heterotrophic microbes.
3. **Pure culture Techniques:** Preparation of slants, stab culture, sub-culturing, types of streaking.
4. **Staining Techniques:** Gram Staining, negative staining, acid-fast staining, endospore, capsule.
5. **Isolation, Identification and characterization of bacteria:** Cultural characteristics of bacteria (autotrophic & heterotrophic), using selective and differential media. Growth on NA, Blood agar, Chocolate agar, DCA, Maconkey's, EMB and Sabouraud's agar. Study of nutritional needs of bacterial growth (growth in the presence of different carbon source, N source).
6. **Biochemical tests for identification of bacteria:** IMViC, catalase, oxidase, mannitol motility test, gelatin test, urease, TSI test, coagulase, nitrate reduction. Production of acid and gas from glucose, arabinose, inositol, lactose, maltose, mannitol, rhamnose, sucrose, xylose, fructose, starch hydrolysis, casein hydrolysis, assessment of effect of metals on microbial growth.
7. **Determination of growth of bacteria:** Growth curve and generation time.
8. **Pathological examination:** Plant diseases caused by Viruses as mentioned in course of studies (a case study of any one disease).

Scheme of examination:

Lab performances	60 marks	
Spotting	20 marks	
Internal assessment -		
Oral evaluation	10 marks	
Sessional	10 marks	
Total	100 marks	Provided period- 06 hr.

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SEMESTER SYLLABUS
M.Sc. MICROBIOLOGY

FIRST SEMESTER
Lab. Course - 102
(PHYCOLOGY, MYCOLOGY, PROTOZOLOGY AND BIOCHEMISTRY)

Total Marks: 100
Internal assessment Marks: 20
Term end Exam Marks: 80

1. Isolation and identification of algae from soil and water. Isolation and identification of cyanobacteria, extraction and separation of algal pigments.
2. Isolation and identification of fungi from different substrates (saprophytic, parasitic, coprophilous, keratinophilic).
3. Study of environmental requirements of fungi (pH, temperature) by linear growth and biomass.
4. Assessment of the effect of antifungal agents (antibiotics/ chemicals/plant extracts) on isolated fungal samples.
5. Extraction and separation of amino acid and mycotoxin (aflatoxins) by paper chromatography.
6. Identification and characterization of protozoans as mentioned in course studies. Case study of any one disease.
7. Pathological examination. Human diseases caused by protozoans as mentioned in course studies (a case study of any one disease).
8. Colorimetric/ spectrophotometric estimations of proteins, pigments, DNA/RNA and sugars.
9. Study of enzyme kinetics and enzyme activity. Isolation of amylase producing microorganisms from the environment; estimation of amylase activity and determining its Km and Vmax; effect of environmental conditions (temperature, pH and substrate concentration) on the activity of amylase.
10. Estimation of enzyme activity: Phosphatase and catalase.
11. Separation of isolated phospholipids by thin layer chromatography and hemoglobin by gel filtrations.

Scheme of Examination:		
Lab performances	60 marks	
Spotting	20 marks	
Internal assessment: -		
Oral evaluation	10 marks	
Sessional	10 marks	
Total	100 marks	Provided period- 06 hrs

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SEMESTER SYLLABUS
M.Sc. MICROBIOLOGY

SECOND SEMESTER
Lab. Course - 201

(BIOINSTRUMENTATION, BIOCHEMICAL TECHNIQUES, CELL BIOLOGY AND MICROBIAL PHYSIOLOGY)

Total Marks: 100
Internal assessment Marks: 20
Term end Exam Marks: 80

1. Studies on pH titration curves of amino acids/ acetic acid and determination of pKa values and Handerson-Hasselbach equation.
2. Separation of bacterial lipids/amino acids/ sugars/organic acids by TLC or paper chromatography.
3. Separation of serum proteins by [illegible] gel electrophoresis.
4. Paper electrophoresis and separation of [illegible] or blue dextran by gel filtration.
5. Separation of bacterial DNA by agarose gel electrophoresis.
6. Preparation of mitotic plate by carmine squashing method and phase identification.
7. Preparation of Karyotype of metaphase plate.
8. Preparation of Meiotic plate and determination of phases.
9. Computation of Chaisma frequency and determination of phases
10. Micrometry and Camera lucida drawings
11. Isolation and cultivation of autotrophic microbes.
12. To study the effect of salt concentration on bacterial growth by turbidometry method.
13. Determination of thermal death point (TDP) of an organism.
14. UV absorption of proteins, DNA and RNA.

Scheme of Examination:

Lab performances	60 marks	
Spotting	20 marks	
Internal Assessment		
Oral evaluation	10 marks	
Sessional	10 marks	
Total	100 marks	Provided period- 06 hrs

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SEMESTER SYLLABUS
M.Sc. MICROBIOLOGY

SECOND SEMESTER

Lab. Course - 202

(MICROBIAL GENETICS, MOLECULAR BIOLOGY, ENVIRONMENTAL MICROBIOLOGY & AGRICULTURE MICROBIOLOGY)

Total Marks: 100
Internal assessment Marks: 20
Term end Exam Marks: 80

1. Transformation of *E. Coli*, preparation of competent cells.
2. Conjugation in *E.coli* by using plate method.
3. Isolation of plasmid DNA from *E.coli*.
4. Isolation of DNA from plant cell (Onion/ Mustard).
5. Isolation of microorganisms from different habitats, soil, water and air.
6. Potability test/potability of water (MPN and HS).
7. Physical, chemical and microbial analysis of water: pH, COD, BOD, total and dissolved solids.
8. Study of different types of microbial air samplers/ air sampling devices.
9. Study of microbial contamination of industrial products and of fabrics.
10. Production of ammonia from organic compounds (ammonification).
11. Bioconversion of ammonia to nitrate (nitrification).
12. Determination of phenol coefficient.
13. Characterization of different cells for detection of various microbial enzymes: amylase, lipase, protease and cellulase.
14. Microbiological examination of cyanobacteria, separation and determination of cyanobacterial pigments.

Scheme of examination

Lab performances	60 marks	
Spotting	20 marks	
Internal Assessment:		
Oral evaluation	10 marks	
Sessional	10 marks	
Total	100 marks	Provided period: 06 hrs

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SEMESTER SYLLABUS
M.Sc. MICROBIOLOGY

THIRD SEMESTER
Lab. Course – 301
(IMMUNOLOGY, MEDICAL AND VETERINARY MICROBIOLOGY)

Total Marks: 100
Internal assessment Marks: 20
Term end Exam Marks: 80

1. Determination of Blood groups and Rh typing.
2. Widal (slide) test for Typhoid by antigen- antibody reaction.
3. Pregnancy testing through commercially available method.
4. Rheumatoid Arthritis test (RA) by antigen- antibody reaction.
5. RPR (Rapid Plasma Reagin) test for syphilis.
6. Detection of specific antigen by using ELISA technique.
7. Separation and characterization of lymphocytes from blood and demonstration of lymphocytes Population.
8. Study of antigen and antibody reaction by immuno-diffusion.
9. Different staining techniques Acid fast staining, Giesma staining and Leishmann staining.
10. Special staining methods for [illegible] granules, capsule and spores.
11. Isolation of pathogen from [illegible], blood and urine.
12. Isolation and identification of [illegible] pathogenic bacteria and fungi:

Bacteria: *Staphylococcus aureus*, *Escherichia coli*, *Proteus vulgaris*, *Proteus mirabilis*, *Salmonella typhi*, *Salmonella paratyphi*, *Shigella dysenteriae* and *Shigella felexneri*.

Fungi: *Candida albicans*, *Microsporum* and *Trichophyton*.

13. Antibiotic sensitivity testing by disc diffusion method.

Scheme of examination

Lab performances	60 marks	
Spotting	20 marks	
Internal Assessment:		
Oral evaluation	10 marks	
Sessional	10 marks	
Total	100 marks	Provided period- 06 hrs

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SEMESTER SYLLABUS
M.Sc. MICROBIOLOGY

THIRD SEMESTER
Lab. Course - 302
(BIOSTATISTICS, BIOINFORMATICS, ENZYMOLOGY AND INDUSTRIAL MICROBIOLOGY)

Total Marks: 100
Internal assessment Marks: 20
Term end Exam Marks: 80

1. Determination of Statistical averages / Central Tendencies: a) Arithmetic mean b) Median c) Mode.
2. Determination of measures of dispersion a) Mean Deviation b) Standard Deviation c) Standard Error d) Coefficient of Variation.
3. Test of significance – Application of a) Chi-Square test b) T-test c) ANOVA
4. Studies of public domain, databases for nucleic acid and protein sequences and determination of Protein structure, Protein Data Base (PDB), genome sequence analysis.
5. Determination of Kinetic constant of Amylase activity, Vmax, Km.
6. Effect of pH and Temperature on Amylase activity.
7. Effect of inhibitor on Amylase activity.
8. Determination of Proteins, DNA and RNA concentration by Spectrophotometer.
9. Production of Protease by microorganism.
10. Demonstration of production of Ethanol by Yeast.
11. Isolation of antibiotic producing microorganism from soil.

Scheme of examination

Lab performances	60 marks	
Spotting	20 marks	
Internal Assessment:		
Oral evaluation	10 marks	
Sessional	10 marks	
Total	100 marks	Provided period- 06 hrs

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SEMESTER SYLLABUS

M.Sc. MICROBIOLOGY

Scheme and Courses of Studies

SEM.	Paper	COURSES: Title of the Paper		MARKS: Paper wise	Internal Assessment	Univ. Exam. Marks*
First	First (MB-101)	General Microbiology and Bacteriology		100	20	80
	Second (MB-102)	Virology		100	20	80
	Third (MB-103)	Phycology, Mycology and Proto-zoology		100	20	80
	Fourth (MB-104)	Biochemistry		100	20	80
	Lab. Course-101	Concern with paper - I & II		100	Sessional	100
	Lab. Course-102	Concern with paper - III & IV		100	Sessional	100
Second	First (MB-201)	Bioinstrumentation & Biochemical techniques		100	20	80
	Second (MB-202)	Cell biology and Microbial physiology		100	20	80
	Third (MB-203)	Microbial genetics and Molecular Biology		100	20	80
	Fourth (MB-204)	Environmental & Agriculture Microbiology		100	20	80
	Lab. Course-201	Concern with paper - I & II		100	Sessional	100
	Lab. Course-202	Concern with paper - III & IV		100	Sessional	100
Third	First (MB-301)	Immunology		100	20	80
	Second (MB-302)	Medical & Veterinary Microbiology		100	20	80
	Third (MB-303)	Biostatics & Bioinformatics		100	20	80
	Fourth (MB-304)	Enzymology and Industrial Microbiology		100	20	80
	Lab. Course-301	Concern with paper - I & II		100	Sessional	100
	Lab. Course-302	Concern with paper - III & IV		100	Sessional	100
Fourth	First (MB-401)	Plant pathology & Disease management		100	20	80
	Second (MB-402)	Food Microbiology		100	20	80
	Third (MB-403)	Microbial ecology & Forest microbiology		100	20	80
	Lab. Course-402	Project work (minor) at local level	OR PROJECT WORK **(External)		Project Report-	60
	Fourth (MB-404)	Computer Fundamentals and Research		100	20	80

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SEMESTER SYLLABUS

M.Sc. BOTANY

SCHEME OF EXAMINATION & DISTRIBUTION OF MARKS

SEMESTER - I

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Biology & Diversity of Virus Bacteria & Fungi	Theory	20	80	100
2.	Biology &Diversity Of Algae, Bryophytes And Pteridophytes	Theory	20	80	100
3.	Cell And Molecular Biology of Plants	Theory	20	80	100
4.	Taxonomy Of Angiosperms	Theory	20	80	100
Lab-1	Based On Paper I&II	Practical	-	-	100
Lab-2	Based On Paper III&IV	Practical	-	-	100
				Total	**600**

SEMESTER - II

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Cytology ,Genetics And Cytogenetics	Theory	20	80	100
2.	Biology & Diversity Of Gymnosperm species	Theory	20	80	100
3.	Plant Physiology	Theory	20	80	100
4.	Plant Biochemistry And Bioenergetics	Theory	20	80	100
Lab-1	Based On Paper I&II	Practical	-	-	100
Lab-2	Based On Paper III&IV	Practical	-	-	100
				Total	**600**

SEMESTER - III

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Plant Development	Theory	20	80	100
2.	Plant Reproduction	Theory	20	80	100
3.	Plant Ecology	Theory	20	80	100
4.	Elective Paper (A) Plant Pathology - I (B) Weed Biology- I	Theory	20	80	100
Lab-1	Based On Paper I&II	Practical	-	-	100
Lab-2	Based On Paper III&IV	Practical	-	-	100
				Total	**600**

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SEMESTER SYLLABUS

M.Sc. BOTANY

SEMESTER - IV

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Plant cell, Tissue and organ culture	Theory	20	80	100
2.	Plant Resource Utilization And Conservation	Theory	20	80	100
3.	Genetic Engineering Of Plant And Microbes &Biostatics	Theory	20	80	100
4.	Elective Paper (A) Plant Pathology –II (B) Weed Biology- II	Theory	20	80	100
Lab-1	Based On Paper I&II	Practical	-	-	100
Lab-2	Based On Paper III&IV	Practical	-	-	100
				Total	600
				GRAND TOTAL	2400

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SEMESTER- I
PAPER - IV
TAXONOMY OF ANGIOSPERMS

UNIT -1

Origin of Intra- Population Variation: Population & the environment, ecads & ecotypes, evolution & differentiation of species – various models.

The Species Concept: Taxonomic hierarchy ,species ,genus family & other categories , principles used in assessing relationship ,delimitations of taxa & attribution of rank salient feature of the international code of botanical nomenclature and salient features of Melbourne code

UNIT -2

Taxonomic Evidence: Morphology, anatomy, embryology, cytology, photochemistry, genome analysis & nucleic acid hybridization.

Taxonomy Tools: Herbarium, floras, histological photochemical cytology serological biochemical & molecular techniques, computers & GIS.

UNIT -3

System of Angiosperm Classification: Phonetic versus phylogenetic systems, cladistics taxonomy, relative merits & demerits of major system of classification; relevance of taxonomy to conservation, sustainable utilization of bio resource & ecosystem research.

UNIT -4

Concept of Phytogeography: Endemism, hot spots and hottest hot spots, plant exploration, invasion & introduction, local plant diversity and its socio-economic importance.

Suggested Readings:

1. Gole, A.J. ((1969) Numerical Taxonomy. academic Press London.
2. Devis ,P. H. And Heywood, V.H (1973) Principle of Angiosperm Taxonomy .Robert E. Kreiger .Pub. Co. New York.
3. Grant, V. (1971) plant Speciation .Columbia Univ.Press, New York.
4. Grant, W.F. (1984) Plant Biosystematics .Academic Press. London.
5. Heslop- Harrison, J/ (1976) Plant Taxonomy .English Language Book Assoc .and Edward Pub. Ltd. U.K.
6. Stace ,C.A. (1989)Plant Taxonomy and Biosystematic Edward Arnold Ltd.London .
7. Takhtajan, A.L. (1997) Diversity and classification of flowering plant Columbiauniv.Press.New York.
8. Woodland, D.W. (1991) Contemporary Plant Systematic. Prentice Hall new Jersey.
9. Sharma, A.K. and Sharma, R.(2007) Taxonomy .PragatiPrakashan Meerut.

Suggested Laboratory Exercise:

1. Description of specimen from representative locally available families .

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2. Description of species based on various specimen to study Intraspecific various variation ,a collective exercise.
3. Field trip within and around the campus, comppation of field notes and preparation of herbarium sheets of such plant wild or cultivated as are abundant .
4. Training in using floras and herbaria for identification of Specimen described in the class.
5. Comparison of different species of genus and different genera of a family to Calculate Similarity Coefficient and Preparation of Dendrograms
6. Demonstration of the Utility of Secondary metabolites in the taxonomy of some appropriated genera.
7. Description of various species of a genus, study of key characters and preparation of keys at generic level.
8. Location of keys and use of key at family level

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Suggested Laboratory Exercise:

1. Demonstration of plasmolysis and deplasmolysis in plant cell .
2. Demonstration of transpiration.
3. Measurement of transpiration rate photometer.
4. Study of inter-relationship between transpiration and absorption and by T/A apparatus.
5. Extraction of chloroplast pigment from green leaves.
6. Separation of chloroplast pigment through paper chromatography.
7. Separation of chloroplast pigment through solvent method.
8. Preparation of absorption spectrum of chlorophyll -a
9. Determination of chlorophyll a/ chlorophyll-b ratio in C_3 and C_4 plants.
10. Extraction of seed proteins depending upon solubility.
11. Fractionation of proteins using gel filtration chromatography using sephadex G-100 or sephadex G-200 .
12. Principal of colorimetry spectrometry and fluorimerty

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4. Kumar , H.D. (1986) Modern Concept of Ecology . Vikas Publishing House Privet Ltd New Delhi .
5. Hill M.K.(1997) Understanding Environmental Pollution . Cambridge Uni. Press, , Cambridge UK.
6. Odum ,E.P. (1971) Fundamental of Ecology .,Saunders ,Philadelphia .
7. Odum ,E.P. (1983) Basic Ecology .,Saunders ,Philadelphia
8.

Suggested Laboratory Exercise

1. To calculate mean , variance ,standard deviation ,standard error ,coefficient of variation and use of t-test for comparing ecological data .
2. To determine minimum size and number of quadrates required for reliable estimate of biomass in Grassland ecosystem.
3. To study of frequency, abundance and density of dominant plants in the local ecosystem by quadrate method.
4. To determine gross and net productivity by light and dark bottle method.
5. To determine soil moisture content, porosity and bulk density of soil collected from different location.
6. To determine percent organic carbon and organic matter in soil of grass land cropland and forests.
7. To determine the water holding capacity of various soil.

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SEMESTER-IV

PAPER I

PLANT CELL, TUSSE AND ORGAN CULTURE

UNIT -1

Biotechnology: Basic concept, principal and scope

Plant cell And Tissue Culture: General introduction, history, scope, concept of cellular differentiation, tot potency.

UNIT -2

Organogenesis and Adventive Embryogenesis: Fundamental aspects morphogenesis somatic embryogenesis and androgenizes, mechanism, techniques and utility.

Somatic Hybridization: Protoplast isolation fusion and culture hybrid selection and regeneration, possibilities achievements and limitations of protoplast research.

UNIT -3

Application of Plant Tissue Culture: Clonal propagation, artificial seed, production of hybrids and soma clones and production of secondary metabolites /natural products, cryopreservation and germ plasma storage.

UNIT -4

Biostatistics: Definition and importance of Biostatistics scope, Measurement of central tendencies –mean mode and median.

Suggested Reading :

1. Bhojwani, S.S. and Razdan ,N.K. (1996) plant Tissue Culture : Theory and Practice Elservier Science Publishers New York ,USA.
2. Collin H.A. and Edwards ,S. (1998) plant cell Culture Bios .Scientific Publishers Oxford ,U.K.
3. Kartha ,K.K. (1985) Cryopreservation of plant cells and Organs CRC Press ,Boca Raton ,Florida USA.
4. Vasil, I.K. and Thorbe ,T.A.(1994) Plant cell and tissue culture . Kluwer Academic Publishers ,Netherlands.
5. Smith R.H. (200) Plant Tissue Culture : Techniques and Experiment ,Academic Ness ,New York.

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Suggested Laboratory Exercise :

1. Preparation of Tissue culture (ms) medium .
2. Study technique s of tissue culture : sterilization of glass wares and plant materials transfer of explants on culture media ,incubation .
3. Isolation of plant protoplast by mechanical and enzymatic method.
4. Counting of protoplast in the suspension by haemocytometer method.

5. Effect of physical (example, temperature) and chemical (e.g. osmoticum) .factors on protoplast yield .
6. Demonstration of protoplast fusion employing PEG.
7. Initiation of organogenesis and embryogenesis using appropriate explants.

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Suggested Laboratory Exercise

1. Preparation of liquid and solid culture media for bacteria culture.
2. Study of growth characteristics of E .coli using plating and turbido metric method.
3. Isolation of total DNA from E. Coli by lysozyme lysis method and its quantification by spectrophotometric method .
4. Isolation of plasmid DNA from E. Coli by alkaline lysis method and its quantification by spectrophotometric method.
5. Restriction digestion of plasmid and genomic DNA and estimation of size of various DNA fragments.
6. Isolation of Rhizobium from root nodules of leguminous plants
7. Isolation of Agrobacterium tumifaciens form tumours of dicot plants.

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SEMESTER SYLLABUS

M.Sc. BOTANY

SEMESTER-IV

PAPER IV

ELECTIVE –I (B)

WEED BIOLOGY

UNIT -1

Germination, Establishment and Growth – Light Requirement for germination, Seedlongevity AndMortality. Pattern of emergence, The Safe -Site Concept.

UNIT -2

Management of Weeds- Type of weed control: Prevention, Suppression and Eradication; physical, chemical and Biological control of weeds .concept of Integrated Weed Management

UNIT -3

Classification of Herbicides Selective and non selective herbicides, contact and Trans located herbicides. Mode of Action of Herbicides. Application method of Herbicides and Precautions.

UNIT -4

Chemistry of some importance herbicides: Phenoxy acid as 2, 4-D, Pendimethalin Butachlor and Nitro fen. Critical Period for weed control,Aquatic weed management .Plant Environment and Herbicides interactions. Weed Thresholds and management.

PRACTICALS –

Exercises involving

- The study of different factors of the percentage germination of some important weed seeds.
- Measurement of seedling growth of weed plant.
- Study of a weed plant using different growth parameters.
- Measurement of effect of density on Mortality of a weed plant.
- Measurement of effect of density on competition.
- Calculation of Competition Index.

Suggested Books –

1. V.S. Rao , Principles of Weed Science – Oxford & IBH Publishing Pvt. Co. Ltd. New Delhi
2. O. P. Gupta, Modern Weed Management – AgrobiosIndia, Jodhpur.
3. N.C. Joshi, Researchco Publication Delhi.
4. Ashton &Crafts, Mode of Action of Herbicides – Wiley Interscience Publication New York.
5. U.S. Shree Ramulu –Chemistry of Herbicides – Oxford & IBH Publishing Co. Ltd. New Delhi.
6. Majid, F.Z. Aquatic Weed: Utility and Development .Agrobotanica, Bikaner, India.

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SEMESTER SYLLABUS

M.Sc. CHEMISTRY

SCHEME OF EXAMINATION & DISTRIBUTION OF MARKS

SEMESTER - I

Paper No.	Title of the Paper (s)	Internal Assessment	Term End Exam	Practical	Total Marks
1.	Inorganic Chemistry	20	80		100
2.	Organic Chemistry, Stereochemistry & Pericyclic Reaction	20	80		100
3.	Physical Chemistry- I	20	80		100
4.	Spectroscopy And Mathematics/Biology For Chemists	20	80		100
LAB-I	Organic Chemistry				100
LAB-II	Analytical Chemistry				100
				TOTAL	600

SEMESTER - II

Paper No.	Title of the Paper (s)	Internal Assessment	Term End Exam	Practical	Total Marks
1.	Inorganic Chemistry	20	80		100
2.	Organic Chemistry	20	80		100
3.	Physical Chemistry	20	80		100
4.	Spectroscopy, Diffraction Methods & Computer For Chemists	20	80		100
LAB-I	Inorganic Chemistry				100
LAB-II	Physical Chemistry				100
				TOTAL	600

SEMESTER - III

Paper No.	Title of the Paper (s)	Internal Assessment	Term End Exam	Practical	Total Marks
COMPULSORY FOR GROUP A, B & C					
1.	Applications Of Spectroscopy	20	80		100
2.	Chemistry Of Bio-Inorganic & Bio-Organic	20	80		100
LAB-I	General (Compulsory)			200	200
OPTIONAL GROUP-A INORGANIC					
3.	Organotrasition Metal Chemistry	20	80		100
4.	Photo inorganic Chemistry	20	80		100
OPTIONAL GROUP- B ORGANIC					
3.	Physical Organic Chemistry	20	80		100
4.	Chemistry Of Heterocyclic Compounds	20	80		100
OPTIONAL GROUP-C PHYSICAL					
3.	Chemistry Of Materials	20	80		100
4.	Advanced Quantum Chemistry	20	80		100
				TOTAL	600

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SEMESTER - IV

Paper No.	Title of the Paper (s)	Internal Assessment	Term End Exam	Practical	Total Marks
COMPULSORY FOR GROUP A, B & C					
1.	Photochemistry & Solid State Chemistry	20	80		100
2.	Bio-Physical & Environmental Chemistry	20	80		100
OPTIONAL GROUP-A INORGANIC					
3.	Bioinorganic Chemistry & Supra-Molecular Chemistry	20	80		100
4.	Analytical Chemistry	20	80		100
LAB-I	Special			200	200
OPTIONAL GROUP- B ORGANIC					
3.	Medicinal Chemistry	20	80		100
4.	Chemistry Of Natural Product	20	80		100
LAB-II	Special			200	200
OPTIONAL GROUP-C PHYSICAL					
3.	Liquid States	20	80		100
4.	Computation Chemistry	20	80		100
LAB-I	Special			200	200
				TOTAL	600
				GRAND TOTAL	2400

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SEMESTER I
LABORATORY COURSE - I
ORGANIC CHEMISTRY

1. **Qualitative Analysis:-**
   Separation, Purification and Identification of compounds of Binary Mixture, T.L.C. and Column chromatography. I.R. Spectra may be used for functional group identification of compound by suitable derivatives preparation and determination of their melting points.
2. **Organic Synthesis:-**
   1. Bromination - Prepration of p-Bromo Aniline from Acetanilide.
   2. Nitration - Prepration of p-Nitro Aniline from Acetanilide
   3. Hoffman Bromide Reaction. Prepration of Anthranilic Acid from Pthallic anhydride.
   4. Aldol Condensation - Dibenzal acetone from Bazaldelyde.
   5. Sandmeyer Reaction -
      - o-Chloro Benzoic Acid from Anthranilic Acid.
      - p- Chloro toluene from Toludine.
   6. Friedal Craft Reaction - □ -Benzoyl.Propionic Acid from Succinic Anhydride and Benzene.
   7. Oxidation - Adipic Acid by Chromic Acid oxidation of cyclohexanol.
   7. Diazotization:-
      - Preparation of methyl orange from Sulphanilic Acid.
      - Phenyl Azo- □. Naphthol from Aniline.
   8. Preparation of Acridone from N- Phenyl anthranilic acid.
   9. Grignard's reaction: Synthesis of tripheny lmethanol from Benzoic acid.

   Note: Two stage preparation. Preparation of pure and crystalline compound based on any two of above principals with conformation of melting point.
3. **Quantitative Analysis:-**
   1. Determination of the percentage or number of Hydroxyl group in an organic compound by Acetylation method.
   2. Estimation of Amines/Phenols using Bromate - Bromide Solution / or Acetylation method.
   3. Determination of equivalent- weight of carboxylic compound.
   4. Estimation of carboxyl group by tritration / silver salt-method.
   5. Estimation of Carbonyl group by Hydrazone method.
   6. Estimation of Glycine by titration.

Instruction to Practical Examiners in Chemistry Semester –I

1. The Board of Examiners; one external and one internal for each branch will meet to decide the exercises and other matter in connection with the conduct of practical examinations

S. No.	Lab. Course (branch)	Max. Marks	Duration
1.	I- Organic Chemistry	100	5 hrs.
2.	II- Analytical Chemistry	100	5 hrs.

2. The distribution of marks is as under. Marks of Ex-students are given in parentheses.

(a) Qualitative Analysis of mixture containing two Organic compounds	30 (40) marks
(b) Preparation	10 (15) marks
(c) Estimation	20 (25) marks
(d) Viva voice	20 (20) marks
(c) Sessional	20 (-) marks
	Total-100 (100) marks

As far as possible all the exercises as laid down in the syllabus are set. The scale of marking will be determined by examiners in accordance with the nature of exercises.

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SEMESTER I
LABORATORY COURSE II
ANALYTICAL CHEMISTRY
SECTION- A
INSTRUMENTATION AND COMPUTERS

1. Error Analysis & Statistical data Analysis:-
   Errors, types of errors, Minimization of Error, Statistical treatment for error analysis, standard deviation, Relative standard deviation, Linear least square. Calibration of volumetric apparatus burrettes pipette, standard flask, weight box etc.
2. Volumetric Analysis:-
   Basic Principles, determination of I_2 and saponification values of oil sample determination of DO, COD, BOD, Hardness of water samples.
3. Chromatography:-
   Separation of Cations and anions by (A) Paper Chromatography, (B) Column Chromatography.

SECTION- B

4. pH Metry / Potentiometry / Conductometry titration :-
   Determination of strength of acid etc.
5. Flame Photometry / AAS/FIA/Colorimetry :-
   Determination of Cations / anions and metal Ions eg. Na^+, K^+, Ca^{2+}, $SO4^{2-}$ NO_2, Fe, Mo, Ni ,Cu, Zn etc.
6. Spectro Photometry :-
   Verification of Beer - Lambert Law. Molar Absorptivity calculation, Plotting graph to obtain □max etc. effect of pH in aqueous coloured system. Determination of metal ions eg. Fe, Cu, Zn, Pb etc
7. Nephelometry / Turbidimetry :- Determination of chlorine, sulphate phosphate turbidity etc.
8. Application of Computer in Chemistry:- As Specified in Theory paper in section II (A).

For Lab. Course –II (Analytical Chemistry):

(a)Two practical exercise (one from each section) (at least one of these will be based on instrumental analysis)	60 (80) marks
(b) Viva voice	20 (20) marks
(c) Sessional	20 (-) marks
Total-	100 (100) marks

As far as possible all the exercises as laid down in the syllabus are set. The scale of marking will be determined by examiners in accordance with the nature of exercises. Sessional marks will be awarded by External Examiner in consultation with the internal Examiner

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SEMESTER-II

LABORATORY – COURSE I

INORGANIC CHEMISTRY

Note- Students is accepted to complete all exercises.

1. Qualitative analysis of mixture containing eight radical including some less common metal ions among the following by common method (Preferably semi-micro method)

Group-A

Basic Radicals : - {Ag, Pb, Hg, Cu, Cd, Bi, As, Sb, Sn, Fe, Al, Cr, Zn, Mn, co, Ni, Ba, Sr, Ca, Mg, Na, K, NH_4 ,}

Acid Radicals: - {CO_3, SO_4, SO_3, NO_3, F, Cl, Br, I, NO_2, BO_3, C_2O_4, PO_4}

Group– B

Basic Radicals: - {Ce, Th, Zr, W, Te, Ti, Mo, U, V, Be, Li, Au, Pt.}

Acid Radicals :-{SiO_4, Thiosulphate, Ferrocynide, Ferricyanide, Chromate, Arsenite , Arsenate, Permanganate }

Note – The mixture to be analysed by the students must contain at least one basic and one acid radical from Group B.

2. **Quantitative Analysis:-**
   Involving two of the following in ores, alloys or mixture in solution- one by volumetric and other by gravimetric method Ag, Cu, Fe, Cr, Mn, Ni, Zn, Ca, Mg, Chloride, Sulphate.
3. **Estimation of:-**
   (A) Phosphoric acid in Commercial ortho phosphoric acid.
   (B) Boric Acid in Borax.
   (C) Ammonium Ion in Ammonium Salt.
   (D) MnO_2 in pyrolusite
   (E) Available Chlorine in bleaching powder.
   (F) H_2O_2 in commercial sample.

   Students are expected to perform at least three exercises From above during laboratory work.
4. Preparation of selected Inorganic compounds and study of their properties by various method including IR, Electronic Spectra, Mossbaur, ESR. Spectra+ Magnetic susceptibility etc.
   (i) V0 $(acac)_2$
   (ii) cis K $[Cr(C_2O_4)_2(H_2O)_2]$, trans K $[Cr(C_2O_4)_2(H_2O)_2]$,.$2H_2O$
   (iii) $[Co(NH_3)_6]Cl_3$
   (iv) Na $[Cr(NH_3)_2(SCN)_4]$
   (v) Mn $(acac)_3$
   (vi) $K_3[Fe(C_2O_4)_3]$
   (vii) Prussian Blue Turnbull's Blue.
   (viii) $[Co(NH_3)_6][Co(NO_2)_6]$
   (ix) Hg $[Co(SCN)_4]$
   (x) $[Ni(NH_3)_4]Cl_2$, $[Ni(NH_3)_4]Cl_2$
   (xi) Ni $(DMG)_2$(xii)$[Cu(NH_3)_4]SO_4$
   (xii) $K_3[Cr(C_2O_4)_3].3H_2O$
   (xiii) $[Cu(NH_3)_4]SO_4$

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SEMESTER-II
LABORATORY COURSE- II
PHYSICAL CHEMISTRY

1. **Adsorption:-**
   a. Verification of Freundlich's Adsorption Isotherm.
   b. To study surface tension – concentration relationship for solutions. (Gibbs equation).
2. **Phase Equilibria:**
   a. Determination of congruent composition and temperature of binary system e.g. diphenylamine – benzophenone system.
   b. Determination of glass transition temperature of given salt e. g. $CaCl_2$ conductometrically.
   c. To construct the phase diagram for three component system e. g. chloroform, acetic acid and water.
3. **Chemical Kinetics**
   a. Hydrolysis of an ester/ ionic reactions.
   b. Determination of the velocity constant of hydrolysis of an ester. Determination of effect of (a)change of temperatures, (b)change of concentration of reactants and catalyst and(c)ionic strength of the media on the velocity constant of media.
   c. Determination of the rate constant for the oxidation of iodide ions by hydrogen peroxide
   d. Determination of the primary salt effect on the kinetics of ionic reaction and testing of the Bronsted relationship (iodide ions oxidized by persulphate ion).
4. **Conductometry**
   a. Determination of solubility of sparingly soluble salt (eg, $PbSO_4$, $BaSO_4$) Conductometrically.
   b. Determination of the strength of strong and weak acids in a given mixture conductometrically.
   c. Determination of dissociation constant of weak electrolyte by conductometer.
   d. Determination of velocity constant, Order of reaction and energy of activation for saponification of ethyl acetate by sodium hydroxide.
5. **pH Metry/Potentiometry**
   a. Determination of the strength of strong and weak acid in a given mixture using pH meter/potentiometer.
   b. Determination of dissociation constant of weak acid by pH meter.
   c. Determination of concentration of acid in given buffer solution by pH meter.
   d. Determination of strength of halides in a mixture potentiometrically.
   e. Determination of the valency of mercurous ions potentiometrically.
   f. Determination of the strength of strong acid, weak acids in a given mixture using a potentiometer/ pH meter.
   g. Determination of temperature dependence of EMF of a cell.
   h. Determination of the formation constant of silver- ammonia complex and stoichiometry of the complex potentiometrically.
   i. Determination of activity and activity coefficient of electrolytes.
   j. Determination of thermodynamic constant. $\Delta G, \Delta S$ and ΔH for the reaction by e.m.f. method. $Zn + H_2SO_4 = ZnSO_4 + H_2$
   k. Determination of the dissociation constant of monobasic / dibasic acid
6. **Polarimetry:-**
   Determination of rate constant for hydrolysis/inversion of sugar using a polarimeter. Enzyme kinetic – inversion of sucrose.

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SEMESTER-IV
GROUP-B
LABORATORY COURSE (SPECIAL)
ORGANIC CHEMISTRY

200 marks

Note: Laboratory course with Group 'B' will be of 12 hrs duration spread over two days. The examinee will have to perform three experiments. These experiments will be of 40 marks each. 40 marks each will be allotted for viva-voce and Sessional work.

Qualitative Analysis

Separation, Purification and identification of the components of a mixture of binary organic compounds & mixture of three organic compounds.

Multi-step synthesis of Organic compounds (Three stage preparations. Preparation of pure crystalline product. By using any two following principals Conformation by melting point determination.)-

The exercises should illustrate the use of organic reagents and may involve purification of the products by chromatographic techniques.

1. Photochemical reaction: Benzophenone- Benzopinacol- Benzpinacolone.
2. Beckmann rearrangement: Benzanilide from benzene, Benzene- benzophenone ,oxime- Benzanilide.
3. Benzilic acid rearrangement : Benzilic acid from benzoin, (Benzoin- Benzil- Benzilic acid)
4. Synthesis of heterocyclic compounds, Skraup synthesis: Preparation of quinoline from aniline, Skraup synthesis: Preparation of 2 phenyl-indole from phenyl hydrazine.
5. Sandmeyer Reaction: Preparation of o chlorobenzoic acid from anthranilic acid.
6. Ultman reaction - Preparation of N-Phenyl anthranilic acid from o-chlorobenzoic acid.
7. Preparation of Acridone from N-Phenyl anthranilic acid.
8. Prepration of p nitro aniline
9. Prepration of p bromo aniline
10. Prepration of methyl orange from aniline via sulphanilic acid.

Extraction of Organic compounds from Natural sources-

1. Isolation of caffeine from tea leaves
2. Isolation of casein from milk
3. Isolation of lactose from milk
4. Isolation of nicotine dipicrate from tobacco
5. Isolation of piperine from black pepper
6. Isolation of lycopene from tomatoes
7. Isolation of b-carotene from carrots.

Paper Chromatography

Separation and identification of the sugars, dyes and amino acids present in the given mixture of sugars, dyes and amino acids by paper chromatography and determination of RF values.

Spectroscopy:

Identification of organic compounds by the analysis of their spectral data (UV. IR. PMR, CMR & M) Spectrophotometric (UV/VIS) Estimations of

1. Amino acids
2. Proteins
3. Carbohydrates
4. Aspiri

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SEMESTER-IV
GROUP-B
LABORATORY COURSE (SPECIAL)
PHYSICIAL CHEMISTRY

1. Study of kinetics of exchange between ethyl iodide and the iodide ion.
2. Determination of the solubility product of lead iodide.
3. Determination of the dissociation constant of barium nitrate.
4. Determination of relative strength of the acids by studying the hydrolysis of an ester.
5. Study the hydrolysis of methyl acetate catalysed by HCl and equimolar urea hydrochloride and hence the degree of hydrolysis of the salt.
6. Investigate the inversion of can-sugar in presence of an acid. Determine also the energy of activation of the reaction.
7. Study in inversion of can-sugar in presence of HCL and H_2SO_4 and hence determine the relative strength of the acids.
8. Study the kinetics of hydrolysis of ethyl acetate by NaOH at two temperatures by conductance measurement, and hence the energy of activation of the reaction.
9. Study the kinetics of hydrolysis of tertiary amyl iodide, and determine the order and energy of activation of the reaction.
10. Investigate the reaction between H_2O_2 and HI.
11. Study the kinetics of decomposition of benzene diazonium chloride at different temperatures.
12. Study the kinetics of reaction between $K_2S_2O_8$ and KI.
    (a) Determine and rat constant and order of reaction.
    (b) Study of influence of ionic strength on the rate constant.
13. Investigate the kinetics of autocatalytic reaction between KMno4 and Oxalic acid.
14. Determination of order of reaction between bromic acid and hydrobromic acids.
15. Determination of concentration f iodine in a given sample (KI) by isotope dilution technique.
16. Determination of effect of-
    (a) Change of temperature,
    (b) Change of concentration.
    (c) Ionic strength of the media on the velocity constant of hydrolysis of an ester.
17. Determination of the primary salt effect on the kinetics of ionic reactions and testing of the Bronsted relationship (iodide ion is oxidised by persulphate ion.)
18. Investigate the adsorption of oxalic acid from aqueous solution by activated charcoal and verify Frenndlish and Langmuir's adospriton isotherms.
19. Determine adsoption isotherms of acetic acid from aqueous solution by charcoal.

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SEMESTER SYLLABUS

M.Sc. PHYSICS

SCHEME OF EXAMINATION & DISTRIBUTION OF MARKS

SEMESTER I

Paper No.	Title of the Paper	Internal Assessment	Term End Exam	Total Marks
1.	Mathematical Methods-I	20	80	100
2.	Classical Mechanics	20	80	100
3.	Numerical Methods and C Programming	20	80	100
4.	Electronics-I	20	80	100
LAB I	General	-	-	100
LAB II	Computer Programming	-	-	100
			TOTAL	600

SEMESTER II

Paper No.	Title of the Paper	Internal Assessment	Term End Exam	Total Marks
1.	Mathematical Methods-II	20	80	100
2.	Quantum Mechanics-I	20	80	100
3.	Thermodynamics	20	80	100
4.	Electronics-II	20	80	100
LAB I	Electronics (Devices)	-	-	100
LAB II	Electronics (Circuits) Power supply, Amplifier, Oscillators, Modulation, Detection etc.	-	-	100
			TOTAL	600

SEMESTER III

Paper No.	Title of the Paper	Internal Assessment	Term End Exam	Total Marks
1.	Quantum Mechanics II	20	80	100
2.	Statistical Mechanics	20	80	100
3.	Condensed Matter Physics I	20	80	100
4.	Electronics III	20	80	100
LAB I	Condensed Matter Physics	-	-	100
LAB II	Digital Electronics	-	-	100
			TOTAL	600

SEMESTER IV

Paper No.	Title of the Paper	Internal Assessment	Term End Exam	Total Marks
1.	Condensed Matter Physics II	20	80	100
2.	Nuclear Physics	20	80	100
3.	Atomic and Molecular physics	20	80	100
4.	Electronics IV	20	80	100
5.	Project	-	-	200
			TOTAL	600
			GRAND TOTAL	2400

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SEMESTER SYLLABUS

M.Sc. PHYSICS

SCHEME OF EXAMINATION & DISTRIBUTION OF MARKS

SEMESTER I

Paper No.	Title of the Paper	Internal Assessment	Term End Exam	Total Marks
1.	Mathematical Methods-I	20	80	100
2.	Classical Mechanics	20	80	100
3.	Numerical Methods and C Programming	20	80	100
4.	Electronics-I	20	80	100
LAB I	General	-	-	100
LAB II	Computer Programming	-	-	100
			TOTAL	600

SEMESTER II

Paper No.	Title of the Paper	Internal Assessment	Term End Exam	Total Marks
1.	Mathematical Methods-II	20	80	100
2.	Quantum Mechanics-I	20	80	100
3.	Electrodynamics	20	80	100
4.	Electronics-II	20	80	100
LAB I	Electronics (Devices)	-	-	100
LAB II	Electronics (Circuits) Power supply, Amplifier, Oscillators, Modulation, Detection etc.	-	-	100
			TOTAL	600

SEMESTER III

Paper No.	Title of the Paper	Internal Assessment	Term End Exam	Total Marks
1.	Quantum Mechanics II	20	80	100
2.	Statistical Mechanics	20	80	100
3.	Condensed Matter Physics I	20	80	100
4.	Electronics III	20	80	100
LAB I	Condensed Matter Physics	-	-	100
LAB II	Digital Electronics	-	-	100
			TOTAL	600

SEMESTER IV

Paper No.	Title of the Paper	Internal Assessment	Term End Exam	Total Marks
1.	Condensed Matter Physics II	20	80	100
2.	Nuclear Physics	20	80	100
3.	Atomic and Molecular physics	20	80	100
4.	Electronics IV	20	80	100
5.	Project	-	-	200
			TOTAL	600
			GRAND TOTAL	2400

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बिलासपुर विश्वविद्यालय, बिलासपुर (छत्तीसगढ़)

सेमेस्टर पाठ्यक्रम

M.Sc. COMPUTER SCIENCE

SCHEME OF EXAMINATION & DISTRIBUTION OF MARKS

SEMESTER - I

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Digital Electronics and Microprocessor	Theory	20	80	100
2.	Advance Computer Network	Theory	20	80	100
3.	OOPs using JAVA	Theory	20	80	100
4.	Advanced Operating System	Theory	20	80	100
Lab-1	Digital Electronics	Practical	-	-	100
Lab-2	Java Programming	Practical	-	-	100

SEMESTER - II

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Analysis and Design of Algorithm	Theory	20	80	100
2.	Relational Database Management System (RDBMS)	Theory	20	80	100
3.	Data Structure using C++	Theory	20	80	100
4.	Software Engineering	Theory	20	80	100
Lab-1	RDBMS	Practical	-	-	100
Lab-2	Data Structure using C++	Practical	-	-	100

SEMESTER - III

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Theory of computation and compiler design	Theory	20	80	100
2.	artificial intelligence and expert system	Theory	20	80	100
3.	soft computing techniques	Theory	20	80	100
4.	.net technology	Theory	20	80	100
Lab-1	MAT LAB	Practical	-	-	100
Lab-2	Programming through .NET	Practical	-	-	100

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SEMESTER - IV

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Advanced Trends And Technology In Computer Science	Theory	20	80	100
2.	ELECTIVE - I Data Mining and Data Warehousing ELECTIVE - II Computer Graphics and Multimedia ELECTIVE - III Embedded System ELECTIVE-IV Network Security & Cryptography	Theory	20	80	100
3.	Major Project		-	-	400

Note: Internal assessment of 20 marks will consist of two parts -

1. Unit Test (10 Marks): Two tests will be conducted and average of these tests will be the marks of Unit Test.
2. Seminar/Assignment (10 Marks): To be conducted by the Department concerned.

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UNIT–V

Advance Topics of Operating System

Embedded Operating Systems, eCos, Tiny OS, Computer Security Concepts, Threats, Attacks, and Assets, Intruders, Malicious Software Overview, Viruses, Worm, Authentication, Access Control, Intrusion Detection, Malware Defense, Dealing With Buffer Overflow Attacks, Distributed Process Management, Process Migration, Distributed Global States, Distributed Mutual Exclusion, Distributed Deadlock.

Text Books:

1. Operating System Concepts, Silbersachatz and Galvin, Pearson Education Pub.
2. Operating Systems, Madnick E., Donovan J., Tata McGraw Hill,
3. Operating Systems, A. S. Tannenbaum, PHI

Reference Books:

1. Operating Systems Internals and Design Principle, William Stallings, Prentice Hall Publishers
2. Operating Systems- AConcept-Based Approach, Dhananjay M. Dhamdhere, McGraw-Hill

SEMESTER-I

LAB 1: DIGITAL ELECTRONICS

SEMESTER-I

LAB 2: JAVA PROGRAMMING

LAB Detail

Break-up of marks for External Practical Examination			
S. No.	Argument	Maximum Marks	Minimum Passing Marks
1	Lab Record	20	36
1.	Viva-voce	40	
2.	Program Development and Execution	40	
	Total Marks	100	36

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SEMESTER-II
LAB 1: RDBMS

SEMESTER-II
LAB 2: DATA STRUCTURE

Break-up of marks for External Practical Examination			
S. No.	Argument	Maximum Marks	Minimum Passing Marks
1	Lab Record	20	36
1.	Viva-voce	40	
2.	Program Development and Execution	40	
	Total Marks	100	36

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SEMESTER-III
LAB-1
MAT LAB

LAB-2
PROGRAMMING THROUGH .NET

The break-up of marks for Practical will be as under :

Sr. No.	Argument	Maximum Marks	Minimum Passing Marks
1.	Lab Record	20	
2.	Viva-voce	40	
3.	Program Development and Execution	40	
	Total Marks	100	36

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SEMESTER - IV
MAJOR PROJECT

Note:

1. It is compulsory, that students would have group of maximum of two students and project should be done under Government Sectors/ Public Sector / Pvt. LTD. S/W Company.
2. The students should not make any project under local or private institutions.
3. The students should make project themselves and project will not be copy of other project.

Steps for Live Project

1. Getting customer's requirements
2. Preparing designs, database and business logics
3. Developing software application project
4. Testing and implementing the project
5. Troubleshooting the project application after implementation

The break-up of marks for fourth semester's Major Project will be as under:

Sr. No.	Argument	Maximum Passing Marks	Minimum Passing Marks
1.	Project Record	100	
2.	Viva-voce	100	
3.	Program Development and Execution	200	
Total Marks		400	144

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SEMESTER - IV

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Advanced Trends And Technology In Computer Science	Theory	20	80	100
2.	ELECTIVE - I Data Mining and Data Warehousing ELECTIVE - II Computer Graphics and Multimedia ELECTIVE - III Embedded System ELECTIVE-IV Network Security & Cryptography	Theory	20	80	100
3.	Major Project		-	-	400

Note: Internal assessment of 20 marks will consist of two parts -

1. Unit Test (10 Marks): Two tests will be conducted and average of these tests will be the marks of Unit Test.
2. Seminar/Assignment (10 Marks): To be conducted by the Department concerned.

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SEMESTER - IV
MAJOR PROJECT

Note:

1. It is compulsory, that students would have group of maximum of two students and project should be done under Government Sectors/ Public Sector / Pvt. LTD. S/W Company.
2. The students should not make any project under local or private institutions.
3. The students should make project themselves and project will not be copy of other project.

Steps for Live Project

1. Getting customer's requirements
2. Preparing designs, database and business logics
3. Developing software application project
4. Testing and implementing the project
5. Troubleshooting the project application after implementation

The break-up of marks for fourth semester's Major Project will be as under:

Sr. No.	Argument	Maximum Passing Marks	Minimum Passing Marks
1.	Project Record	100	
2.	Viva-voce	100	
3.	Program Development and Execution	200	
Total Marks		400	144

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2018-19

D.P. Vipra College

Old High Court Road, Bilaspur

Chhattisgarh, India 495001

Part-I

SYLLABUS FOR ENVIRONMENTAL STUDIES AND HUMAN RIGHTS FOR UNDER GRADUATE

'इन्वाहरमेंटल साईसेस' के पाठ्यक्रम को स्नातक स्तर भाग–एक की कक्षाओं में विश्वविद्यालय अनुदान आयोग के निर्देशानुसार अनिवार्य रूप से शिक्षा सत्र 2003–2004 (परीक्षा 2004) से प्रभावशील किया गया है । स्वशासी महाविद्यालयों द्वारा भी अनिवार्य रूप से अंगीकृत किया जाएगा ।

भाग 1, 2 एवं 3 में से किसी भी वर्ष में पर्यावरण प्रश्न –पत्र उत्तीर्ण करना अनिवार्य है । तभी उपाधि प्रदाय योग्य होगी ।

पाठ्यक्रम 100 अंकों का होगा, जिसमें से 75 अंक सैद्धांतिक प्रश्नों पर होगें एवं 25 अंक क्षेत्रीय कार्य (Field Work) पर्यावरण पर होगें ।

सैद्धांतिक प्रश्नों पर अंक –75 (सभी प्रश्न इकाई आधार पर रहेगें जिसमें आंतरिक विकल्प रहेगा)

(अ) लघु प्रश्नोंत्तर – 25 अंक

(ब) निबंधात्मक – 50 अंक

Field Work – 25 अंकों का मूल्याकन आतरिक मूल्यांकन पद्धति से कर विश्वविद्यालय को प्रेषित किया जावेगा । अभिलेखों की प्रायोगिक उत्तर पुस्तिकाओं के समान संबंधित महाविद्यालयों द्वारा सुरक्षित रखेगें ।

उपरोक्त पाठ्यक्रम से संबंधित परीक्षा का आयोजन वार्षिक परीक्षा के साथ किया जाएगा ।

पर्यावरण विज्ञान विषय अनिवार्य विषय है, जिसमें अनुत्तीर्ण होने पर स्नातक स्तर भाग–एक के छात्र/छात्राओं को एक अन्य विषय के साथ पूरक की पात्रता होगी । पर्यावरण विज्ञान के सैद्धांतिक एवं फील्ड वर्क में संयुक्त रूप से 33% (तैतींस प्रतिशत) अंक उत्तीर्ण होने के लिए अनिवार्य होंगे ।

स्नातक स्तर भाग–एक के समस्त नियमित/भूतपूर्व/अमहाविद्यालयीन छात्र/छात्राओं को अपना फील्ड वर्क सैद्धांतिक परीक्षा की समाप्ति के पश्चात् 10 (दस) दिनों के भीतर संबंधित महाविद्यालय/परीक्षा केन्द्र में जमा करेंगे एवं महाविद्यालय के प्राचार्य/केन्द्र अधिक्षक, परीक्षकों की नियुक्ति के लिए अधिकृत रहेंगे तथा फील्ड वर्क जमा होने के सात दिनों के भीतर प्राप्त अंक विश्वविद्यालय को भेजेंगे ।

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कृपया पर्यावरण विज्ञान व मानवाधिकार
का पाठ्यक्रम अनुमोदनार्थ प्रस्तुत है।

Dr R.G.
11/11/13

1. Prof A.K. Gupta
2. Prof C.L. Patel
3. Dr. R. Prasad

11.11.13

11-11-13

बिलासपुर विश्वविद्यालय, बिलासपुर (छ.ग.)

पुराना हाईकोर्ट भवन, बिलासपुर (छ.ग.) 495001,
फोन : 07752-220031, फैक्स 07752-260294, ई-मेल : bilaspuruniversity.2012@gmail.com,
वेबसाईट : www.bilaspuruniversity.ac.in

क्र. 1186 /अका./2014

बिलासपुर दिनांक 11/9/14

अधिसूचना

बिलासपुर विश्वविद्यालय से सम्बद्ध समस्त महाविद्यालय को सूचित किया जाता है कि केन्द्रीय अध्ययन मण्डल द्वारा अनुमोदित पर्यावरण अध्ययन के संशोधित पाठ्यक्रम "पर्यावरण अध्ययन व मानवाधिकार" स्नातक स्तर पर शिक्षा सत्र 2014-15 से प्रभावशील होगा । (अनुमोदित पाठ्यक्रम संलग्न)

आदेशानुसार,

कुलसचिव

पृ.क्रमांक 1187 /अका./2014

बिलासपुर, दिनांक 11/9/14 /

प्रतिलिपि:-

1. कुलपति के निज सहायक को माननीय कुलपति महोदय के सूचनार्थ प्रेषित।
2. परीक्षा नियंत्रक / उप-कुलसचिव (परीक्षा/गोपनीय) बिलासपुर विश्वविद्यालय, बिलासपुर को सूचनार्थ प्रेषित ।
5. प्राचार्य, समस्त सम्बद्ध महाविद्यालय, को इस आशय के साथ प्रेषित की महाविद्यालय में केन्द्रीय अध्ययन मण्डल द्वारा अनुमोदित **"पर्यावरण अध्ययन व मानवाधिकार"** विषय का अंगीकृत पाठ्यक्रम अध्ययन-अध्यापन कराना सुनिश्चित करें ।
6. संपादक, दैनिक ..... को इस अनुरोध के साथ प्रेषित की कृपया उपरोक्त अधिसूचना को अपने लोकप्रिय दैनिक समाचार पत्र में छात्रहीत में प्रकाशित करने का कष्ट करें ।

कुलसचिव

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Part-I

SYLLABUS FOR ENVIRONMENTAL STUDIES AND HUMAN RIGHTS FOR UNDER GRADUATE

(paper code - 0828)

M.M. 75

UNIT -I THE MULTI DISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES:

Definition, Scope and Importance

Natural Resources:

Renewable and Nonrenewable Resources:

Natural resources and associated problems

(a) Forest resources: Use and over-exploitation, deforestation, Timber extraction, mining, dams and their effects on forests and tribal people and relevant forest Act.

(b) Water resources: Use and over-utilization of surface and ground water, floods drought, conflicts over water, dams benefits and problems and relevant Act.

(c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources.

(d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity.

(e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources.

(f) Land resources: Land as a resource, land degradation, man induced landslides soil erosion and desertification.

UNIT-II ECOSYSTEM

(12 Lecturer)

(a) Concept, Structure and Function of an ecosystem

- Producers, consumers and decomposers.
- Energy flow in the ecosystem
- Ecological succession.
- Food chains, food webs and ecological pyramids.
- Introduction, Types, Characteristic Features, Structure and Function of Forest, Grass, Desert and Aquatic Ecossystem.

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(b) Biodiversity and its Conservation

- Introduction - Definition: genetic, species and ecosystem diversity.
- Bio-geographical classification of India.
- Value of biodiversity: consumptive use, productive use, social, ethics, aesthetic and option values.
- Biodiversity at global, National and local levels.
- India as mega-diversity nation.
- Hot spots of biodiversity
- Threats to biodiversity: habitat loss, poaching of wildlife, man-wild life conflict.
- Endangered and endemic species of India.
- Conservation of biodiversity: In situ and Ex-situ conservation of biodiversity.

UNIT-III ENVIRONMENTAL POLLUTION

Definition **(12 Lecturer)**

(a) Causes, effect and control measures of -

- Air water, soil, marine, noise, nuclear pollution and Human population.
- Solid waste management: Causes, effects and control measures of urban and industrial wastes.
- Role of an individual in prevention of pollution.
- Disaster Management: floods, earthquake, cyclone and landslides.

(b) Environmental Management

(12 Lecturer)

- From Unsustainable to sustainable development.
- Urban problems related to energy.
- Water conservation, rain water harvesting, watershed management.
- Resettlement and rehabilitation of people, its problems and concerns.
- Environmental ethics: Issues and possible solutions.
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust.

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Wasteland reclamation.

- Environment Protection Act: Issues involved in enforcement of environmental legislation.

- Role of Information Technology in Environment and Human Health.

UNIT-IV

General background and historical perspective- Historical development and concept of Human Rights. Meaning and definition of Human Rights. Kind and Classification of Human Rights.

Protection of Human Rights under the UNO Charter. Protection of Human Rights under the Universal Declaration of Human Rights, 1948

Convention on the Elimination of all Forms of Discrimination against women

Convention on the Rights of the Child, 1989

UNIT-V

Impact of Human Rights norms in India, Human Rights under the Constitution of India, Fundamental Rights under the Constitution of India, Directive Principles of State Policy under the Constitution of India, Enforcement of Human Rights in India

Protection of Human Rights under the Human Rights Act, 1993 - National Human Rights Commission, State Human Rights Commission and Human Rights court in India.

Fundamental Duties under the Constitution of India

Reference/Books Recommended:

1. SK Kapoor- Human rights under International Law and Indian Law
2. HO Agrawal- Internation Law and Human Rights
3. एस. के. कपूर – मानव अधिकार
4. जे. एन. पान्डेय – भारत का संविधान
5. एम. डी. चतुर्वेदी – भारत का संविधान
6. J. N. Pandey - Constitutional Law of India
7. Agarwal K.C. 2001 Environmental Biology, Nidi Pub. Ltd. Bikaner
8. Bharucha Erach, the Biodiversity of India, Mapin Pub. Pvt. Ltd. Ahmedabad 380013, India, Email: mapin@icenet.net(R)

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B.A. /B.Sc. Part I

PAPER - III
PRACTICAL GEOGRAPHY
Max. Marks: 50

SECTION A

CARTOGRAPHY AND STASTISTICAL METHODS (M.M. 25)

Unit I Scale: Statement Scale , Representative Fraction (R.F.), Linear scale – Simple, Diagonal, Comparative, and Time Scales.

Unit II Contour: Methods of showing relief; Hachures, Contours; Representation of different landforms by contours.

Unit III Graph and Diagram: Line graph, Bar Diagram (Simple and Compound), Circle Diagram, Pie Diagram

Unit IV Statistical Technique: Mean, Median and Mode

SECTION B

SURVEYING - (M.M. 15)

Unit V Chain and Tape Survey. Triangulation method, Open Traverse and Closed Traverse

PRACTICAL RECORD AND VIVA VOCE (M.M. 10)

Books Recommended:

1. Davis, R.E. and Foote, F.S. (1953): Surveying, 4th edition, McGraw Hill Publication, New York
2. Jones, P.A.(1968): Fieldwork in Geography, Longmans, Green and Company Ltd., First Publication, London
3. Monkhouse, F. J. and Wilkinson, F.J. (1985): Maps and Diagrams. Methuen, London
4. Natrajan, V. (1976): Advanced Surveying, B.I. Publications., Mumbai
5. Pugh, J.C. (1975): Surveying for Field Scientists, Methuen and Company Ltd., London, First Publication.
6. Raisz, E. (1962): General Cartography. John Wiley and Sons, New York. 5th edition.
7. Sarkar, A. K. (1997): Practical Geography: A Systematic Approach. Orient Longman, Kolkata.
8. Sharma, J. P. (2001): *Prayogik Bhugol.,* Rastogi Publication, Meerut 3rd. edition.
9. Singh, R.L. and Singh, Rana P.B. (1993): Elements of Practical Geography. (Hindi and English editions). Kalyani Publishers, New Delhi,.
10. Singh, L.R. (2006): Fundamentals of Practical Geography, Sharda Pustak Bhawan, Allahabad.
11. Venkatramaiah, C. (1997): A Text Book of Surveying, Universities Press, Hyderabad.

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B.A. /B.Sc. Part II

PAPER - III

PRACTICAL GEOGRAPHY

Max. Marks: 50

SECTION A

MAP INTERPRETATION, PROJECTIONS AND STATISTICAL METHODS (M.M. 25)

Unit I Distribution Maps: Dot Map, Choropleth Map and Isopleth Map.

Unit II Map Projections: Definition and classification; Conical, Zenithal, and Cylindrical Projections.

Unit III Interpretation of Weather Maps: Use of Meteorological Instruments.

Unit IV Statistical Methods: Quartile: Mean Deviation, Standard Deviation and Quartile Deviation; Relative Variability and Co-efficient of Variation.

SECTION B

SURVEYING (M.M. 15)

Unit V Surveying: Whole Circle Bearing and Reduced Bearing, Methods of Prismatic Compass Survey.

PRACTICAL RECORD AND VIVA VOCE (M.M. 10)

Books Recommended:

1. Alvi, Z. 1995 : Statistical Geography: Methods and Applications, Rawat Pub. New Delhi: .
2. Davis, R.E. and Foote, F.S. (1953): Surveying, 4th edition, McGraw Hill Publication, New York
3. Kanetker, T.P. and Kulkarni, S.V.(1967): Surveying and Levelling, Vol I and II V.G. Prakashan, Poona.
4. Natrajan, V. (1976): Advanced Surveying, B.I. Publications., Mumbai.
5. Pal, S.K. 1999 : Statistics for Geoscientists, Concept publishing Company, New Delhi
6. Punmia, B.C.(1994): Surveying, Vol I, Laxmi Publications Private Ltd, New Delhi.
7. Raisz, E. (1962): General Cartography. John Wiley and Sons, New York. 5th edition
8. Sarkar, A. K. (1997): Practical Geography: A Systematic Approach. Orient Longman, Kolkata.
9. Sharma, J. P. (2001): *Prayogik Bhugol.*, Rastogi Publication, Meerut 3rd. edition.
10. Silk, J. 1979 : Statistical techniques in Geography, George Allen and Unwin, London
11. Singh, R.L. and Singh, Rana P.B. (1993): Elements of Practical Geography. (Hindi and English editions). Kalyani Publishers, New Delhi,.
12. Singh, L.R. (2006): Fundamentals of Practical Geography, Sharda Pustak Bhawan, Allahabad.
13. Venkatramaiah, C. (1997): A Text Book of Surveying, Universities Press, Hyderabad.

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बी.ए. / बी.एस.सी. तृतीय वर्ष
प्रश्न पत्र–तृतीय
प्रायोगिक भूगोल

अधिकतम अंक : 50

खण्ड (अ)

मनचित्र पठन एवं निर्वचन **20**

इकाई –1. बैन्ड ग्राफ, हीदर ग्राफ, क्लाइमोग्राफ, पवनारेख ।

इकाई –2. भारतीय स्थलाकृतिक मानचित्र की व्याख्या प्रकार, वर्गीकरण धरतलीय मानचित्र के प्रकार एवं विष्लेषण, राष्ट्रीय एवं अन्तराष्ट्रीय, भौतिक एवं सांस्कृतिक तत्वों के आधार पर विष्लेषण ।

इकाई –3. उपग्रह बिम्ब : प्रारम्भिक सूचनाओं की व्याख्या बिम्ब निर्वाचन : चाक्षुश विधि – भूमि उपयोग भूमि आच्छादन मानचित्रण, जी0 पी0 एस0 का उपयोग एवं अनुप्रयोग ।

खण्ड (ब)

सर्वेक्षण एवं क्षेत्रीय प्रतिवेदन **20**

इकाई –4. सर्वेक्षण , समपटल सर्वेक्षण, प्रतिच्छेदन एवं स्थिति निर्धारण ।

इकाई –5. भूगोल में क्षेत्रीय कार्य का महत्व किसी छोटे क्षेत्र का भौतिक सामाजिक आर्थिक सर्वेक्षण और रिपोर्ट तैयार करना ।

प्रायोगिक पुस्तिका और मौखिक परिक्षण परीक्षा **10**

Books Recommended:

1. Archer, J.E. and Dalton, T.H. (1968): *Field Work in Geography*. William Clowes and Sons Ltd. London and Beccles.
2. Bolton, T. and Newbury, P.A. (1968): *Geography through Fieldwork*. Blandford Press, London.
3. Campell, J. B. (2003): Introduction to Remote Sensing. 4th edition. Taylor and Francis, London.
4. Chaunial, D. D. (2004): Remote Sensing and Geographical Information System(in Hindi), Sharda Pustak Bhawan, Allahabad
5. Cracknell, A. and Ladson, H. (1990): Remote Sensing Year Book. Taylor and Francis, London.
6. Curran, P.J. (1985): Principles of Remote Sensing. Longman, London.
7. Davis, R.E. and Foote, F.S. (1953): Surveying, 4th edition, McGraw Hill Publication, New York
8.
9. Deekshatulu, B.L. and Rajan, Y.S. (ed.) (1984): Remote Sensing. Indian Academy of Science, Bangalore.
10. Floyd, F. and Sabins, Jr. (1986): Remote Sensing: Principles and Interpretation. W.H. Freeman, New York.
11. Gautam, N.C. and Raghavswamy, V. (2004). Land Use/ Land Cover and Management Practices in India. B.S. Publication., Hyderabad.
12. Jensen, J.R. (2004): Remote Sensing of the Environment: An Earth Resource Perspective. Prentice-Hall, Englewood Cliffs, New Jersey. Indian reprint available.

PRINCIPAL
D.P. Vipra College
Bilaspur (C.G.)

B.Sc. I (BOTANY)

PRACTICAL

Study of external (Morphorgical) and internal (microscopic/anatomical) features of representative gerera given in the theory.

1. Algae: Gloeocapsa, Scytonema, Gloeotrichia, Volvox, Oedogonium, Vaucheria, Chara, Ectocarpus, Sargassum, Batrachosperrmum
2. Gram staining
3. Fungi: Albugo, Aspergillus, Peziza, Agaricus, Puccinia, Alternaria and Cercospora
4. Bryophyta: Riccia, Marchantia, Pellia, Anthoceros, Sphagnum, Funaria
5. Pteridophyta: Lycopodium, Selaginella, Equsetum, Marsilea.
6. Gymnosperm: Cycas, Pinus, Epherda.

PRACTICAL SCHEME

TIME: 4 Hrs. **M.M. : 50**

1.	Algae/Fungi/Gram Staining	10
2.	Bryophyta/Pteridophyta	10
3.	Gymnosperm	10
4.	Spotting	10
5.	Viva-Voce	05
6.	Sessional	05

(Dr. J.N. Verma)
Proff. & Head
Govt. D.B. Girls PG College
Raipur, (C.G.)

(Dr. Rekha Pimpalgaonkar)
Proff. & Head
Govt. N PG Science College
Raipur, (C.G.)

(Dr.Ranjana Shristava)
Proff. & Head
Govt. VYTPG Science College
Raipur, (C.G.)

(Mrs. Sanchal Moghe)
Govt. Bilasa Girls College, Bilaspur

(Mr. Shivakant Mishra)

(Mr Sudheer Tiwari)

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Bilaspur (C.G.)

Zoology
B.Sc. Part I 2018-19
Practical

The practical work will, in general be based on the syllabus prescribed in theory and the candidates will be required to show knowledge of the following:-

- Dissection of Earthworm, Cockroach, Palaemon and Pila
- Minor dissection—appendages of Prawn & hastate plate, mouth parts of insects, radulla of Pila.

(Alternative methods: By Clay/Thermacol/drawing/Model etc.)

- Adaptive characters of Aquatic, terrestrial, aerial and desert animals.
- Museum specimen invertebrate
- Slides- Invertebrates, frog embryology, Chick embryology and cytology,

Scheme of Practical Exam	**Time: 3hrs**
1. Major Dissection	10 Marks
2. Minor Dissection	05 Marks
3. Comments on Excersice based on Adaptation	04 Marks
4. Cytological Preparation	05 Marks
5. Spots-8 (Slides-4, Specimens-4)	16 Marks
6. Sessional	10 Marks

PRINCIPAL
D.P. Vipra College
Bilaspur (C.G.)

NEW CURRICULUM OF B.Sc. PART I

CHEMISTRY

The new currlculam will comprisc of Three theory papers of 33, 33 and 34 marks each and practical work of 50 marks. The curricuram is to be completed in 180 working days as per the UGC norms & conforming to the directives of the Govt. of Chhattisgarh.The theory papers are of 60 hrs each duration and the practical work of 180 hrs duration.

PAPER I

INORGANIC CHEMISTRY

M.M.33

UNIT-I

A. ATOMIC STRUCTURE

Bohr's theory, its limitation and atomic spectrum of hydrogen atom. General idea of de-Broglie matter-waves, Heisenberg uncertainty principle, Schrödinger wave equation, significance of Ψ and Ψ^2, radial & angular wave functions and probability distribution curves, quantum numbers, Atomic orbital and shapes of s, p, d orbitals, Aufbau and Pauli exclusion principles, Hund's Multiplicity rule, electronic configuration of the elements.

B. PERIODIC PROPERTIES

Detailed discussion of the following periodic properties of the elements, with reference to s and p-block. Trends in periodic table and applications in predicting and explaining the chemical behavior.

a) Atomic and ionic radii,
b) Ionization enthalpy,
c) Electron gain enthalpy,
d) Electronegativity, Pauling's, Mulliken's, Allred Rochow's scales.
e) Effective nuclear charge, shielding or screening effect, Slater rules, variation of effective nuclear charge in periodic table.

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UNIT-II

CHEMICAL BONDING I

Ionic bond: Ionic Solids - Ionic structures, radius ratio & co-ordination number, limitation of radius ratio rule, lattice defects, semiconductors, lattice energy Born- Haber cycle, Solvation

CHEMISTRY

PRACTICAL EXAMINATION

05 Hrs.
M.M. 50

Three experiments are to be performed

1. Inorganic Mixture Analysis, four radicals two basic & two acid (excluding insoluble, Interfering & combination of acid radicals) OR Two Titrations (Acid-Bases,Redox and Iodo/Iodimetry)

12 marks

2. Detection of functional group in the given organic compound and determine its MPt/BPt.

8 marks

O R
Crystallization of any one compound as given in the prospectus along with the determination of mixed MPt.
O R
Decolorisation of brown sugar along with sublimation of camphor/ Naphthlene.

3. Any one physical experiment that can be completed in two hours including calculations.

14 marks

4. Viva **10 marks**
5. Sessionals **06 marks**

In case of Ex-Students two marks will be added to each of the experiments

REFERENCE TEXT:

1. Mendham, J., A. I. Vogel's Quantitative Chemical Analysis 6th Ed., Pearson, 2009.
2. Ahluwalia, V. K., Dhingra, S. and Gulati, A. College practical Chemistry, University Press.
3. Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009)
4. Furniss, B.S.; Hannaford, A.J.; Smith, P.W.G.; Tatchell, A.R. Practical Organic Chemistry, 5th Ed., Pearson (2012)
5. Khosla, B. D.; Garg, V. C. & Gulati, A. Senior Practical Physical Chemistry, R. Chand & Co.: New Delhi (2011).
6. Garland, C. W.; Nibler, J. W. & Shoemaker, D. P. Experiments in Physical Chemistry 8th Ed.; McGraw-Hill: New York (2003).
7. Halpern, A. M. & McBane, G. C. Experimental Physical Chemistry 3rd Ed.; W.H. Freeman & Co.: New York (2003).

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D.P. Vipra College
Bilaspur (C.G.)

MICROBIOLOGY

BSc-1st

Paper- I: General Microbiology & Basic Technique

UNIT-1: Fundamental, History & Developments

Introduction to major groups of microorganisms and fields of Microbiology; Historical development, Contributions of Pioneers (Louis Pasteur, Edward Jenner, Anton Von Leewenhoeck and Alexander Flemming). Beneficial and harmful microbes and its role in daily life.

UNIT-2: Basic Microbial Techniques

Methods of studying microorganism; Sterilization Techniques (Physical & Chemical Sterilization). Pure culture isolation Technique: Streaking,Waksman serial dilution and plating methods. cultivation, maintenance and preservation of pure cultures. Culture media & conditions for microbial growth. Staining technique: simple staining, Differential (gram staining), negative staining and acid fast staining.

UNIT-3: Virology & Bacteriology

Diversity of microbial world; Principle and classification of Viruses and Bacteria. Structure, Multiplication and Economic importance of viruses (TMV, Influenza virus & T_4-Phage). Structure & Functional organization of Bacteria, Cell wall of Gram Positive & Gram Negative bacteria; Economic importance of Bacteria.

UNIT-4: Mycology

General characteristics and classification of Fungi; Structure and Reproduction of fungi (*Rhizopus, Penicillium, Aspergillus, Yeast & Agaricus*). Common fungal disease of crops (Late & Early blight of potato, Smut of Rice, Tikka and Red rot of Sugarcane). Structure, reproduction and economic aspect of Lichens.

UNIT-5: Phycology & Protozoology

General characteristics and classification of Algae and Protozoa; General account & economic importance of Cyanobacteria (*Microcystis, Ocillitoria, Nostoc & Anabaena)* and Protozoa *(Amoeba, Paramoecium, Euglena and plasmodium).*

Text Books Recommended:

1. General microbiology; Vol I & II, Powar C. B. and Daginawala H. I., Himalaypub.house, Bombay.
2. A textbook of Microbiology; Dubey &Maheshwari.
3. Microbiology: An Introduction; G. Tor tora, B. Funke, C. Benjamin Cummings.
4. General Microbiology; Seventh edition by Hans G Schlegel, CambridgeUniversity Press.
5. Practical Microbiology; Dubey and Maheshwari.
6. Handbook of Microbiology; Bisen P.S., Varma K., CBS Publishers and Distributors, Delhi. General Microbiology by Brock.
7. General Microbiology by Pelzar et al.
8. Introduction on Microbial Techniques by Gunasekaran.

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Microbiology

PRACTICAL

M. M. 50

Basic information about autoclave, hot air oven, laminar air flow and other laboratory instruments
Preparation of solid/liquid culture media.
Isolation of single colonies on solid media.
Enumeration of bacterial numbers by serial dilution and plating.
Simple and differential staining.
Measurement of microorganism (micrometry) and camera Lucida drawing of isolated organism.
Determination of bacterial growth by optical density measurement.
General and specific qualitative test for carbohydrates
General and specific qualitative test for amino acids
General and specific qualitative test for lipids
Estimation of protein
Estimation of blood glucose
Assay of the activity of amylases
Assay of the activity of Phosphates

Scheme of Practical Examination

Time - 4 hours

	M.M. 50
1. Exercise on Microbiological methods	10
2. Exercise on Biochemical tests	10
3. Exercise on staining method	05
4. Spotting (1-5)	10
5. Viva-Voce	05
6. Sessional	10
	Total 50

PRINCIPAL
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B.Sc. Part-I

Paper-I

MECHANICS, OSCILLATIONS AND PROPERTIES OF MATTER

(Paper code 0793)

Unit- 1 Cartesian, Cylindrical and Spherical coordinate system, Inertial and non-inertial frames of reference, uniformly rotating frame, Coriolis force and its applications. Motion under a central force, Kepler's laws. Effect of Centrifugal and Coriolis forces due to earth's rotation, Center of mass (C.M.), Lab and C.M. frame of reference, motion of C.M. of system of particles subject to external forces, elastic, and inelastic collisions in one and two dimensions, Scattering angle in the laboratory frame of reference, Conservation of linear and angular momentum, Conservation of energy.

Unit-2 Rigid body motion, rotational motion, moments of inertia and their products, principal moments & axes, introductory idea of Euler's equations. Potential well and Periodic Oscillations, case of harmonic small oscillations, differential equation and its solution, kinetic and potential energy, examples of simple harmonic oscillations: spring and mass system, simple and compound pendulum, torsional pendulum.

Unit-3 Bifilar oscillations, Helmholtz resonator, LC circuit, vibrations of a magnet, oscillations of two masses connected by a spring. Superposition of two simple harmonic motions of the same frequency, Lissajous figures, damped harmonic oscillator, case of different frequencies. Power dissipation, quality factor, examples, driven (forced) harmonic oscillator, transient and steady states, power absorption, resonance.

Unit-4 E as an accelerating field, electron gun, case of discharge tube, linear accelerator, E as deflecting field- CRO sensitivity, Transverse B field, 180° deflection, mass spectrograph, curvatures of tracks for energy determination, principle of a cyclotron. Mutually perpendicular E and B fields: velocity selector, its resolution. Parallel E and B fields, positive ray parabolas, discovery of isotopes, elements of mass spectrography, principle of magnetic focusing lens.

Unit-5 Elasticity: Strain and stress, elastic limit, Hooke's law, Modulus of rigidity, Poisson's ratio, Bulk modulus, relation connecting different elastic- constants, twisting couple of a cylinder (solid and hallow), Bending moment, Cantilever, Young modulus by bending of beam.

Viscosity: Poiseulle's equation of liquid flow through a narrow tube, equations of continuity. Euler's equation, Bernoulli's theorem, viscous fluids, streamline and turbulent flow. Poiseulle's law, Coefficient of viscosity, Stoke's law, Surface tension and molecular interpretation of surface tension, Surface energy, Angle of contact, wetting.

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Paper-II
ELECTRICITY, MAGNETISM AND ELECTROMAGNETIC THEORY

Unit-1 Repeated integrals of a function of more than one variable, definition of a double and triple integral. Gradient of a scalar field and its geometrical interpretation, divergence and curl of a vector field, and their geometrical interpretation, line, surface and volume integrals, flux of a vector field. Gauss's divergence theorem, Green's theorem and Stoke's theorem and their physical significance. Kirchoff's law, Ideal Constant-voltage and Constant-current Sources. Thevenin theorem, Norton theorem, Superposition theorem, Reciprocity theorem and Maximum Power Transfer theorem.

Unit-2 Coulomb's law in vacuum expressed in Vector forms, calculations of E for simple distributions of charges at rest, dipole and quadrupole fields. Work done on a charge in a electrostatic field expressed as a line integral, conservative nature of the electrostatic field. Relation between Electric potential and Electric field, torque on a dipole in a uniform electric field and its energy, flux of the electric field.
Gauss's law and its application: E due to (1) an Infinite Line of Charge, (2) a Charged Cylindrical Conductor, (3) an Infinite Sheet of Charge and Two Parallel Charged Sheets, capacitors, electrostatic field energy, force per unit area of the surface of a conductor in an electric field, conducting sphere in a uniform electric field.

Unit-3 Dielectric constant, Polar and Non Polar dielectrics, Dielectrics and Gauss's Law, Dielectric Polarization, Electric Polarization vector P, Electric displacement vector D. Relation between three electric vectors, Dielectric susceptibility and permittivity, Polarizability and mechanism of Polarization, Lorentz local field, Clausius Mossotti equation, Debye equation,

Ferroelectric and Paraelectric dielectrics, Steady current, current density J, non-steady currents and continuity equation, rise and decay of current in LR, CR and LCR circuits, decay constants, AC circuits, complex numbers and their applications in solving AC circuit problems, complex impedance and reactance, series and parallel resonance, Q factor, power consumed by an a AC circuit, power factor.

Unit-4 Magnetization Current and magnetization vector M, three magnetic vectors and their relationship, Magnetic permeability and susceptibility, Diamagnetic, paramagnetic and ferromagnetic substances. B.H. Curve, cycle of magnetization and hysteresis, Hysteresis loss.

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Physics

PRACTICALS

Minimum 16 (Eight from each group)

Experiments out of the following or similar experiments of equal standard

GROUP-A

1. Study of laws of parallel and perpendicular axes for moment of inertia.
2. Moment of inertia of Fly wheel.
3. Moment of inertia of irregular bodies by inertia table.
4. Study of conservation of momentum in two dimensional oscillations.
5. Study of a compound pendulum.
6. Study of damping of a bar pendulum under various mechanics.
7. Study of oscillations under a bifilar suspension.
8. Study of modulus of rigidity by Maxwell's needle.
9. Determination of Y, k, η by Searl's apparatus.
10. To study the oscillation of a rubber band and hence to draw a potential energy curve from it.
11. Study of oscillation of a mass under different combinations of springs.
12. Study of torsion of wire (static and dynamic method).
13. Poisson's ratio of rubber tube.
14. Study of bending of a cantilever or a beam.
15. Study of flow of liquids through capillaries.
16. Determination of surface tension of a liquid.
17. Study of viscosity of a fluid by different methods.

GROUP-B

1. Use of a vibration magnetometer to study a field.
2. Study of magnetic field B due to a current.
3. Measurement of low resistance by Carey-Foster bridge.
4. Measurement of inductance using impedance at different frequencies.
5. Study of decay of currents in LR and RC circuits.
6. Response curve for LCR circuit and response frequency and quality factor.
7. Study of waveforms using cathode-ray oscilloscope.
8. Characteristics of a choke and Measurement of inductance.
9. Study of Lorentz force.
10. Study of discrete and continuous LC transmission line.
11. Elementary FORTRAN programs, Flowcharts and their interpretation.
18. To find the product of two matrices.
19. Numerical solution of equation of motion.
20. To find the roots of quadratic equation.

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PRINCIPAL
D.P. Vipra College
Bilaspur (C.G.)

B.Sc. (CS)
I Year

B.Sc. PART - I

COMPUTER SCIENCE

PAPER - I

COMPUTER FUNDAMENTAL

(PAPER CODE - 08025)

Max Marks: 60

NOTE: The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.

UNIT - I Classification and Organization of Computers

History of computer, Generation of computer, Calculator vs. Computer, Digital and Analog computers and its evolution, Major components of digital computers, Memory addressing capability of CPU, Word length and processing speed of computer, Microprocessors, Single chipMicrocomputer, Large and small computers, Users interface, Hardware, software and firmware, multi programming multi user system, Dumb smart and intelligent terminals, computer network and distributed processing, LAN parallel processing Flynn's classification of computers, Control flow and data flow computers

UNIT - II Central Processing Unit

Parts of CPU- ALU, Control Unit, RegistersArchitecture of Intel 8085 microprocessor, Instructions for Intel 8085 microprocessor, Instruction Word size, Various addressing mode,Interrupts,some special Control signals, Instruction cycle, fetch and execute operation, Timing Diagram, Instruction flow and data flow

UNIT - III Memory

Memory hierarchy, Primary andSecondary Memory, Cache memory, Virtual Memory, Direct Access Storage Devices (DASD), Destructive and Nondestructive Readout, Program and data Memory, Memory Management Unit (MMU), PCMCIA Cards and Slot

UNIT - IV I/O Devices

I/O devices- Keyboard, Mouse, Monitor, Impact and Non-ImpactPrinters, Plotter, Scanner, other input/output devices, Scan method of Display- Raster Scan, Vector Scan, Bit Mapped Scan, CRT Controller, I/O Port- Programmable and Non Programmable I/O ports, Inbuilt I/O ports, Parallel and Serial ports, USB, IEEE 1394, AGP, Serial data transfer scheme, Micro controller, Signal Processor, I/O processor, Arithmetic Processor

UNIT-V SOFTWARE AND PROGRAMMING TECHNIQUES

Application and System Software, Introduction, Example, Difference etc., Introduction to Open Source Software such as Unix/Linux (Ubuntu), Libre office etc., Introduction to Machine Language, Assembly Language and High Level Language, Programming Techniques, Stack, Subroutine, Debugging of programs, Macro, Program Design, Software development, Flow Chart, Multi programming, Multiuser, Multitasking, Protection, Operating System and Utility programs, Application packages

TEXT BOOKS

1. Computer Fundamentals P. K. Sinha, BPB Publication, Fourth Edition
2. Computer Fundamentals: Architecture and Organization, [illegible]
3. Fundamentals of Computers, V. Rajaraman, PHI, Sixth Edition
4. Computing Fundamentals, Donald H. Sanders, McGraw-Hill, Third Edition
5. IBM PC [illegible] McGraw-Hill, Second Edition
6. DOS Concepts and [illegible] Tony McGrew, [illegible]

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11/6/18 (Dr. A.K. Dwivedi)

B.Sc. PART - I
COMPUTER SCIENCE
PAPER II
PROGRAMMING IN 'C' LANGUAGE
(Paper Code - 0806)

Max Marks: 50

NOTE: The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.

UNIT-I

Fundamentals of C Programming: Overview of C: History of 'C', Structure of 'C' program. Keywords, Tokens, Data types, Constants, Literals and Variables, Operators and Expressions: Arithmetic operators, Relational operator, Logical operators, Expressions, Operator: operator precedence and associatively, Type casting, Console I/O formatting, Unformatted I/O functions: getch(), getchar, getche(), gete(), putc(), putchar().

UNIT- II

Control Constructs: If-else, conditional operators, switch and break, nested conditional branching statements, loops: do while, while, for, Nested loops, break and continue, goto and label, exit function.

Functions: Definition, function components: Function arguments, return value, function call statement, function prototype, Types of function, Scope and lifetime of variable, Call by value and call by reference. Function using arrays, function with command line argument. User defined function: maths and character functions, Recursive function.

UNIT-III

Array: Array declaration, One and Two dimensional numeric and character arrays, Multidimensional arrays.

String: String declaration, initialization, string manipulation with/without using library function.

Structure, Union and Enum - Structure: Basics, declaring structure and structure variable, typedef statement, array of structure, array within structure, Nested structure; passing structure to function, function returning structure. **Union**: basics, declaring union and union variable, **Enum**: declaring enum and enum variable.

UNIT- IV

Pointer: Definition of pointer, Pointer declaration, Using & and * operators, Void pointer, Pointer to pointer, Pointer in math expression, Pointer arithmetic, Pointer comparison, Dynamic memory allocation functions – malloc, calloc, realloc and free, Pointer vs. Array, Array of pointer, Pointer to array, Pointers to function, Function returning pointer, Passing function as Argument to function, Pointer to structure, Dynamic array of structure through pointer to structure.

UNIT-V

File Handling and Miscellaneous Features: File handling: file pointer, File accessing functions, fopen, fclose, fputc, fgetc, fprintf, fscanf, fread, fwrite,beof, fflush, rewind, fseek, ferror. File handling through command line argument. Introduction to C preprocessor #include, #define, Conditional compilation directives: #if, #else, #elif, #endif, #ifndef etc.

TEXT BOOKS:

1. Programming in ANSI C, E Balagurusamy, Tata McGraw-Hill, Third Edition.
2. Let Us C, YashwantKanetkar, Infinity Science Press, Eighth Edition
3. Mastering C, K R Venugopal, Tata McGraw-Hill.
4. The C Programming Language, Brian W. Kernighan, Dennis M. Ritchie, Prentice Hall, Second Edition.
5. Applications Programming in ANSI C, R. Johnsonbaugh , Martin Kalin, Macmillan, Second Edition.
6. The Spirit of C, Mullish Cooper, Jaico publishing House.
7. How to solve it by Computer, R.G. Dromey, Pearson Education

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11/06/18
(Dr. A.K. Dwivedi)

11/06/18

11-06-18

11/6/18

Practical

- At least 20 Practical based on Syllabus of Paper-I and Paper-II.

11-06-2018
(Dr. Sanjay Kumar)

11/6/2018
(Dr. A.K. Dwivedi)

11/6/18
(L.K. Gavel)

11/6/18
(Dr. J. Durga Prasad Rao)

11-06-18
Hari Shankar Prasad Pande

PRINCIPAL
Vipra College
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ELECTRONICS LABORATORY

ELB 103P: NETWORK ANALYSIS AND ANALOG ELECTRONICS LAB

(Hardware and Circuit Simulation Software) **Max.Marks:25**

The scheme of practical examination will be as follows-

Experiment	--	**30**
Viva	--	**10**
Sessional	--	**10**
Total	--	**50**

AT LEAST 06 EXPERIMENTS FROM THE FOLLOWING BESIDES #1

1. To familiarize with basic electronic components (R, C, L, diodes, transistors), digital Multimeter, Function Generator and Oscilloscope.
2. Measurement of Amplitude, Frequency & Phase difference using Oscilloscope.
3. Verification of (a) Thevenin's theorem and (b) Norton's theorem.
4. Verification of (a) Superposition Theorem and (b) Reciprocity Theorem.
5. Verification of the Maximum Power Transfer Theorem.
6. Study of the I-V Characteristics of (a) p-n junction Diode, and (b) Zener diode.
7. Study of (a) Half wave rectifier and (b) Full wave rectifier (FWR).
8. Study the effect of (a) C- filter and (b) Zener regulator on the output of FWR.
9. Study of the I-V Characteristics of UJT and design relaxation oscillator..
10. Study of the output and transfer I-V characteristics of common source JFET.
11. Study of Fixed Bias and Voltage divider bias configuration for CE transistor.
12. Design of a Single Stage CE amplifier of given gain.
13. Study of the RC Phase Shift Oscillator.
14. Study the Colpitt`s oscillator.

Reference Books:

1. Electrical Circuits, M. Nahvi and J. Edminister, Schaum's Outline Series, Tata McGraw-Hill (2005)
2. Networks, Lines and Fields, J.D.Ryder, Prentice Hall of India.
3. J. Millman and C. C. Halkias, Integrated Electronics, Tata McGraw Hill (2001)
4. Allen Mottershead, Electronic Devices and Circuits, Goodyear Publishing Corporation.

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B.Sc.-I

BIOTECHNOLOGY

PAPER–II

CELL BIOLOGY, GENETICS AND MICROBIOLOGY

UNIT-I

1. Concept of life, Cell as a basic unit of living system and Cell theory.
2. Diversity of Cell shape and size.
3. Prokaryotic cell structure: Function and ultra structure of cell (Gram positive and Gram negative Bacteria), Plasma membrane, Flagella, Pilli, Endospore and Capsule.
4. Eukaryotic cell: Plant cell wall and Plasma membrane.

UNIT-II

1. Cytoplasm: Structure and Functions of Endoplasmic reticulum, Ribosome, Golgi complex, Lysosomes, Nucleus, Mitochondria and Chloroplast.
2. Cytoskeleton: Microtubules, Microfilaments and Intermediate filaments.
3. Cell division: Mitosis and Meiosis.
4. Programmed Cell Death.

UNIT-III

1. Mendel's Laws of Inheritance.
2. Linkage and Crossing over.
3. Chromosome variation in number and structure: Deletion, Duplication, Translocation, Inversion and Aneuploidy, Euploidy (Monoploidy and Polyploidy and its importance).

UNIT-IV

1. History, Scope and Development of Microbiology.
2. Basic techniques of Microbial Culture
3. Microbial Growth & Nutrition of Bacteria: Isolation, media sterilization- physical and chemical agents, pure culture-pour plate method, streak plate method and spread plate method.
4. General features and Economic importance of Fungi, Algae and Protozoa etc.

UNIT-V

1. Bacterial Reproduction: Conjugation, Transduction and Transformation.
2. Mycoplasma – History, Classification, Structure reproduction & Diseases.
3. Viruses – Basic features, Structure, Classification, Multiplication, Bacteriophages (Morphology, life cycle, infection and medicinal importance)

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List of Practical's

MICROBIOLOGY AND BIOCHEMICAL TECHNIQUES

(1) Laboratory rules, Tools, Equipment and Other requirements in Microbiological laboratory.

(2) Micrometry – Use of ocular & stage Micrometrer.

(3) Counting of bacteria by counting chamber, by plate count.

(4)Preparation of media and cultivation techniques:
- (a) Basic liquid media (broth)
- (b) Basic Solid media, (agar slants and deep tubes)
- (c) Demonstration of selective and differential media
- (d) Isolation and enumeration of micro organisms
- (e) Isolation from air and Soil

(5)Smears and staining methods:
- (a) Preparation of bacterial smear
- (b) Gram Negative & Positive staining

(6)Methods of obtaining pure cultures
- (a) Streak plate method
- (b) Pure plate method
- (c) Spread plate method
- (d) Broth cultures

(7)Growth & Biochemical techniques
- (a) Determination of bacterial growth curve
- (b) Amylase production test
- (c) Cellulose production test
- (d) Estimation of Sugar in given solution
- (e) Extraction and separation of lipids
- (f) Estimation of proteins
- (h) Mitosis and Meiosis

(8)Biostatistics:
- (a) By Manual and by computer.
- (b) Problems on mean, mode and median.

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SCHEME OF PRACTICAL EXAMINATION

Time – 4 hrs. **M. M.: 50**

1. Experiment based on culture of micro-organisms	15 Marks
2. Bacterial growth/Staining techniques	10 Marks
3. Biochemical techniques	05 Marks
4. Bio statistics	05 Marks
5. Spotting	05 Marks
6. *Viva – Voce*	05 Marks
7. Record/Sessional	05 Marks

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PRACTICAL FOR Ist YEAR
LABORATORY-I (BCH 105)

1. Preparation of standard buffers and determination of pH of a solution
2. Qualitative tests for :
   a. Carbohydrates
   b. Proteins and amino acids
   c. Lipids
3. Determination of saponification value and iodine number of fats
4. Estimation of ascorbic acid.
5. Titration curve for amino acids and determination of pKa values
6. Verification of Beer-Lambert's law.
7. Estimation of
   i) Carbohydrate by anthrone method.
   ii) Blood glucose by the methods (a) Folin-Wu, (b) Nelson-Somogyi
8. Estimation of amino acids by ninhydrin method.
9. Isolation and assay of glycogen from rat liver.
10. i) Extraction of total lipids by Folch method
    ii) Estimation of food adulterant.
11. Estimation of DNA and RNA.
12. Separation of sugars using paper chromatography.

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Singh, JS Singh SP and Gupta SR. ***Ecology and Environmental Science and Conservation***, S. Chand Publishing, New Delhi

Sharma, PD. ***Ecology and Environment,*** Rastogi Publications, Merrut

Hopkins, WG and Huner, PA. ***Introduction to Plant Physiology,*** John Wiley and Sons.

Pandey SN and Sinha BK, ***Plant Physiology,*** Vikas Publishing, New Delhi

Taiz, L and Zeiger. E. ***Plant Physiology,*** 5th edition, Sinauer Associates Inc. M.A, USA

Srivastava, HS ***Plant Physiology and Biotechnology***, Rastogi Publications, Meerut

B.Sc. II (BOTANY)

Practical

1. Taxonomy: Detailed description and identification of locally available plants of the families as prescribed in the theory paper.
2. Economic Botany: Identification and comment on the plants and plant products belonging to different economic use categories
3. Preparation of Herbarium of local wild plants.
4. Quantitative vegetation analysis of a grassland ecosystem.
5. Anatomical characteristics of hydrophytes and xerophytes.
6. Demonstration of root pressure.
7. Demonstration of transpiration.
8. Demonstration of evolution of O_2 in photosynthesis, factors affecting of photosynthesis.
9. Comparison of R.Q. of different respiratory substrates.
10. Demonstration of fermentation.
11. Determination of BOD of a water body.
12. Demonstration of mitosis.

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PRACTICAL SCHEME

TIME: 4 Hrs. **M.M. : 50**

1.	Anatomy	08
2.	Economic Botany	04
3.	Physiology	08
4.	Ecology	10
5.	Spotting	10
6.	Viva-Voce	05
7.	Project Work/ Field Study	10

(Dr. J.N. Verma
Proff. & Head
Govt. D.B. Girls PG College
Raipur, (C.G.)

(Dr. Rekha Pimpalgaonkar)
Proff. & Head
Govt. N PG Science College
Raipur, (C.G.)

(Dr.Ranjana Shristava)
Proff. & Head
Govt. VYTPG Science College
Raipur, (C.G.)

(Mrs. Sanchal Moghe)
Govt. Bilasa Girls College, Bilaspur

(Mr. Shivakant Mishra)

(Mr Sudheer Tiwari)

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Zoology
B.Sc. Part II 2018-19
Practical

The practical work in general shall be based on the syllabus prescribed and the students will be required to show the knowledge of the following:

- Study of the representative examples of the different chordates (Classified characters).
- Dissection of various systems of scoliodon-Afferent and Efferent branchial cranial nerves, internal ear.

Alternative methods: By Clay/Thermacol/ Drawing/ Model etc.)

- Simple microscopic technique through unstained or stained permanent mount.
- Study of prepared slides histological, as per theory papers.
- Study of limb girdles and vertebrae of Frog, Varanus, Fowl and Rabbit.
- Identification of species and individual of honey bee.
- Life cycle of honey bee and silkworm.
- Exercise based on Evolution and Animal behavior.

Scheme of Practical Exam **Time: 3:30hrs**

• Major dissection (Cranial nerves/efferent branchial vessel)	10
• Exercise based on evolution	05
• Exercise based on applied zoology	05
• Exercise based on animal behavior	04
• Spotting-8 (slides-4,bones-2,specimen-2)	16
• Viva	05
• Sessional marks.	05

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NEW CURRICULUM OF B.Sc. PART II

CHEMISTRY

The new curriculum will comprise of three papers of 33, 33 and 34 marks each and practical work of 50 marks. The Curriculum is to be completed in 180 working days as per UGC norms and conforming to the directives of Govt. of Chhattisgarh. The theory papers are of 60 hrs. each duration and practical work of 180 hrs duration.

Paper – I
INORGANIC CHEMISTRY

60 Hrs., Max Marks 33

UNIT-I

CHEMISTRY OF TRANSITION SERIES ELEMENTS

Transition Elements: Position in periodic table, electronic configuration, General Characteristics, *viz.*, atomic and ionic radii, variable oxidation states, ability to form complexes, formation of coloured ions, magnetic moment μ_{so} (spin only) and μ_{eff} and catalytic behaviour. General comparative treatment of 4d and 5d elements with their 3d analogues with respect to ionic radii, oxidation states and magnetic properties.

UNIT-II

A. Oxidation and Reduction: Redox potential, electrochemical series and its applications, Principles involved in extraction of the elements.

B. COORDINATION COMPOUNDS: Werner's theory and its experimental verification, IUPAC nomenclature of coordination compounds, isomerism in coordination compounds. Stereochemistry of complexes with 4 and 6 coordination numbers. Chelates, polynuclear complexes.

UNIT-III

COORDINATION CHEMISTRY

Valence bond theory (inner and outer orbital complexes), electroneutrality principle and back bonding. Crystal field theory, Crystal field splitting and stabilization energy, measurement of 10 Dq (Δ_o), CFSE in weak and strong fields, pairing energies, factors affecting the magnitude of 10 Dq (Δ_o, Δ_t). Octahedral vs. tetrahedral coordination.

UNIT-IV

A. CHEMISTRY OF LANTHANIDE ELEMENTS

Electronic structure, oxidation states and ionic radii and lanthanide contraction, complex formation, occurrence and isolation, lanthanide compounds.

B. CHEMISTRY OF ACTINIDES

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CHEMISTRY

Paper –IV

LABORATORY COURSE

INORGANIC CHEMISTRY

Qualitative semimicro analysis of mixtures containing 5 radicals. Emphasis should be given to the understanding of the chemistry of different reactions. The following radicals are suggested:

CO_3^{2-}, NO_2^- , S^{2-}, SO_3^{2-},$S_2O_3^{2-}$, CH_3COO^-, F^- ,Cl^- , Br^- , I^- , NO_3^- , BO_3^{3-}, $C_2O_4^{2-}$, PO_4^{3-}, NH_4^+ , K^+, Pb^{2+}, Cu^{2+}, Cd^{2+}, Bi^{3+}, Sn^{2+}, Sb^{3+}, Fe^{3+}, Al^{3+}, Cr^{3+}, Zn^{2+}, Mn^{2+}, Co^{2+}, Ni^{2+}, Ba^{2+}, Sr^{2+}, Ca^{2+}, Mg^{2+}.

Mixtures should preferably contain one interfering anion, or insoluble component ($BaSO_4$, $SrSO_4$, $PbSO_4$, CaF_2 or Al_2O_3) or combination of anions e.g. CO_3^{2-} and SO_3^{2-}, NO_2^- and NO_3^-, Cl^-, Br^-, and I^-.

Volumetric analysis

(a) Determination of acetic acid in commercial vinegar using NaOH.

(b) Determination of alkali content-antacid tablet using HCl.

(c) Estimation of calcium content in chalk as calcium oxalate by permanganometry.

(d) Estimation of hardness of water by EDTA.

(e) Estimation of ferrous & ferric by dichromate method.

(f) Estimation of copper using thiosulphate.

- Principles involved in chromatographic separations. Paper chromatographic separation of following metal ions: i. Ni (II) and Co (II) ii. Fe (III) and Al (III)

ORGANIC CHEMISTRY

- Detection of elements (X, N, S).
- Qualitative analysis of unknown organic compounds containing simple functional groups (alcohols, carboxylic acids, phenols, nitro, amine, amide, and carbonyl compounds, carbohydrates)
- Preparation of Organic Compounds:
  (i) m-dinitrobenzene, (ii) Acetanilide, (iii) Bromo/Nitro-acetanilide, (iv) Oxidation of primary alcohols-Benzoic acid from benzylacohol, (v) azo dye.

PHYSICAL CHEMISTRY

Transition Temperature

PRINCIPAL

- Determination of the transition temperature of the given substance by thermometric/ dialometric method (e.g. $MnCl_2.4H_2O/SrBr_2.2H_2O$).

Thermochemistry

- Determination of heat capacity of a calorimeter for different volumes using change of enthalpy data of a known system (method of back calculation of heat capacity of calorimeter from known enthalpy of solution or enthalpy of neutralization).
- Determination of heat capacity of the calorimeter and enthalpy of neutralization of hydrochloric acid with sodium hydroxide.
- To determine the solubility of benzoic acid at different temperature and to determine ΔH of the dissolution process.
- To determine the enthalpy of neutralization of a weak acid/ weak base versus strong base/ strong acid and determine the enthalpy of ionization of the weak acid/ weak base.
- To determine the enthalpy of solution of solid calcium chloride and calculate the lattice energy of calcium chloride from its enthalpy data using Born Haber cycle.

Phase Equilibrium

- To study the effect of a solute (e.g. NaCl, Succinic acid) on the critical solution temperature of two partially miscible liquids (e.g. phenol-water system) and to determine the concentration of that solute in the given phenol-water system.
- To construct the phase diagram of two component system (e.g. diphenylamine–benzophenone) by cooling curve method.
- Distribution of acetic/ benzoic acid between water and cyclohexane.
- Study the equilibrium of at least one of the following reactions by the distribution method:

  (i) $I_2(aq) + I^- \rightarrow I^-_3(aq)^{2+}$

  (ii) $Cu^{2+}(aq) + nNH_3 \rightarrow Cu(NH_3)n$

Molecular Weight Determination

Determination of molecular weight by Rast Camphor and Landsburger method.

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Note: **Experiments may be added/ deleted subject to availability of time and facilities.**

Reference Books

1. Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009)
2. Furniss, B.S., Hannaford, A.J., Smith, P.W.G. & Tatchell, A.R. Practical Organic Chemistry, 5th Ed. Pearson (2012)
3. Ahluwalia, V.K. & Aggarwal, R. Comprehensive Practical Organic Chemistry: Preparation and Quantitative Analysis, University Press (2000). 22
4. Ahluwalia, V.K. & Dhingra, S. Comprehensive Practical Organic Chemistry: Qualitative Analysis, University Press (2000).
5. Khosla, B. D.; Garg, V. C. & Gulati, A. Senior Practical Physical Chemistry, R. Chand & Co.: New Delhi (2011). Garland, C. W.; Nibler, J. W. & Shoemaker, D. P. Experiments in Physical Chemistry 8th Ed.; McGraw-Hill: New York (2003).
6. Halpern, A. M. & McBane, G. C. Experimental Physical Chemistry 3rd Ed.; W.H. Freeman & Co.: New York

Hrs.5 PRACTICAL EXAMINATION M.M.50

Three Experiments are to be performed.

1. Inorganic – Qualitative semimicro analysis of mixtures. **12 marks**

OR

One experiment from synthesis and analysis by preparing the standard solution.

2. (a) Identification of the given organic compound & determine its M.Pt./B.Pt. **6 marks**

(b) Determination of Rf value and identification of organic compounds by paper chromatography. **6 marks**

3. Any one physical experiment that can be completed in two hours including calculations. **12 marks**

4. Viva **10 marks**

5. Sessional **04 marks**

In case of Ex-Students one marks will be added to each of the experiment.

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MICROBIOLOGY

BSc-2nd

Paper- I: Molecular Biology and Genetic Engineering

UNIT-1: FUNDAMENTALS OF MOLECULAR BIOLOGY

History and scope of molecular biology, concept and mechanism of heredity. DNA as genetic material- experimental evidences. DNA replication- mechanism, process and enzymes/proteins involved in replication.

UNIT-2: CENTRAL DOGMA OF PROTEIN SYNTHESIS

Transcription- initiation, elongation, termination, RNA polymerases and sigma factor. Transcription inhibitors (antibiotics, drugs). Translation- initiation, elongation and termination. Factors involved in translation. Genetic code.

UNIT-3: MUTATION AND DNA REPAIR MECHANISM

Introduction and Types of Gene mutations- Base substitution, frame shift mutation (insertion, deletion, miss-sense, nonsense mutation.) Mutagens – physical and chemical. Reverse mutation in bacteria. DNA repair mechanism (mismatch repair, photo-reactivation, excision and SOS repair). Beneficial and harmful effect of mutation.

UNIT-4: GENE REGULATION

Concept of gene- Cistron, Recon, Muton. Operon Concept- lac Operon, tryptophan Operon, His Operon. Activator, Co-activator and Repressor. Introduction to Bioinformatics- Elementary genome Database.

UNIT-5: GENETIC ENGINEERING

Basic concept of Genetic Engineering, DNA modifying enzymes Restriction endonuclease, DNA ligase, terminal transferase. Vectors- pBR322, pUC19, BAC and YAC. Phage based vectors, expression of vector. Transformation – physical and chemical method. Bacterial Host. Screening of recombinant vector Blue white Screening, Colony Hybridization.

Text Books Recommended:

1. Gene Cloning by T.A. Brown.
2. General Microbiology by Power and Daganiwala.
3. Zinssers Microbiology by KJ Wolfgang, McGraw- HJill Company.
4. Microbial Genetics by RM Stanley, F David and EC John.
5. Bacteriological Techniques by FJ Baker.
6. .Molecular Biology of the Cell; *3rd Edition;* Bruce Alberts ,et.al; Garland Publishing.
7. Cell biology; C.B. Powar; Himalaya Publishing House; Fifth edition
8. Cell & Molecular Biology; Gerald Karp; Fourth edition
9. A Textbook of Microbiology; Dubey&Maheshwari; S.chand& Sons.
10. Cell biology & Genetics; P. K. Gupta
11. Introduction to Bioinformatics; T K Atwood and D J Parry-Smith; Pearson Education Ltd

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Microbiology

PRACTICAL

M. M. 50

Determination of antibiotic resistance by plating method.
Assaying of microbial enzymes; Catalase, Proteases, Peroxidases, Cellulase, Cellobioases, Amylase, Diastase.
Exercise on paper, thin layer, column chromatography.
Exercise on paper and gel electrophoresis.
determination of pH of various water and soil sample.
testing of lambert beer's law.
Determination of lamda max of dye by spectrophotometer
Isolation of resistant bacteria from soil and water sample

Scheme of Practical Examination

Time - 4 hours M.M. 50

1. Exercise on spectrophotometer/ pH meter	10
2. Exercise on chromatography	10
3. Exercise on genetics	05
4. Spotting (1-5)	10
5. Viva-Voce	05
6. Sessional	10
	Total 50

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B.Sc. Part-II

Paper-I

THERMODYNAMICS, KINETIC THEORY AND STATISTICAL PHYSICS

Unit-1 The laws of thermodynamics : The Zeroth law, first law of thermodynamics, internal energy as a state function, reversible and irreversible change, Carnot's cycle, carnot theorem, second law of thermodynamics. Claussius theorem inequality. Entropy, Change of entropy in simple cases (i) Isothermal expansion of an ideal gas (ii) Reversible isochoric process (iii) Free adiabatic expansion of an ideal gas. Concept of entropy, Entropy of the universe. Entropy change in reversible and irreversible processes, Entropy of Ideal gas, Entropy as a thermodynamic variable, S-T diagram, Principle of increase of entropy. The thermodynamic scale of temperature, Third law of thermodynamics, Concept of negative temperature.

Unit-2 Thermodynamic functions, Internal energy, Enthalpy, Helmholtz function and Gibb's free energy, Maxwell's thermodynamical equations and their applications, TdS equations, Energy and heat capacity equations Application of Maxwell's equation in Joule-Thomson cooling, adiabatic cooling of a system, Van der Waals gas, Clausius-Clapeyron heat equation. Blackbody spectrum, Stefan-Boltzmann law, Wien's displacement law, Rayleigh-Jean's law, Planck's quantum theory of radiation.

Unit-3 Maxwellian distribution of speeds in an ideal gas: Distribution of speeds and velocities, experimental verification, distinction between mean, rms and most probable speed values. Doppler broadening of spectral lines. Transport phenomena in gases: Molecular collisions mean free path and collision cross sections. Estimates of molecular diameter and mean free path. Transport of mass, momentum and energy and interrelationship, dependence on temperature and pressure.

Behaviour of Real Gases: Deviations from the Ideal Gas Equation. The Virial Equation. Andrew's Experiments on CO_2 Gas. Critical Constants.

Unit-4 The statistical basis of thermodynamics: Probability and thermodynamic probability, principle of equal a priori probabilities, statistical postulates. Concept of Gibb's ensemble, accessible and inaccessible states. Concept of phase space, γ phase space and μ phase space. Equilibrium before two systems in thermal contact, probability and entropy, Boltzmann entropy relation. Boltzmann canonical distribution law and its applications, law of equipartition of energy.

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Paper-II
WAVES, ACOUSTICS AND OPTICS

Unit-1 Waves in media: Speed of transverse waves on uniform string, speed of longitudinal waves in a fluid, energy density and energy transmission in waves. Waves over liquid surface: gravity waves and ripples. Group velocity and phase velocity and relationship between them. Production and detection of ultrasonic and infrasonic waves and applications.

Reflection, refraction and diffraction of sound : Acoustic impedance of a medium, percentage reflection & refraction at a boundary, impedance matching for transducers, diffraction of sound, principle of a sonar system, sound ranging.

Unit-2 Fermat's Principle of extremum path, the aplanatic points of a sphere and other applications. Cardinal points of an optical system, thick lens and lens combinations. Lagrange equation of magnification, telescopic combinations, telephoto lenses. Monochromatic aberrations and their reductions; aspherical mirrors and Schmidt corrector plates, aplanatic points, oil immersion objectives, meniscus lens.

Optical instruments: Entrance and exit pupils, need for a multiple lens eyepiece, common types of eyepieces. (Ramsdon and Hygen's eyepieces).

Unit-3 Interference of light: The principle of superpositions, two slit interference, coherence requirement for the sources, optical path retardations, Conditions for sustained interference, Theory of interference, Thin films. Newton's rings and Michelson interferometer and their applications its application for precision determinations of wavelength, wavelength difference and the width of spectral lines. Multiple beam interference in parallel film and Fabry-Perot interferometer. Rayleigh refractometer, Twyman-Green interferometer and its uses.

Unit-4 Diffraction, Types of Diffraction, Fresnel's diffraction, half-period zones, phasor diagram and integral calculus methods, the intensity distribution, Zone plates, diffraction due to straight edge, Fraunhofer diffraction due to a single slit and double slit, Diffraction at N-Parallel slit, Plane Diffraction grating, Rayleigh criterion, resolving power of grating , Prism, telescope.

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Polarized light and its mathematical representation, Production of polarized light by reflection, refraction and scattering. Polarization by double refraction and Huygen's theory, Nicol prism, Retardation plates, Production and analysis of circularly and elliptically polarized light. Optical activity and Fresnel's theory, Biquartz polarimeter.

Unit-5 Laser system: Basic properties of Lasers, coherence length and coherence time, spatial coherence of a source, Einstein's A and B coefficients, Spontaneous and induced emissions, conditions for laser action, population inversion, Types of Laser : Ruby and, He-Ne laser and. Applications of laser : Application in communication, Holography and Basics of non linear optics and Generation of Harmonic.

TEXT AND REFERENCE BOOKS:

1. A.K. Ghatak, 'Physical Optics'
2. D.P. Khandelwal, Optical and Atomic Physics' (Himalaya Publishing House, Bombay, 1988)
3. K.D. Moltev; 'Optics' (Oxford University Press)
4. Sears: 'Optics'
5. Jenkins and White: 'Fundamental of Optics' (McGraw-Hill)
6. B.B. Laud: Lasers and Non-linear Optics (Wiley Eastern 1985)
7. Smith and Thomson: 'Optics' (John Wiley and Sons)
8. Berkely Physics Courses: Vol.-III, 'Waves and Oscillations'
9. I.G. Main, 'Vibrations and Waves' (Cambridge University Press)
10. H.J. Pain: 'The Physics of Vibrations and Waves' (MacMillan 1975)
11. Text Book of Optics: B.K. Mathur
12. B.Sc. (Part III) Physics: Editor: B.P. Chandra, M.P. Hindi Granth Academy.
13. F. Smith and J.H. Thomson, Manchester Physics series: optics (John wiley, 1971)
14. Born and Wolf : 'Optics'.
15. Physical Optics: B. K. Mathur and T. P. Pandya.
16. A textbook of Optics: N. Subrahmanyam, Brijlal and M. N. Avadhanulu.
17. Geometrical and Physical Optics: Longhurst.
18. Introduction to Modern Optics: G. R. Fowels.
19. Optics: P. K. Srivastav.

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Physics

PRACTICALS

Minimum 16 (Eight from each group)

Experiments out of the following or similar experiments of equal standard

1. Study of Brownian motion.
2. Study of adiabatic expansion of a gas.
3. Study of conversion of mechanical energy into heat.
4. Heating efficiency of electrical kettle with varying voltage.
5. Study of temperature dependence of total radiation.
6. Study of temperature dependence of spectral density of radiation.
7. Resistance thermometry.
8. Thermo emf thermometry.
9. Conduction of heat through poor conductors of different geometries.
10. Experimental study of probability distribution for a two-option system using a coloured dice.
11. Study of statistical distribution on nuclear disintegration data (GM counter used as a black box).
12. Speed of waves on a stretched strings.
13. Studies on torsional waves in a lumped system.
14. Study of interference with two coherent source of sound.
15. Chlandi's figures with varying excitation and loading points.
16. Measurements of sound intensities with different situations.
17. Characteristics of a microphone-loudspeakers system
18. Designing an optical viewing system.
19. Study of monochromatic defects of images.
20. Determining the principle point of a combination of lenses.
21. Study of interference of light (biprism or wedge film).
22. Study of diffraction at a straight edge or a single slit.
23. Study of F-P etalon fringes.
24. Study of diffraction grating and its resolving power.
25. Resolving power of telescope system.
26. Polarization of light by reflection; also cos-squared law.
27. Study of optical rotation for any system.
28. Study of laser as a monochromatic coherent source.
29. Study of a divergence of laser beam.
30. Calculation of days between two dates of a year.
31. To check if triangle exists and the type of a triangles.
32. To find the sum of the sine and cosines series and print out the curve.

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33. To solve simultaneous equation by elimination method.
34. To prepare a mark-list of polynomials.
35. Fitting a straight line or a simple curve
36. Convert a given integer into binary and octal systems and vice versa .
37. Inverse of a matrix.
38. Spiral array.

TEXT AND REFERENCE BOOKS

1. D.P. Khandelwal, Optics and Atomic physics (Himalaya Publishing house, Bombay 1988).
2. D.P. Khandelwal, A Laboratory Manual for Undergraduate Classes (Vani Publishing House, New Delhi).
3. S. Lipschutz and a Poe, Schaum's outline of theory and Problems of Programming with Fortran(McGraw-hill Book Company 1986).
4. C Dixon, Numerical Analysis .

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B.Sc.(CS)
II Year

COMPUTER SCIENCE

PAPER - I

COMPUTER HARDWARE

(Paper Code - 0655)

Max.Marks 50

Duration 3 hours

AIM - The emphasis in on the desing concepts & organisational details of the common PC, leaving the complicated electronics of the system of the computer Engineers.

OBJECT OF THE COURSE -

1. To introduce the overall organisation of the microcomputers.
2. To introduce the common peripheral devices used in computers.
3. To introduce the hardware components, use of micro processor and function of various chips used in microcomputer.

N.B. : Since the computer organisation study is very vast & complicated, so the study is restricted to only the description and understanding part, fence the paper setter is requested to keep this important factor in mind.

UNIT-I CLASSIFICATION AND ORGANIZATION OF COMPUTERS

Digital and analog computers and its evolution. Major components of digital computers; Memory addressing capability of CPU; word length and processing speed of computes. Microprocessors single chip microcomputers; large and small computers. Users interface Hardware software and firmware. multi programming multi user system. Dumb smart and intelligent terminals computer network and multi processing, LAN parallel processing. Flinn's classification of computers. Computer flow and data flow computers.

UNIT-II CENTRAL PROCESSING UNIT.

CPU organization, ALU control unit registers. Instructions for INTEL 8085, Instruction word size, Various addressing mode interrupts and exceptions, some special Control signals and I/O devices. Instruction cycle fetch and execute operation, time Diagram, data flow.

UNIT-III MEMORY OF COMPUTERS.

Main memory secondary memory, backup memory, cache memory; real and virtual Memory Semiconductor memory. Memory controller and magnetic memory; RAM; disks, optical disks Magnetic bubble memory; DASD, destructive and non destructive. readout. Program of data Memory and MMU.

UNIT-IV I/O DEVICES.

I/O devices of micro controller; processors. I/O devices, printer, plotter, other out put devices, I/O port serial data transfer scheme, Micro controller, signal processor, I/O processor I/O processor arithmetic processor.

UNIT-V SYSTEM SOFTWARE AND PROGRAMMING TECHNIQUE.

ML, AL, HLL, stac subroutine debugging of programs macro, micro programming, Program Design, software development, flow & chart multi programming, multiuser, multi tasking Protection, operating system and utility program, application package.

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(Dr. J. Durga)

11.06.18

RECOMMENDED BOOKS :

1 Computer Fundamentals : Architecture and Organization - By B.Ram (Wilwy Bastem Ltd.)

2 Computers Today - By Donal H. Sanders

3 Computers Fundamental - By Rajaraman.

4 IBM PC - XT Clones - By Govinda Rajalu

PAPER - II

SOFTWARE

(Paper Code - 0856)

AIM - Introduction to the web-language-HTML & problem solving throgh the concept of object oriented programming.

OBJECT OF THE COURSE -

1 To introduce the internet & web related technology & learn the intricacies of web-page designing using HTML.

2 To introduce the object oriented programming concept using C++ language.

3 To introduce the problem solving methodology using the C++ programming features.

N.B. : Examiners are requested to prepare unit-wise Questions papers.

UNIT-I HTML BASICS & WEB SITE DESIGN PRINCIPLES

Concept of a Web Site, Web Standards, What is HTML? HTML Versions, Naming Scheme for HTML Documents , HTML document/file, HTML Editor , Explanation of the Structure of the homepage , Elements in HTML Documents ,HTML Tags, Basic HTML Tags, Comment tag in HTML, Viewing the Source of a web page, How to download the web page source? XHTML, CSS, Extensible Markup Language (XML), Extensible Style sheet language (XSL), Some tips for designing web pages, HTML Document Structure. HTML Document Structure-Head Section, Illustration of Document Structure,<BASE> Element,<ISINDEX> Element,<LINK> Element ,META, <TITLE> Element,<SCRIPT> Element ,Practical Applications, HTML Document Structure-Body Section:-Body elements and its attributes: Background; Background Color; Text; Link; Active Link (ALINK); Visited Link (VLINK); Left margin; Top margin, Organization of Elements in the BODY of the document: Text Block Elements; Text Emphasis Elements; Special Elements – Hypertext Anchors; Character-Level Elements; Character References ,Text Block Elements: HR (Horizontal Line); Hn (Headings) ; P (Paragraph); Lists; ADDRESS ; BLOCKQUOTE; TABLE; DIV (HTML 3.2 and up) ; PRE (Preformatted); FORM ,Text Emphasis Elements, Special Elements – Hypertext Anchors ,Character-Level Elements: line breaks (BR) and Images (IMG), Lists , ADDRESS Element, BLOCKQUOTE Element, TABLE Element, COMMENTS in HTML ,CHARACTER Emphasis Modes, Logical & Physical Styles, Netscape, Microsoft and Advanced Standard Elements List, FONT, BASEFONT and CENTER.

UNIT-II IMAGE, INTERNAL AND EXTERNAL LINKING BETWEEN WEBPAGES

Netscape, Microsoft and Advanced Standard Elements List, FONT, BASEFONT and CENTER Insertion of images using the element IMG (Attributes: SRC (Source),

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WIDTH, HEIGHT, ALT (Alternative), ALIGN), IMG (In-line Images) Element and Attributes; Illustrations of IMG Alignment, Image as Hypertext Anchor, Internal and External Linking between Web Pages Hypertext Anchors ,HREF in Anchors ,Links to a Particular Place in a Document ,NAME attribute in an Anchor ,Targeting NAME Anchors ,TITLE attribute, Practical IT Application Designing web pages links with each other, Designing Frames in HTML. Practical examples.

UNIT-III INTRODUCTION TO OOP

Advantages of OOP, The Object Oriented Approach, Characteristics of object oriented languages- Object, Classes, Inheritance, Reusability, Polymorphism and C++.

Function: Function Declaration, Calling Function, Function Defines, Passing Argument to function, Passing Constant, Passing Value, Reference Argument, returning by reference, Inline Function, Function Overloading, Default Arguments in function.

UNIT-IV OBJECT CLASSES AND INHERITANCE

Object and Class, Using the class, class constructor, class destructors, object as function argument ,copy constructor ,struct and classes , array as class member, Static Class Data, Static Member Functions, , Friend function, Friend class, operator overloading. Type of inheritance, Base class, Derive class. Access Specifier: protected. Function Overriding, member function, String, Template Function.

UNIT-V POINTERS AND VIRTUAL FUNCTION

pointers: & and * operator pointer variables, .pointer to pointer, void pointer,pointer and array, pointer and function, pointer and string, memory management, new and delete, pointer to object, this pointer Virtual Function: Virtual Function, Virtual member function, accesses with pointer,pure virtual function

File and Stream: C++ streams, C++ Manipulators, Stream class, string I/O, char I/O, Object I/O, I/O with multiple object, Disk I/O,

RECOMMENDED BOOKS :

1	Introduction to HTML	:	Kamlesh Agarwala, O.P.Vyas, Prateek A. Agrawala (Kitab Mahal Publication)
2	Let us C++	:	Y. Kanetkar B.P.B Publication
3	Programming in C++	:	E. Balaguruswami
4	Mastering in C++	:	Venu Gopal
5	Object Oriented Programming in C++	:	Lafore R, Galgotia Publications.

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(L.K. Gavel)

11.06.18
Hari Shankar Prasad Tade

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ELECTRONICS LABORATORY

The scheme of practical examination will be as follows-

Experiment	--	**30**
Viva	--	**10**
Sessional	--	**10**
Total	--	**50**

ELB 203P: COMMUNICATIONELECTRONICS LAB

(Hardware and Circuit Simulation Software) 60 Lectures
Max.Marks:25

1. To design an Amplitude Modulator using Transistor
2. To study envelope detector for demodulation of AM signal
3. To study FM - Generator and Detector circuit
4. To study AM Transmitter and Receiver
5. To study FM Transmitter and Receiver
6. To study Time Division Multiplexing (TDM)
7. To study Pulse Amplitude Modulation (PAM)
8. To study Pulse Width Modulation (PWM)
9. To study Pulse Position Modulation (PPM)
10. To study ASK, PSK and FSK modulators

Reference Books:

1. Electronic Communication systems, G. Kennedy, 1999, Tata McGraw Hill.
2. Electronic Communication system, Blake, Cengage, 5th edition.

ELB 204P: MICROPROCESSOR ANDMICROCONTROLLER LAB(Hardware and Circuit Simulation Software)

Max.Marks:25

At least 06 experiments each from Section-A and Section-B

Section-A: Programs using 8085 Microprocessor

1. Addition and subtraction of numbers using direct addressing mode
2. Addition and subtraction of numbers using indirect addressing mode
3. Multiplication by repeated addition.
4. Division by repeated subtraction.
5. Handling of 16-bit Numbers.
6. Use of CALL and RETURN Instruction.
7. Block data handling.
8. Other programs (e.g. Parity Check, using interrupts, etc.).

Section-B: Experiments using 8051 microcontroller:

1. To find that the given numbers is prime or not.
2. To find the factorial of a number.
3. Write a program to make the two numbers equal by increasing the smallest number and decreasing the largest number.
4. Use one of the four ports of 8051 for O/P interfaced to eight LED's. Simulate binary counter (8 bit) on LED's .
5. Program to glow the first four LEDs then next four using TIMER application.
6. Program to rotate the contents of the accumulator first right and then left
7. Program to run a countdown from 9-0 in the seven segment LED display.
8. To interface seven segment LED display with 8051 microcontroller and display 'HELP' in the seven segment LED display.
9. To toggle '1234' as '1324' in the seven segment LED display.
10. Interface stepper motor with 8051 and write a program to move the motor through a given angle in clock wise or counter clockwise direction.
11. Application of embedded systems: Temperature measurement & display on LCD

Reference Books:

1. Microprocessor Architecture Programming & applications with 8085, 2002, R.S. Goankar, Prentice Hall.
2. Embedded Systems: Architecture, Programming & Design, Raj Kamal, 2008, Tata McGraw Hill
3. The 8051 Microcontroller and Embedded Systems Using Assembly and C, M.A. Mazidi, J.G. Mazidi, and R.D. McKinlay, 2nd Ed., 2007, Pearson Education India.
4. 8051 microcontrollers, Satish Shah, 2010, Oxford University Press.
5. Embedded Microcomputer systems: Real time interfacing, J.W. Valvano 2011, Cengage Learning

B.Sc. II

BIOTECHNOLOGY

PAPER – I

MOLECULAR BIOLOGY & BIOPHYSICS

M.M. 50

UNIT-I

1. Nucleic Acid: Bases, Nucleosides and Nucleotides, DNA and RNA structure.
2. Plasmids.
3. Transposons: Repetitive elements, LINEs & SINEs, Structure of Gene.

UNIT-II

1. DNA Replication: Enzymes involved and mechanism of DNA Replication in Prokaryotes.
2. Mutation: Molecular level of Mutation, Types of Mutagens, Spontaneous and Induced Mutation.
3. DNA Repair: NER, BER and Mismatch Repair.

UNIT-III

1. Genetic Code: Features, Condon Assignment and Wobble hypothesis.
2. Transcription: Initiation, Elongation and Termination in Prokaryotes.
3. Translation: Initiation, Elongation and Termination Translation machinery in Prokaryotes. Operon-Concept of Operator, Regulator, Promoter gene, Inducer and Co-repressor.

UNIT –IV

1. Biophysics : Introduction, Scope and Application
2. Principle, Structure, Functions of the following:
   a. Microscopy b. Colorimeter and Spectroscopy c. Electrophoresis
   d. Centrifugation e. Chromatography.

UNIT –V

1. Radioisotopes techniques: Measurement of radioactivity, Ionization Chambers, Geiger Muller and Scintillation Counter.
2. Autoradiography and DNA Fingerprinting.
3. Biosensor.

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Biotechnology

List of Practical's

MOLECULAR BIOLOGY, BIOPHYSICS, RECOMBINANT DNA TECHNOLOGY AND GENOMICS

1. Isolation of DNA from Plant cell.
2. Estimation of DNA by DPA method.
3. Isolation RNA from yeast cells

Experiment based on-

4. Centrifugation
5. Spectrophotometer/Colorimeter
6. Electrophoresis
7. Paper chromatography/TLC

Experiment based on Bioinformatics -

8. Retrieve DNA /Protein sequence from Biological Data Bases (NCBI).
9. Use of tools studied

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SCHEME FOR PRACTICAL EXAMINATION

Time: 4 hrs. M.M.: 50

1. Experiment based on DNA/RNA	10 marks
2. Experiment based on Instruments	10 marks
3. Experiment based on Bioinformatics	10 marks
4. Spotting	10 marks
5. *Viva - Voce*	05 marks
6. Record / Sessional	05 marks

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BIOCHEMISTRY

PAPER - I

ENZYMOLOGY

M.M. 50

UNIT-I INTRODUCTION

History, general characteristics, nomenclature, IUB enzyme classification (rationale, over view and specific examples), significance of numbering system. Definitions with examples of holoenzyme, apoenzyme, coenzymes. cofactors, activators, inhibitors, active site (identification of groups excluded), metallo-enzymes, units of enzyme activity, specific enzymes, Isoenzymes, monomeric enzymes, oligomeric enzymes and multienzyme complexes. Enzyme specificity.

Hostorical perspective, nature of non-enzymatic and enzymatic catalysis. Measurement and expression of enzyme activity-enzyme assays. Definition of IU, Katal, enzyme turn over number and specific acitivity. Role of non-protein organic molecules and inorganic ions coenzyme, prosthetic groups. Role of vitamins as coenzymes precursors (general treatment).

UNIT-I ENZYME CATALSIS

Role of cofactors in enzyme catalysis : NAD/NADP+, FMN/FAD, coenzyme A, biocytin, cobamide, lipoamide, TPP, pyridoxal phosphate, tetrahydrofolate and metal ions with special emphasis on coenzyme functions. Acid-base catalysis, covalent, proximity and orientaton effects, strain and distortion theory. Mechanism of action of chymotrypsin, carboxypeptidase, ribonuclease and lysozyme.

UNIT-II ENZYME PURIFICATION

Methods for isolation, purification and characterization of enzymes.

UNIT-IV ENZYME KINETICS

Factors affecting enzyme activity : enzyme concentration, substrate concentration, pH and temperature. Derivation of Michaelis-Menten equation for uni-substrate reactions. Km and its significance. Line weaver-Burk plot and its limitations. Importance of K_{ca}/K_m. Bi-substrate reactions-brief introduction to sequential and ping-pong mechanism with examples.

Kinetics of zero and first order reactions. Significance and evaluation of energy of activation and free energy.

Reversible and irreversible inhibition, competitive, non-competitive and uncompetitive inhibitions. determination of K_m & V_{max} in presence and absence of inhibitor. Allosteric enzymes.

UNIT-V INDUSTRIAL AND CLINICAL APLLICATION OF ENZYME.

Immobilization of enzyme and their industrial applications. Production of glucose from starch, cellulose and dextran; use of lactase in dairy industry; production of glucose-fructose syrup from sucrose; use proteases in food, detergent and leather industry; medical application of enzymes. use of glucose oxidase in enzyme electrodes.

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Biochemistry

PAPER - II

INTERMEDIARY METABOLISM

M.M. 50

UNIT-I INTRODUCTION TO METABOLISM

General features of metabolism, experimental approaches to study metabolism; use of intact organism, becterial mutants, tissue slices, stable and radioactive isotopes.

CARBOHYDRATE METABOLISM

Reactions and energetics of glycolysis. Alcoholic and lactic acid fermentations. Entry of fructose, galactose, mannose etc. Reactions and energetics of TCA cycle. Gluconeogenesis, glycogenesis and glycogenolysis, Reactions and physiological signifacance of pentose phosphate pathway. Regulation of glycolysis and TCA cycle. Photosynthesis, a brief review.

UNIT-II ELECTRON TRANSPORT CHAIN AND OXIDATIVE PHOSPHORYLATION

Structure of mitochondria, sequence of electron carriers, sites of ATP production, inhibitors of electron transport chain. Hypothesis of mitochondrial oxidative phosphorylation (basic concepts). Inhibitors and uncouplers of oxidative phosphorylation. Transport of reducing potentials into mitochondria.

UNIT-III LIPID METABOLISM

Introduction, hydrolysis of triacylglycerols, transport of fatty acids into mitochondria. β – oxidation of saturated fatty acids, ATP yield from fatty acid oxidation. biosynthesis of saturated and unsaturated fatty acids. Metabolism of ketone bodies, oxidation of unsaturated and odd chain fatty acids. Biosynthesis of triglycerides and important phospholipids, glycolipids, sphingolipids and cholesterol. Regulation of cholesterol metabolism.

UNIT-IV AMINO ACID METABOLISM

General reactions of amino acid metabolism : transmination, oxodative deamination and decarboxylation. Urea cycle. Degradation and biosynthesis of amino acids. Glycogenic and ketogenic amino acids.

UNIT-V NUCLEOTIDE METABOLISM

Sources of the atoms in the purine and pyrimidine molecules. Biosynthesis and degradation of purines and pyrimidines. Regulation of purine and pyrimidine biosynthesis.

PORPHYRIN METABOLISM

Biosynthesis and degradation of porphyrins. Production of bile pigments.

PRECTICAL

1 Separation of Blood Plasm and Serum

a Estimation of proteins from serum by biuret and lowry methods.

b Determination of albumin and A/G ratio in serum.

2 Estimation of bilirubin (conjugated and unconjugated) in serum.

3 i Estimation of total lipids in serum by vanillin method.

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i. Estimation of cholesterol in serum.

4. Estimation of lipoproteins in plasma.

5. Estimation of lactic acid in blood before and after exercise.

6. Estimation of blood urea nitrogen from plasma.

7. Separation and identification of amino acids by (a) paper chromatography and (b) thin-layer chromatography.

8. Separation of polar and non-polar lipids by thin-layer chromatography.

9. Estimation of SGPT and SGOT in serum.

10. a. Assay of serum alkaline phosphatase activity.
    b. Inhibition of alkaline phosphatase activity by EDTA.
    c. Effect of substrate concentration on alkaline phosphatase activity and determination of its K_m value.

11. a. Effect of temperature on enzyme activity and determination of activation energy.
    b. Effect of pH on enzyme activity and determination of optimum pH.
    c. Effect of enzyme concentration on enzyme activity.

12. a. Preparation of starch from potato and its hydrolysis by salivary amylase.
    b. Determination of achromatic point in salivary amylase.
    c. Effect of sodium chloride onamylases.

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Singh BD, ***Genetics***, Kalyani Publication

Gupta, PK, ***Cell and Molecular Biology,*** Rastogi Publications, Meerut

Singh, BD, ***Biotechnology: Expanding Horizons,*** Kalyani publications

Gupta, PK, ***Elements of Plant Biotechnology,*** Rastogi Publications, Meerut

Gupta, SN, ***Concepts of Biochemistry,*** Rastogi Publications, Meeru

Jain, JL., Jain S, Jain, N, ***Fundamentals of Biochemistry***, S Chand Publishing, New Delhi

B.Sc.-III (Botany)

Practical

1. Study of host parasite relationship pf plant diseases listed above.
2. Demonstration of preparation of Czapek's Dox medium and Potato dextrose agar medium, sterilization of culture medium and pouring.
3. Inoculation in culture tubes and petriplates.
4. Gram Staining.
5. Microscopic examination of Curd.
6. Study of plant diseases as listed in the theory paper.
7. Biochemical test of carbohydrate and protein.
8. Instrumentation techniques

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PRACTICAL SCHEME

TIME: 4 Hrs. **M.M. : 50**

1.	Plant Disease/Symptoms	10
2.	Instrumentation techniques	05
3.	Staining of Microbes	05
4.	Tissue Culture techniques	05
5.	Spotting	10
6.	Project Work/ Field Study	05
5.	Viva-Voce	05
6.	Sessional	05

(Dr. J.N. Verma) (Dr. Rekha Pimpalgaonkar) (
Dr.Ranjana Shristava)

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Proff. & Head
Govt. N PG Science College
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Govt. Bilasa Girls College, Bilaspur

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B. Sc. Part III 2018-19

Zoology

Practical

The practical work in general shall be based on syllabus prescribed in theory.
The candidates will be required to show knowledge of the following:

- Estimation of population density, percentage frequency, relative density.
- Analysis of producers and consumers in grassland.
- Detection of gram-negative and gram-positive bacteria.
- Blood group detection (A,B,AB,O)
- R. B. C. and W.B.C count
- Blood coagulation time
- Preparation of hematin crystals from blood of rat
- Observation of Drosophila, wild and mutant.
- Chromatography-Paper or gel.
- Colorimetric estimation of Protein.
- Mitosis in onion root tip.
- Biochemical detection of Carbohydrate, Protein and Lipid.
- Study of permanent slides of parasites, based on theory paper.
- Working principles of pH meter, colorimeter, centrifuge and microscope.

Scheme of marks distribution **Time: 3:30hrs**

• Hematological Experiment	08
• Ecological Experiment: Grassland Ecosystem/ Population Density/Frequency/relative density	06
• Bacterial staining	05
• Biochemical experiment	06
• Practical based on Instrumentation (Chromatography/ pH meter/microscope/centrifuge.	05
• Spotting (5 spots)	10
7 Viva	05
8. Sessional	05

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CHEMISTRY

B.Sc. Part- III

PRACTICAL

Max. Marks-50

INORGANIC CHEMISTRY

Gravimetric analysis:

- Estimation of nickel (II) using Dimethylglyoxime (DMG).
- Estimation of copper as CuSCN
- Estimation of iron as Fe_2O_3 by precipitating iron as $Fe(OH)_3$.
- Estimation of Al (III) by precipitating with oxine and weighing as $Al(oxine)_3$ (aluminium oxinate).
- Estimation of Barium as $BaSO_4$

Inorganic Preparations:

- Tetraamminecopper (II) sulphate, $[Cu(NH_3)_4]SO_4.H_2O$
- Cis and trans $K[Cr(C_2O_4)_2.(H_2O)_2]$ Potassium dioxalatodiaquachromate(III)
- Tetraamminecarbonatocobalt (III) ion
- Potassium tris(oxalate)ferrate(III)/ Sodium tris(oxalate)ferrate(III)
- Cu(I) thiourea complex, Bis (2,4-pentanedionate) zinc hydrate; Double salts (Chrome alum/ Mohr's salt)

ORGANIC CHEMISTRY

1. Preparation of organic Compounds

- Acetylation of one of the following compounds: amines (aniline, o-, m-, p- toluidines and o-,m-, p-anisidine) and phenols (β-naphthol, vanillin, salicylic acid)
- Benzolyation of one of the following amines (aniline, o-, m-, p- toluidines and o-, m-, panisidine) and one of the following phenols (β-naphthol, resorcinol, p cresol) by Schotten-Baumann reaction.
- Bromination of any one of the following: a. Acetanilide by conventional methods b.Acetanilide using green approach (Bromate-bromide method)
- Nitration of any one of the following: a. Acetanilide/nitrobenzene by conventional method b. Salicylic acid by green approach (using ceric ammonium nitrate).
- Reduction of p-nitrobenzaldehyde by sodium borohydride.
- Hydrolysis of amides and esters.
- Semicarbazone of any one of the following compounds: acetone, ethyl methyl ketone, cyclohexanone, benzaldehyde.

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- Benzylisothiouronium salt of one each of water soluble and water insoluble acids (benzoic acid, oxalic acid, phenyl acetic acid and phthalic acid).
- Aldol condensation using either conventional or green method.
- Benzil-Benzilic acid rearrangement.
- Preparation of sodium polyacrylate.
- Preparation of urea formaldehyde.
- Preparation of methyl orange.

The above derivatives should be prepared using 0.5-1g of the organic compound. The solid samples must be collected and may be used for recrystallization, melting point and TLC.

2. Qualitative Analysis Analysis of an organic mixture containing two solid components using water, $NaHCO_3$, NaOH for separation and preparation of suitable derivatives.
3. Extraction of caffeine from tea leaves.
4. Analysis of Carbohydrate: aldoses and ketoses, reducing and non-reducing sugars.
5. Identification of simple organic compounds by IR spectroscopy and NMR spectroscopy. (Spectra to be provided).
6. Estimation of glycine by Sorenson's formalin method.
7. Study of the titration curve of glycine.
8. Estimation of proteins by Lowry's method.
9. Study of the action of salivary amylase on starch at optimum conditions.
10. Effect of temperature on the action of salivary amylase.

PHYSICAL CHEMISTRY

Conductometry

- Determination of cell constant
- Determination of equivalent conductance, degree of dissociation and dissociation constant of a weak acid.
- Perform the following conductometric titrations:
  - i. Strong acid vs. strong base
  - ii. Weak acid vs. strong base
  - iii. Mixture of strong acid and weak acid vs. strong base
  - iv. Strong acid vs. weak base
- To determine the strength of the given acid conductometrically using standard alkali solution.
- To determine the solubility and solubility product of a sparingly soluble electrolyte conductometrically
- To study the saponification of ethyl acetate conductometrically.

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8 Hrs. **PRACTICAL EXAMINATION** **M.M.50**

Five experiments are to be performed.

1. **Inorganic** - Two experiments to be performed. Gravimetric estimation compulsory **08 marks**. (Manipulation 3 marks)

   Anyone experiment from synthesis and analysis **04 marks**.

2. **Organic** - Two experiments to be performed. Qualitative analysis of organic mixture containing two solid components. compulsory carrying **08 marks** (03 marks for each compound and two marks for separation).

One experiment from synthesis of organic compound (Single step) **04 marks**.

3. Physical-One physical experiment **12 marks**.
4. Sessional **04 marks**.
5. Viva Voce **10 marks**.

In case of Ex-Students one mark each will be added to Gravimetric analysis and Qualitative analysis of organic mixture and two marks in Physical experiment.

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MICROBIOLOGY

BSc-3rd

Paper- I: Medical Microbiology and Immunology

UNIT-1: AIR BORNE DISEASES

Air borne diseases: Types- Tuberculosis, Pertussis, Diphtheria, Influenza, Small & Chicken pox, Mumps, Measles. Symptoms, treatment and prevention.

UNIT-2: WATER BORNE DISEASES

Concept and cause of water borne diseases; Types, Hepatitis, Dysentery, Diarrhea, Cholera, typhoid. Symptoms, treatment and prevention.

UNIT-3: CLINICAL DISEASE AND DIAGNOSIS

Clinical diseases: Diabetes, Asthma, multiple sclerosis, rheumatoid arthritis, cancer. Symptoms, Treatment and prevention.

UNIT-4: BASIC CONCEPT OF IMMUNITY

Immune system: Structure and function of the cells, tissues and organs of immune system. Types of immunity- humoral and cell-mediated, innate, acquired immunity. **Antigen- Antibody**: types, properties. Hapten, adjuvants, Immuno-globulins: Structure types, Properties and their function - Theory of antibody production.

UNIT-5: IMMUNO DISEASE DIAGNOSIS

Methods based on Ag-Ab interaction- precipitation, agglutination, ELISA, RIA, Immuno-electrophoresis, PCR based diagnosis method for infectious diseases.

Text Books Recommended:

1. Immunology: Kuby.
2. General Microbiology by Power and Daganiwala.
3. Zinssers Microbiology by K. J Wolfgang, McGraw- Hill Company.
4. Medical Microbiology; N. C. Dey and T.K. Dey, Allied agency, Calcutta.
5. Bacteriological Techniques by FJ Baker.
6. A Textbook of Microbiology; Dubey & Maheshwari; S. chand & Sons.
7. Scott's Diagnostic Microbiology by EJ Baron.

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Microbiology

PRACTICAL

M. M. 50

Isolation of bacteria from air and soil (crop fields)
Isolation of fungi from air and soil
Relationship between OD and CFU measurements.
Measurement of fungal growth by dry weight and wet weight
Study of rhizospheric and phyllospheric microbes from economically important plants.
Biodegradation study of some organic molecules
Microbial assessment of potable water.
Determination of BOD, COD and dissolved oxygen.
Determination of blood group by slide agglutination test./TLC/DLC
Determination of heamoglobin.
Determination of quality of milk by MBRT
Isolation of Rhizobium from root nodules.

Scheme of practical examination

Time 4 hour MM- 50

1. Exercise on immunological test	10
2. Exercise on water analysis	10
3. Exercise on isolation and characterization of micro organism	05
4. Spotting (1 to 5)	10
5. Viva voce	05
6. Sessional	10
	Total- 50

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B.Sc. Part-III

Paper-I

RELATIVITY, QUANTUM MECHANICS, ATOMIC MOLECULAR AND NUCLEAR PHYSICS

Unit-1 Reference systems, inertial frames, Galilean invariance propagation of light, Michelson-Morley experiment, search for ether. Postulates for the special theory of relativity, Lorentz transformations, length contraction, time dilation, velocity addition, variation of mass with velocity, mass-energy equivalence, particle with zero rest mass.

Unit-2 Origin of the quantum theory : Failure of classical physics to explain the phenomena such as black-body spectrum, photoelectric effect, Compton effect, Wave-particle duality, uncertainty principle, de Broglie's hypothesis for matter waves, the concept of Phase and group velocities, experimental demonstration of mater waves. Davisson and Germer's experiment. Consequence of de Broglie's concepts, Bohr's complementary Principle, Bohr's correspondence principle, Bohr's atomic model, energies of a particle in a box, wave packets. Consequence of the uncertainty relation, gamma ray microscope, diffraction at a slit.

Unit-3 Quantum Mechanics: Schrodinger's equation, Statistical interpretation of wave function, Orthogonality and normalization of wave function, Probability current density, Postulatory basis of quantum mechanics, operators, expectation values, Ehrenfest's theorem, transition probabilities, applications to particle in a one and three dimensional boxes, harmonic oscillator in one dimension, reflection at a step potential, transmission across a potential barrier.

Unit-4 Spectra of hydrogen, deuteron and alkali atoms spectral terms, doublet fine structure, screening constants for alkali spectra for s, p, d and f states, selection rules. Discrete set of electronic energies of moleculers, quantisation of vibrational and rotational energies, determination of inter-nuclear distance, pure rotational and rotation vibration spectra. Dissociation limit for the ground and other electronic states, transition rules for pure vibration and electronic vibration spectra. Raman effect, Stokes and anti-Stokes lines, complimentary character of Raman and infrared spectra, experimental arrangements for Raman spectroscopy.

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Unit-5 Structure of nuclei:- Basic Properties of Nuclei: (1) Mass, (2) Radii, (3) Charge, (4) Angular Momentum, (5) Spin, (5) Magnetic Moment (μ), (6) Stability and (7) Binding Energy, Nuclear Models:- Liquid Drop Model, Mass formula, Shell Model, Types of Nuclear reactions, laws of conservation, Q-value of reactions, Interaction of Energetic particles with matter, Ionization chamber, GM Counter, Cloud Chambers, Fundamental Interactions, Classification of Elementary Particles, Particles and Antiparticles, Baryons, Hyperons, Leptons, and Mesons, Elementary Particle Quantum Numbers: Baryon Number, Lepton Number, Strangeness, Electric Charge, Hypercharge and Isospin, introductory idea of discovery of Higg's Boson.

TEXT AND REFERENCE BOOKS:

1. H.S. Mani and G.K. Metha: "Introduction to Modern Physics"" (Affiliated East-West Press, 1989).
2. A Beiser, "Prospective of Modern Physics".
3. H.E. White, Introduction to Atomic Physic".
4. Barrow, "Introduction to Molecular Physics".
5. R.P. Feynman, R.B. Leighton and M Sands, "The Feynman Lectures on Physics", Vol.III (B.I. Publications, Bombay, Delhi, Calcutta, Madras).
6. T.A. Littlefield and N Thorley, "Atomic and Nuclear Physics" (Engineering Language Book Society)
7. H.A. Enge, "Introduction to Nuclear Physics", (Addision-Wesly)
8. Eisenberg and Resnick, "Quantum Physics of Atoms, Molecules, Solids, Nuclei and Particles" (John Wiley)
9. D.P. Khandelwal, "Optics and Atomic Physics", (Himalaya Publishing House, Bombay, 1988).
10. Quarks and Leptons, F. Halzen and A.D. Martin, Wiley India, New Delhi, 1984.
11. Radiation detection and measurement, G.F. Knoll (John Wiley & Sons, 2000).
12. Theoretical Nuclear Physics, J.M. Blatt & V.F.Weisskopf (Dover Pub.Inc., 1991).

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Paper-II

SOLID STATE PHYSICS, SOLID STATE DEVICES AND ELECTRONICS

Unit-1 Amorphous and crystalline solids, Elements of symmetry, seven crystal system, Cubic lattices, Crystal planes, Miller indices, Laue's equation for X-ray diffraction, Bragg's Law, Bonding in solids, classification. Cohesive energy of solid, Madelung constant, evaluation of Parameters, Specific heat of solids, classical theory (Dulong-Petit's law), Einstein and Debye theories, Vibrational modes of one dimensional monoatomic lattice, Dispersion relation, Brillouin Zone.

Unit-2 Free electron model of a metal, Solution of one dimensional Schrödinger equation in a constant potential, Density of states, Fermi Energy, Energy bands in a solid (Kronig-Penny model without mathematical details), Difference between Metals, Insulator and Semiconductors, Hall effect, Dia, Para and Ferromagnetism, Langevin's theory of dia and para-magnetism, Curie- Weiss's Law, Qualitative description of Ferromagnetism (Magnetic domains), B-H curve and Hysteresis loss.

Unit-3 Intrinsic and extrinsic semi conductors, Concept of Fermi level, Generation and recombination of electron hole pairs in semiconductors, Mobility of electrons and holes, drift and diffusion currents, p-n junction diode, depletion width and potential barrier, junction capacitance, I-V characteristics, Tunnel diode, Zener diode, Light emitting diode, solar cell, Bipolar transistors, pnp and npn transistors, characteristics of transistors, different configurations, current amplification factor, FET and MOSFET Characteristics.

Unit-4 Half and full wave rectifier, rectifier efficiency ripple factor, Bridge rectifier, Filters, Inductor filter, L and π section filters, Zener diode, regulated power supply using zener diode, Applications of transistors, Bipolar Transistor as amplifier, h-parameter, h-parameter equivalent circuit, Transistor as power amplifier, Transistor as oscillator, principle of an oscillator and Bark Hausen's condition, requirements of an oscillator, Wein-Bridge oscillator and Hartley oscillator.

Unit-5 Digital Circuits: Difference between Analog and Digital Circuits, Binary Numbers, Decimal to Binary and Binary to Decimal Conversion, AND, OR and NOT Gates (Realization using Diodes and Transistor), NAND and NOR Gates as Universal Gates, XOR and XNOR Gate, De Morgan's Theorems, Boolean Laws, Simplification of Logic Circuit using Boolean Algebra, Digital to Analog Converter, Analog to Digital Converter.

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Physics

TEXT AND REFERENCE BOOKS:

1. Introduction to solid state physics: C. Kittel.
2. Solid State Physics: A.J. Dekkar.
3. Electronic Circuits: Mottershead.
4. Electronic Circuits: Millman and Halkias.
5. Semiconductor Devices: S.M. Sze.
6. Electronic devices: T.L. Floyd.
7. Device and Circuits: J. Millman and C. Halkias.
8. Electronic Fundamental and Applications: D. Chatopadhyay and P.C. Rakshit.
9. Electricity and Magnetism: K.K. Tiwari.

PRACTICALS

Minimum 16 (Eight from each group)

Experiments out of the following or similar experiments of equal standard

1. Determination of Planck's constant.
2. Determination of e/m by using Thomson tube.
3. Determination of e by Millikan's methods.
4. Study of spectra of hydrogen and deuterium (Rydberg constant and ratio of masses of electron proton).
5. Absorption spectrum of iodine vapour.
6. Study of alkali or alkaline earth spectra using a concave grating.
7. Study of Zeeman effect for determination of a Lande g-factor.
8. Analysis of a given band spectrum.
9. Study of Raman spectrum using laser as an excitation source.
10. Study of absorption of alpha and beta rays.
11. Study of statistics in radioactive measurement.
12. Coniometric study of crystal faces.
13. Determination of dielectric constant.
14. Hysteresis curve of transformer core.
15. Hall-probe method for measurement of magnetic field.
16. Specific resistance and energy gap of semiconductor.
17. Characteristics of transistor.
18. Characteristics of tunnel diode.
19. Study of voltage regulation system.
20. Study of regulated power supply.

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B.Sc.(CS)
III Year

COMPUTTER SCIENCE

PAPER - I

(Paper Code-0909)

COMPUTER HARDWARE PART-C

AIM : The emphasis is on the design concepts & organisational details of the common PC, leaving the complicated Electronics of the system to the computer engineers.

Objective of the Course :

1. To introduce the overall organisation of the microcomputers and operating systems.
2. To introduce the interaction of common devices used with computers with operating softwares, excluding the Assembly languages, with special reference to DOS/WINDOWS.
3. To introduce the working of hardware components, Micro-Processor and various chips used in micro-computers by operating system, without the use of electronic circuitry.
4. To introduce the use of operating systems architecture with IBM-PC & clones, excluding Assembly language, with forms an important part of hardwares.

N.B. : Since the computer organisation study is very vast & complicated, so the study is restricted only to the description and understanding part, hence the paper-setter is requested to keep this important factor in mind.

UNIT-1 : ORGANISATION OF Micro-Processor & MIRCO-COMPUTER :-

1. **Introduction & organisation of Micro-Computer :**
   - (a) Basic Components of Micro-computer : Basic Block; Prom ram memory; Data memory; I/O Ports; Clock generator; Integration of functional blocks.
   - (b) Interconnecting Components in a Micro-computer : Necessary functional block; Bussed architecture for microcomputer; memory addressing; Addressing I/O ports; comparision of I/O mapped and memory mapped I/O.
   - (c) Input Output Techniques : Non-CPU devices, Program & interrupt controlled I/O; Hardware controlled I/O or DMA.
2. **An Introduction to the various as :**
   - (a) General understanding of different µP or CPU :
     Intel 8088, 286, 386, 486, 586 Pentium, P54C, MMX P55C; Motorola 6800 & 88100 series; CYRIX & AMD CPUs.
   - (b) The Registers of CPU : (Give Example of P-8088) Register organisation of 8088, Scrach pad segment, pointer, Index and Flag, Registers.
   - (c) Memory addressing modes of P-8088 : Segment offset; Data addressing modes; Addressing for branch instructions.
   - (d) I/O Addressing with P-8088 : Memory mapped I/O & I/O mapped I/O.

UNIT-2 : SYSTEM HARDWARE ORGANISATION OF COMPUTERS :

1. **Hardware Organisation of the Personal Computer :**
   - (a) Block diagram with various parts of PC.
   - (b) The Mother Board of General P.C. : 8088 CPU; ROM & RAM; Keyboard

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& its interface; System timer/counters; Hardware interrupt vectoring; DMA controller & channels; Interfacing to audio speaker; Bus slots & facture cards.

(c) The Serial I/O ports, COM-1 & COM-2.

(d) The parallel Port for Printer.

(e) Expansion Slots for RAM.

(f) Disk Controllers : For floppy, Hard disk, CD-ROM & Cassets drives.

2. **The Video Display of PCs :**

(a) Video Monitors; Monochrome and colour.

(b) Video Display Adapters & Their Video Modes; Monochrome & colour graphics adapters.

(c) Video Control Through ANSI-SYS.

(d) Video Control Through ROM-BOIS : INT 10H.

(e) Direct Video Control; Monochrom & colour graphics adapters.

(f) Installing Customized Character Sets.

UNIT-3 : ORGANISATION OF OPERTING SYSTEM WITH SYSTEM HARDWARE :

1 **The ROM-BIOS Services :**

(a) Introduction to UNIX, ENIX, SUN, solaris, DOS & MAC with special reference to DOS & Windows, its ver., as DOS becomes more popular than others in PCs.

(b) The ROM-BIOS Diskette Services, INT 13H.

(c) The ROM-BIOS Serial Port Services, INT 14H.

(d) The ROM-BIOS Keyboard Services, INT 16H.

(e) The ROM-BIOS Printer Services, INT 17H.

(f) Miscellaneous Service Provided by the ROM-BIOS : INT 05H, INT 11H, INT 12H, INT 18H, INT 19H, INT 1AH.

2 **The fundamental of Operating System viz. DOS/WINDOWS :**

(a) The loading of DOS & Its Basic Structure ; ROM bootstrap, IO.SYS, DOS.SYS & Command..COM.

(b) The Execution of the programs under DOS ; EXEC functions, program segment prefix; Features of COM & EXE program files.

(c) Device Handling by Dos ; FDD, HDD, CON, Keyboard, PRN, AUX, CLOCK and NUL devices; Block devices; Character devices; Driver installation sequence.

(d) File Structures of DOS ;

(e) The DOS Interrupts : INT 20H-2FH

(f) The DOS functions through INT 21H; Discuss only the understanding part of various other DOS function to handle hard & softwares.

(g) Installation of windows : Important system files in windows.

UNIT-4 : ORGANIZATION & HANDLING BY OPERATING SYSTEMS :

1 **Disk and Files under DOS :**

(a) Logical Structure of a Disk : Organisation of disk for use; Boot record ; FAT

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files; disk or root directory.

(b) File Organisation on a DOS disk : Logical volumes ; Sub directories; Volume lables.

(c) Manipulating Files under DOS : File attributes ; date and time, file Access; FCB functions.

2 **Memory Allocation, Program Loading and Execution :**

(a) Memory Management under DOS : EXEC loader; Memory Management & its functions; Modifying a Program's memory allocation.

(b) Loading and Executing Programs under DOS : The EXEC function ; Memory considerations; parameter blocks; calling & returning from EXEC.

(c) Loading the program overlays through EXEC.

UNIT-5 : ORGANISATION OF HARDWARE BY OPERATING SYSTEM :

1 **Interrupt Handling through DOS :**

(a) Types of interrupts.

(b) Interrupt Vector Table in PC.

(c) Interrupt Service Routines.

(d) Special Interrupts in PC : Clock Interrupt; The -C or Break Interrupt ; DOS reserved interupt INT 28H ; Patching memory resident routines.

2. **Filters for DOS :**

(a) Filters in operating systems.

(b) Redirection of I/O under DOS.

(c) The Filters Supplied with DOS.

(d) Writing Filters to run under DOS.

3. **Handling of Various Versions of Windows O.S. :**

(a) Setup Installation

(b) Trouble shooting

(c) Networking features

Text Book :

1 Hardware and Software of Personal Computers.
By Sanjay K. Bose. (Wiley Eastern Ltd. New Delhi).

Supporting Text Books :

1 Digital System from Gates to Microprocessor.
By Sanjay K. Bose. (Wiley Eastern Ltd. New Delhi).

4 Computer Fundamentals : Architecture & Organisation.
By B. Ram.. (Wiley Eastern Ltd. New Delhi).

Reference Books :

1 IBM PC-XT and Clones : By Govinda Rajalu.

2 Microprocessor and interfacing : By Douglas Hall.

3 Insight the IBM-PC : Peter Norton.

4 Micriprocessor System : 8086/8088 family architecture, programming & design : By Liu and Gibson.

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PAPER - II

(Paper Code-0910)

Atm : To introduce DBMS and RDBMS using Back-end tool and Front-end tool.

Object of the Course :

1. To introduce Data BAse Management System concepts.
2. To introduce the Relational Database Management System and Relational Database Design.
3. To introduce the RDBMS software and utility of query language.
4. To introduce basic concept of GUI Programming and database connectivity using Visual Basic.

UNIT-1 : CONCEPT OF D.B.M.S. AND DATA MODELS

(a) Introduction to DBMS :- Purpose of Data base systems, Views of data, Data Modeling Database Languages, Transaction management, Storage Management, Database Administrator and User, Database System Structure.

(b) E-R Model : Basic concepts, Constraints, Keys, Mapping Constaint, E-R Diagram, Weak and Strong Entity sets, E-R Database Schema, Reduction of an E-R Schema to Table.

UNIT-2. : RELATIONAL DATABASE MANAGEMENT SYSTEM

(a) Relational Model : Structure of Relational Database, Relational Algebra, Domain Relational Calculus, Extended Relational- Algebra Operation, Modification of database, Views.

(b) Relational Database Design : Pitfalls in Relational Database Desing, Decomposition Functional Dependencies, Normalization : 1NF, 2NF, BCNF, 3NF, 4NF, 5NF.

UNIT-3 : INTRODUCTION TO RDBMS SOFTWARE - ORACLE

(a) Introduction : Introduction to personal and Enterprises Oracle, Data Types, Commercial Query Language, SQL, SQL*PLUS.

(b) DDL and DML : Creating Table, Specifying Integrity Constraint, Modifying Existing Table, Dropping Table, Inserting Deleting and Updating Rows in as Table, Where Clause, Operators, ORDER BY, GROUP Function, SQL Function, JOIN, Set Operation, SQL Sub Queries. Views : What is Views, Create, Drop and Retrieving data from views.

(c) Security : Management of Roles, Changing Passward, Granting Roles & Privilege, with drawing privileges.

(d) PL/SQL : Block Structure in PL/SQL, Variable and constants, Running PL/SQL in the SQL*PLUS, Data base Access with PL/SQL, Exception Handling, Record Data type in PL/SQL, Triggers in PL/SQL.

UNIT-4 : G.U.I. PROGRAMMING

(a) Introduction to Visual Basic : Event Driven Programming, IDE, Introduction to Object, Controlling Objects, Models and Events, Working with Forms, MDI Form Working with standard Controls.

(b) Overview of Variables, Declaring, Scope, Arrays, User defined data types, Constants, Working with procedures : Function, Subroutine, and Property.

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Working with Data, Time, Format, String, and Math's Function. Controlling Program Execution: Comparison and Logical Operators, If...Then statements, Select Case Statement, Looping Structures, Exiting a loop. Error Trapping and Debugging.

(c) File Organization : Saving data to file. Sequential and Random access file, the desing and coding.

UNIT-5 : V DATA BASE PROGRAMMING IN VB

(a) Introduction :- Concept of DAO, RDO, ADO, input validation : field & form level validation, ADO object model : the ADO object Hierarchy, the connection object, the command object, record set object, parameter object, field object, record object, stream object, Error object, parameter object.

(b) Using Bound control to Present ADO data : Using the ADO data control, ADO data control properties, binding simple controls : Data list, data combo, Data Grid, Data Form Wizard : single form wizard, Grid form, master/Detail form. Programming the ADO data control : Refresh method, Event, Hierarchical flex Grid control.

(c) Data Environment & Data Report : Creating connection, Using command object in the data Environment, Data Environment option and operation, Binding Form to the data Environment, ADO Events in the Data report, Print Preview, Print, Export, Data report in code : Data reports Events, Binding data reports Directly.

REFERENCE BOOKS :

1 Data Base System Concept : By Hery F. Korth. Tata McGraw Hill

2 Fundamental of Data Base System Concept : Nawathe & Elmasri (Pearson educations)

3 Oracle Complete Reference : By Oracle Press

4 Introduction to OOPS & VB : By V.K. Jain, Vikas Publishing House

5 Database Programming VB 6 : By B.P.B. Publication

PRACTICALS :

1 **Practicals on Oracle :**

At least 20 practicals covering the SQL, PL/SQL, Triggers, Views.

2 **Practicals on Visual Basic :**

At least 20 pracricals on VB that covering basic and data controls components.

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21. Study of lissajous figures using CRO.
22. Study of VTVM.
23. Study of RC and TC coupled amplifiers.
24. Study of AF and RF oscillators.
25. Find roots of f(x) = 0 by using Newton-Raphson Method.
26. Find root of f(x) = 0 by using secant method.
27. Integration by Simpson rule.
28. To find the value of V at
29. String manipulations.
30. Towers of Hanoi (Non-recursive).
31. Finding first four perfect numbers.
32. Quadratic interpolation using Newton's forward-difference formula of degree two.

TEXT AND REFERENCE BOOKS:

1. B.G. Strechman, Solid state electronics devices II edition (Prentice-Hall of India New Delhi 1986)
2. W.D. Stanley, Electronics devices, circuits and applications (Prentice-Hall new jersey, USA 1988).
3. S. Lipschutz and A Poe; Schaum's outline of theory and problems of programming with Fortran (Mc Graw-Hill Book Co. Singapore, 1986).
4. C Dixon, Numerical Analysis.

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ELECTRONICS LABORATORY

The scheme of practical examination will be as follows-

Experiment	--	**30**
Viva	--	**10**
Sessional	--	**10**
Total	--	**50**

ELB 303P: INDUSTRIAL ELECTRONICS & PCB Design LAB **MM-25**
(Hardware and Circuit Simulation Software)
Max.Marks:25

1. Study of I-V characteristics of DIAC
2. Study of I-V characteristics of a TRIAC
3. Study of I-V characteristics of a SCR
4. SCR as a half wave and full wave rectifiers with R and RL loads
5. DC motor control using SCR.
6. DC motor control using TRIAC.
7. AC voltage controller using TRIAC with UJT triggering.
8. Study of parallel and bridge inverter.
9. Design of snubber circuit
10. Study of chopper circuits

Design and Fabrication of Printed Circuit Boards

1. Design automation, Design Rule Checking; Exporting Drill andGerber Files; Drills; Footprints and Libraries Adding and Editing Pins, copper clad laminatesmaterials of copper clad laminates, properties of laminates (electrical & physical),
2. Study of soldering techniques. Film master preparation, Image transfer, photo printing, Screen Printing, Plating techniques etching techniques,
3. Study of Mechanical Machining operations,Lead cutting and Soldering Techniques, Testing and quality controls.
4. Study ofLead cutting and Soldering Techniques, Testing and quality controls.

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BIOTECHNOLOGY

List of Practical's

PLANT, ENVIRONMENTAL, INDUSTRIAL AND MEDICAL BIOTECHNOLOGY

1. Preparation of Tissue culture media.
2. Sterilization of plant material.
3. Seed Germination, Root, Shoot and Callus Culture
4. Determination of total dissolved solids of water.
5. Determination of DO, BOD, COD of water.
6. Determination of Coliform by MPN Test.
7. Production of Enzymes/Antibiotics/Acids.
8. Effect of Biopesticides on microorganism
9. Antigen Antibody interaction- Determination of Blood Group and Rh factor.
10. Widal Test
11. VDRL Test.
12. ELISA Test.
13. Perform of Immuno-diffusion

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SCHEME FOR PRACTICAL EXAMINATION

Time: 4 hrs. **MM-50**

1. Experiment based on Paper - I	
(i) Plant tissue culture	08 marks
(ii) Environment / Industrial	07marks
2. Experiment based on Paper - II	15 marks
3. Spots	10marks
4. *Viva-voce*	05marks
5. Sessional/ Record	05marks

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BIOCHEMISTRY

PAPER - I

MOLECULAR BIOLOGY

UNIT-I BASIC CONCEPTS OF GENETIC INFORMATION

a Nucleic acids as genetic information carriers, experimental evidence e.g. bacterial genetic transformation, Hershey - Chase Experiment, TMV reconstitution rexperiment.

b Central dogma of molecular genetics - current version, reverse transcription and retroviruses.

c Primary structure of nucleic acids and their properties, silent features of eukaryotic, prokaryotic and viral genome; highly repetitive, moderately repretitive and unique DNA sequences.

d Basic concepts about the secondary structures of nucleic acids, 5' 3' direction antiparallel strands, base composition, base equivalence, bae pairing and base stacking in DNA molecule. and buoyant density and their.

UNIT-II STRUCTURAL LAVELS OF NUCLEIC ACIDS AND SEQUENCING

a Scondary and tertiary structure of DNA : Watson and Crick model, A.B. and Z types of DNA major and minor grooves, chirality of DNA, tertiary structure of DNA.

b Structure and properties of RNA; Classes of RNA secondary and tertiary structures.

c Nucleic acid hybridization : Cot T_m value and satellite DNA.

d Sequencing : Restriction and modification system; sequencing of DNA and RNA.

UNIT-III a DNA REPLICATION

DNA replication in prokaryotes - conservative, semi conservative and dispersive types, experimental evidence for semi conservative replication. DNA polymerases, other enzymes and protein factors involved in replication. Mechanism of replication. Inhibitors of DNA replication.

b TRANSCRIPTION

Transcription in prokaryotes RNA polymerase, promoters, initiation, elongation and termination of RNA synthesis, inhibitors of transcription. Reverse transcriptase, post transcriptional processing of RNA in eukaryotes.

UNIT-IV TRANSLATION AND REGULATION OF GENE EXPRESSION

a Genetic code : Basic feature of genetic code, biological significance of degeneracy. Wobble hypothesis, gene within genes and overlapping genes.

b Mechanism of translation : Ribosome tructure, A and P sites, charged tRNA, f-mat-tRNA initiator codon, Shine Dalgarno consensus sequence (AGGA), formation of 70S initiation complex, role of EF-Tu, EF-Ts, EF G and GTP, nonsense codons and release factors RF 1 and RF 2.

c Regulation of gene Expression in prokaryotes : Enzyme induction and repression,

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Bio-Chemistry

PRACTICAL FOR IIIrd YEAR

LABORATORY - III (BCH 305)

1. Estimation of DNA by diphenylamine method.
2. Effect of temperature on the viscosity of DNA using Ostwald's Viscometer.
3. Extraction of RNA and its estimation by Orcinol method.
4. Estimation of hemoglobin by measuring total iron in blood.
5. Estimation of calcium and phosphorus in serum & urine.
6. Estimation of creatine and creatinine in urine.
7. Estimation of immunoglobulins by precipitation with saturated ammonium sulphate.
8. Denaturation fo enzyme, studies on DNA.
9. a Separation of proteins by column chromatography.
   b Determination of proteins by dye binding assay.
10. Separation of proteins by SDS-polyacrylamide gel electrophoresis.

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b. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.

c. Apart from Question No. 1, rest of the paper shall consist of five units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 15 marks.

10. The Year wise Structure & plan of the programme shall be as follows :

SCHEME OF EXAMINATION BCA PART-I

Paper no.	Title of Paper/s	Maximum Marks		Maximum Marks	Minimum Passing Marks
		Theory	Practical		
1.	आधार पाठ्यक्रम–हिन्दी भाषा	75	--	75	26
2.	Foundation Course- English Language	75	--	75	26
3.	Environmental Studies & Human Rights **(Additional & Compulsory)**	75	25	100	33
4.	Discrete Mathematics	100	--	100	33
5.	Computer Fundamental and Concepts of Software	100	--	100	33
6.	PC Software Packages and Programming in C	100	--	100	33
7.	Data Structure	100	--	100	33
8.	Lab-1 Software Packages Lab	--	75	75	25
9.	Lab-2 Programming lab in C	--	75	75	25
	Total Marks	**650**	**150**	**800**	

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LAB-I
SOFTWARE PACKAGES LAB

The lab exercise should be based on MS Windows 7 or higher version and MS Office 2007 or higher version and comprises the theoretical paper as well as practical paper.

Section-A

WINDOWS 7 : Basic Elements of WINDOWS, My Computer, Sharing Devices, Windows Explorer, Accessories: Entertainment, Communication, System Tools, Paint Brush, Calculator, Calendar, Clock, Note Pad, Word Pad Etc., Control Panel, Changing Color and Theme, Changing the Desktop Background, Screen Saver, Adjusting Display Settings, Adjusting Sound, Adjusting the Mouse, Changing the Date and Time.

Section-B

Introduction to MS Word: Menus, Shortcuts, Document types; Working with Documents: Opening Files – New & Existing, Saving Files, Formatting page and Setting Margins, Converting files to different formats- Importing, Exporting, Sending files to others, Editing text documents- Inserting, Deleting, Cut, Copy, paste, Undo, Redo, Find, Search, Replace, Using Tool bars, Ruler- Using Icons, Using help; Formatting Documents: Setting Font Styles, Setting Paragraph style, Setting Page Style, Setting Document Styles, Creating Tables, Drawing, Tools, Printing Documents.

Section-C

Introduction to MS Power Point: Opening new Presentation, Different presentation templates, Setting backgrounds, Selecting presentation layouts, Creating a presentation, Formatting a presentation-Adding style, Color, gradient fills, Arranging objects, Adding Header & Footer, Slide Background, Slide layout, Inserting pictures, movies, tables.

Section-D

Introduction to MS Excel: Introduction: Spreadsheet & its Applications, Opening spreadsheet, Menus & Toolbars & icons, Shortcuts, Working with Spreadsheets-Opening a File, Saving Files, Setting Margins, Converting files to different formats- Importing, Exporting and Sending files to others, Spreadsheet addressing, Entering and Editing Data, Computing data- Setting Formula, Finding total in a column or row, Mathematical operations, Formulas, Formatting Spreadsheets & Printing worksheet.

Section-E:

Introduction MS Access: Database concepts: Tables, Queries, Forms, Reports, Opening & Saving database files: Creating Tables, Table Design, Indexing, Entering data, Importing data, Creating Queries: SQL statements, Setting relationship, Creating Forms: GUI, Form, Creating & printing reports.

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LAB-II
PROGRAMMING LAB IN C

1. Program to find area and circumference of circle.
2. Program to find the simple interest.
3. Program to convert temperature from degree centigrade to Fahrenheit.
4. Program to calculate sum of 5 subjects & find percentage.
5. Program to show swap of two no's without using third variable.
6. Program to reverse a given number.
7. Program to print a table of any number.
8. Program to find greatest in 3 numbers.
9. Program to show the use of conditional operator.
10. Program to find that entered year is leap year or not.
11. Program to find whether given no is even or odd.
12. Program to shift inputed data by two bits to the left.
13. Program to use switch statement. Display Monday to Sunday.
14. Program to display arithmetic operator using switch case.
15. Program to display first 10 natural no & their sum.
16. Program to print Fibonacci series up to 100.
17. Program to find GCD & HCF of given Numbers using Recursion.
18. Program to find whether given no is a prime no or not.
19. Program to display sum of series 1+1/2+1/3+.....+1/n.
20. Program to display series and find sum of 1+3+5+.....+n.
21. Program to use bitwise AND operator between the two integers.
22. Program to add two number using pointer.
23. Program to find sum, subtraction, multiplication & transpose of matrices.
24. Program to reverse a number using pointer.
25. Program to show input and output of a string.
26. Program to find square of a number using functions.
27. Program to swap two numbers using functions.
28. Program to find factorial of a number using functions.
29. Program to show table of a number using functions.
30. Program to show call by value.
31. Program to show call by reference.
32. Program to find largest of two numbers using functions.
33. Program to find factorial of a number using recursion.
34. Program to find whether a string is palindrome or not.

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The break-up of marks for second Year's Practical will be as under :			
Sr. No.	Argument	Maximum Marks	Minimum Passing Marks
1.	Lab Record	15	
2.	Viva-voce	20	
3.	Program Development and Execution	40	
Total Marks		75	25

SCHEME OF EXAMINATION

Paper no.	Title of Paper/s	Maximum Marks		Maximum Marks	Minimum Passing Marks
		Theory	Practical		
1.	आधार पाठ्यक्रम–हिन्दी भाषा	75	--	75	26
2.	Foundation Course- English Language	75	--	75	26
3.	Operating System	100	--	100	33
4.	Digital Electronics and Microprocessor	100	--	100	33
5.	Computer Networks and Cyber Technology	100	--	100	33
6.	Object Oriented Programming Using C++	100	--	100	33
7.	Computer Graphics and Multimedia	100	--	100	33
8.	Lab-1 Programming Lab Using C++	--	75	75	25
9.	Lab- 2 Multimedia Lab	--	75	75	25
	Total Marks	**650**	**150**	**800**	

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LAB-I
PROGRAMMING LAB USING C++

List of Sample Problems/Experiments:

1. Write a C++ program to find the sum of individual digits of a positive integer.
2. A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1.Subsequent terms are found by adding the preceding two terms in the sequence.Write a C++ program to generate the first n terms of the sequence.
3. Write a C++ program to generate all the prime numbers between 1 and n , where n is a value supplied by the user.
4. Write C++ programs that use both recursive and non-recursive functions
   a. To find the factorial of a given integer. b. To find the GCD of two given integers.
   c. To find the nth Fibonacci number.
5. Write a C++ program that uses a recursive function for solving Towers of Hanoi problem.
6. Write a C++ program to find both the largest and smallest number in a list of integers.
7. Write a C++ program to implement the matrix ADT using a class. The operations supported by this ADT are:
   a)Reading a matrix. c) Addition of matrices.
   b)Printing a matrix. d) Subtraction of matrices.
   e)Multiplication of matrices.

Note: Practical must be as per syllabus of theoretical paper.

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LAB-II
MULTIMEDIA LAB

Series of Practical Curriculums

Photoshop:

1. (i) Handling different file formats and interchanging them, changing the resolution, color, grayscales and size of the images
(ii) Using brushes and creating multicolor real life images
2. Cropping, rotating, overlapping, superimposing, pasting photos on a page
3. Creation of a single image from selected portions of many
4. Developing a commercial brochure with background tints
5. Creating an image with multi-layers of images and texts.
6. Applying masks and filtering on images

7. CorelDRAW X4 Part 1

- Getting Started with CorelDRAW
- Starting CorelDRAW
- Working with Command Bars
- Working with Layers
- Examining a Master Page
- Creating a Master Layer
- Working with Layers
- Using Brush Tools and Adding Objects
- Working with Interactive Tools
- Using Advanced Techniques for Text Manipulation
- Working with Paragraph Text
- The PowerClip Feature and the Envelope Tool
- Creating Bulleted Lists
- Working with Vector and Bitmap Graphics
- Converting Vector Objects to Bitmaps
- Working with Bitmap Graphics
- Introduction to CorelTRACE
- Advanced Output Options
- Preparing a Document For Printing
- Other Printing Options

The break-up of marks for Fourth Year's Practical will be as under :			
Sr. No.	Argument	Maximum Marks	Minimum Passing Marks
1.	Lab Record	15	
2.	Viva-voce	20	
3.	Program Development and Execution	40	
Total Marks		75	25

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SCHEME OF EXAMINATION

Paper no.	Title of Paper/s	Maximum Marks		Maximum Marks	Minimum Passing Marks
		Theory	Practical		
1.	आधार पाठ्यक्रम–हिन्दी भाषा	75	--	75	26
2.	Foundation Course- English Language	75	--	75	26
3.	Computer Organization and Architecture	100	--	100	33
4.	Software Engineering	100	--	100	33
5.	Database Design and RDBMS (Oracle)	100	--	100	33
6.	Web Technology	100	--	100	33
7.	Numerical Analysis	100	--	100	33
8.	Lab-1 RDBMS & Web Technology	--	75	75	25
9.	Lab-2 Minor Project	--	75	75	25
	Total Marks	**650**	**150**	**800**	
	Grand Total Marks of BCA- I, II & III			**2400**	

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LAB-I
RDBMS & WEB TECHNOLOGY
Practical as per syllabi of theoretical paper.

The break-up of marks for Third Year Practical will be as under :			
Sr. No.	Argument	Maximum Marks	Minimum Passing Marks
1.	Lab Record	15	
2.	Viva-voce	20	
3.	Program Development and Execution	40	
	Total Marks	75	25

BCA PART-III
LAB-II
Minor Project

The break-up of marks for Project will be as under :			
Sr. No.	Argument	Maximum Marks	Minimum Passing Marks
1.	Project Report	25	
2.	Viva-voce/ Presentation	25	
3.	Project Execution	50	
Total Marks		100	50

SCHEME OF EXAMINATION FOR ONE YEAR DCA PROGRAMME
w.e.f. Session 2017-18

Paper No.	Title of the Paper/s	Term End Examination Maximum marks	Total Maximum Marks	Minimum Passing Marks in Term End Examination
I	Fundamentals of Computers	100	100	33
II	Windows & PC Packages	100	100	33
III	Print Technology and Desktop Publishing	100	100	33
IV	Internet and Web Technology	100	100	33
V	Programming in C	100	100	33
VI	Introduction to Operating System	100	100	33
VII	LAB-I PC Package and DTP Lab	100	100	33
VIII	LAB-II Programming in C Lab	100	100	33
		Total Marks	**800**	

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PAPER-VII
LAB-I
PC PACKAGE AND DTP LAB

Note: - Practical should cover syllabus of respected theoretical papers.

The break-up of marks for Practical will be as under :			
Sr. No.	Argument	Maximum Marks	Minimum Passing Marks
1.	Lab Record	20	
2.	Viva-voce	30	
3.	Program Development and Execution	50	
	Total Marks	100	33

PAPER-VIII
LAB-II
PROGRAMMING IN C LAB

Note: - Practical should cover syllabus of respected theoretical papers.

The break-up of marks for Practical will be as under :			
Sr. No.	Argument	Maximum Marks	Minimum Passing Marks
1.	Lab Record	20	
2.	Viva-voce	30	
3.	Program Development and Execution	50	
	Total Marks	100	33

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प्रपत्र

विषय / संकाय / प्रश्न–पत्र का नाम– **B.Com.(Computer Application)**

कमांक	कक्षा का नाम	वर्तमान पाठ्यक्रम	नवीन संशोधित पाठ्यक्रम	नवीन संशोधित पाठ्यक्रम का औचित्य
1.	1st Year	COMPUTER FUNDAMENTALS AND OFFICE AUTOMATION	COMPUTER FUNDAMENTAL	Updation Required
2.	1st Year	COMPUTERIZED FINANCIAL ACCOUNTING	PC SOFTWARE AND MULTIMEDIA	Updation Required
3.	1st Year	PRACTICAL	PRACTICAL	Updation Required
4.	2nd Year	INTERNET APPLICATION & E-COMMERCE	INTERNET APPLICATION & E-COMMERCE	No Change
5.	2nd Year	RELATIONAL DATABASE MANAGEMENT SYSTEM	RELATIONAL DATABASE MANAGEMENT SYSTEM	No Change
6.	2nd Year	PRACTICAL	PRACTICAL	No Change
7.	3rd Year	PROGRAMMING IN VISUAL BASIC	PROGRAMMING IN VISUAL BASIC	No Change
8.	3rd Year	SYSTEM ANALYSIS, DESING & MIS	SYSTEM ANALYSIS, DESING & MIS	No Change
9.	3rd Year	PRACTICAL	PRACTICAL	No Change

केन्द्रीय अध्ययन मंडल के अध्यक्ष एवं सदस्यों का हस्ताक्षर

S.N.	Name	Designation/University/College	Signature with Date
1.	Dr. Sanjay Kumar	Head, S.o.S. in Computer Science & I.T., Pt. R.S. University, Raipur	11-06-2018
2.	Mr. Hari Shankar Prasad Tonde	Head, Dept. of Computer Science, Sarguja University, Ambikapur	11-06-18
3.	Dr. Anuj Kumar Dwivedi	Head, Dept. of Computer Science, Govt. V.B.S.D. Girls College, Jashpur Nagar, Jashpur	11/6/2018
4.	Mr. L.K. Gavel	Head, Dept. of Computer Science, Govt. G.S.G. P.G. College Balod	11/06/18
5.	Dr. J. Durga Prasad Rao	Head, Dept. of Computer Science, Shri Sankracharya Mahavidyalaya, Bhilai	11/6/18

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Practical

- At least 20 Practical based on Syllabus of Paper-I and Paper-II.

11-06-2018
(Dr. Sanjay Kumar)

11/6/2018
(Dr. A.K. Dwivedi)

11/6/18
(L.K. Gavel)

11/6/18
(Dr. J. Durga Prasad Rao)

11-06-18
Hari Shankar Prasad Tandel

B. Com II year
(Computer Application)

COMPUTER APPLICATION

MARKS DISTRIBUTION

Theory Paper — Paper - I — Total Marks - 50

Paper - II — Total Marks - 50

Every unit of theory paper will consists of 10 marks.

Practical Paper — Total Marks - 50

Practical Marks Distribution :

Viva	- 10
Internal	- 15
Practical	- 25
Total Marks	- 150

Practical Test will consist of 3 Hrs.

Syllabus of B.Com.-II (Computer Application)

PAPER - I

INTERNET APPLICATION & E-COMMERCE

(Paper Code-1139)

UNIT - I Introduction to HTML

Introduction to Internet & World Wide Web

Internet - Indian and the Internet, Profile of Indian Surfer, History of the Internet, Indian Internet History, Technological Foundation of Internet, Application in Internet Environment, Movement of files/data between two computers, TCP/IP, IP Addresses, Domain Name System, Domain Name Services, allocation of second level domains in India, Internet & India.

World Wide Web (WWW) - WWW consortium browsing and Information retrieval, exploring the WWW, address : URL.

UNIT - II

Introduction to HTML & Designing Web Page

Concept to Website, Web standards, What is HTML, HTML documents / file, HTML Editor, Explanation of the structure of Homepage, Elements in HTML Documents, HTML Elements, HTML Tags & Basic HTML Tags, viewing the source of web page & downloading the web page source, Extensible HTML, CSS, XML, XSL.

HTML Document Structure - Head Section

Illustration of Document Structure, Mark-up elements within the Head : BASE, ISINDEX, LINK, META, TITLE, SCRIPT.

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11-06-2018 (Dr. A.K. Dwivedi) (L.K. Gavel) Hari Shankar Prasad Tande (Dr. J. Dayal)

UNIT - V

(a) **Security** : Management of Roles, Changing Password, Granting Roles & Privilege, with drawing privileges.

(b) **PL/SQL** : Block Structure in PL/SQL, Variable and constants, Running PL/SQL in the SQL*PLUS, Data base Access with PL/SQL, Exception Handling, Record Data type in PL/SQL, Triggers in PL/SQL.

SUGGESTED BOOKS :

1 Data base system : Korth & Siberschatz.

2 An Introduction to Data base System : C.J. Date

PAPER - III

PRACTICAL EXERCISES BASED ON PAPER I & II

Practicals to be done :

1 Creating simple Web-pages using html.

2 Designing *business web-sites* using HTML features (e.g. html forms)

[Each student should study the existing *business web-sites* and do atleast 05 exercises to create business websites using various html features]

3 Should perform various queries using SQL.

[Each student should create ER diagrams for various business scenario, and convert it into tables, using any RDBMS Software (i.e. Oracle / Access)

4 Practical using various aspects of Oracle.

[At least 10 practical-exercises covering the contents of paper-II]

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11/06/18 (C.K. Gavel)

11-06-18 Hari Chandan Prasad Pande

11/6/18 (Dr. J. Durga Prasad)

11-06-2018 (Dr. Sanjay Kumar)

UNIT-IV Introduction to MIS & Other Subsystem-

Evolution of MIS, Need of MIS, Definition & Benefits of MIS, Characteristic, Role component of Information system, data base as a future of MIS, Decision making, logic of Management Information system. Structure of MIS.

UNIT-V Information System Concept -

Difference between Transaction Processing System (TPS) and Management Information System, How MIS works, MIS and Information Resource Management, Quality information Building Blocks for the information system, information system concept, Other system characteristic (Open & Closed System), difference between MIS & Strategic System, Adaptive system, Business function information system.

BOOK REFERENCE :

1. System Analysis and Design - Elias M. Awad.
2. System Analysis and Design - Alan Dennis & Barbara Haley Wixo.
3. Management Information systems - C.S.V. Murthy, Himalaya Publication House.

PAPER - III

PRACTICAL EXERCISES BASED ON PAPER I & II

Practicals to be done -

1. At least 20 practical - exercises covering the contents of paper - I (e.g. Designing calculator, sorting of elements, Generating Fibbonacci series)
2. Design the Project on one of the following - Application Software / Website Design/ Accounting software / Inventory control System / System Software & other (e.g. Library Management System, Medical management, Stock Management, Hotel Management, Website for your institute / Website of any Organization)
3. The Project Report cover the following topic - Objective, Hardware & Software Requirements, Analysis, Design, Coding, input forms, testing, Reports, Future enhancement of s/w.
4. Practical exam is based on the Project Demonstration & report.

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- - - - - - - -

11-06-2018
(Dr. Sanjay Kumar)

11/6/18
(Dr. A.K. Dwivedi)

11/06/18
(L.K. Gauri)

11.06.18
Hari Shankar Prasad Tande

11/6/18
(Dr. J. Durga Rao)

YEAR WISE PLAN
PGDCA

S.N.	Subject Name	End Semester Examination Maximum Marks	End Semester Examination Minimum Passing Marks
1.	Fundamentals of Computer and Information Technology	100	40
2.	PC- Packages and Computerized Accounting System	100	40
3.	Data Communication and Computer Network	100	40
4.	Programming using 'C' & C++	100	40
5.	Relational Database Management System (Oracle)	100	40
6.	System Analysis & Design	100	40
7.	PC Package and Tally ERP Lab	50	17
8.	C,C++ and Oracle Lab	50	17
9.	Project	100	40

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PC Package & Tally ERP Lab

Note: Practical should be as per syllabus of theoretical papers.

C, C++ & Oracle Lab

Note: Practical should be as per syllabus of theoretical papers.

PROJECT

Note:

01. It is compulsory, that students would have group of maximum of two students and project should be done under Government sectors/ Public Sector/ Pvt. Limited S/W Company/ Software Technology park of India/ ISO 9001 certified company etc.
02. The students should not make any project under local or private institutions.
03. The students should make project themselves and project will not be copy of other project.

Steps for Live Project

01. Getting customer's requirements
02. Designs, database and business logics.
03. Developing software application project.
04. Testing and implementing the project.
05. Troubleshooting the project application after implementation.

The break-up of marks for Practical will be as under :			
Sr. No.	**Argument**	**Maximum Marks**	**Minimum Passing Marks**
1.	Lab Record	10	
2.	Viva-voce	20	
3.	Program Development & Execution	20	
Total Marks		50	17

The break-up of marks for Practical will be as under :			
Sr. No.	**Argument**	**Maximum Marks**	**Minimum Passing Marks**
1.	Project Report	25	
2.	Viva-voce/ Presentation	25	
3.	Project Execution	50	
Total Marks		100	40

PRINCIPAL

YEAR WISE PLAN
PGDCA

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9.	Project	100	40

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PC Package & Tally ERP Lab
Note: Practical should be as per syllabus of theoretical papers.

C, C++ & Oracle Lab
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The break-up of marks for Practical will be as under :			
Sr. No.	**Argument**	**Maximum Marks**	**Minimum Passing Marks**
1.	Project Report	25	
2.	Viva-voce/ Presentation	25	
3.	Project Execution	50	
Total Marks		100	40

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Books Recommonded

1. Manual of Foreign Exchange H.E Evitt.
2. A Text book on Foreign Exchange P.Einzlti.
3. Foreign Exchange Arthmtic V.V. Keshkamat.
4. Principles and Arithmetic of Foreign Exchange O.S. Ramamurty.
5. Finance of Foreign Trade and Foreign Exchange V.V.Venkatraman
6. Foreign Exchange and Introduction .V.V. Keshkamat.
7. Finance of Foreign Trade and Foreign Exchange G S. Lall.
8. Finance of Foreign trade and Foreign Exchange B.C.Ajmera.

Procedure of Internal evaluation for the students of Diploma course of Banking.

1. Internal evaluation would be a countinuous process which may take the form of graidings for class participation and home assigement Each candidate will be required to (i) Submit two howme assignment in the form of two papers concerning each subject and (ii) Participate in class discussion and seminars.On the basis of this grading the teacher concerned would prepare the subject wise award lists.
2. The Papers submitted by the students will be returned to the dodidates after evaluation .if the papers are not found upto the standard The students if he so desires, will be advised to resubmit the paper on the lines suggested by the teacher and the papers then will be finally as sessed.
3. The award list as finalised by the head of the department of commerce of the institute would be forwarded to the Universily , through the principal of the institute.ordinarily by the 31st March.
4. Distribution of marks between examination and internal assessment will be 75/25.
5. The marks of Internal assessment obtained by student will be carried over towards his subsequent examination in which he appears as ex student if he has obtained more than 48% marks in each internal evaluations.

COURSE DETAILS FOR

P/G DIPLOMA IN BUSINESS MANAGEMENT

PAPER -1	MANAGEMENT CONCEPTS AND ORGANISATIONAL BEHAVIOUR
PAPER -2	PORTFOLIO - MANAGEMENT AND TOTAL QUALITY MANAGEMENT
PAPER - 3	HUMAN RESOURCE MANAGEMENT
PAPER - 4	PRODUCTION AND OPERATION MANAGEMENT
PAPER - 5	MARKETING RESEARCH AND CONSUMER BEHAVIOUR

Students will have to visit any industry and prepare a report under the guidence of their mead of the department The "Viva-Voce" will be held immeddiately after or before the annual Examination.

A.	Theory Paper (5 Paper)	- 500 Marks
B.	Industrial visit report	- 100 Marks
C.	Viva - Voce	- 100 Marks
D.	Internal Marks for Class activities	- 100 Marks

All students have to give three internal written tests for each theory Paper Each test will Carry 25 Marks and minimum Passing Marks will be .....12 for each test. Average of best of the three written papers will be count for annual result of internal evalution

- An external examiner will be appointed to conduct the viva-voce by University.
- The report of the Industrial visit will be valued by External Examiner.

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SEMESTER SYLLABUS

M.A. GEOGRAPHY

SCHEME OF EXAMINATION & DISTRIBUTION OF MARKS

SEMESTER – I

Paper No.	Title of the Paper(s)	Internal Assessment	Term End Exam	Total Marks
1.	Geomorphology	20	80	100
2.	Climatology	20	80	100
3.	Evolution of Geographical thoughts	20	80	100
4.	Geography of India	20	80	100
Prac-1	Instrumental Survey	-	-	100
			Total	500

SEMESTER – II

Paper No.	Title of the Paper(s)	Internal Assessment	Term End Exam	Total Marks
1.	Applied Geomorphology	20	80	100
2.	Oceanography	20	80	100
3.	Geographical Methodology	20	80	100
4.	Geography of Chhattisgarh	20	80	100
Prac-1	Cartography	-	-	100
			Total	500

SEMESTER – III

Paper No.	Title of the Paper(s)	Internal Assessment	Term End Exam	Total Marks
1.	Rural Settlement Geography	20	80	100
2.	Resource Geography	20	80	100
3.	Regional Planning & Development	20	80	100
4.	Population Geography with special reference of world	20	80	100
Prac-1	Statistical Technique & field survey			100
			Total	500

SEMESTER – IV

Paper No.	Title of the Paper(s)	Internal Assessment	Term End Exam	Total Marks
1.	Population Geography with special reference of India	20	80	100
2.	Urban Geography	20	80	100
3.	Agricultural Geography	20	80	100
4.	Resource Conservation & Management	20	80	100
Prac-1	Advanced Cartography	-	-	100
			Total	500

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SEMESTER SYLLABUS

M.A. GEOGRAPHY

M.A. I SEMESTER PRACTICAL
INSTRUMENTAL SURVEY

1. surveying- importance of instrumental surveying and application -survey instruments.
2. **Prismatic Compass-**

   Method of prism pass surveying: Radiation, inter section and traverse, correction of bearing, Elimination the closing error, Bow ditch method.
3. **Plane table-**

   Plan preparation, methods of plane table surveying - radiation, inter section, traverse & resection method.
4. **Dumpy level:-**

   Meaning of the terms used in leveling Method of leveling:- simple leveling, differential leveling. Profile.
5. **Theodolite:-**Meaning of terms used in theodolite surveying, measurement of horizontal distance & vertical height, accessible and non accessible method, digital surveying equipment- Electronic Distance measurement (EDM) instruments, total station, global positioning system (GPS).

SUGGESTED READINGS-

1.. Monk house, F.J. & H.R. Wilkinson : Map and Diagrams, methouen, London.

2. Singh, L. R. : Practical Geography.

3. शर्मा, जे.पी., :प्रायोगिक भूगोल

4.चौहान, पी.आर. : प्रयोगात्मक भूगोल

5.यादव, हीरालाल, प्रायोगिक भूगोल

6.चंद्रकारपी. सर्वेक्षण विधि तंत्र, एस. शारदा पब्लिकेशन, बिलासपुर

7.SarkarAashish Practical Geography

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ATAL BIHARI VAJPAYEE VISHWAVIDYALAYA BILASPUR (C.G.)

SEMESTER SYLLABUS

M.A. GEOGRAPHY

M.A. Geography Semester I shall consist the following papers :

1. The M.A. Semester -I examination in Geography shall consist of 500 marks.
2. The theory papers shall be of three hours duration.
3. Candidates will be required to pass separately in theory and practical examination.
4. a) In the practical examination the following shall be allotment of time and marks.

i)	Practical Record	20% Marks
ii)	Survey (up to six hours)	70% Marks
iii)	Viva on i and ii	10% Marks

b) The external and internal examiners shall jointly submit marks.

c) All the candidates shall present at the time of the practical examination their practical record regularly signed by the teachers concerned.

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ATAL BIHARI VAJPAYEE VISHWAVIDYALAYA BILASPUR (C.G.)

SEMESTER SYLLABUS

M.A. GEOGRAPHY

M.A. GEOGRAPHY
SEMESTER-II

PRACTICAL

OBEJECTIVES:

To apprise the student with latest trends in the development of cartography as a tool in mapping thematic and quantitative data to facilitate spatial analysis and synthesis. To enhance the skill of the students in field of survey and to understand the basic

1. Principles of Map making & concept of Cartography
2. Topographical information: International Series, South East Asia Series, Indexing, Classification and interpretation of topographical sheets, profiles
3. Morphometric Analysis: Hypsometric curve, Altimetry cursive, Histogram, Clinograph, Slope Analysis, Wentworth's Method, smith method.
4. Graphs and diagrams: Triangular Diagram, Ergo graph. Rainfall dispersion diagram Proportional circle, Spheres and cubes diagram.
5. Map Projection construction of world map projection.

SUGGESTED READINGS-

1.. Monk house, F.J. & H.R. Wilkinson : Map and Diagrams, methouen, London.

2. Singh, L. R. : Practical Geography.

3. शर्मा, जे.पी., :प्रायोगिक भूगोल

4.चौहान, पी.आर. : प्रयोगात्मक भूगोल

5.यादव, हीरालाल,प्रायोगिक भूगोल

6.चंद्रकारपी. सर्वेक्षणविधि तंत्र, एस. शारदा पब्लिकेशन, बिलासपुर

7.सरकारआशीष, प्रायोगिकभूगोल,

M.A. Geography Semester-II shall consist the following papers :

1. The M.A. Semester - II examination in Geography shall consist of 500 marks.
2. The theory papers shall be of three hours duration.
3. Candidates will be required to pass separately in theory and practical examination.
4. a) In the practical examination the following shall be allotment of time and marks.

i)	Lab work (up to three hours)	70% Marks
ii)	Practical Record	20% Marks
iii)	Viva	10%Marks

b) The external and internal examiners shall jointly submit marks.

c) All the candidates shall present at the time of the practical examination their practical record regularly signed by the teachers concerned.

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SEMESTER SYLLABUS

M.A. GEOGRAPHY

M.A. GEOGRAPHY
SEMESTER-III

STATISTICAL TECHNIQUE AND FIELD SURVEY

1. **Statist** :Correlation, Probability, Hypothesis testing, chi test, f test meak center, Nearest neighbor Analysis
2. Project work - Micro region basis physical, socio-economic survey about project report in 50 pages
3. Excursion

SUGGESTED READINGS-

1.. Monk house, F.J. & H.R. Wilkinson : Map and Diagrams, methouen, London.
2. Singh, L. R. : Practical Geography.
3. शर्मा, जे.पी., :प्रायोमिक भूगोल
4. चौहान, पी.आर. : प्रयोगात्मक भूगोल
5. यादव, हीरालाल, प्रायोगिक भूगोल
6. चंद्रकारपी, सर्वेक्षणविधि तंत्र, एस. शारदा पब्लिकेशन, बिलासपुर
7. सरकार आशीष, प्रायोगिक भूगोल,

M.A. Geography Semester-III shall consist the following papers :

1. The M.A. Semester - III examination in Geography shall consist of 500 marks.
2. The theory papers shall be of three hours duration.
3. Candidates will be required to pass separately in theory and practical examination.
4. a) In the practical examination the following shall be allotment of time and marks.

i)	Lab work (up to two hours)	30% Marks
ii)	Project Report	40% + 10% Marks
iii)	Excursion	10 % Marks
iv)	Viva on i and III	10 % marks

b) The external and internal examiners shall jointly submit marks.

c) All the candidates shall present at the time of the practical examination their practical record regularly signed by the teachers concerned.

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SEMESTER SYLLABUS

M.A. GEOGRAPHY

M.A. GEOGRAPHY
SEMESTER - IV

ADVANCE CORTOGRAPHY

1. **Themalic maps :**
   Choropleth, Isopleth, Dot method, flow map-
2. **Geological Maps:**
   Basic definition, Interpretation Conformable series and unconformable series
3. **Remote sensing:**
   Fundamental of Remote sensing, Components of Image Interpretation
4. **GIS :**
   An overview of GIS Software, Elements of GIS
5. **Computer Cartography :**
   Advantages of computer cartography, Creation of Graphs and Maps.

SUGGESTED READING :

1- American Society of Photogrammetry : Manual of Remote Sensing, ASP, Falls Church V.A., 1983.

2- Barett E.G. and L.F. Curits : Fundamentals of Remote sensing and AIR photo Interpretation on, Memillan, New York, 1992.

3- Compbell J. : Introduction of Remote Sensing, Guilford, New York, 1989.

4- Curran, Paul J. : Principles of Remote Sensing, Longman, London 1985.

5- Burrought P.A. Principles of Geographic Information systems of Land Reson Assessment Oxford University Press, New York 1986.

6- चैनियाल, देवीदत्त रू सुदूरसंवेदन एवं भौगोलिक सूचना प्रणाली

M.A, Geography Semester-IV shall consist the following papers :

1. The M.A. Semester - IV examination in Geography shall consist of 500 marks.
2. The theory papers shall be of three hours duration.
3. Candidates will be required to pass separately in theory and practical examination.
4. a) In the practical examination the following shall be allotment of time and marks.

i)	Lab work (up to three hours) (Lab work 25% and viva 5%)	70% Marks
ii)	Practical Record	20% Marks
iii)	Viva	10% Marks

b) The external and internal examiners shall jointly submit marks.

c) All the candidates shall present at the time of the practical examination their practical record regularly signed by the teachers concerned.

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	General Insurance			

SCHEME OF EXAMINATION & DISTRIBUTION OF MARKS

महत्वपूर्ण नोटः–

1. एम.कॉम प्रथम, द्वितीय तथा तृतीय सेमेस्टर में सभी प्रश्न–पत्र अनिवार्य होंगे। उक्त परीक्षा में वैकल्पिक प्रश्न–पत्र चयन की व्यवस्था नहीं होगी।
2. एम.कॉम चतुर्थ सेमेस्टर में विशिष्टीकरण समूह (A),(B) या (C) में से किसी भी एक वैकल्पिक समूह का चयन कर उस समूह के सभी चार प्रश्न–पत्र अनिवार्य रूप से लेने होंगे।
3. एम.कॉम. चतुर्थ सेमेस्टर में उपरोक्त विशिष्टीकरण समूह के अतिरिक्त 50 अंक की मौखिक परीक्षा तथा 50 अंक का परियोजना प्रतिवेदन (अधिकतम 50 पृष्ठों का) तैयार करना अनिवार्य होगा। यह प्रतिवेदन वाणिज्य या प्रबंध विषय से संबंधित होगा।
4. सभी प्रश्न–पत्रों में लिखित परीक्षा 80 अंकों की तथा 20 अंकों की आंतरिक मूल्यांकन परीक्षा होगी।
5. आंतरिक परीक्षा एवं बाह्य परीक्षा में प्रश्न पत्रवार न्यूनतम उत्तीर्णांक 36 प्रतिशत होगा। जो विश्वविद्यालयीन अध्यादेश के प्रावधानों के अनुसार होगा।

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सेमेस्टर पाठ्यक्रम

M.Sc. ZOOLOGY

SCHEME OF EXAMINATION & DISTRIBUTION OF MARKS

SEMESTER - I

Paper No.	Title of the Paper	Marks	
		External	Internal
I	Invertebrate structure and function, Minor Phyla	80	20
II	Animal Behaviour	80	20
III	Quantitative Biology	80	20
IV	Ecology and environmental physiology	80	20
	M.Sc. Zoology Lab Course I	100	
	M.Sc. Zoology Lab Course II	100	

SEMESTER - II

Paper No.	Title of the Paper	Marks	
		External	Internal
I	General & comparative endocrinology of vertebrates	80	20
II	Gamete biology and reproductive physiology in human beings	80	20
III	Molecular cell biology	80	20
IV	Tools and techniques for biology	80	20
	M.Sc. Zoology Lab Course I	100	
	M.Sc. Zoology Lab Course II	100	

SEMESTER - III

Paper No.	Title of the Paper	Marks	
		External	Internal
I	Comparative anatomy of vertebrates	80	20
II	Biosystematics, taxonomy & biodiversity	80	20
III	Immunology and developmental biology	80	20
IV	Population genetics & evolution	80	20
	M.Sc. Zoology Lab Course I	100	
	M.Sc. Zoology Lab Course II	100	

SEMESTER - IV

Paper No	Title of Paper	Marks	
		External	Internal
I	General physiology and neurophysiology (*compulsory*)	80	20
II	Biochemistry and metabolic regulation and cell function (*compulsory*)	80	20
Optional Group-I			

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III	Fish(Ichthyology) structure and function	80	20
IV	Applied Fisheries	80	20
Optional Group-II			
III	Cell biology	80	20
IV	Cellular organization and molecular organization	80	20
Optional Group-III			
III	Entomology	80	20
IV	Applied Entomology	80	20
Optional Group-IV			
III	Wildlife conservation	80	20
IV	Environment and biodiversity conservation	80	20
	M.Sc. Zoology Lab Course I	100	
	M.Sc. Zoology Lab Course II	100	

Student has choice to opt. For any one group out of four optional groups.(Paper III and IV in semester four)

Each theory paper will have 5 questions of equal marks. First question will be compulsory encompassing all the five units without any internal choice, whereas rest questions will be unit wise with internal choice.

Internal Assessment shall comprise of two parts- Ten marks for test and ten marks for seminar/ assignment /presentation.

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SEMESTER-I
LAB-COURSE I

Time-06 Hours
Max. Marks-100

Invertebrates

1. Study of non-chordates through museum specimen
2. Study of permanent slides of non-chordates
3. Dissection of representative types (invertebrates)
4. Squilla, Mytilus, Sepia, Aplysia, Echinus

5. Mounting-

Permanent and suitable stained micro-preparation
Earthworm-nerve ring, ovary, spermathecal, nephridia
Cockroach-mouth parts , salivary glands, trachea
Prawn appendages, statocyst
Protozoan- rhizopods, flagellates and ciliates (fresh water forms) prolozoon ullase
Porifera-spicule sand gemmules of fresh water sponges
Crustaceans and rotifers
Larval forms of the free living invertebrates

Animal behaviour-

6. Experiments related to Animal Behaviour

Feeding behaviour in house fly
Life cycle of Lac insect and honey bee (chart/model/material)
Study of structural organization of the bee hive
Learning behaviour-
Conditioned and unconditioned reflex

7. Projects-

a)Visit to study the management of following->
Fish farm, dairy farm, poultry farm, sericulture and apiculture
b) Study of Invertebrate local fauna
c) Any other relevant topic

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Student should prepare a report and submit

Note-

1. Use of animal for dissection and practical work is subject to the conditions that they are not banned under the wildlife protection act
2. External features and anatomy should be studied by digital techniques and the alternatives. Wherever live animals is studies it should be either pest or colourable species without paining them

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M.Sc. ZOOLOGY

SEMESTER-I
LAB-COURSE I

Time-06 Hours
Max. Marks-100

Distribution of marks in practical exam

1. Spotting (1-10)-invertebrates	(20)
2. Mounting	(10)
3. Dissection (virtual)	(10)
4. Exercises based on behaviour (Two exercises)	(30)
5. Viva	(10)
6. Sessional	(20)
Total =	100

M.SC. SEMESTER I
LAB-COURSE II

Quantitative Biology

1. Collection methods of different types of data
2. Data analysis- tabulation
3. Different graphical and diagrammatic methods of data presentation
4. Calculation of central tendencies based on given data
5. Application of parametric and non-parametric tests
6. ANOVA
7. Study of model types
8. Exercises based on regression
9. Exercise based on correlation

Ecology and Environmental Physiology

10. Study of animals showing adaptation to different environments
11. Soil analysis physical and chemical composition of soil
12. Effect of physical exercise on blood pressure
13. Exercise based on blood glucose level
14. Carbonates and nitrates from soil sample
15. Determination of free CO_2 and salinity in pond

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M.Sc. ZOOLOGY

M.SC. SEMESTER I

LAB-COURSE II

Time-06 Hours
Max. Marks-100

Distribution of marks in practical exam

1. Exercises based on biostatics (Three)	(30)
2. Exercises based Soil and Water analysis (Two)	(20)
3. Exercises based on Physiology (Two)	(20)
4. Viva	(10)
5. Sessional	(20)
Total =	100

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1. Introduction to instrumental analysis-Robert Braun , McGraw Hill Publication
2. A biologist guide to principles and techniques of practical biochemistry-K, Wilson and K.H.Goulding EBS Edn.
3. Clark and Swizer, Experimental Biochemistry, Freeman, 2000
4. Locquin and Langeron, Handbook of Microscopy, Butterwaths, 1983
5. Boyer, Modern Experimental Biochemistry, Benjamin, 1993

SEMESTER-II
LAB-COURSE I

General & comparative endocrinology of vertebrates

1. Dissection of various endocrine glands of vertebrates (Fishes, Amphibians, Reptiles, Birds, Mammals, any available animals/ Virtual)
2. Dissection of various endocrine glands of insects (Cockroach/any other insect, any available animals/ Virtual)
3. Study of histo-pathologic slides of endocrine and related structures
   - T.S. Pituitary, T.S. of Thyroid, T.S. of Parathyroid, T.S. of Adrenal, T.S. of Testes, T.S. of Ovary, T.S. Thymus, T.S. of Kidney, T.S. of Heart, T.S. of Stomach, T.S. of Intestine
4. Effect of epinephrine on chromatophores of fishes
5. Biochemical estimation of cholesterol content in adrenal tissue, glycogen in uterine tissue
6. Microtomy-block preparation, section cutting, stretching and straining
7. Gamete biology and reproductive physiology in human beings
8. Study of Estrous cycle in mouse or rat
9. Preparation on Blastodisc of hen's egg
10. Formation of egg window in chicken egg
11. Collection of developmental stages of eggs of Lymnea or any gastropod
12. Collection of developmental stages of insects/ fishes
13. Study of development stages of frog through slides and whole mounts.
14. Study of development stages of chick through slides and whole mounts.
15. Slide preparation (earthworm ovary, amphibian, reptiles, birds and mammals testes & ovary.)

Note-

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SEMESTER-II
LAB-COURSE I

Time-06 Hours
Max. Marks-100

Distribution of marks in practical exam.

1. Dissection of Endocrine glands /virtual	(10)
2. Spotting (Endocrine glands& Embryology)	(20)
3. Cytological preparation/preparation of estrogen cycle	(10)
4. Microtomy	(20)
5. Preparation of egg window and Blastodisc	(10)
6. Viva	(10)
7. Sessional	(20)
Total =	100

SEMESTER-II
Lab-course II

Molecular cell biology
1. Study of Prokaryotic and Eukaryotic cells
2. Study of permanent slides -Mitosis, Meiosis and cell organelles
3. Temporary squash preparation to show mitosis and meiosis
4. Preparation of giant chromosomes, barr bodies
5. Histological study of cancer cells

Tools and techniques for biology
6. Use of balance Ph meter, colorimeter, centrifuge spectrophotometer, camera Lucida etc.
7. Molecular separation by Chromatography, Electrophoresis
8. Media preparation
9. Cell culture
10. Colorimetric estimation of glucose, protein, RNA, DNA
11. Absorption spectrum of any coloured solution
12. Histochemical techniques

Note-
1. Use of animal for dissection and practical work is subject to the conditions that they are not banned under the wildlife protection act

2. External features and anatomy should be studied by digital techniques and the alternatives. Wherever live animals is studies it should be either pest or culturable species without paining them

SEMESTER-II
LAB-COURSE II

Time-06 Hours
Max. Marks-100

Distribution of marks in practical exam.

1. Spotting (mitosis and meiosis, Tools & Techniques)	(20)
2. Exercise based on cell Biology	(10)
3. Chromatography	(20)
4. Colorimetric estimation	(10)
5. Application of different instruments	(10)
6. Viva	(10)
7. Sessional	(20)
Total =	100

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M.Sc. Semester III

Zoology Practical
Lab-course I

(Comparative Anatomy)

1. Dissection of animals :- Amphioxus, Scoliodon, Electric ray, Sting ray, Calotis, Bird head, Rat (Subject to availability of material) / study through alternative methods of dissection.
2. Micro preparation of suitable and available material.
3. Study of the representative examples of different classes of Chordates.
4. Study of permanent slides showing whole mount or section as per Theory syllabus, including embryological slides of Frog and Chick.
5. Osteology of Amphibia, Reptile, Bird, Mammal.
6. Study of animal diversity by field trip and excursion, Extension activity to spread health awareness. Students have to submit project report.

Biosystematics, taxonomy & Biodiversity

1. Study of biodiversity among various invertebrates and vertebrates (Listing of all the animals found in and around your house and also try to find out their Zoological names)
2. Collection of various insect species
3. Visits to a local animal park or zoo to identify and study the captive fauna and preparation of report
4. Study of adaptive characteristics of various invertebrates and vertebrates in different climate
5. Taxonomic key formation and conversion
6. Study of biodiversity in grassland and pond water by using Shannon - Weiner index .

M.Sc. Semester III

Zoology Practical

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Lab-course I

Time-06 Hours

Max. Marks-100

Distribution of marks in practical exam.

1. Dissection of Vertebrate (virtual/other method) (10)
2. Spotting 1 to 10 (20)
3. Micro preparation (10)

4. Exercises related to Taxonomy. (Three) (30)

5. Viva (10)
6. Sessional (20)

Total = 100

M.Sc. Semester III

Zoology Practical

Lab-course II

Immunology and developmental Biology

1. Dissection of Primary and secondary immune organ from mice
a. Preparation of single suspension from bone marrow
b. Cell counting and vigbility testing of the spleenocytes prepared
2. Preparation and study of phagocytosis by spleenic peritoneal macrophase.
3. Raising polyclonal antibody in mice, serum collecton and estimating antibody titre in serum by following method-
a. Ouchterlony (double diffusion) assay for antigen-antibody specificity and titre.
b. ELISA
4. Antibody purification from the serum collected from immunized mice, affinity purification chromatography
5. Blood group testing A, B ,O ,AB AND Rh factor
6. Indused Breeding in Frog
7. Culture of chick Embryo in Vitro
8. Study of chick embryos by vital staiting
9. The Technique for the whole mount preparation of chick embryo
10. Demonstration of Cell death
11. Study of Mitosis (a) Techniques for chromosomes preparation (b) Preparation of Meiotic chromosomes for Grosshopper testies (c) Auto Rediography

Population Genetics and Evolution

a. i. An experiment related to quantitative genetics, genotypic frequencies in light of hardy weinberg law
ii. ABO blood group data
b. Numeric exercise related to-
i. Natural selection
ii. Changing gene frequency
Chromosomal Polymorphism

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M.Sc. Semester III

Zoology Practical

Lab-course II

Time-06 **Hours**

Max. Marks-100

Distribution of marks in practical exam.

1. **Dissection showing primary and secondary immune organ of mice virtual / other method (10)**
2. **Exercise related to immune response** (20)
3. **Exercise related to developmental biology/ Preparation of egg window and Blastodisc (10)**
4. **Exercises related to quantitative genetics / hardy Weinberg law** **(20)**
5. **Exercise related to natural selection (10)**
6. **Viva** **(10)**
7. **Sessional** **(20)**

Total = 100

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M.Sc. ZOOLOGY

BILASPUR UNIVERSITY, BILASPUR

M.Sc. Semester IV

Zoology Practical
Lab-course I

A. Practical based on Paper I and Paper II as per Theory

1. Estimation of Protein by the Biuret, Lowry, Brad ford and Eosine-a comparasion
2. Determination of N-terminal Amino acids by the Sangers reagent (FDND)
3. Paper chromatographic separation of Amino acids
4. Quantitative estimation of Protein, carbohydrate, Mucosaccharide, Lipids and Enzyme (Bromphenol blue, PAS, Alcian blue, aldehyde fucsin, Acetylcholinestrase technique)
5. Identification of hypothalamic nuclei histological, hystochemical and Immunocytochemical method
6. Isolation and characterization of Pituitary cell
7. Estimation of MAC, MCH and MCHC
8. Total count of WBC and RBC
9. Differetial count of WBC
10. Haemoglobin estimation and PCV estimation or ESR estimation
11. Quantitative estimation of blood serum by Colorimetry (I) Blood Urea (II) Blood glucose (III) Blood Calcium (IV) Blood Creatine (V) Blood cholesterol (VI) Blood Protein (VII) Blood Albumin
12. Blood clotting time
13. ECG Recording
14. Blood Pressure estimation
15. EEG

M.Sc. Semester IV

Zoology Practical

Lab-course I

Time-06 Hours

Max. Marks-100

Distribution of marks in practical exam.

1. Estimation of Protein	(10)
2. estimations of, carbohydrate, Mucosaccharide, Lipids and Enzyme (two exercises)	(20)
3. Exercise based on histochemical and Immuno-cytochemical method	(10)
Exercises based on haematology. (two exercises)	(20)

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M.Sc. Semester IV

Zoology Practical
Lab-course II

Practical (Special Paper – Group II Cytology)

1. Examination of different cell types in Vertebrate tissue
2. Contrast Microscopy
3. Photomichrography
4. Study of permanent cytological preparation
5. Squash preparation of chromosomes and preparing karyotype
6. Preparation of Giant Chromosomes and demonstration of puffs
7. Golgi material and Mitochondrial preparation
8. Demonstration of Barr body and drum stick
9. Histochemical demonstration of RNA DNA phospholipid and enzyme
10. Microbial culture media preparation and microbial growth
11. Molecular separation by chromatography and Electrophorasis

M.Sc. Semester IV

Zoology Practical

Lab-course II **Hours**
Time-06
Max. Marks-100

Distribution of marks in practical exam.

1. Spotting (1to 10) (20)
2. Exercise based on cytological preparation (10)
3. Exercise based on histochemical preparation (10)
4. Molecular separation by chromatography and Electrophorasis (20)
5. Exercise based on microbiology/ karyotype study (10)

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6. Viva	(10)
7. Sessional	(20)

Total = 100

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M.Sc. Semester IV

Zoology Practical
Lab-course II

Practical (Special Paper – Group III Entomology)

1. Collection, Preservationand classification of the insects of order :- Thysaneura, Collembola, Orthoptera, Hemiptera, Lepidoptera, Mallophaga, Diptera, Hymenoptera and Coleoptera
2. Dissectionof Grasshopper, Cockroach, Cricket, wasp, and honey bee, with special reference to their Nervous system, Salivary gland, Endocrine gland, Sting apparatus, of honey bee, reproductive organs of Grasshopper and cockroach.
3. Whole mounts of small insects eg Collembola, Thysaneura, bedbug, louse, stored grain pests
4. Whole mount of different types of legs, antennae, wings, mouth parts, salivary glands and scales
5. Microtomy of Insect materials
6. Simple experiment on Insect Physiology
7. Identification of common insect pests
8. Collection of life cycle of the pest of any economic crop

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M.Sc. Semester IV

Zoology Practical

Lab-course II

Time-06

Max. Marks-100

Distribution of marks in practical exam.

		Hours
1. Dissection of Available insect pests /Virtual		(10)
2. Spotting (1 to 10)	(20)	
3. Micropreparation	(10)	
4. Experiment based on insect physiology (10)		
5. Identification of common insect pests		(10)
6. Project Report and field visit		(10)
7. Viva	(10)	
8. Sessional	(20)	

Total = 100

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M.Sc. Semester IV

Zoology Practical

Lab-course II

Exercises based on paper III – Wild life conservation

Exercises based on paper IV - Environment and biodiversity conservation

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M.Sc. Semester IV

Zoology Practical

Lab-course II

Time-06

Max. Marks-100

Distribution of marks in practical exam.

		Hours
1. paper III – Wild life conservation		(35)
2. Environment and biodiversity conservation		(35)
3. Viva	(10)	

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SEMESTER-I
LAB-COURSE I

Time-06 Hours
Max. Marks-100

Invertebrates

1. Study of non-chordates through museum specimen
2. Study of permanent slides of non-chordates
3. Dissection of representative types (invertebrates)
4. Squilla, Mytilus, Sepia, Aplysia, Echinus

5. Mounting-

Permanent and suitable stained micro-preparation
Earthworm-nerve ring, ovary, spermathecal, nephridia
Cockroach-mouth parts , salivary glands, trachea
Prawn appendages, statocyst
Protozoan- rhizopods, flagellates and ciliates (fresh water forms) prolozoon ullase
Porifera-spicule sand gemmules of fresh water sponges
Crustaceans and rotifers
Larval forms of the free living invertebrates

Animal behaviour-

6. Experiments related to Animal Behaviour

Feeding behaviour in house fly
Life cycle of Lac insect and honey bee (chart/model/material)
Study of structural organization of the bee hive
Learning behaviour-
Conditioned and unconditioned reflex

7. Projects-

a)Visit to study the management of following->
Fish farm, dairy farm, poultry farm, sericulture and apiculture
b) Study of Invertebrate local fauna
c) Any other relevant topic

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Student should prepare a report and submit

Note-

1. Use of animal for dissection and practical work is subject to the conditions that they are not banned under the wildlife protection act
2. External features and anatomy should be studied by digital techniques and the alternatives. Wherever live animals is studies it should be either pest or colourable species without paining them

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SEMESTER SYLLABUS
M.Sc. MICROBIOLOGY

Scheme and Courses of Studies

SEM.	COURSES		MARKS		
	Paper	Title of the Paper	Paper wise	Internal Assessment	Univ. Exam. Marks*
First	First (MB-101)	General Microbiology and Bacterology	100	20	80
	Second (MB-102)	Virology	100	20	80
	Third (MB-103)	Phycology, Mycology and Proto-zoology	100	20	80
	Fourth (MB-104)	Biochemistry	100	20	80
	Lab. Course-	Concern with paper - I & II	100	Sessional	100
	Lab. Course-	Concern with paper - III & IV	100	Sessional	100
Second	First (MB-201)	Bioinstrumentation & Biochemical techniques	100	20	80
	Second (MB-202)	Cell biology and Microbial physiology	100	20	80
	Third (MB-203)	Microbial genetics and Molecular Biology	100	20	80
	Fourth (MB-204)	Environmental & Agriculture Microbiology	100	20	80
	Lab. Course-	Concern with paper - I & II	100	Sessional	100
	Lab. Course-	Concern with paper - III & IV	100	Sessional	100
Third	First (MB-301)	Immunology	100	20	80
	Second (MB-302)	Medical & Veterinary Microbiology	100	20	80
	Third (MB-303)	Biostatics & Bioinformatics	100	20	80
	Fourth (MB-304)	Enzymology and Industrial Microbiology	100	20	80
	Lab. Course-301	Concern with paper - I & II	100	Sessional	100
	Lab. Course-302	Concern with paper - III & IV	100	Sessional	100
Fourth	First (MB-401)	Plant pathology & Disease management	100	20	80
	Second (MB-402)	Food Microbiology	100	20	80
	Third (MB-403)	Microbial ecology & Forest microbiology	100	20	80
	Lab. Course-402	Project work (minor) at local level OR PROJECT WORK **(External)		Project Report-	60
	Fourth (MB-404)	Computer Fundamentals and Research	100	20	80

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FIRST SEMESTER
Lab Course - 101
(GENERAL MICROBIOLOGY, BACTERIOLOGY AND VIROLOGY)

Total Marks: 100
Internal assessment Marks: 20
Term end Exam Marks: 80

1. **Preparation of Glassware:** Various techniques of cleaning (discarding & washing) and sterilization of glassware for microbiological laboratory.
2. **Preparation of Culture Media:** Different types of nutrient media as per nutritional need, dehydrated, selective and differential media for autotrophic & heterotrophic microbes.
3. **Pure culture Techniques:** Preparation of slants, stab culture, sub-culturing, types of streaking.
4. **Staining Techniques:** Gram Staining, negative staining, acid-fast staining, endospore, capsule.
5. **Isolation, Identification and characterization of bacteria:** Cultural characteristics of bacteria (autotrophic & heterotrophic), using selective and differential media. Growth on NA, Blood agar, Chocolate agar, DCA, Maconkey's, EMB and Sabouraud's agar. Study of nutritional needs of bacterial growth (growth in the presence of different carbon source, N source).
6. **Biochemical tests for identification of bacteria:** IMViC, catalase, oxidase, mannitol motility test, gelatin test, urease, TSI test, coagulase, nitrate reduction. Production of acid and gas from glucose, arabinose, inositol, lactose, maltose, mannitol, rhamnose, sucrose, xylose, fructose, starch hydrolysis, casein hydrolysis, assessment of effect of metals on microbial growth.
7. **Determination of growth of bacteria:** Growth curve and generation time.
8. **Pathological examination:** Plant diseases caused by Viruses as mentioned in course of studies (a case study of any one disease).

Scheme of examination:

Lab performances	60 marks	
Spotting	20 marks	
Internal assessment -		
Oral evaluation	10 marks	
Sessional	10 marks	
Total	100 marks	Provided period- 06 hr.

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SEMESTER SYLLABUS
M.Sc. MICROBIOLOGY

FIRST SEMESTER
Lab. Course - 102
(PHYCOLOGY, MYCOLOGY, PROTOZOLOGY AND BIOCHEMISTRY)

Total Marks: 100
Internal assessment Marks: 20
Term end Exam Marks: 80

1. Isolation and identification of algae from soil and water. Isolation and identification of cyanobacteria, extraction and separation of algal pigments.
2. Isolation and identification of fungi from different substrates (saprophytic, parasitic, coprophilous, keratinophilic).
3. Study of environmental requirements of fungi (pH, temperature) by linear growth and biomass.
4. Assessment of the effect of antifungal agents (antibiotics/ chemicals/plant extracts) on isolated fungal samples.
5. Extraction and separation of amino acid and mycotoxin (aflatoxins) by paper chromatography.
6. Identification and characterization of protozoans as mentioned in course studies. Case study of any one disease.
7. Pathological examination. Human diseases caused by protozoans as mentioned in course studies (a case study of any one disease).
8. Colorimetric/ spectrophotometric estimations of proteins, pigments, DNA/RNA and sugars.
9. Study of enzyme kinetics and enzyme activity. Isolation of amylase producing microorganisms from the environment; estimation of amylase activity and determining its Km and Vmax; effect of environmental conditions (temperature, pH and substrate concentration) on the activity of amylase.
10. Estimation of enzyme activity: Phosphatase and catalase.
11. Separation of isolated phospholipids by thin layer chromatography and hemoglobin by gel filtrations.

Scheme of Examination:		
Lab performances	60 marks	
Spotting	20 marks	
Internal assessment: -		
Oral evaluation	10 marks	
Sessional	10 marks	
Total	100 marks	Provided period- 06 hrs

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SEMESTER SYLLABUS
M.Sc. MICROBIOLOGY

SECOND SEMESTER
Lab. Course - 201

(BIOINSTRUMENTATION, BIOCHEMICAL TECHNIQUES, CELL BIOLOGY AND MICROBIAL PHYSIOLOGY)

Total Marks: 100
Internal assessment Marks: 20
Term end Exam Marks: 80

1. Studies on pH titration curves of amino acids/ acetic acid and determination of pKa values and Handerson-Hasselbach equation.
2. Separation of bacterial lipids/amino acids/ sugars/organic acids by TLC or paper chromatography.
3. Separation of serum proteins by [illegible] gel electrophoresis.
4. Paper electrophoresis and separation of [illegible] or blue dextran by gel filtration.
5. Separation of bacterial DNA by agarose gel electrophoresis.
6. Preparation of mitotic plate by carmine squashing method and phase identification.
7. Preparation of Karyotype of metaphase plate.
8. Preparation of Meiotic plate and determination of phases.
9. Computation of Chaisma frequency and determination of phases
10. Micrometry and Camera lucida drawings
11. Isolation and cultivation of autotrophic microbes.
12. To study the effect of salt concentration on bacterial growth by turbidometry method.
13. Determination of thermal death point (TDP) of an organism.
14. UV absorption of proteins, DNA and RNA.

Scheme of Examination:

Lab performances	60 marks	
Spotting	20 marks	
Internal Assessment		
Oral evaluation	10 marks	
Sessional	10 marks	
Total	100 marks	Provided period- 06 hrs

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SEMESTER SYLLABUS
M.Sc. MICROBIOLOGY

SECOND SEMESTER

Lab. Course - 202

(MICROBIAL GENETICS, MOLECULAR BIOLOGY, ENVIRONMENTAL MICROBIOLOGY & AGRICULTURE MICROBIOLOGY)

Total Marks: 100
Internal assessment Marks: 20
Term end Exam Marks: 80

1. Transformation of *E. Coli*, preparation of competent cells.
2. Conjugation in *E.coli* by using plate method.
3. Isolation of plasmid DNA from *E.coli*.
4. Isolation of DNA from plant cell (Onion/ Mustard).
5. Isolation of microorganisms from different habitats, soil, water and air.
6. Potability test/potability of water (MPN and HS).
7. Physical, chemical and microbial analysis of water: pH, COD, BOD, total and dissolved solids.
8. Study of different types of microbial air samplers/ air sampling devices.
9. Study of microbial contamination of industrial products and of fabrics.
10. Production of ammonia from organic compounds (ammonification).
11. Bioconversion of ammonia to nitrate (nitrification).
12. Determination of phenol coefficient.
13. Characterization of different cells for detection of various microbial enzymes: amylase, lipase, protease and cellulase.
14. Microbiological examination of cyanobacteria, separation and determination of cyanobacterial pigments.

Scheme of examination

Lab performances	60 marks	
Spotting	20 marks	
Internal Assessment:		
Oral evaluation	10 marks	
Sessional	10 marks	
Total	100 marks	Provided period: 06 hrs

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SEMESTER SYLLABUS
M.Sc. MICROBIOLOGY

THIRD SEMESTER
Lab. Course – 301
(IMMUNOLOGY, MEDICAL AND VETERINARY MICROBIOLOGY)

Total Marks: 100
Internal assessment Marks: 20
Term end Exam Marks: 80

1. Determination of Blood groups and Rh typing.
2. Widal (slide) test for Typhoid by antigen- antibody reaction.
3. Pregnancy testing through commercially available method.
4. Rheumatoid Arthritis test (RA) by antigen- antibody reaction.
5. RPR (Rapid Plasma Reagin) test for syphilis.
6. Detection of specific antigen by using ELISA technique.
7. Separation and characterization of lymphocytes from blood and demonstration of lymphocytes Population.
8. Study of antigen and antibody reaction by immuno-diffusion.
9. Different staining techniques Acid fast staining, Giesma staining and Leishmann staining.
10. Special staining methods for [illegible] granules, capsule and spores.
11. Isolation of pathogen from [illegible], blood and urine.
12. Isolation and identification of [illegible] pathogenic bacteria and fungi:

Bacteria: *Staphylococcus aureus*, *Escherichia coli*, *Proteus vulgaris*, *Proteus mirabilis*, *Salmonella typhi*, *Salmonella paratyphi*, *Shigella dysenteriae* and *Shigella felexneri*.

Fungi: *Candida albicans*, *Microsporum* and *Trichophyton*.

13. Antibiotic sensitivity testing by disc diffusion method.

Scheme of examination

Lab performances	60 marks	
Spotting	20 marks	
Internal Assessment:		
Oral evaluation	10 marks	
Sessional	10 marks	
Total	100 marks	Provided period- 06 hrs

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SEMESTER SYLLABUS
M.Sc. MICROBIOLOGY

THIRD SEMESTER
Lab. Course - 302
(BIOSTATISTICS, BIOINFORMATICS, ENZYMOLOGY AND INDUSTRIAL MICROBIOLOGY)

Total Marks: 100
Internal assessment Marks: 20
Term end Exam Marks: 80

1. Determination of Statistical averages / Central Tendencies: a) Arithmetic mean b) Median c) Mode.
2. Determination of measures of dispersion a) Mean Deviation b) Standard Deviation c) Standard Error d) Coefficient of Variation.
3. Test of significance – Application of a) Chi-Square test b) T-test c) ANOVA
4. Studies of public domain, databases for nucleic acid and protein sequences and determination of Protein structure, Protein Data Base (PDB), genome sequence analysis.
5. Determination of Kinetic constant of Amylase activity, Vmax, Km.
6. Effect of pH and Temperature on Amylase activity.
7. Effect of inhibitor on Amylase activity.
8. Determination of Proteins, DNA and RNA concentration by Spectrophotometer.
9. Production of Protease by microorganism.
10. Demonstration of production of Ethanol by Yeast.
11. Isolation of antibiotic producing microorganism from soil.

Scheme of examination

Lab performances	60 marks	
Spotting	20 marks	
Internal Assessment:		
Oral evaluation	10 marks	
Sessional	10 marks	
Total	100 marks	Provided period- 06 hrs

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SEMESTER SYLLABUS

M.Sc. MICROBIOLOGY

Scheme and Courses of Studies

SEM.	Paper	COURSES: Title of the Paper		MARKS: Paper wise	Internal Assessment	Univ. Exam. Marks*
First	First (MB-101)	General Microbiology and Bacteriology		100	20	80
	Second (MB-102)	Virology		100	20	80
	Third (MB-103)	Phycology, Mycology and Proto-zoology		100	20	80
	Fourth (MB-104)	Biochemistry		100	20	80
	Lab. Course-101	Concern with paper - I & II		100	Sessional	100
	Lab. Course-102	Concern with paper - III & IV		100	Sessional	100
Second	First (MB-201)	Bioinstrumentation & Biochemical techniques		100	20	80
	Second (MB-202)	Cell biology and Microbial physiology		100	20	80
	Third (MB-203)	Microbial genetics and Molecular Biology		100	20	80
	Fourth (MB-204)	Environmental & Agriculture Microbiology		100	20	80
	Lab. Course-201	Concern with paper - I & II		100	Sessional	100
	Lab. Course-202	Concern with paper - III & IV		100	Sessional	100
Third	First (MB-301)	Immunology		100	20	80
	Second (MB-302)	Medical & Veterinary Microbiology		100	20	80
	Third (MB-303)	Biostatics & Bioinformatics		100	20	80
	Fourth (MB-304)	Enzymology and Industrial Microbiology		100	20	80
	Lab. Course-301	Concern with paper - I & II		100	Sessional	100
	Lab. Course-302	Concern with paper - III & IV		100	Sessional	100
Fourth	First (MB-401)	Plant pathology & Disease management		100	20	80
	Second (MB-402)	Food Microbiology		100	20	80
	Third (MB-403)	Microbial ecology & Forest microbiology		100	20	80
	Lab. Course-402	Project work (minor) at local level	OR PROJECT WORK **(External)		Project Report-	60
	Fourth (MB-404)	Computer Fundamentals and Research		100	20	80

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SEMESTER SYLLABUS

M.Sc. BOTANY

SCHEME OF EXAMINATION & DISTRIBUTION OF MARKS

SEMESTER - I

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Biology & Diversity of Virus Bacteria & Fungi	Theory	20	80	100
2.	Biology &Diversity Of Algae, Bryophytes And Pteridophytes	Theory	20	80	100
3.	Cell And Molecular Biology of Plants	Theory	20	80	100
4.	Taxonomy Of Angiosperms	Theory	20	80	100
Lab-1	Based On Paper I&II	Practical	-	-	100
Lab-2	Based On Paper III&IV	Practical	-	-	100
				Total	**600**

SEMESTER - II

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Cytology ,Genetics And Cytogenetics	Theory	20	80	100
2.	Biology & Diversity Of Gymnosperm species	Theory	20	80	100
3.	Plant Physiology	Theory	20	80	100
4.	Plant Biochemistry And Bioenergetics	Theory	20	80	100
Lab-1	Based On Paper I&II	Practical	-	-	100
Lab-2	Based On Paper III&IV	Practical	-	-	100
				Total	**600**

SEMESTER - III

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Plant Development	Theory	20	80	100
2.	Plant Reproduction	Theory	20	80	100
3.	Plant Ecology	Theory	20	80	100
4.	Elective Paper (A) Plant Pathology - I (B) Weed Biology- I	Theory	20	80	100
Lab-1	Based On Paper I&II	Practical	-	-	100
Lab-2	Based On Paper III&IV	Practical	-	-	100
				Total	**600**

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SEMESTER SYLLABUS

M.Sc. BOTANY

SEMESTER - IV

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Plant cell, Tissue and organ culture	Theory	20	80	100
2.	Plant Resource Utilization And Conservation	Theory	20	80	100
3.	Genetic Engineering Of Plant And Microbes &Biostatics	Theory	20	80	100
4.	Elective Paper (A) Plant Pathology –II (B) Weed Biology- II	Theory	20	80	100
Lab-1	Based On Paper I&II	Practical	-	-	100
Lab-2	Based On Paper III&IV	Practical	-	-	100
				Total	600
				GRAND TOTAL	2400

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SEMESTER- I
PAPER - IV
TAXONOMY OF ANGIOSPERMS

UNIT -1

Origin of Intra- Population Variation: Population & the environment, ecads & ecotypes, evolution & differentiation of species – various models.

The Species Concept: Taxonomic hierarchy ,species ,genus family & other categories , principles used in assessing relationship ,delimitations of taxa & attribution of rank salient feature of the international code of botanical nomenclature and salient features of Melbourne code

UNIT -2

Taxonomic Evidence: Morphology, anatomy, embryology, cytology, photochemistry, genome analysis & nucleic acid hybridization.

Taxonomy Tools: Herbarium, floras, histological photochemical cytology serological biochemical & molecular techniques, computers & GIS.

UNIT -3

System of Angiosperm Classification: Phonetic versus phylogenetic systems, cladistics taxonomy, relative merits & demerits of major system of classification; relevance of taxonomy to conservation, sustainable utilization of bio resource & ecosystem research.

UNIT -4

Concept of Phytogeography: Endemism, hot spots and hottest hot spots, plant exploration, invasion & introduction, local plant diversity and its socio-economic importance.

Suggested Readings:

1. Gole, A.J. ((1969) Numerical Taxonomy. academic Press London.
2. Devis ,P. H. And Heywood, V.H (1973) Principle of Angiosperm Taxonomy .Robert E. Kreiger .Pub. Co. New York.
3. Grant, V. (1971) plant Speciation .Columbia Univ.Press, New York.
4. Grant, W.F. (1984) Plant Biosystematics .Academic Press. London.
5. Heslop- Harrison, J/ (1976) Plant Taxonomy .English Language Book Assoc .and Edward Pub. Ltd. U.K.
6. Stace ,C.A. (1989)Plant Taxonomy and Biosystematic Edward Arnold Ltd.London .
7. Takhtajan, A.L. (1997) Diversity and classification of flowering plant Columbiauniv.Press.New York.
8. Woodland, D.W. (1991) Contemporary Plant Systematic. Prentice Hall new Jersey.
9. Sharma, A.K. and Sharma, R.(2007) Taxonomy .PragatiPrakashan Meerut.

Suggested Laboratory Exercise:

1. Description of specimen from representative locally available families .

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2. Description of species based on various specimen to study Intraspecific various variation ,a collective exercise.
3. Field trip within and around the campus, comppation of field notes and preparation of herbarium sheets of such plant wild or cultivated as are abundant .
4. Training in using floras and herbaria for identification of Specimen described in the class.
5. Comparison of different species of genus and different genera of a family to Calculate Similarity Coefficient and Preparation of Dendrograms
6. Demonstration of the Utility of Secondary metabolites in the taxonomy of some appropriated genera.
7. Description of various species of a genus, study of key characters and preparation of keys at generic level.
8. Location of keys and use of key at family level

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Suggested Laboratory Exercise:

1. Demonstration of plasmolysis and deplasmolysis in plant cell .
2. Demonstration of transpiration.
3. Measurement of transpiration rate photometer.
4. Study of inter-relationship between transpiration and absorption and by T/A apparatus.
5. Extraction of chloroplast pigment from green leaves.
6. Separation of chloroplast pigment through paper chromatography.
7. Separation of chloroplast pigment through solvent method.
8. Preparation of absorption spectrum of chlorophyll -a
9. Determination of chlorophyll a/ chlorophyll-b ratio in C_3 and C_4 plants.
10. Extraction of seed proteins depending upon solubility.
11. Fractionation of proteins using gel filtration chromatography using sephadex G-100 or sephadex G-200 .
12. Principal of colorimetry spectrometry and fluorimerty

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4. Kumar , H.D. (1986) Modern Concept of Ecology . Vikas Publishing House Privet Ltd New Delhi .
5. Hill M.K.(1997) Understanding Environmental Pollution . Cambridge Uni. Press, , Cambridge UK.
6. Odum ,E.P. (1971) Fundamental of Ecology .,Saunders ,Philadelphia .
7. Odum ,E.P. (1983) Basic Ecology .,Saunders ,Philadelphia
8.

Suggested Laboratory Exercise

1. To calculate mean , variance ,standard deviation ,standard error ,coefficient of variation and use of t-test for comparing ecological data .
2. To determine minimum size and number of quadrates required for reliable estimate of biomass in Grassland ecosystem.
3. To study of frequency, abundance and density of dominant plants in the local ecosystem by quadrate method.
4. To determine gross and net productivity by light and dark bottle method.
5. To determine soil moisture content, porosity and bulk density of soil collected from different location.
6. To determine percent organic carbon and organic matter in soil of grass land cropland and forests.
7. To determine the water holding capacity of various soil.

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SEMESTER-IV

PAPER I

PLANT CELL, TUSSE AND ORGAN CULTURE

UNIT -1

Biotechnology: Basic concept, principal and scope

Plant cell And Tissue Culture: General introduction, history, scope, concept of cellular differentiation, tot potency.

UNIT -2

Organogenesis and Adventive Embryogenesis: Fundamental aspects morphogenesis somatic embryogenesis and androgenizes, mechanism, techniques and utility.

Somatic Hybridization: Protoplast isolation fusion and culture hybrid selection and regeneration, possibilities achievements and limitations of protoplast research.

UNIT -3

Application of Plant Tissue Culture: Clonal propagation, artificial seed, production of hybrids and soma clones and production of secondary metabolites /natural products, cryopreservation and germ plasma storage.

UNIT -4

Biostatistics: Definition and importance of Biostatistics scope, Measurement of central tendencies –mean mode and median.

Suggested Reading :

1. Bhojwani, S.S. and Razdan ,N.K. (1996) plant Tissue Culture : Theory and Practice Elservier Science Publishers New York ,USA.
2. Collin H.A. and Edwards ,S. (1998) plant cell Culture Bios .Scientific Publishers Oxford ,U.K.
3. Kartha ,K.K. (1985) Cryopreservation of plant cells and Organs CRC Press ,Boca Raton ,Florida USA.
4. Vasil, I.K. and Thorbe ,T.A.(1994) Plant cell and tissue culture . Kluwer Academic Publishers ,Netherlands.
5. Smith R.H. (200) Plant Tissue Culture : Techniques and Experiment ,Academic Ness ,New York.

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Suggested Laboratory Exercise :

1. Preparation of Tissue culture (ms) medium .
2. Study technique s of tissue culture : sterilization of glass wares and plant materials transfer of explants on culture media ,incubation .
3. Isolation of plant protoplast by mechanical and enzymatic method.
4. Counting of protoplast in the suspension by haemocytometer method.

5. Effect of physical (example, temperature) and chemical (e.g. osmoticum) .factors on protoplast yield .
6. Demonstration of protoplast fusion employing PEG.
7. Initiation of organogenesis and embryogenesis using appropriate explants.

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Suggested Laboratory Exercise

1. Preparation of liquid and solid culture media for bacteria culture.
2. Study of growth characteristics of E .coli using plating and turbido metric method.
3. Isolation of total DNA from E. Coli by lysozyme lysis method and its quantification by spectrophotometric method .
4. Isolation of plasmid DNA from E. Coli by alkaline lysis method and its quantification by spectrophotometric method.
5. Restriction digestion of plasmid and genomic DNA and estimation of size of various DNA fragments.
6. Isolation of Rhizobium from root nodules of leguminous plants
7. Isolation of Agrobacterium tumifaciens form tumours of dicot plants.

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SEMESTER SYLLABUS

M.Sc. BOTANY

SEMESTER-IV

PAPER IV

ELECTIVE –I (B)

WEED BIOLOGY

UNIT -1

Germination, Establishment and Growth – Light Requirement for germination, Seedlongevity AndMortality. Pattern of emergence, The Safe -Site Concept.

UNIT -2

Management of Weeds- Type of weed control: Prevention, Suppression and Eradication; physical, chemical and Biological control of weeds .concept of Integrated Weed Management

UNIT -3

Classification of Herbicides Selective and non selective herbicides, contact and Trans located herbicides. Mode of Action of Herbicides. Application method of Herbicides and Precautions.

UNIT -4

Chemistry of some importance herbicides: Phenoxy acid as 2, 4-D, Pendimethalin Butachlor and Nitro fen. Critical Period for weed control,Aquatic weed management .Plant Environment and Herbicides interactions. Weed Thresholds and management.

PRACTICALS –

Exercises involving

- The study of different factors of the percentage germination of some important weed seeds.
- Measurement of seedling growth of weed plant.
- Study of a weed plant using different growth parameters.
- Measurement of effect of density on Mortality of a weed plant.
- Measurement of effect of density on competition.
- Calculation of Competition Index.

Suggested Books –

1. V.S. Rao , Principles of Weed Science – Oxford & IBH Publishing Pvt. Co. Ltd. New Delhi
2. O. P. Gupta, Modern Weed Management – AgrobiosIndia, Jodhpur.
3. N.C. Joshi, Researchco Publication Delhi.
4. Ashton &Crafts, Mode of Action of Herbicides – Wiley Interscience Publication New York.
5. U.S. Shree Ramulu –Chemistry of Herbicides – Oxford & IBH Publishing Co. Ltd. New Delhi.
6. Majid, F.Z. Aquatic Weed: Utility and Development .Agrobotanica, Bikaner, India.

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SEMESTER SYLLABUS

M.Sc. CHEMISTRY

SCHEME OF EXAMINATION & DISTRIBUTION OF MARKS

SEMESTER - I

Paper No.	Title of the Paper (s)	Internal Assessment	Term End Exam	Practical	Total Marks
1.	Inorganic Chemistry	20	80		100
2.	Organic Chemistry, Stereochemistry & Pericyclic Reaction	20	80		100
3.	Physical Chemistry- I	20	80		100
4.	Spectroscopy And Mathematics/Biology For Chemists	20	80		100
LAB-I	Organic Chemistry				100
LAB-II	Analytical Chemistry				100
				TOTAL	600

SEMESTER - II

Paper No.	Title of the Paper (s)	Internal Assessment	Term End Exam	Practical	Total Marks
1.	Inorganic Chemistry	20	80		100
2.	Organic Chemistry	20	80		100
3.	Physical Chemistry	20	80		100
4.	Spectroscopy, Diffraction Methods & Computer For Chemists	20	80		100
LAB-I	Inorganic Chemistry				100
LAB-II	Physical Chemistry				100
				TOTAL	600

SEMESTER - III

Paper No.	Title of the Paper (s)	Internal Assessment	Term End Exam	Practical	Total Marks
COMPULSORY FOR GROUP A, B & C					
1.	Applications Of Spectroscopy	20	80		100
2.	Chemistry Of Bio-Inorganic & Bio-Organic	20	80		100
LAB-I	General (Compulsory)			200	200
OPTIONAL GROUP-A INORGANIC					
3.	Organotrasition Metal Chemistry	20	80		100
4.	Photo inorganic Chemistry	20	80		100
OPTIONAL GROUP- B ORGANIC					
3.	Physical Organic Chemistry	20	80		100
4.	Chemistry Of Heterocyclic Compounds	20	80		100
OPTIONAL GROUP-C PHYSICAL					
3.	Chemistry Of Materials	20	80		100
4.	Advanced Quantum Chemistry	20	80		100
				TOTAL	600

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SEMESTER - IV

Paper No.	Title of the Paper (s)	Internal Assessment	Term End Exam	Practical	Total Marks
COMPULSORY FOR GROUP A, B & C					
1.	Photochemistry & Solid State Chemistry	20	80		100
2.	Bio-Physical & Environmental Chemistry	20	80		100
OPTIONAL GROUP-A INORGANIC					
3.	Bioinorganic Chemistry & Supra-Molecular Chemistry	20	80		100
4.	Analytical Chemistry	20	80		100
LAB-I	Special			200	200
OPTIONAL GROUP- B ORGANIC					
3.	Medicinal Chemistry	20	80		100
4.	Chemistry Of Natural Product	20	80		100
LAB-II	Special			200	200
OPTIONAL GROUP-C PHYSICAL					
3.	Liquid States	20	80		100
4.	Computation Chemistry	20	80		100
LAB-I	Special			200	200
				TOTAL	600
				GRAND TOTAL	2400

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SEMESTER I
LABORATORY COURSE - I
ORGANIC CHEMISTRY

1. **Qualitative Analysis:-**
   Separation, Purification and Identification of compounds of Binary Mixture, T.L.C. and Column chromatography. I.R. Spectra may be used for functional group identification of compound by suitable derivatives preparation and determination of their melting points.
2. **Organic Synthesis:-**
   1. Bromination - Prepration of p-Bromo Aniline from Acetanilide.
   2. Nitration - Prepration of p-Nitro Aniline from Acetanilide
   3. Hoffman Bromide Reaction. Prepration of Anthranilic Acid from Pthallic anhydride.
   4. Aldol Condensation - Dibenzal acetone from Bazaldelyde.
   5. Sandmeyer Reaction -
      - o-Chloro Benzoic Acid from Anthranilic Acid.
      - p- Chloro toluene from Toludine.
   6. Friedal Craft Reaction - □ -Benzoyl.Propionic Acid from Succinic Anhydride and Benzene.
   7. Oxidation - Adipic Acid by Chromic Acid oxidation of cyclohexanol.
   7. Diazotization:-
      - Preparation of methyl orange from Sulphanilic Acid.
      - Phenyl Azo- □. Naphthol from Aniline.
   8. Preparation of Acridone from N- Phenyl anthranilic acid.
   9. Grignard's reaction: Synthesis of tripheny lmethanol from Benzoic acid.

   Note: Two stage preparation. Preparation of pure and crystalline compound based on any two of above principals with conformation of melting point.
3. **Quantitative Analysis:-**
   1. Determination of the percentage or number of Hydroxyl group in an organic compound by Acetylation method.
   2. Estimation of Amines/Phenols using Bromate - Bromide Solution / or Acetylation method.
   3. Determination of equivalent- weight of carboxylic compound.
   4. Estimation of carboxyl group by tritration / silver salt-method.
   5. Estimation of Carbonyl group by Hydrazone method.
   6. Estimation of Glycine by titration.

Instruction to Practical Examiners in Chemistry Semester –I

1. The Board of Examiners; one external and one internal for each branch will meet to decide the exercises and other matter in connection with the conduct of practical examinations

S. No.	Lab. Course (branch)	Max. Marks	Duration
1.	I- Organic Chemistry	100	5 hrs.
2.	II- Analytical Chemistry	100	5 hrs.

2. The distribution of marks is as under. Marks of Ex-students are given in parentheses.

(a) Qualitative Analysis of mixture containing two Organic compounds	30 (40) marks
(b) Preparation	10 (15) marks
(c) Estimation	20 (25) marks
(d) Viva voice	20 (20) marks
(c) Sessional	20 (-) marks
	Total-100 (100) marks

As far as possible all the exercises as laid down in the syllabus are set. The scale of marking will be determined by examiners in accordance with the nature of exercises.

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SEMESTER I
LABORATORY COURSE II
ANALYTICAL CHEMISTRY
SECTION- A
INSTRUMENTATION AND COMPUTERS

1. Error Analysis & Statistical data Analysis:-
   Errors, types of errors, Minimization of Error, Statistical treatment for error analysis, standard deviation, Relative standard deviation, Linear least square. Calibration of volumetric apparatus burrettes pipette, standard flask, weight box etc.
2. Volumetric Analysis:-
   Basic Principles, determination of I_2 and saponification values of oil sample determination of DO, COD, BOD, Hardness of water samples.
3. Chromatography:-
   Separation of Cations and anions by (A) Paper Chromatography, (B) Column Chromatography.

SECTION- B

4. pH Metry / Potentiometry / Conductometry titration :-
   Determination of strength of acid etc.
5. Flame Photometry / AAS/FIA/Colorimetry :-
   Determination of Cations / anions and metal Ions eg. Na^+, K^+, Ca^{2+}, $SO4^{2-}$ NO_2, Fe, Mo, Ni ,Cu, Zn etc.
6. Spectro Photometry :-
   Verification of Beer - Lambert Law. Molar Absorptivity calculation, Plotting graph to obtain □max etc. effect of pH in aqueous coloured system. Determination of metal ions eg. Fe, Cu, Zn, Pb etc
7. Nephelometry / Turbidimetry :- Determination of chlorine, sulphate phosphate turbidity etc.
8. Application of Computer in Chemistry:- As Specified in Theory paper in section II (A).

For Lab. Course –II (Analytical Chemistry):

(a)Two practical exercise (one from each section) (at least one of these will be based on instrumental analysis)	60 (80) marks
(b) Viva voice	20 (20) marks
(c) Sessional	20 (-) marks
Total-	100 (100) marks

As far as possible all the exercises as laid down in the syllabus are set. The scale of marking will be determined by examiners in accordance with the nature of exercises. Sessional marks will be awarded by External Examiner in consultation with the internal Examiner

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SEMESTER-II

LABORATORY – COURSE I

INORGANIC CHEMISTRY

Note- Students is accepted to complete all exercises.

1. Qualitative analysis of mixture containing eight radical including some less common metal ions among the following by common method (Preferably semi-micro method)

Group-A

Basic Radicals : - {Ag, Pb, Hg, Cu, Cd, Bi, As, Sb, Sn, Fe, Al, Cr, Zn, Mn, co, Ni, Ba, Sr, Ca, Mg, Na, K, NH_4 ,}

Acid Radicals: - {CO_3, SO_4, SO_3, NO_3, F, Cl, Br, I, NO_2, BO_3, C_2O_4, PO_4}

Group– B

Basic Radicals: - {Ce, Th, Zr, W, Te, Ti, Mo, U, V, Be, Li, Au, Pt.}

Acid Radicals :-{SiO_4, Thiosulphate, Ferrocynide, Ferricyanide, Chromate, Arsenite , Arsenate, Permanganate }

Note – The mixture to be analysed by the students must contain at least one basic and one acid radical from Group B.

2. **Quantitative Analysis:-**
   Involving two of the following in ores, alloys or mixture in solution- one by volumetric and other by gravimetric method Ag, Cu, Fe, Cr, Mn, Ni, Zn, Ca, Mg, Chloride, Sulphate.
3. **Estimation of:-**
   (A) Phosphoric acid in Commercial ortho phosphoric acid.
   (B) Boric Acid in Borax.
   (C) Ammonium Ion in Ammonium Salt.
   (D) MnO_2 in pyrolusite
   (E) Available Chlorine in bleaching powder.
   (F) H_2O_2 in commercial sample.

   Students are expected to perform at least three exercises From above during laboratory work.
4. Preparation of selected Inorganic compounds and study of their properties by various method including IR, Electronic Spectra, Mossbaur, ESR. Spectra+ Magnetic susceptibility etc.
   (i) V0 $(acac)_2$
   (ii) cis K $[Cr(C_2O_4)_2(H_2O)_2]$, trans K $[Cr(C_2O_4)_2(H_2O)_2]$,.$2H_2O$
   (iii) $[Co(NH_3)_6]Cl_3$
   (iv) Na $[Cr(NH_3)_2(SCN)_4]$
   (v) Mn $(acac)_3$
   (vi) $K_3[Fe(C_2O_4)_3]$
   (vii) Prussian Blue Turnbull's Blue.
   (viii) $[Co(NH_3)_6][Co(NO_2)_6]$
   (ix) Hg $[Co(SCN)_4]$
   (x) $[Ni(NH_3)_4]Cl_2$, $[Ni(NH_3)_4]Cl_2$
   (xi) Ni $(DMG)_2$(xii)$[Cu(NH_3)_4]SO_4$
   (xii) $K_3[Cr(C_2O_4)_3].3H_2O$
   (xiii) $[Cu(NH_3)_4]SO_4$

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SEMESTER-II
LABORATORY COURSE- II
PHYSICAL CHEMISTRY

1. **Adsorption:-**
   a. Verification of Freundlich's Adsorption Isotherm.
   b. To study surface tension – concentration relationship for solutions. (Gibbs equation).
2. **Phase Equilibria:**
   a. Determination of congruent composition and temperature of binary system e.g. diphenylamine – benzophenone system.
   b. Determination of glass transition temperature of given salt e. g. $CaCl_2$ conductometrically.
   c. To construct the phase diagram for three component system e. g. chloroform, acetic acid and water.
3. **Chemical Kinetics**
   a. Hydrolysis of an ester/ ionic reactions.
   b. Determination of the velocity constant of hydrolysis of an ester. Determination of effect of (a)change of temperatures, (b)change of concentration of reactants and catalyst and(c)ionic strength of the media on the velocity constant of media.
   c. Determination of the rate constant for the oxidation of iodide ions by hydrogen peroxide
   d. Determination of the primary salt effect on the kinetics of ionic reaction and testing of the Bronsted relationship (iodide ions oxidized by persulphate ion).
4. **Conductometry**
   a. Determination of solubility of sparingly soluble salt (eg, $PbSO_4$, $BaSO_4$) Conductometrically.
   b. Determination of the strength of strong and weak acids in a given mixture conductometrically.
   c. Determination of dissociation constant of weak electrolyte by conductometer.
   d. Determination of velocity constant, Order of reaction and energy of activation for saponification of ethyl acetate by sodium hydroxide.
5. **pH Metry/Potentiometry**
   a. Determination of the strength of strong and weak acid in a given mixture using pH meter/potentiometer.
   b. Determination of dissociation constant of weak acid by pH meter.
   c. Determination of concentration of acid in given buffer solution by pH meter.
   d. Determination of strength of halides in a mixture potentiometrically.
   e. Determination of the valency of mercurous ions potentiometrically.
   f. Determination of the strength of strong acid, weak acids in a given mixture using a potentiometer/ pH meter.
   g. Determination of temperature dependence of EMF of a cell.
   h. Determination of the formation constant of silver- ammonia complex and stoichiometry of the complex potentiometrically.
   i. Determination of activity and activity coefficient of electrolytes.
   j. Determination of thermodynamic constant. $\Delta G, \Delta S$ and ΔH for the reaction by e.m.f. method. $Zn + H_2SO_4 = ZnSO_4 + H_2$
   k. Determination of the dissociation constant of monobasic / dibasic acid
6. **Polarimetry:-**
   Determination of rate constant for hydrolysis/inversion of sugar using a polarimeter. Enzyme kinetic – inversion of sucrose.

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SEMESTER-IV
GROUP-B
LABORATORY COURSE (SPECIAL)
ORGANIC CHEMISTRY

200 marks

Note: Laboratory course with Group 'B' will be of 12 hrs duration spread over two days. The examinee will have to perform three experiments. These experiments will be of 40 marks each. 40 marks each will be allotted for viva-voce and Sessional work.

Qualitative Analysis

Separation, Purification and identification of the components of a mixture of binary organic compounds & mixture of three organic compounds.

Multi-step synthesis of Organic compounds (Three stage preparations. Preparation of pure crystalline product. By using any two following principals Conformation by melting point determination.)-

The exercises should illustrate the use of organic reagents and may involve purification of the products by chromatographic techniques.

1. Photochemical reaction: Benzophenone- Benzopinacol- Benzpinacolone.
2. Beckmann rearrangement: Benzanilide from benzene, Benzene- benzophenone ,oxime- Benzanilide.
3. Benzilic acid rearrangement : Benzilic acid from benzoin, (Benzoin- Benzil- Benzilic acid)
4. Synthesis of heterocyclic compounds, Skraup synthesis: Preparation of quinoline from aniline, Skraup synthesis: Preparation of 2 phenyl-indole from phenyl hydrazine.
5. Sandmeyer Reaction: Preparation of o chlorobenzoic acid from anthranilic acid.
6. Ultman reaction - Preparation of N-Phenyl anthranilic acid from o-chlorobenzoic acid.
7. Preparation of Acridone from N-Phenyl anthranilic acid.
8. Prepration of p nitro aniline
9. Prepration of p bromo aniline
10. Prepration of methyl orange from aniline via sulphanilic acid.

Extraction of Organic compounds from Natural sources-

1. Isolation of caffeine from tea leaves
2. Isolation of casein from milk
3. Isolation of lactose from milk
4. Isolation of nicotine dipicrate from tobacco
5. Isolation of piperine from black pepper
6. Isolation of lycopene from tomatoes
7. Isolation of b-carotene from carrots.

Paper Chromatography

Separation and identification of the sugars, dyes and amino acids present in the given mixture of sugars, dyes and amino acids by paper chromatography and determination of RF values.

Spectroscopy:

Identification of organic compounds by the analysis of their spectral data (UV. IR. PMR, CMR & M) Spectrophotometric (UV/VIS) Estimations of

1. Amino acids
2. Proteins
3. Carbohydrates
4. Aspiri

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SEMESTER-IV
GROUP-B
LABORATORY COURSE (SPECIAL)
PHYSICIAL CHEMISTRY

1. Study of kinetics of exchange between ethyl iodide and the iodide ion.
2. Determination of the solubility product of lead iodide.
3. Determination of the dissociation constant of barium nitrate.
4. Determination of relative strength of the acids by studying the hydrolysis of an ester.
5. Study the hydrolysis of methyl acetate catalysed by HCl and equimolar urea hydrochloride and hence the degree of hydrolysis of the salt.
6. Investigate the inversion of can-sugar in presence of an acid. Determine also the energy of activation of the reaction.
7. Study in inversion of can-sugar in presence of HCL and H_2SO_4 and hence determine the relative strength of the acids.
8. Study the kinetics of hydrolysis of ethyl acetate by NaOH at two temperatures by conductance measurement, and hence the energy of activation of the reaction.
9. Study the kinetics of hydrolysis of tertiary amyl iodide, and determine the order and energy of activation of the reaction.
10. Investigate the reaction between H_2O_2 and HI.
11. Study the kinetics of decomposition of benzene diazonium chloride at different temperatures.
12. Study the kinetics of reaction between $K_2S_2O_8$ and KI.
    (a) Determine and rat constant and order of reaction.
    (b) Study of influence of ionic strength on the rate constant.
13. Investigate the kinetics of autocatalytic reaction between KMno4 and Oxalic acid.
14. Determination of order of reaction between bromic acid and hydrobromic acids.
15. Determination of concentration f iodine in a given sample (KI) by isotope dilution technique.
16. Determination of effect of-
    (a) Change of temperature,
    (b) Change of concentration.
    (c) Ionic strength of the media on the velocity constant of hydrolysis of an ester.
17. Determination of the primary salt effect on the kinetics of ionic reactions and testing of the Bronsted relationship (iodide ion is oxidised by persulphate ion.)
18. Investigate the adsorption of oxalic acid from aqueous solution by activated charcoal and verify Frenndlish and Langmuir's adospriton isotherms.
19. Determine adsoption isotherms of acetic acid from aqueous solution by charcoal.

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SEMESTER SYLLABUS

M.Sc. PHYSICS

SCHEME OF EXAMINATION & DISTRIBUTION OF MARKS

SEMESTER I

Paper No.	Title of the Paper	Internal Assessment	Term End Exam	Total Marks
1.	Mathematical Methods-I	20	80	100
2.	Classical Mechanics	20	80	100
3.	Numerical Methods and C Programming	20	80	100
4.	Electronics-I	20	80	100
LAB I	General	-	-	100
LAB II	Computer Programming	-	-	100
			TOTAL	600

SEMESTER II

Paper No.	Title of the Paper	Internal Assessment	Term End Exam	Total Marks
1.	Mathematical Methods-II	20	80	100
2.	Quantum Mechanics-I	20	80	100
3.	Thermodynamics	20	80	100
4.	Electronics-II	20	80	100
LAB I	Electronics (Devices)	-	-	100
LAB II	Electronics (Circuits) Power supply, Amplifier, Oscillators, Modulation, Detection etc.	-	-	100
			TOTAL	600

SEMESTER III

Paper No.	Title of the Paper	Internal Assessment	Term End Exam	Total Marks
1.	Quantum Mechanics II	20	80	100
2.	Statistical Mechanics	20	80	100
3.	Condensed Matter Physics I	20	80	100
4.	Electronics III	20	80	100
LAB I	Condensed Matter Physics	-	-	100
LAB II	Digital Electronics	-	-	100
			TOTAL	600

SEMESTER IV

Paper No.	Title of the Paper	Internal Assessment	Term End Exam	Total Marks
1.	Condensed Matter Physics II	20	80	100
2.	Nuclear Physics	20	80	100
3.	Atomic and Molecular physics	20	80	100
4.	Electronics IV	20	80	100
5.	Project	-	-	200
			TOTAL	600
			GRAND TOTAL	2400

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SEMESTER SYLLABUS

M.Sc. PHYSICS

SCHEME OF EXAMINATION & DISTRIBUTION OF MARKS

SEMESTER I

Paper No.	Title of the Paper	Internal Assessment	Term End Exam	Total Marks
1.	Mathematical Methods-I	20	80	100
2.	Classical Mechanics	20	80	100
3.	Numerical Methods and C Programming	20	80	100
4.	Electronics-I	20	80	100
LAB I	General	-	-	100
LAB II	Computer Programming	-	-	100
			TOTAL	600

SEMESTER II

Paper No.	Title of the Paper	Internal Assessment	Term End Exam	Total Marks
1.	Mathematical Methods-II	20	80	100
2.	Quantum Mechanics-I	20	80	100
3.	Electrodynamics	20	80	100
4.	Electronics-II	20	80	100
LAB I	Electronics (Devices)	-	-	100
LAB II	Electronics (Circuits) Power supply, Amplifier, Oscillators, Modulation, Detection etc.	-	-	100
			TOTAL	600

SEMESTER III

Paper No.	Title of the Paper	Internal Assessment	Term End Exam	Total Marks
1.	Quantum Mechanics II	20	80	100
2.	Statistical Mechanics	20	80	100
3.	Condensed Matter Physics I	20	80	100
4.	Electronics III	20	80	100
LAB I	Condensed Matter Physics	-	-	100
LAB II	Digital Electronics	-	-	100
			TOTAL	600

SEMESTER IV

Paper No.	Title of the Paper	Internal Assessment	Term End Exam	Total Marks
1.	Condensed Matter Physics II	20	80	100
2.	Nuclear Physics	20	80	100
3.	Atomic and Molecular physics	20	80	100
4.	Electronics IV	20	80	100
5.	Project	-	-	200
			TOTAL	600
			GRAND TOTAL	2400

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बिलासपुर विश्वविद्यालय, बिलासपुर (छत्तीसगढ़)

सेमेस्टर पाठ्यक्रम

M.Sc. COMPUTER SCIENCE

SCHEME OF EXAMINATION & DISTRIBUTION OF MARKS

SEMESTER - I

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Digital Electronics and Microprocessor	Theory	20	80	100
2.	Advance Computer Network	Theory	20	80	100
3.	OOPs using JAVA	Theory	20	80	100
4.	Advanced Operating System	Theory	20	80	100
Lab-1	Digital Electronics	Practical	-	-	100
Lab-2	Java Programming	Practical	-	-	100

SEMESTER - II

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Analysis and Design of Algorithm	Theory	20	80	100
2.	Relational Database Management System (RDBMS)	Theory	20	80	100
3.	Data Structure using C++	Theory	20	80	100
4.	Software Engineering	Theory	20	80	100
Lab-1	RDBMS	Practical	-	-	100
Lab-2	Data Structure using C++	Practical	-	-	100

SEMESTER - III

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Theory of computation and compiler design	Theory	20	80	100
2.	artificial intelligence and expert system	Theory	20	80	100
3.	soft computing techniques	Theory	20	80	100
4.	.net technology	Theory	20	80	100
Lab-1	MAT LAB	Practical	-	-	100
Lab-2	Programming through .NET	Practical	-	-	100

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SEMESTER - IV

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Advanced Trends And Technology In Computer Science	Theory	20	80	100
2.	ELECTIVE - I Data Mining and Data Warehousing ELECTIVE - II Computer Graphics and Multimedia ELECTIVE - III Embedded System ELECTIVE-IV Network Security & Cryptography	Theory	20	80	100
3.	Major Project		-	-	400

Note: Internal assessment of 20 marks will consist of two parts -

1. Unit Test (10 Marks): Two tests will be conducted and average of these tests will be the marks of Unit Test.
2. Seminar/Assignment (10 Marks): To be conducted by the Department concerned.

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UNIT–V

Advance Topics of Operating System

Embedded Operating Systems, eCos, Tiny OS, Computer Security Concepts, Threats, Attacks, and Assets, Intruders, Malicious Software Overview, Viruses, Worm, Authentication, Access Control, Intrusion Detection, Malware Defense, Dealing With Buffer Overflow Attacks, Distributed Process Management, Process Migration, Distributed Global States, Distributed Mutual Exclusion, Distributed Deadlock.

Text Books:

1. Operating System Concepts, Silbersachatz and Galvin, Pearson Education Pub.
2. Operating Systems, Madnick E., Donovan J., Tata McGraw Hill,
3. Operating Systems, A. S. Tannenbaum, PHI

Reference Books:

1. Operating Systems Internals and Design Principle, William Stallings, Prentice Hall Publishers
2. Operating Systems- AConcept-Based Approach, Dhananjay M. Dhamdhere, McGraw-Hill

SEMESTER-I

LAB 1: DIGITAL ELECTRONICS

SEMESTER-I

LAB 2: JAVA PROGRAMMING

LAB Detail

Break-up of marks for External Practical Examination			
S. No.	Argument	Maximum Marks	Minimum Passing Marks
1	Lab Record	20	36
1.	Viva-voce	40	
2.	Program Development and Execution	40	
	Total Marks	100	36

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SEMESTER-II
LAB 1: RDBMS

SEMESTER-II
LAB 2: DATA STRUCTURE

Break-up of marks for External Practical Examination			
S. No.	Argument	Maximum Marks	Minimum Passing Marks
1	Lab Record	20	36
1.	Viva-voce	40	
2.	Program Development and Execution	40	
	Total Marks	100	36

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SEMESTER-III
LAB-1
MAT LAB

LAB-2
PROGRAMMING THROUGH .NET

The break-up of marks for Practical will be as under :

Sr. No.	Argument	Maximum Marks	Minimum Passing Marks
1.	Lab Record	20	
2.	Viva-voce	40	
3.	Program Development and Execution	40	
	Total Marks	100	36

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SEMESTER - IV
MAJOR PROJECT

Note:

1. It is compulsory, that students would have group of maximum of two students and project should be done under Government Sectors/ Public Sector / Pvt. LTD. S/W Company.
2. The students should not make any project under local or private institutions.
3. The students should make project themselves and project will not be copy of other project.

Steps for Live Project

1. Getting customer's requirements
2. Preparing designs, database and business logics
3. Developing software application project
4. Testing and implementing the project
5. Troubleshooting the project application after implementation

The break-up of marks for fourth semester's Major Project will be as under:

Sr. No.	Argument	Maximum Passing Marks	Minimum Passing Marks
1.	Project Record	100	
2.	Viva-voce	100	
3.	Program Development and Execution	200	
Total Marks		400	144

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SEMESTER - IV

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Advanced Trends And Technology In Computer Science	Theory	20	80	100
2.	ELECTIVE - I Data Mining and Data Warehousing ELECTIVE - II Computer Graphics and Multimedia ELECTIVE - III Embedded System ELECTIVE-IV Network Security & Cryptography	Theory	20	80	100
3.	Major Project		-	-	400

Note: Internal assessment of 20 marks will consist of two parts -

1. Unit Test (10 Marks): Two tests will be conducted and average of these tests will be the marks of Unit Test.
2. Seminar/Assignment (10 Marks): To be conducted by the Department concerned.

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SEMESTER - IV
MAJOR PROJECT

Note:

1. It is compulsory, that students would have group of maximum of two students and project should be done under Government Sectors/ Public Sector / Pvt. LTD. S/W Company.
2. The students should not make any project under local or private institutions.
3. The students should make project themselves and project will not be copy of other project.

Steps for Live Project

1. Getting customer's requirements
2. Preparing designs, database and business logics
3. Developing software application project
4. Testing and implementing the project
5. Troubleshooting the project application after implementation

The break-up of marks for fourth semester's Major Project will be as under:

Sr. No.	Argument	Maximum Passing Marks	Minimum Passing Marks
1.	Project Record	100	
2.	Viva-voce	100	
3.	Program Development and Execution	200	
Total Marks		400	144

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2019-20

D.P. Vipra College

Old High Court Road, Bilaspur

Chhattisgarh, India 495001

Part-I

SYLLABUS FOR ENVIRONMENTAL STUDIES AND HUMAN RIGHTS FOR UNDER GRADUATE

'इन्वाहरमेंटल साईसेस' के पाठ्यक्रम को स्नातक स्तर भाग–एक की कक्षाओं में विश्वविद्यालय अनुदान आयोग के निर्देशानुसार अनिवार्य रूप से शिक्षा सत्र 2003–2004 (परीक्षा 2004) से प्रभावशील किया गया है । स्वशासी महाविद्यालयों द्वारा भी अनिवार्य रूप से अंगीकृत किया जाएगा ।

भाग 1, 2 एवं 3 में से किसी भी वर्ष में पर्यावरण प्रश्न –पत्र उत्तीर्ण करना अनिवार्य है । तभी उपाधि प्रदाय योग्य होगी ।

पाठ्यक्रम 100 अंकों का होगा, जिसमें से 75 अंक सैद्धांतिक प्रश्नों पर होगें एवं 25 अंक क्षेत्रीय कार्य (Field Work) पर्यावरण पर होगें ।

सैद्धांतिक प्रश्नों पर अंक –75 (सभी प्रश्न इकाई आधार पर रहेगें जिसमें आंतरिक विकल्प रहेगा)

(अ) लघु प्रश्नोंत्तर – 25 अंक

(ब) निबंधात्मक – 50 अंक

Field Work – 25 अंकों का मूल्याकन आतरिक मूल्यांकन पद्धति से कर विश्वविद्यालय को प्रेषित किया जावेगा । अभिलेखों की प्रायोगिक उत्तर पुस्तिकाओं के समान संबंधित महाविद्यालयों द्वारा सुरक्षित रखेगें ।

उपरोक्त पाठ्यक्रम से संबंधित परीक्षा का आयोजन वार्षिक परीक्षा के साथ किया जाएगा ।

पर्यावरण विज्ञान विषय अनिवार्य विषय है, जिसमें अनुत्तीर्ण होने पर स्नातक स्तर भाग–एक के छात्र/छात्राओं को एक अन्य विषय के साथ पूरक की पात्रता होगी । पर्यावरण विज्ञान के सैद्धांतिक एवं फील्ड वर्क में संयुक्त रूप से 33% (तैतींस प्रतिशत) अंक उत्तीर्ण होने के लिए अनिवार्य होंगे ।

स्नातक स्तर भाग–एक के समस्त नियमित/भूतपूर्व/अमहाविद्यालयीन छात्र/छात्राओं को अपना फील्ड वर्क सैद्धांतिक परीक्षा की समाप्ति के पश्चात् 10 (दस) दिनों के भीतर संबंधित महाविद्यालय/परीक्षा केन्द्र में जमा करेंगे एवं महाविद्यालय के प्राचार्य/केन्द्र अधिक्षक, परीक्षकों की नियुक्ति के लिए अधिकृत रहेंगे तथा फील्ड वर्क जमा होने के सात दिनों के भीतर प्राप्त अंक विश्वविद्यालय को भेजेंगे ।

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कृपया पर्यावरण विज्ञान व मानवाधिकार
का पाठ्यक्रम अनुमोदनार्थ प्रस्तुत है।

Dr R.G.
11/11/13

1. Prof A.K. Gupta
2. Prof C.L. Patel
3. Dr. R. Prasad

11.11.13

11-11-13

बिलासपुर विश्वविद्यालय, बिलासपुर (छ.ग.)

पुराना हाईकोर्ट भवन, बिलासपुर (छ.ग.) 495001,
फोन : 07752-220031, फैक्स 07752-260294, ई-मेल : bilaspuruniversity.2012@gmail.com,
वेबसाईट : www.bilaspuruniversity.ac.in

क्र. 1186 /अका./2014

बिलासपुर दिनांक 11/9/14

अधिसूचना

बिलासपुर विश्वविद्यालय से सम्बद्ध समस्त महाविद्यालय को सूचित किया जाता है कि केन्द्रीय अध्ययन मण्डल द्वारा अनुमोदित पर्यावरण अध्ययन के संशोधित पाठ्यक्रम "पर्यावरण अध्ययन व मानवाधिकार" स्नातक स्तर पर शिक्षा सत्र 2014-15 से प्रभावशील होगा । (अनुमोदित पाठ्यक्रम संलग्न)

आदेशानुसार,

कुलसचिव

पृ.क्रमांक 1187 /अका./2014

बिलासपुर, दिनांक 11/9/14 /

प्रतिलिपि:-

1. कुलपति के निज सहायक को माननीय कुलपति महोदय के सूचनार्थ प्रेषित।
2. परीक्षा नियंत्रक / उप-कुलसचिव (परीक्षा/गोपनीय) बिलासपुर विश्वविद्यालय, बिलासपुर को सूचनार्थ प्रेषित ।
5. प्राचार्य, समस्त सम्बद्ध महाविद्यालय, को इस आशय के साथ प्रेषित की महाविद्यालय में केन्द्रीय अध्ययन मण्डल द्वारा अनुमोदित **"पर्यावरण अध्ययन व मानवाधिकार"** विषय का अंगीकृत पाठ्यक्रम अध्ययन-अध्यापन कराना सुनिश्चित करें ।
6. संपादक, दैनिक ..... को इस अनुरोध के साथ प्रेषित की कृपया उपरोक्त अधिसूचना को अपने लोकप्रिय दैनिक समाचार पत्र में छात्रहीत में प्रकाशित करने का कष्ट करें ।

कुलसचिव

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Part-I

SYLLABUS FOR ENVIRONMENTAL STUDIES AND HUMAN RIGHTS FOR UNDER GRADUATE

(paper code - 0828)

M.M. 75

UNIT -I THE MULTI DISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES:

Definition, Scope and Importance

Natural Resources:

Renewable and Nonrenewable Resources:

Natural resources and associated problems

(a) Forest resources: Use and over-exploitation, deforestation, Timber extraction, mining, dams and their effects on forests and tribal people and relevant forest Act.

(b) Water resources: Use and over-utilization of surface and ground water, floods drought, conflicts over water, dams benefits and problems and relevant Act.

(c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources.

(d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity.

(e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources.

(f) Land resources: Land as a resource, land degradation, man induced landslides soil erosion and desertification.

UNIT-II ECOSYSTEM

(12 Lecturer)

(a) Concept, Structure and Function of an ecosystem

- Producers, consumers and decomposers.
- Energy flow in the ecosystem
- Ecological succession.
- Food chains, food webs and ecological pyramids.
- Introduction, Types, Characteristic Features, Structure and Function of Forest, Grass, Desert and Aquatic Ecossystem.

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(b) Biodiversity and its Conservation

- Introduction - Definition: genetic, species and ecosystem diversity.
- Bio-geographical classification of India.
- Value of biodiversity: consumptive use, productive use, social, ethics, aesthetic and option values.
- Biodiversity at global, National and local levels.
- India as mega-diversity nation.
- Hot spots of biodiversity
- Threats to biodiversity: habitat loss, poaching of wildlife, man-wild life conflict.
- Endangered and endemic species of India.
- Conservation of biodiversity: In situ and Ex-situ conservation of biodiversity.

UNIT-III ENVIRONMENTAL POLLUTION

Definition **(12 Lecturer)**

(a) Causes, effect and control measures of -

- Air water, soil, marine, noise, nuclear pollution and Human population.
- Solid waste management: Causes, effects and control measures of urban and industrial wastes.
- Role of an individual in prevention of pollution.
- Disaster Management: floods, earthquake, cyclone and landslides.

(b) Environmental Management

(12 Lecturer)

- From Unsustainable to sustainable development.
- Urban problems related to energy.
- Water conservation, rain water harvesting, watershed management.
- Resettlement and rehabilitation of people, its problems and concerns.
- Environmental ethics: Issues and possible solutions.
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust.

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Wasteland reclamation.

- Environment Protection Act: Issues involved in enforcement of environmental legislation.

- Role of Information Technology in Environment and Human Health.

UNIT-IV

General background and historical perspective- Historical development and concept of Human Rights. Meaning and definition of Human Rights. Kind and Classification of Human Rights.

Protection of Human Rights under the UNO Charter. Protection of Human Rights under the Universal Declaration of Human Rights, 1948

Convention on the Elimination of all Forms of Discrimination against women

Convention on the Rights of the Child, 1989

UNIT-V

Impact of Human Rights norms in India, Human Rights under the Constitution of India, Fundamental Rights under the Constitution of India, Directive Principles of State Policy under the Constitution of India, Enforcement of Human Rights in India

Protection of Human Rights under the Human Rights Act, 1993 - National Human Rights Commission, State Human Rights Commission and Human Rights court in India.

Fundamental Duties under the Constitution of India

Reference/Books Recommended:

1. SK Kapoor- Human rights under International Law and Indian Law
2. HO Agrawal- Internation Law and Human Rights
3. एस. के. कपूर – मानव अधिकार
4. जे. एन. पान्डेय – भारत का संविधान
5. एम. डी. चतुर्वेदी – भारत का संविधान
6. J. N. Pandey - Constitutional Law of India
7. Agarwal K.C. 2001 Environmental Biology, Nidi Pub. Ltd. Bikaner
8. Bharucha Erach, the Biodiversity of India, Mapin Pub. Pvt. Ltd. Ahmedabad 380013, India, Email: mapin@icenet.net(R)

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B.A. /B.Sc. Part I

PAPER - III
PRACTICAL GEOGRAPHY
Max. Marks: 50

SECTION A

CARTOGRAPHY AND STASTISTICAL METHODS (M.M. 25)

Unit I Scale: Statement Scale , Representative Fraction (R.F.), Linear scale – Simple, Diagonal, Comparative, and Time Scales.

Unit II Contour: Methods of showing relief; Hachures, Contours; Representation of different landforms by contours.

Unit III Graph and Diagram: Line graph, Bar Diagram (Simple and Compound), Circle Diagram, Pie Diagram

Unit IV Statistical Technique: Mean, Median and Mode

SECTION B

SURVEYING - (M.M. 15)

Unit V Chain and Tape Survey. Triangulation method, Open Traverse and Closed Traverse

PRACTICAL RECORD AND VIVA VOCE (M.M. 10)

Books Recommended:

1. Davis, R.E. and Foote, F.S. (1953): Surveying, 4th edition, McGraw Hill Publication, New York
2. Jones, P.A.(1968): Fieldwork in Geography, Longmans, Green and Company Ltd., First Publication, London
3. Monkhouse, F. J. and Wilkinson, F.J. (1985): Maps and Diagrams. Methuen, London
4. Natrajan, V. (1976): Advanced Surveying, B.I. Publications., Mumbai
5. Pugh, J.C. (1975): Surveying for Field Scientists, Methuen and Company Ltd., London, First Publication.
6. Raisz, E. (1962): General Cartography. John Wiley and Sons, New York. 5th edition.
7. Sarkar, A. K. (1997): Practical Geography: A Systematic Approach. Orient Longman, Kolkata.
8. Sharma, J. P. (2001): *Prayogik Bhugol.,* Rastogi Publication, Meerut 3rd. edition.
9. Singh, R.L. and Singh, Rana P.B. (1993): Elements of Practical Geography. (Hindi and English editions). Kalyani Publishers, New Delhi,.
10. Singh, L.R. (2006): Fundamentals of Practical Geography, Sharda Pustak Bhawan, Allahabad.
11. Venkatramaiah, C. (1997): A Text Book of Surveying, Universities Press, Hyderabad.

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B.A. /B.Sc. Part II

PAPER - III

PRACTICAL GEOGRAPHY

Max. Marks: 50

SECTION A

MAP INTERPRETATION, PROJECTIONS AND STATISTICAL METHODS (M.M. 25)

Unit I Distribution Maps: Dot Map, Choropleth Map and Isopleth Map.

Unit II Map Projections: Definition and classification; Conical, Zenithal, and Cylindrical Projections.

Unit III Interpretation of Weather Maps: Use of Meteorological Instruments.

Unit IV Statistical Methods: Quartile: Mean Deviation, Standard Deviation and Quartile Deviation; Relative Variability and Co-efficient of Variation.

SECTION B

SURVEYING (M.M. 15)

Unit V Surveying: Whole Circle Bearing and Reduced Bearing, Methods of Prismatic Compass Survey.

PRACTICAL RECORD AND VIVA VOCE (M.M. 10)

Books Recommended:

1. Alvi, Z. 1995 : Statistical Geography: Methods and Applications, Rawat Pub. New Delhi: .
2. Davis, R.E. and Foote, F.S. (1953): Surveying, 4th edition, McGraw Hill Publication, New York
3. Kanetker, T.P. and Kulkarni, S.V.(1967): Surveying and Levelling, Vol I and II V.G. Prakashan, Poona.
4. Natrajan, V. (1976): Advanced Surveying, B.I. Publications., Mumbai.
5. Pal, S.K. 1999 : Statistics for Geoscientists, Concept publishing Company, New Delhi
6. Punmia, B.C.(1994): Surveying, Vol I, Laxmi Publications Private Ltd, New Delhi.
7. Raisz, E. (1962): General Cartography. John Wiley and Sons, New York. 5th edition
8. Sarkar, A. K. (1997): Practical Geography: A Systematic Approach. Orient Longman, Kolkata.
9. Sharma, J. P. (2001): *Prayogik Bhugol.*, Rastogi Publication, Meerut 3rd. edition.
10. Silk, J. 1979 : Statistical techniques in Geography, George Allen and Unwin, London
11. Singh, R.L. and Singh, Rana P.B. (1993): Elements of Practical Geography. (Hindi and English editions). Kalyani Publishers, New Delhi,.
12. Singh, L.R. (2006): Fundamentals of Practical Geography, Sharda Pustak Bhawan, Allahabad.
13. Venkatramaiah, C. (1997): A Text Book of Surveying, Universities Press, Hyderabad.

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बी.ए. / बी.एस.सी. तृतीय वर्ष
प्रश्न पत्र–तृतीय
प्रायोगिक भूगोल

अधिकतम अंक : 50

खण्ड (अ)

मनचित्र पठन एवं निर्वचन **20**

इकाई –1. बैन्ड ग्राफ, हीदर ग्राफ, क्लाइमोग्राफ, पवनारेख ।

इकाई –2. भारतीय स्थलाकृतिक मानचित्र की व्याख्या प्रकार, वर्गीकरण धरतलीय मानचित्र के प्रकार एवं विष्लेषण, राष्ट्रीय एवं अन्तराष्ट्रीय, भौतिक एवं सांस्कृतिक तत्वों के आधार पर विष्लेषण ।

इकाई –3. उपग्रह बिम्ब : प्रारम्भिक सूचनाओं की व्याख्या बिम्ब निर्वाचन : चाक्षुश विधि – भूमि उपयोग भूमि आच्छादन मानचित्रण, जी0 पी0 एस0 का उपयोग एवं अनुप्रयोग ।

खण्ड (ब)

सर्वेक्षण एवं क्षेत्रीय प्रतिवेदन **20**

इकाई –4. सर्वेक्षण , समपटल सर्वेक्षण, प्रतिच्छेदन एवं स्थिति निर्धारण ।

इकाई –5. भूगोल में क्षेत्रीय कार्य का महत्व किसी छोटे क्षेत्र का भौतिक सामाजिक आर्थिक सर्वेक्षण और रिपोर्ट तैयार करना ।

प्रायोगिक पुस्तिका और मौखिक परिक्षण परीक्षा **10**

Books Recommended:

1. Archer, J.E. and Dalton, T.H. (1968): *Field Work in Geography*. William Clowes and Sons Ltd. London and Beccles.
2. Bolton, T. and Newbury, P.A. (1968): *Geography through Fieldwork*. Blandford Press, London.
3. Campell, J. B. (2003): Introduction to Remote Sensing. 4th edition. Taylor and Francis, London.
4. Chaunial, D. D. (2004): Remote Sensing and Geographical Information System(in Hindi), Sharda Pustak Bhawan, Allahabad
5. Cracknell, A. and Ladson, H. (1990): Remote Sensing Year Book. Taylor and Francis, London.
6. Curran, P.J. (1985): Principles of Remote Sensing. Longman, London.
7. Davis, R.E. and Foote, F.S. (1953): Surveying, 4th edition, McGraw Hill Publication, New York
8.
9. Deekshatulu, B.L. and Rajan, Y.S. (ed.) (1984): Remote Sensing. Indian Academy of Science, Bangalore.
10. Floyd, F. and Sabins, Jr. (1986): Remote Sensing: Principles and Interpretation. W.H. Freeman, New York.
11. Gautam, N.C. and Raghavswamy, V. (2004). Land Use/ Land Cover and Management Practices in India. B.S. Publication., Hyderabad.
12. Jensen, J.R. (2004): Remote Sensing of the Environment: An Earth Resource Perspective. Prentice-Hall, Englewood Cliffs, New Jersey. Indian reprint available.

PRINCIPAL
D.P. Vipra College
Bilaspur (C.G.)

B.Sc. I (BOTANY)

PRACTICAL

Study of external (Morphorgical) and internal (microscopic/anatomical) features of representative gerera given in the theory.

1. Algae: Gloeocapsa, Scytonema, Gloeotrichia, Volvox, Oedogonium, Vaucheria, Chara, Ectocarpus, Sargassum, Batrachosperrmum
2. Gram staining
3. Fungi: Albugo, Aspergillus, Peziza, Agaricus, Puccinia, Alternaria and Cercospora
4. Bryophyta: Riccia, Marchantia, Pellia, Anthoceros, Sphagnum, Funaria
5. Pteridophyta: Lycopodium, Selaginella, Equsetum, Marsilea.
6. Gymnosperm: Cycas, Pinus, Epherda.

PRACTICAL SCHEME

TIME: 4 Hrs. **M.M. : 50**

1.	Algae/Fungi/Gram Staining	10
2.	Bryophyta/Pteridophyta	10
3.	Gymnosperm	10
4.	Spotting	10
5.	Viva-Voce	05
6.	Sessional	05

(Dr. J.N. Verma)
Proff. & Head
Govt. D.B. Girls PG College
Raipur, (C.G.)

(Dr. Rekha Pimpalgaonkar)
Proff. & Head
Govt. N PG Science College
Raipur, (C.G.)

(Dr.Ranjana Shristava)
Proff. & Head
Govt. VYTPG Science College
Raipur, (C.G.)

(Mrs. Sanchal Moghe)
Govt. Bilasa Girls College, Bilaspur

(Mr. Shivakant Mishra)

(Mr Sudheer Tiwari)

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Bilaspur (C.G.)

Zoology
B.Sc. Part I 2018-19
Practical

The practical work will, in general be based on the syllabus prescribed in theory and the candidates will be required to show knowledge of the following:-

- Dissection of Earthworm, Cockroach, Palaemon and Pila
- Minor dissection—appendages of Prawn & hastate plate, mouth parts of insects, radulla of Pila.

(Alternative methods: By Clay/Thermacol/drawing/Model etc.)

- Adaptive characters of Aquatic, terrestrial, aerial and desert animals.
- Museum specimen invertebrate
- Slides- Invertebrates, frog embryology, Chick embryology and cytology,

Scheme of Practical Exam	**Time: 3hrs**
1. Major Dissection	10 Marks
2. Minor Dissection	05 Marks
3. Comments on Excersice based on Adaptation	04 Marks
4. Cytological Preparation	05 Marks
5. Spots-8 (Slides-4, Specimens-4)	16 Marks
6. Sessional	10 Marks

PRINCIPAL
D.P. Vipra College
Bilaspur (C.G.)

NEW CURRICULUM OF B.Sc. PART I

CHEMISTRY

The new currlculam will comprisc of Three theory papers of 33, 33 and 34 marks each and practical work of 50 marks. The curricuram is to be completed in 180 working days as per the UGC norms & conforming to the directives of the Govt. of Chhattisgarh.The theory papers are of 60 hrs each duration and the practical work of 180 hrs duration.

PAPER I

INORGANIC CHEMISTRY

M.M.33

UNIT-I

A. ATOMIC STRUCTURE

Bohr's theory, its limitation and atomic spectrum of hydrogen atom. General idea of de-Broglie matter-waves, Heisenberg uncertainty principle, Schrödinger wave equation, significance of Ψ and Ψ^2, radial & angular wave functions and probability distribution curves, quantum numbers, Atomic orbital and shapes of s, p, d orbitals, Aufbau and Pauli exclusion principles, Hund's Multiplicity rule, electronic configuration of the elements.

B. PERIODIC PROPERTIES

Detailed discussion of the following periodic properties of the elements, with reference to s and p-block. Trends in periodic table and applications in predicting and explaining the chemical behavior.

a) Atomic and ionic radii,
b) Ionization enthalpy,
c) Electron gain enthalpy,
d) Electronegativity, Pauling's, Mulliken's, Allred Rochow's scales.
e) Effective nuclear charge, shielding or screening effect, Slater rules, variation of effective nuclear charge in periodic table.

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UNIT-II

CHEMICAL BONDING I

Ionic bond: Ionic Solids - Ionic structures, radius ratio & co-ordination number, limitation of radius ratio rule, lattice defects, semiconductors, lattice energy Born- Haber cycle, Solvation

CHEMISTRY

PRACTICAL EXAMINATION

05 Hrs.
M.M. 50

Three experiments are to be performed

1. Inorganic Mixture Analysis, four radicals two basic & two acid (excluding insoluble, Interfering & combination of acid radicals) OR Two Titrations (Acid-Bases,Redox and Iodo/Iodimetry)

12 marks

2. Detection of functional group in the given organic compound and determine its MPt/BPt.

8 marks

O R
Crystallization of any one compound as given in the prospectus along with the determination of mixed MPt.
O R
Decolorisation of brown sugar along with sublimation of camphor/ Naphthlene.

3. Any one physical experiment that can be completed in two hours including calculations.

14 marks

4. Viva **10 marks**
5. Sessionals **06 marks**

In case of Ex-Students two marks will be added to each of the experiments

REFERENCE TEXT:

1. Mendham, J., A. I. Vogel's Quantitative Chemical Analysis 6th Ed., Pearson, 2009.
2. Ahluwalia, V. K., Dhingra, S. and Gulati, A. College practical Chemistry, University Press.
3. Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009)
4. Furniss, B.S.; Hannaford, A.J.; Smith, P.W.G.; Tatchell, A.R. Practical Organic Chemistry, 5th Ed., Pearson (2012)
5. Khosla, B. D.; Garg, V. C. & Gulati, A. Senior Practical Physical Chemistry, R. Chand & Co.: New Delhi (2011).
6. Garland, C. W.; Nibler, J. W. & Shoemaker, D. P. Experiments in Physical Chemistry 8th Ed.; McGraw-Hill: New York (2003).
7. Halpern, A. M. & McBane, G. C. Experimental Physical Chemistry 3rd Ed.; W.H. Freeman & Co.: New York (2003).

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D.P. Vipra College
Bilaspur (C.G.)

MICROBIOLOGY

BSc-1st

Paper- I: General Microbiology & Basic Technique

UNIT-1: Fundamental, History & Developments

Introduction to major groups of microorganisms and fields of Microbiology; Historical development, Contributions of Pioneers (Louis Pasteur, Edward Jenner, Anton Von Leewenhoeck and Alexander Flemming). Beneficial and harmful microbes and its role in daily life.

UNIT-2: Basic Microbial Techniques

Methods of studying microorganism; Sterilization Techniques (Physical & Chemical Sterilization). Pure culture isolation Technique: Streaking,Waksman serial dilution and plating methods. cultivation, maintenance and preservation of pure cultures. Culture media & conditions for microbial growth. Staining technique: simple staining, Differential (gram staining), negative staining and acid fast staining.

UNIT-3: Virology & Bacteriology

Diversity of microbial world; Principle and classification of Viruses and Bacteria. Structure, Multiplication and Economic importance of viruses (TMV, Influenza virus & T_4-Phage). Structure & Functional organization of Bacteria, Cell wall of Gram Positive & Gram Negative bacteria; Economic importance of Bacteria.

UNIT-4: Mycology

General characteristics and classification of Fungi; Structure and Reproduction of fungi (*Rhizopus, Penicillium, Aspergillus, Yeast & Agaricus*). Common fungal disease of crops (Late & Early blight of potato, Smut of Rice, Tikka and Red rot of Sugarcane). Structure, reproduction and economic aspect of Lichens.

UNIT-5: Phycology & Protozoology

General characteristics and classification of Algae and Protozoa; General account & economic importance of Cyanobacteria (*Microcystis, Ocillitoria, Nostoc & Anabaena)* and Protozoa *(Amoeba, Paramoecium, Euglena and plasmodium).*

Text Books Recommended:

1. General microbiology; Vol I & II, Powar C. B. and Daginawala H. I., Himalaypub.house, Bombay.
2. A textbook of Microbiology; Dubey &Maheshwari.
3. Microbiology: An Introduction; G. Tor tora, B. Funke, C. Benjamin Cummings.
4. General Microbiology; Seventh edition by Hans G Schlegel, CambridgeUniversity Press.
5. Practical Microbiology; Dubey and Maheshwari.
6. Handbook of Microbiology; Bisen P.S., Varma K., CBS Publishers and Distributors, Delhi. General Microbiology by Brock.
7. General Microbiology by Pelzar et al.
8. Introduction on Microbial Techniques by Gunasekaran.

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Microbiology

PRACTICAL

M. M. 50

Basic information about autoclave, hot air oven, laminar air flow and other laboratory instruments
Preparation of solid/liquid culture media.
Isolation of single colonies on solid media.
Enumeration of bacterial numbers by serial dilution and plating.
Simple and differential staining.
Measurement of microorganism (micrometry) and camera Lucida drawing of isolated organism.
Determination of bacterial growth by optical density measurement.
General and specific qualitative test for carbohydrates
General and specific qualitative test for amino acids
General and specific qualitative test for lipids
Estimation of protein
Estimation of blood glucose
Assay of the activity of amylases
Assay of the activity of Phosphates

Scheme of Practical Examination

Time - 4 hours

	M.M. 50
1. Exercise on Microbiological methods	10
2. Exercise on Biochemical tests	10
3. Exercise on staining method	05
4. Spotting (1-5)	10
5. Viva-Voce	05
6. Sessional	10
	Total 50

PRINCIPAL
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B.Sc. Part-I

Paper-I

MECHANICS, OSCILLATIONS AND PROPERTIES OF MATTER

(Paper code 0793)

Unit- 1 Cartesian, Cylindrical and Spherical coordinate system, Inertial and non-inertial frames of reference, uniformly rotating frame, Coriolis force and its applications. Motion under a central force, Kepler's laws. Effect of Centrifugal and Coriolis forces due to earth's rotation, Center of mass (C.M.), Lab and C.M. frame of reference, motion of C.M. of system of particles subject to external forces, elastic, and inelastic collisions in one and two dimensions, Scattering angle in the laboratory frame of reference, Conservation of linear and angular momentum, Conservation of energy.

Unit-2 Rigid body motion, rotational motion, moments of inertia and their products, principal moments & axes, introductory idea of Euler's equations. Potential well and Periodic Oscillations, case of harmonic small oscillations, differential equation and its solution, kinetic and potential energy, examples of simple harmonic oscillations: spring and mass system, simple and compound pendulum, torsional pendulum.

Unit-3 Bifilar oscillations, Helmholtz resonator, LC circuit, vibrations of a magnet, oscillations of two masses connected by a spring. Superposition of two simple harmonic motions of the same frequency, Lissajous figures, damped harmonic oscillator, case of different frequencies. Power dissipation, quality factor, examples, driven (forced) harmonic oscillator, transient and steady states, power absorption, resonance.

Unit-4 E as an accelerating field, electron gun, case of discharge tube, linear accelerator, E as deflecting field- CRO sensitivity, Transverse B field, 180° deflection, mass spectrograph, curvatures of tracks for energy determination, principle of a cyclotron. Mutually perpendicular E and B fields: velocity selector, its resolution. Parallel E and B fields, positive ray parabolas, discovery of isotopes, elements of mass spectrography, principle of magnetic focusing lens.

Unit-5 Elasticity: Strain and stress, elastic limit, Hooke's law, Modulus of rigidity, Poisson's ratio, Bulk modulus, relation connecting different elastic- constants, twisting couple of a cylinder (solid and hallow), Bending moment, Cantilever, Young modulus by bending of beam.

Viscosity: Poiseulle's equation of liquid flow through a narrow tube, equations of continuity. Euler's equation, Bernoulli's theorem, viscous fluids, streamline and turbulent flow. Poiseulle's law, Coefficient of viscosity, Stoke's law, Surface tension and molecular interpretation of surface tension, Surface energy, Angle of contact, wetting.

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Paper-II
ELECTRICITY, MAGNETISM AND ELECTROMAGNETIC THEORY

Unit-1 Repeated integrals of a function of more than one variable, definition of a double and triple integral. Gradient of a scalar field and its geometrical interpretation, divergence and curl of a vector field, and their geometrical interpretation, line, surface and volume integrals, flux of a vector field. Gauss's divergence theorem, Green's theorem and Stoke's theorem and their physical significance. Kirchoff's law, Ideal Constant-voltage and Constant-current Sources. Thevenin theorem, Norton theorem, Superposition theorem, Reciprocity theorem and Maximum Power Transfer theorem.

Unit-2 Coulomb's law in vacuum expressed in Vector forms, calculations of E for simple distributions of charges at rest, dipole and quadrupole fields. Work done on a charge in a electrostatic field expressed as a line integral, conservative nature of the electrostatic field. Relation between Electric potential and Electric field, torque on a dipole in a uniform electric field and its energy, flux of the electric field.
Gauss's law and its application: E due to (1) an Infinite Line of Charge, (2) a Charged Cylindrical Conductor, (3) an Infinite Sheet of Charge and Two Parallel Charged Sheets, capacitors, electrostatic field energy, force per unit area of the surface of a conductor in an electric field, conducting sphere in a uniform electric field.

Unit-3 Dielectric constant, Polar and Non Polar dielectrics, Dielectrics and Gauss's Law, Dielectric Polarization, Electric Polarization vector P, Electric displacement vector D. Relation between three electric vectors, Dielectric susceptibility and permittivity, Polarizability and mechanism of Polarization, Lorentz local field, Clausius Mossotti equation, Debye equation,

Ferroelectric and Paraelectric dielectrics, Steady current, current density J, non-steady currents and continuity equation, rise and decay of current in LR, CR and LCR circuits, decay constants, AC circuits, complex numbers and their applications in solving AC circuit problems, complex impedance and reactance, series and parallel resonance, Q factor, power consumed by an a AC circuit, power factor.

Unit-4 Magnetization Current and magnetization vector M, three magnetic vectors and their relationship, Magnetic permeability and susceptibility, Diamagnetic, paramagnetic and ferromagnetic substances. B.H. Curve, cycle of magnetization and hysteresis, Hysteresis loss.

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Physics

PRACTICALS

Minimum 16 (Eight from each group)

Experiments out of the following or similar experiments of equal standard

GROUP-A

1. Study of laws of parallel and perpendicular axes for moment of inertia.
2. Moment of inertia of Fly wheel.
3. Moment of inertia of irregular bodies by inertia table.
4. Study of conservation of momentum in two dimensional oscillations.
5. Study of a compound pendulum.
6. Study of damping of a bar pendulum under various mechanics.
7. Study of oscillations under a bifilar suspension.
8. Study of modulus of rigidity by Maxwell's needle.
9. Determination of Y, k, η by Searl's apparatus.
10. To study the oscillation of a rubber band and hence to draw a potential energy curve from it.
11. Study of oscillation of a mass under different combinations of springs.
12. Study of torsion of wire (static and dynamic method).
13. Poisson's ratio of rubber tube.
14. Study of bending of a cantilever or a beam.
15. Study of flow of liquids through capillaries.
16. Determination of surface tension of a liquid.
17. Study of viscosity of a fluid by different methods.

GROUP-B

1. Use of a vibration magnetometer to study a field.
2. Study of magnetic field B due to a current.
3. Measurement of low resistance by Carey-Foster bridge.
4. Measurement of inductance using impedance at different frequencies.
5. Study of decay of currents in LR and RC circuits.
6. Response curve for LCR circuit and response frequency and quality factor.
7. Study of waveforms using cathode-ray oscilloscope.
8. Characteristics of a choke and Measurement of inductance.
9. Study of Lorentz force.
10. Study of discrete and continuous LC transmission line.
11. Elementary FORTRAN programs, Flowcharts and their interpretation.
18. To find the product of two matrices.
19. Numerical solution of equation of motion.
20. To find the roots of quadratic equation.

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PRINCIPAL
D.P. Vipra College
Bilaspur (C.G.)

B.Sc. (CS)
I Year

B.Sc. PART - I

COMPUTER SCIENCE

PAPER - I

COMPUTER FUNDAMENTAL

(PAPER CODE - 08025)

Max Marks: 60

NOTE: The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.

UNIT - I Classification and Organization of Computers

History of computer, Generation of computer, Calculator vs. Computer, Digital and Analog computers and its evolution, Major components of digital computers, Memory addressing capability of CPU, Word length and processing speed of computer, Microprocessors, Single chipMicrocomputer, Large and small computers, Users interface, Hardware, software and firmware, multi programming multi user system, Dumb smart and intelligent terminals, computer network and distributed processing, LAN parallel processing Flynn's classification of computers, Control flow and data flow computers

UNIT - II Central Processing Unit

Parts of CPU- ALU, Control Unit, RegistersArchitecture of Intel 8085 microprocessor, Instructions for Intel 8085 microprocessor, Instruction Word size, Various addressing mode,Interrupts,some special Control signals, Instruction cycle, fetch and execute operation, Timing Diagram, Instruction flow and data flow

UNIT - III Memory

Memory hierarchy, Primary andSecondary Memory, Cache memory, Virtual Memory, Direct Access Storage Devices (DASD), Destructive and Nondestructive Readout, Program and data Memory, Memory Management Unit (MMU), PCMCIA Cards and Slot

UNIT - IV I/O Devices

I/O devices- Keyboard, Mouse, Monitor, Impact and Non-ImpactPrinters, Plotter, Scanner, other input/output devices, Scan method of Display- Raster Scan, Vector Scan, Bit Mapped Scan, CRT Controller, I/O Port- Programmable and Non Programmable I/O ports, Inbuilt I/O ports, Parallel and Serial ports, USB, IEEE 1394, AGP, Serial data transfer scheme, Micro controller, Signal Processor, I/O processor, Arithmetic Processor

UNIT-V SOFTWARE AND PROGRAMMING TECHNIQUES

Application and System Software, Introduction, Example, Difference etc., Introduction to Open Source Software such as Unix/Linux (Ubuntu), Libre office etc., Introduction to Machine Language, Assembly Language and High Level Language, Programming Techniques, Stack, Subroutine, Debugging of programs, Macro, Program Design, Software development, Flow Chart, Multi programming, Multiuser, Multitasking, Protection, Operating System and Utility programs, Application packages

TEXT BOOKS

1. Computer Fundamentals P. K. Sinha, BPB Publication, Fourth Edition
2. Computer Fundamentals: Architecture and Organization, [illegible]
3. Fundamentals of Computers, V. Rajaraman, PHI, Sixth Edition
4. Computing Fundamentals, Donald H. Sanders, McGraw-Hill, Third Edition
5. IBM PC [illegible] McGraw-Hill, Second Edition
6. DOS Concepts and [illegible] Tony McGrew, [illegible]

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11/6/18 (Dr. A.K. Dwivedi)

B.Sc. PART - I
COMPUTER SCIENCE
PAPER II
PROGRAMMING IN 'C' LANGUAGE
(Paper Code - 0806)

Max Marks: 50

NOTE: The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.

UNIT-I

Fundamentals of C Programming: Overview of C: History of 'C', Structure of 'C' program. Keywords, Tokens, Data types, Constants, Literals and Variables, Operators and Expressions: Arithmetic operators, Relational operator, Logical operators, Expressions, Operator: operator precedence and associatively, Type casting, Console I/O formatting, Unformatted I/O functions: getch(), getchar, getche(), gete(), putc(), putchar().

UNIT- II

Control Constructs: If-else, conditional operators, switch and break, nested conditional branching statements, loops: do while, while, for, Nested loops, break and continue, goto and label, exit function.

Functions: Definition, function components: Function arguments, return value, function call statement, function prototype, Types of function, Scope and lifetime of variable, Call by value and call by reference. Function using arrays, function with command line argument. User defined function: maths and character functions, Recursive function.

UNIT-III

Array: Array declaration, One and Two dimensional numeric and character arrays, Multidimensional arrays.

String: String declaration, initialization, string manipulation with/without using library function.

Structure, Union and Enum - Structure: Basics, declaring structure and structure variable, typedef statement, array of structure, array within structure, Nested structure; passing structure to function, function returning structure. **Union**: basics, declaring union and union variable, **Enum**: declaring enum and enum variable.

UNIT- IV

Pointer: Definition of pointer, Pointer declaration, Using & and * operators, Void pointer, Pointer to pointer, Pointer in math expression, Pointer arithmetic, Pointer comparison, Dynamic memory allocation functions – malloc, calloc, realloc and free, Pointer vs. Array, Array of pointer, Pointer to array, Pointers to function, Function returning pointer, Passing function as Argument to function, Pointer to structure, Dynamic array of structure through pointer to structure.

UNIT-V

File Handling and Miscellaneous Features: File handling: file pointer, File accessing functions, fopen, fclose, fputc, fgetc, fprintf, fscanf, fread, fwrite,beof, fflush, rewind, fseek, ferror. File handling through command line argument. Introduction to C preprocessor #include, #define, Conditional compilation directives: #if, #else, #elif, #endif, #ifndef etc.

TEXT BOOKS:

1. Programming in ANSI C, E Balagurusamy, Tata McGraw-Hill, Third Edition.
2. Let Us C, YashwantKanetkar, Infinity Science Press, Eighth Edition
3. Mastering C, K R Venugopal, Tata McGraw-Hill.
4. The C Programming Language, Brian W. Kernighan, Dennis M. Ritchie, Prentice Hall, Second Edition.
5. Applications Programming in ANSI C, R. Johnsonbaugh , Martin Kalin, Macmillan, Second Edition.
6. The Spirit of C, Mullish Cooper, Jaico publishing House.
7. How to solve it by Computer, R.G. Dromey, Pearson Education

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11/06/18
(Dr. A.K. Dwivedi)

11/06/18

11-06-18

11/6/18

Practical

- At least 20 Practical based on Syllabus of Paper-I and Paper-II.

11-06-2018
(Dr. Sanjay Kumar)

11/6/2018
(Dr. A.K. Dwivedi)

11/6/18
(L.K. Gavel)

11/6/18
(Dr. J. Durga Prasad Rao)

11-06-18
Hari Shankar Prasad Pande

PRINCIPAL
Vipra College
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ELECTRONICS LABORATORY

ELB 103P: NETWORK ANALYSIS AND ANALOG ELECTRONICS LAB

(Hardware and Circuit Simulation Software) **Max.Marks:25**

The scheme of practical examination will be as follows-

Experiment	--	**30**
Viva	--	**10**
Sessional	--	**10**
Total	--	**50**

AT LEAST 06 EXPERIMENTS FROM THE FOLLOWING BESIDES #1

1. To familiarize with basic electronic components (R, C, L, diodes, transistors), digital Multimeter, Function Generator and Oscilloscope.
2. Measurement of Amplitude, Frequency & Phase difference using Oscilloscope.
3. Verification of (a) Thevenin's theorem and (b) Norton's theorem.
4. Verification of (a) Superposition Theorem and (b) Reciprocity Theorem.
5. Verification of the Maximum Power Transfer Theorem.
6. Study of the I-V Characteristics of (a) p-n junction Diode, and (b) Zener diode.
7. Study of (a) Half wave rectifier and (b) Full wave rectifier (FWR).
8. Study the effect of (a) C- filter and (b) Zener regulator on the output of FWR.
9. Study of the I-V Characteristics of UJT and design relaxation oscillator..
10. Study of the output and transfer I-V characteristics of common source JFET.
11. Study of Fixed Bias and Voltage divider bias configuration for CE transistor.
12. Design of a Single Stage CE amplifier of given gain.
13. Study of the RC Phase Shift Oscillator.
14. Study the Colpitt`s oscillator.

Reference Books:

1. Electrical Circuits, M. Nahvi and J. Edminister, Schaum's Outline Series, Tata McGraw-Hill (2005)
2. Networks, Lines and Fields, J.D.Ryder, Prentice Hall of India.
3. J. Millman and C. C. Halkias, Integrated Electronics, Tata McGraw Hill (2001)
4. Allen Mottershead, Electronic Devices and Circuits, Goodyear Publishing Corporation.

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B.Sc.-I

BIOTECHNOLOGY

PAPER–II

CELL BIOLOGY, GENETICS AND MICROBIOLOGY

UNIT-I

1. Concept of life, Cell as a basic unit of living system and Cell theory.
2. Diversity of Cell shape and size.
3. Prokaryotic cell structure: Function and ultra structure of cell (Gram positive and Gram negative Bacteria), Plasma membrane, Flagella, Pilli, Endospore and Capsule.
4. Eukaryotic cell: Plant cell wall and Plasma membrane.

UNIT-II

1. Cytoplasm: Structure and Functions of Endoplasmic reticulum, Ribosome, Golgi complex, Lysosomes, Nucleus, Mitochondria and Chloroplast.
2. Cytoskeleton: Microtubules, Microfilaments and Intermediate filaments.
3. Cell division: Mitosis and Meiosis.
4. Programmed Cell Death.

UNIT-III

1. Mendel's Laws of Inheritance.
2. Linkage and Crossing over.
3. Chromosome variation in number and structure: Deletion, Duplication, Translocation, Inversion and Aneuploidy, Euploidy (Monoploidy and Polyploidy and its importance).

UNIT-IV

1. History, Scope and Development of Microbiology.
2. Basic techniques of Microbial Culture
3. Microbial Growth & Nutrition of Bacteria: Isolation, media sterilization- physical and chemical agents, pure culture-pour plate method, streak plate method and spread plate method.
4. General features and Economic importance of Fungi, Algae and Protozoa etc.

UNIT-V

1. Bacterial Reproduction: Conjugation, Transduction and Transformation.
2. Mycoplasma – History, Classification, Structure reproduction & Diseases.
3. Viruses – Basic features, Structure, Classification, Multiplication, Bacteriophages (Morphology, life cycle, infection and medicinal importance)

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List of Practical's

MICROBIOLOGY AND BIOCHEMICAL TECHNIQUES

(1) Laboratory rules, Tools, Equipment and Other requirements in Microbiological laboratory.

(2) Micrometry – Use of ocular & stage Micrometrer.

(3) Counting of bacteria by counting chamber, by plate count.

(4)Preparation of media and cultivation techniques:
- (a) Basic liquid media (broth)
- (b) Basic Solid media, (agar slants and deep tubes)
- (c) Demonstration of selective and differential media
- (d) Isolation and enumeration of micro organisms
- (e) Isolation from air and Soil

(5)Smears and staining methods:
- (a) Preparation of bacterial smear
- (b) Gram Negative & Positive staining

(6)Methods of obtaining pure cultures
- (a) Streak plate method
- (b) Pure plate method
- (c) Spread plate method
- (d) Broth cultures

(7)Growth & Biochemical techniques
- (a) Determination of bacterial growth curve
- (b) Amylase production test
- (c) Cellulose production test
- (d) Estimation of Sugar in given solution
- (e) Extraction and separation of lipids
- (f) Estimation of proteins
- (h) Mitosis and Meiosis

(8)Biostatistics:
- (a) By Manual and by computer.
- (b) Problems on mean, mode and median.

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SCHEME OF PRACTICAL EXAMINATION

Time – 4 hrs. **M. M.: 50**

1. Experiment based on culture of micro-organisms	15 Marks
2. Bacterial growth/Staining techniques	10 Marks
3. Biochemical techniques	05 Marks
4. Bio statistics	05 Marks
5. Spotting	05 Marks
6. *Viva – Voce*	05 Marks
7. Record/Sessional	05 Marks

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PRACTICAL FOR Ist YEAR
LABORATORY-I (BCH 105)

1. Preparation of standard buffers and determination of pH of a solution
2. Qualitative tests for :
   a. Carbohydrates
   b. Proteins and amino acids
   c. Lipids
3. Determination of saponification value and iodine number of fats
4. Estimation of ascorbic acid.
5. Titration curve for amino acids and determination of pKa values
6. Verification of Beer-Lambert's law.
7. Estimation of
   i) Carbohydrate by anthrone method.
   ii) Blood glucose by the methods (a) Folin-Wu, (b) Nelson-Somogyi
8. Estimation of amino acids by ninhydrin method.
9. Isolation and assay of glycogen from rat liver.
10. i) Extraction of total lipids by Folch method
    ii) Estimation of food adulterant.
11. Estimation of DNA and RNA.
12. Separation of sugars using paper chromatography.

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Singh, JS Singh SP and Gupta SR. ***Ecology and Environmental Science and Conservation***, S. Chand Publishing, New Delhi

Sharma, PD. ***Ecology and Environment,*** Rastogi Publications, Merrut

Hopkins, WG and Huner, PA. ***Introduction to Plant Physiology,*** John Wiley and Sons.

Pandey SN and Sinha BK, ***Plant Physiology,*** Vikas Publishing, New Delhi

Taiz, L and Zeiger. E. ***Plant Physiology,*** 5th edition, Sinauer Associates Inc. M.A, USA

Srivastava, HS ***Plant Physiology and Biotechnology***, Rastogi Publications, Meerut

B.Sc. II (BOTANY)

Practical

1. Taxonomy: Detailed description and identification of locally available plants of the families as prescribed in the theory paper.
2. Economic Botany: Identification and comment on the plants and plant products belonging to different economic use categories
3. Preparation of Herbarium of local wild plants.
4. Quantitative vegetation analysis of a grassland ecosystem.
5. Anatomical characteristics of hydrophytes and xerophytes.
6. Demonstration of root pressure.
7. Demonstration of transpiration.
8. Demonstration of evolution of O_2 in photosynthesis, factors affecting of photosynthesis.
9. Comparison of R.Q. of different respiratory substrates.
10. Demonstration of fermentation.
11. Determination of BOD of a water body.
12. Demonstration of mitosis.

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PRACTICAL SCHEME

TIME: 4 Hrs. **M.M. : 50**

1.	Anatomy	08
2.	Economic Botany	04
3.	Physiology	08
4.	Ecology	10
5.	Spotting	10
6.	Viva-Voce	05
7.	Project Work/ Field Study	10

(Dr. J.N. Verma
Proff. & Head
Govt. D.B. Girls PG College
Raipur, (C.G.)

(Dr. Rekha Pimpalgaonkar)
Proff. & Head
Govt. N PG Science College
Raipur, (C.G.)

(Dr.Ranjana Shristava)
Proff. & Head
Govt. VYTPG Science College
Raipur, (C.G.)

(Mrs. Sanchal Moghe)
Govt. Bilasa Girls College, Bilaspur

(Mr. Shivakant Mishra)

(Mr Sudheer Tiwari)

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Zoology
B.Sc. Part II 2018-19
Practical

The practical work in general shall be based on the syllabus prescribed and the students will be required to show the knowledge of the following:

- Study of the representative examples of the different chordates (Classified characters).
- Dissection of various systems of scoliodon-Afferent and Efferent branchial cranial nerves, internal ear.

Alternative methods: By Clay/Thermacol/ Drawing/ Model etc.)

- Simple microscopic technique through unstained or stained permanent mount.
- Study of prepared slides histological, as per theory papers.
- Study of limb girdles and vertebrae of Frog, Varanus, Fowl and Rabbit.
- Identification of species and individual of honey bee.
- Life cycle of honey bee and silkworm.
- Exercise based on Evolution and Animal behavior.

Scheme of Practical Exam **Time: 3:30hrs**

• Major dissection (Cranial nerves/efferent branchial vessel)	10
• Exercise based on evolution	05
• Exercise based on applied zoology	05
• Exercise based on animal behavior	04
• Spotting-8 (slides-4,bones-2,specimen-2)	16
• Viva	05
• Sessional marks.	05

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NEW CURRICULUM OF B.Sc. PART II

CHEMISTRY

The new curriculum will comprise of three papers of 33, 33 and 34 marks each and practical work of 50 marks. The Curriculum is to be completed in 180 working days as per UGC norms and conforming to the directives of Govt. of Chhattisgarh. The theory papers are of 60 hrs. each duration and practical work of 180 hrs duration.

Paper – I
INORGANIC CHEMISTRY

60 Hrs., Max Marks 33

UNIT-I

CHEMISTRY OF TRANSITION SERIES ELEMENTS

Transition Elements: Position in periodic table, electronic configuration, General Characteristics, *viz.*, atomic and ionic radii, variable oxidation states, ability to form complexes, formation of coloured ions, magnetic moment μ_{so} (spin only) and μ_{eff} and catalytic behaviour. General comparative treatment of 4d and 5d elements with their 3d analogues with respect to ionic radii, oxidation states and magnetic properties.

UNIT-II

A. Oxidation and Reduction: Redox potential, electrochemical series and its applications, Principles involved in extraction of the elements.

B. COORDINATION COMPOUNDS: Werner's theory and its experimental verification, IUPAC nomenclature of coordination compounds, isomerism in coordination compounds. Stereochemistry of complexes with 4 and 6 coordination numbers. Chelates, polynuclear complexes.

UNIT-III

COORDINATION CHEMISTRY

Valence bond theory (inner and outer orbital complexes), electroneutrality principle and back bonding. Crystal field theory, Crystal field splitting and stabilization energy, measurement of 10 Dq (Δ_o), CFSE in weak and strong fields, pairing energies, factors affecting the magnitude of 10 Dq (Δ_o, Δ_t). Octahedral vs. tetrahedral coordination.

UNIT-IV

A. CHEMISTRY OF LANTHANIDE ELEMENTS

Electronic structure, oxidation states and ionic radii and lanthanide contraction, complex formation, occurrence and isolation, lanthanide compounds.

B. CHEMISTRY OF ACTINIDES

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CHEMISTRY

Paper –IV

LABORATORY COURSE

INORGANIC CHEMISTRY

Qualitative semimicro analysis of mixtures containing 5 radicals. Emphasis should be given to the understanding of the chemistry of different reactions. The following radicals are suggested:

CO_3^{2-}, NO_2^- , S^{2-}, SO_3^{2-},$S_2O_3^{2-}$, CH_3COO^-, F^- ,Cl^- , Br^- , I^- , NO_3^- , BO_3^{3-}, $C_2O_4^{2-}$, PO_4^{3-}, NH_4^+ , K^+, Pb^{2+}, Cu^{2+}, Cd^{2+}, Bi^{3+}, Sn^{2+}, Sb^{3+}, Fe^{3+}, Al^{3+}, Cr^{3+}, Zn^{2+}, Mn^{2+}, Co^{2+}, Ni^{2+}, Ba^{2+}, Sr^{2+}, Ca^{2+}, Mg^{2+}.

Mixtures should preferably contain one interfering anion, or insoluble component ($BaSO_4$, $SrSO_4$, $PbSO_4$, CaF_2 or Al_2O_3) or combination of anions e.g. CO_3^{2-} and SO_3^{2-}, NO_2^- and NO_3^-, Cl^-, Br^-, and I^-.

Volumetric analysis

(a) Determination of acetic acid in commercial vinegar using NaOH.

(b) Determination of alkali content-antacid tablet using HCl.

(c) Estimation of calcium content in chalk as calcium oxalate by permanganometry.

(d) Estimation of hardness of water by EDTA.

(e) Estimation of ferrous & ferric by dichromate method.

(f) Estimation of copper using thiosulphate.

- Principles involved in chromatographic separations. Paper chromatographic separation of following metal ions: i. Ni (II) and Co (II) ii. Fe (III) and Al (III)

ORGANIC CHEMISTRY

- Detection of elements (X, N, S).
- Qualitative analysis of unknown organic compounds containing simple functional groups (alcohols, carboxylic acids, phenols, nitro, amine, amide, and carbonyl compounds, carbohydrates)
- Preparation of Organic Compounds:
  (i) m-dinitrobenzene, (ii) Acetanilide, (iii) Bromo/Nitro-acetanilide, (iv) Oxidation of primary alcohols-Benzoic acid from benzylacohol, (v) azo dye.

PHYSICAL CHEMISTRY

Transition Temperature

PRINCIPAL

- Determination of the transition temperature of the given substance by thermometric/ dialometric method (e.g. $MnCl_2.4H_2O/SrBr_2.2H_2O$).

Thermochemistry

- Determination of heat capacity of a calorimeter for different volumes using change of enthalpy data of a known system (method of back calculation of heat capacity of calorimeter from known enthalpy of solution or enthalpy of neutralization).
- Determination of heat capacity of the calorimeter and enthalpy of neutralization of hydrochloric acid with sodium hydroxide.
- To determine the solubility of benzoic acid at different temperature and to determine ΔH of the dissolution process.
- To determine the enthalpy of neutralization of a weak acid/ weak base versus strong base/ strong acid and determine the enthalpy of ionization of the weak acid/ weak base.
- To determine the enthalpy of solution of solid calcium chloride and calculate the lattice energy of calcium chloride from its enthalpy data using Born Haber cycle.

Phase Equilibrium

- To study the effect of a solute (e.g. NaCl, Succinic acid) on the critical solution temperature of two partially miscible liquids (e.g. phenol-water system) and to determine the concentration of that solute in the given phenol-water system.
- To construct the phase diagram of two component system (e.g. diphenylamine–benzophenone) by cooling curve method.
- Distribution of acetic/ benzoic acid between water and cyclohexane.
- Study the equilibrium of at least one of the following reactions by the distribution method:

  (i) $I_2(aq) + I^- \rightarrow I^-_3(aq)^{2+}$

  (ii) $Cu^{2+}(aq) + nNH_3 \rightarrow Cu(NH_3)n$

Molecular Weight Determination

Determination of molecular weight by Rast Camphor and Landsburger method.

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Note: **Experiments may be added/ deleted subject to availability of time and facilities.**

Reference Books

1. Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009)
2. Furniss, B.S., Hannaford, A.J., Smith, P.W.G. & Tatchell, A.R. Practical Organic Chemistry, 5th Ed. Pearson (2012)
3. Ahluwalia, V.K. & Aggarwal, R. Comprehensive Practical Organic Chemistry: Preparation and Quantitative Analysis, University Press (2000). 22
4. Ahluwalia, V.K. & Dhingra, S. Comprehensive Practical Organic Chemistry: Qualitative Analysis, University Press (2000).
5. Khosla, B. D.; Garg, V. C. & Gulati, A. Senior Practical Physical Chemistry, R. Chand & Co.: New Delhi (2011). Garland, C. W.; Nibler, J. W. & Shoemaker, D. P. Experiments in Physical Chemistry 8th Ed.; McGraw-Hill: New York (2003).
6. Halpern, A. M. & McBane, G. C. Experimental Physical Chemistry 3rd Ed.; W.H. Freeman & Co.: New York

Hrs.5 PRACTICAL EXAMINATION M.M.50

Three Experiments are to be performed.

1. Inorganic – Qualitative semimicro analysis of mixtures. **12 marks**

OR

One experiment from synthesis and analysis by preparing the standard solution.

2. (a) Identification of the given organic compound & determine its M.Pt./B.Pt. **6 marks**

(b) Determination of Rf value and identification of organic compounds by paper chromatography. **6 marks**

3. Any one physical experiment that can be completed in two hours including calculations. **12 marks**

4. Viva **10 marks**

5. Sessional **04 marks**

In case of Ex-Students one marks will be added to each of the experiment.

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MICROBIOLOGY

BSc-2nd

Paper- I: Molecular Biology and Genetic Engineering

UNIT-1: FUNDAMENTALS OF MOLECULAR BIOLOGY

History and scope of molecular biology, concept and mechanism of heredity. DNA as genetic material- experimental evidences. DNA replication- mechanism, process and enzymes/proteins involved in replication.

UNIT-2: CENTRAL DOGMA OF PROTEIN SYNTHESIS

Transcription- initiation, elongation, termination, RNA polymerases and sigma factor. Transcription inhibitors (antibiotics, drugs). Translation- initiation, elongation and termination. Factors involved in translation. Genetic code.

UNIT-3: MUTATION AND DNA REPAIR MECHANISM

Introduction and Types of Gene mutations- Base substitution, frame shift mutation (insertion, deletion, miss-sense, nonsense mutation.) Mutagens – physical and chemical. Reverse mutation in bacteria. DNA repair mechanism (mismatch repair, photo-reactivation, excision and SOS repair). Beneficial and harmful effect of mutation.

UNIT-4: GENE REGULATION

Concept of gene- Cistron, Recon, Muton. Operon Concept- lac Operon, tryptophan Operon, His Operon. Activator, Co-activator and Repressor. Introduction to Bioinformatics- Elementary genome Database.

UNIT-5: GENETIC ENGINEERING

Basic concept of Genetic Engineering, DNA modifying enzymes Restriction endonuclease, DNA ligase, terminal transferase. Vectors- pBR322, pUC19, BAC and YAC. Phage based vectors, expression of vector. Transformation – physical and chemical method. Bacterial Host. Screening of recombinant vector Blue white Screening, Colony Hybridization.

Text Books Recommended:

1. Gene Cloning by T.A. Brown.
2. General Microbiology by Power and Daganiwala.
3. Zinssers Microbiology by KJ Wolfgang, McGraw- HJill Company.
4. Microbial Genetics by RM Stanley, F David and EC John.
5. Bacteriological Techniques by FJ Baker.
6. .Molecular Biology of the Cell; *3rd Edition;* Bruce Alberts ,et.al; Garland Publishing.
7. Cell biology; C.B. Powar; Himalaya Publishing House; Fifth edition
8. Cell & Molecular Biology; Gerald Karp; Fourth edition
9. A Textbook of Microbiology; Dubey&Maheshwari; S.chand& Sons.
10. Cell biology & Genetics; P. K. Gupta
11. Introduction to Bioinformatics; T K Atwood and D J Parry-Smith; Pearson Education Ltd

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Microbiology

PRACTICAL

M. M. 50

Determination of antibiotic resistance by plating method.
Assaying of microbial enzymes; Catalase, Proteases, Peroxidases, Cellulase, Cellobioases, Amylase, Diastase.
Exercise on paper, thin layer, column chromatography.
Exercise on paper and gel electrophoresis.
determination of pH of various water and soil sample.
testing of lambert beer's law.
Determination of lamda max of dye by spectrophotometer
Isolation of resistant bacteria from soil and water sample

Scheme of Practical Examination

Time - 4 hours M.M. 50

1. Exercise on spectrophotometer/ pH meter	10
2. Exercise on chromatography	10
3. Exercise on genetics	05
4. Spotting (1-5)	10
5. Viva-Voce	05
6. Sessional	10
	Total 50

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B.Sc. Part-II

Paper-I

THERMODYNAMICS, KINETIC THEORY AND STATISTICAL PHYSICS

Unit-1 The laws of thermodynamics : The Zeroth law, first law of thermodynamics, internal energy as a state function, reversible and irreversible change, Carnot's cycle, carnot theorem, second law of thermodynamics. Claussius theorem inequality. Entropy, Change of entropy in simple cases (i) Isothermal expansion of an ideal gas (ii) Reversible isochoric process (iii) Free adiabatic expansion of an ideal gas. Concept of entropy, Entropy of the universe. Entropy change in reversible and irreversible processes, Entropy of Ideal gas, Entropy as a thermodynamic variable, S-T diagram, Principle of increase of entropy. The thermodynamic scale of temperature, Third law of thermodynamics, Concept of negative temperature.

Unit-2 Thermodynamic functions, Internal energy, Enthalpy, Helmholtz function and Gibb's free energy, Maxwell's thermodynamical equations and their applications, TdS equations, Energy and heat capacity equations Application of Maxwell's equation in Joule-Thomson cooling, adiabatic cooling of a system, Van der Waals gas, Clausius-Clapeyron heat equation. Blackbody spectrum, Stefan-Boltzmann law, Wien's displacement law, Rayleigh-Jean's law, Planck's quantum theory of radiation.

Unit-3 Maxwellian distribution of speeds in an ideal gas: Distribution of speeds and velocities, experimental verification, distinction between mean, rms and most probable speed values. Doppler broadening of spectral lines. Transport phenomena in gases: Molecular collisions mean free path and collision cross sections. Estimates of molecular diameter and mean free path. Transport of mass, momentum and energy and interrelationship, dependence on temperature and pressure.

Behaviour of Real Gases: Deviations from the Ideal Gas Equation. The Virial Equation. Andrew's Experiments on CO_2 Gas. Critical Constants.

Unit-4 The statistical basis of thermodynamics: Probability and thermodynamic probability, principle of equal a priori probabilities, statistical postulates. Concept of Gibb's ensemble, accessible and inaccessible states. Concept of phase space, γ phase space and μ phase space. Equilibrium before two systems in thermal contact, probability and entropy, Boltzmann entropy relation. Boltzmann canonical distribution law and its applications, law of equipartition of energy.

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Paper-II
WAVES, ACOUSTICS AND OPTICS

Unit-1 Waves in media: Speed of transverse waves on uniform string, speed of longitudinal waves in a fluid, energy density and energy transmission in waves. Waves over liquid surface: gravity waves and ripples. Group velocity and phase velocity and relationship between them. Production and detection of ultrasonic and infrasonic waves and applications.

Reflection, refraction and diffraction of sound : Acoustic impedance of a medium, percentage reflection & refraction at a boundary, impedance matching for transducers, diffraction of sound, principle of a sonar system, sound ranging.

Unit-2 Fermat's Principle of extremum path, the aplanatic points of a sphere and other applications. Cardinal points of an optical system, thick lens and lens combinations. Lagrange equation of magnification, telescopic combinations, telephoto lenses. Monochromatic aberrations and their reductions; aspherical mirrors and Schmidt corrector plates, aplanatic points, oil immersion objectives, meniscus lens.

Optical instruments: Entrance and exit pupils, need for a multiple lens eyepiece, common types of eyepieces. (Ramsdon and Hygen's eyepieces).

Unit-3 Interference of light: The principle of superpositions, two slit interference, coherence requirement for the sources, optical path retardations, Conditions for sustained interference, Theory of interference, Thin films. Newton's rings and Michelson interferometer and their applications its application for precision determinations of wavelength, wavelength difference and the width of spectral lines. Multiple beam interference in parallel film and Fabry-Perot interferometer. Rayleigh refractometer, Twyman-Green interferometer and its uses.

Unit-4 Diffraction, Types of Diffraction, Fresnel's diffraction, half-period zones, phasor diagram and integral calculus methods, the intensity distribution, Zone plates, diffraction due to straight edge, Fraunhofer diffraction due to a single slit and double slit, Diffraction at N-Parallel slit, Plane Diffraction grating, Rayleigh criterion, resolving power of grating , Prism, telescope.

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Polarized light and its mathematical representation, Production of polarized light by reflection, refraction and scattering. Polarization by double refraction and Huygen's theory, Nicol prism, Retardation plates, Production and analysis of circularly and elliptically polarized light. Optical activity and Fresnel's theory, Biquartz polarimeter.

Unit-5 Laser system: Basic properties of Lasers, coherence length and coherence time, spatial coherence of a source, Einstein's A and B coefficients, Spontaneous and induced emissions, conditions for laser action, population inversion, Types of Laser : Ruby and, He-Ne laser and. Applications of laser : Application in communication, Holography and Basics of non linear optics and Generation of Harmonic.

TEXT AND REFERENCE BOOKS:

1. A.K. Ghatak, 'Physical Optics'
2. D.P. Khandelwal, Optical and Atomic Physics' (Himalaya Publishing House, Bombay, 1988)
3. K.D. Moltev; 'Optics' (Oxford University Press)
4. Sears: 'Optics'
5. Jenkins and White: 'Fundamental of Optics' (McGraw-Hill)
6. B.B. Laud: Lasers and Non-linear Optics (Wiley Eastern 1985)
7. Smith and Thomson: 'Optics' (John Wiley and Sons)
8. Berkely Physics Courses: Vol.-III, 'Waves and Oscillations'
9. I.G. Main, 'Vibrations and Waves' (Cambridge University Press)
10. H.J. Pain: 'The Physics of Vibrations and Waves' (MacMillan 1975)
11. Text Book of Optics: B.K. Mathur
12. B.Sc. (Part III) Physics: Editor: B.P. Chandra, M.P. Hindi Granth Academy.
13. F. Smith and J.H. Thomson, Manchester Physics series: optics (John wiley, 1971)
14. Born and Wolf : 'Optics'.
15. Physical Optics: B. K. Mathur and T. P. Pandya.
16. A textbook of Optics: N. Subrahmanyam, Brijlal and M. N. Avadhanulu.
17. Geometrical and Physical Optics: Longhurst.
18. Introduction to Modern Optics: G. R. Fowels.
19. Optics: P. K. Srivastav.

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Physics

PRACTICALS

Minimum 16 (Eight from each group)

Experiments out of the following or similar experiments of equal standard

1. Study of Brownian motion.
2. Study of adiabatic expansion of a gas.
3. Study of conversion of mechanical energy into heat.
4. Heating efficiency of electrical kettle with varying voltage.
5. Study of temperature dependence of total radiation.
6. Study of temperature dependence of spectral density of radiation.
7. Resistance thermometry.
8. Thermo emf thermometry.
9. Conduction of heat through poor conductors of different geometries.
10. Experimental study of probability distribution for a two-option system using a coloured dice.
11. Study of statistical distribution on nuclear disintegration data (GM counter used as a black box).
12. Speed of waves on a stretched strings.
13. Studies on torsional waves in a lumped system.
14. Study of interference with two coherent source of sound.
15. Chlandi's figures with varying excitation and loading points.
16. Measurements of sound intensities with different situations.
17. Characteristics of a microphone-loudspeakers system
18. Designing an optical viewing system.
19. Study of monochromatic defects of images.
20. Determining the principle point of a combination of lenses.
21. Study of interference of light (biprism or wedge film).
22. Study of diffraction at a straight edge or a single slit.
23. Study of F-P etalon fringes.
24. Study of diffraction grating and its resolving power.
25. Resolving power of telescope system.
26. Polarization of light by reflection; also cos-squared law.
27. Study of optical rotation for any system.
28. Study of laser as a monochromatic coherent source.
29. Study of a divergence of laser beam.
30. Calculation of days between two dates of a year.
31. To check if triangle exists and the type of a triangles.
32. To find the sum of the sine and cosines series and print out the curve.

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33. To solve simultaneous equation by elimination method.
34. To prepare a mark-list of polynomials.
35. Fitting a straight line or a simple curve
36. Convert a given integer into binary and octal systems and vice versa .
37. Inverse of a matrix.
38. Spiral array.

TEXT AND REFERENCE BOOKS

1. D.P. Khandelwal, Optics and Atomic physics (Himalaya Publishing house, Bombay 1988).
2. D.P. Khandelwal, A Laboratory Manual for Undergraduate Classes (Vani Publishing House, New Delhi).
3. S. Lipschutz and a Poe, Schaum's outline of theory and Problems of Programming with Fortran(McGraw-hill Book Company 1986).
4. C Dixon, Numerical Analysis .

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B.Sc.(CS)
II Year

COMPUTER SCIENCE

PAPER - I

COMPUTER HARDWARE

(Paper Code - 0655)

Max.Marks 50

Duration 3 hours

AIM - The emphasis in on the desing concepts & organisational details of the common PC, leaving the complicated electronics of the system of the computer Engineers.

OBJECT OF THE COURSE -

1. To introduce the overall organisation of the microcomputers.
2. To introduce the common peripheral devices used in computers.
3. To introduce the hardware components, use of micro processor and function of various chips used in microcomputer.

N.B. : Since the computer organisation study is very vast & complicated, so the study is restricted to only the description and understanding part, fence the paper setter is requested to keep this important factor in mind.

UNIT-I CLASSIFICATION AND ORGANIZATION OF COMPUTERS

Digital and analog computers and its evolution. Major components of digital computers; Memory addressing capability of CPU; word length and processing speed of computes. Microprocessors single chip microcomputers; large and small computers. Users interface Hardware software and firmware. multi programming multi user system. Dumb smart and intelligent terminals computer network and multi processing, LAN parallel processing. Flinn's classification of computers. Computer flow and data flow computers.

UNIT-II CENTRAL PROCESSING UNIT.

CPU organization, ALU control unit registers. Instructions for INTEL 8085, Instruction word size, Various addressing mode interrupts and exceptions, some special Control signals and I/O devices. Instruction cycle fetch and execute operation, time Diagram, data flow.

UNIT-III MEMORY OF COMPUTERS.

Main memory secondary memory, backup memory, cache memory; real and virtual Memory Semiconductor memory. Memory controller and magnetic memory; RAM; disks, optical disks Magnetic bubble memory; DASD, destructive and non destructive. readout. Program of data Memory and MMU.

UNIT-IV I/O DEVICES.

I/O devices of micro controller; processors. I/O devices, printer, plotter, other out put devices, I/O port serial data transfer scheme, Micro controller, signal processor, I/O processor I/O processor arithmetic processor.

UNIT-V SYSTEM SOFTWARE AND PROGRAMMING TECHNIQUE.

ML, AL, HLL, stac subroutine debugging of programs macro, micro programming, Program Design, software development, flow & chart multi programming, multiuser, multi tasking Protection, operating system and utility program, application package.

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(Dr. J. Durga)

11.06.18

RECOMMENDED BOOKS :

1 Computer Fundamentals : Architecture and Organization - By B.Ram (Wilwy Bastem Ltd.)

2 Computers Today - By Donal H. Sanders

3 Computers Fundamental - By Rajaraman.

4 IBM PC - XT Clones - By Govinda Rajalu

PAPER - II

SOFTWARE

(Paper Code - 0856)

AIM - Introduction to the web-language-HTML & problem solving throgh the concept of object oriented programming.

OBJECT OF THE COURSE -

1 To introduce the internet & web related technology & learn the intricacies of web-page designing using HTML.

2 To introduce the object oriented programming concept using C++ language.

3 To introduce the problem solving methodology using the C++ programming features.

N.B. : Examiners are requested to prepare unit-wise Questions papers.

UNIT-I HTML BASICS & WEB SITE DESIGN PRINCIPLES

Concept of a Web Site, Web Standards, What is HTML? HTML Versions, Naming Scheme for HTML Documents , HTML document/file, HTML Editor , Explanation of the Structure of the homepage , Elements in HTML Documents ,HTML Tags, Basic HTML Tags, Comment tag in HTML, Viewing the Source of a web page, How to download the web page source? XHTML, CSS, Extensible Markup Language (XML), Extensible Style sheet language (XSL), Some tips for designing web pages, HTML Document Structure. HTML Document Structure-Head Section, Illustration of Document Structure,<BASE> Element,<ISINDEX> Element,<LINK> Element ,META, <TITLE> Element,<SCRIPT> Element ,Practical Applications, HTML Document Structure-Body Section:-Body elements and its attributes: Background; Background Color; Text; Link; Active Link (ALINK); Visited Link (VLINK); Left margin; Top margin, Organization of Elements in the BODY of the document: Text Block Elements; Text Emphasis Elements; Special Elements – Hypertext Anchors; Character-Level Elements; Character References ,Text Block Elements: HR (Horizontal Line); Hn (Headings) ; P (Paragraph); Lists; ADDRESS ; BLOCKQUOTE; TABLE; DIV (HTML 3.2 and up) ; PRE (Preformatted); FORM ,Text Emphasis Elements, Special Elements – Hypertext Anchors ,Character-Level Elements: line breaks (BR) and Images (IMG), Lists , ADDRESS Element, BLOCKQUOTE Element, TABLE Element, COMMENTS in HTML ,CHARACTER Emphasis Modes, Logical & Physical Styles, Netscape, Microsoft and Advanced Standard Elements List, FONT, BASEFONT and CENTER.

UNIT-II IMAGE, INTERNAL AND EXTERNAL LINKING BETWEEN WEBPAGES

Netscape, Microsoft and Advanced Standard Elements List, FONT, BASEFONT and CENTER Insertion of images using the element IMG (Attributes: SRC (Source),

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WIDTH, HEIGHT, ALT (Alternative), ALIGN), IMG (In-line Images) Element and Attributes; Illustrations of IMG Alignment, Image as Hypertext Anchor, Internal and External Linking between Web Pages Hypertext Anchors ,HREF in Anchors ,Links to a Particular Place in a Document ,NAME attribute in an Anchor ,Targeting NAME Anchors ,TITLE attribute, Practical IT Application Designing web pages links with each other, Designing Frames in HTML. Practical examples.

UNIT-III INTRODUCTION TO OOP

Advantages of OOP, The Object Oriented Approach, Characteristics of object oriented languages- Object, Classes, Inheritance, Reusability, Polymorphism and C++.

Function: Function Declaration, Calling Function, Function Defines, Passing Argument to function, Passing Constant, Passing Value, Reference Argument, returning by reference, Inline Function, Function Overloading, Default Arguments in function.

UNIT-IV OBJECT CLASSES AND INHERITANCE

Object and Class, Using the class, class constructor, class destructors, object as function argument ,copy constructor ,struct and classes , array as class member, Static Class Data, Static Member Functions, , Friend function, Friend class, operator overloading. Type of inheritance, Base class, Derive class. Access Specifier: protected. Function Overriding, member function, String, Template Function.

UNIT-V POINTERS AND VIRTUAL FUNCTION

pointers: & and * operator pointer variables, .pointer to pointer, void pointer,pointer and array, pointer and function, pointer and string, memory management, new and delete, pointer to object, this pointer Virtual Function: Virtual Function, Virtual member function, accesses with pointer,pure virtual function

File and Stream: C++ streams, C++ Manipulators, Stream class, string I/O, char I/O, Object I/O, I/O with multiple object, Disk I/O,

RECOMMENDED BOOKS :

1	Introduction to HTML	:	Kamlesh Agarwala, O.P.Vyas, Prateek A. Agrawala (Kitab Mahal Publication)
2	Let us C++	:	Y. Kanetkar B.P.B Publication
3	Programming in C++	:	E. Balaguruswami
4	Mastering in C++	:	Venu Gopal
5	Object Oriented Programming in C++	:	Lafore R, Galgotia Publications.

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(L.K. Gavel)

11.06.18
Hari Shankar Prasad Tade

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ELECTRONICS LABORATORY

The scheme of practical examination will be as follows-

Experiment	--	**30**
Viva	--	**10**
Sessional	--	**10**
Total	--	**50**

ELB 203P: COMMUNICATIONELECTRONICS LAB

(Hardware and Circuit Simulation Software) 60 Lectures
Max.Marks:25

1. To design an Amplitude Modulator using Transistor
2. To study envelope detector for demodulation of AM signal
3. To study FM - Generator and Detector circuit
4. To study AM Transmitter and Receiver
5. To study FM Transmitter and Receiver
6. To study Time Division Multiplexing (TDM)
7. To study Pulse Amplitude Modulation (PAM)
8. To study Pulse Width Modulation (PWM)
9. To study Pulse Position Modulation (PPM)
10. To study ASK, PSK and FSK modulators

Reference Books:

1. Electronic Communication systems, G. Kennedy, 1999, Tata McGraw Hill.
2. Electronic Communication system, Blake, Cengage, 5th edition.

ELB 204P: MICROPROCESSOR ANDMICROCONTROLLER LAB(Hardware and Circuit Simulation Software)

Max.Marks:25

At least 06 experiments each from Section-A and Section-B

Section-A: Programs using 8085 Microprocessor

1. Addition and subtraction of numbers using direct addressing mode
2. Addition and subtraction of numbers using indirect addressing mode
3. Multiplication by repeated addition.
4. Division by repeated subtraction.
5. Handling of 16-bit Numbers.
6. Use of CALL and RETURN Instruction.
7. Block data handling.
8. Other programs (e.g. Parity Check, using interrupts, etc.).

Section-B: Experiments using 8051 microcontroller:

1. To find that the given numbers is prime or not.
2. To find the factorial of a number.
3. Write a program to make the two numbers equal by increasing the smallest number and decreasing the largest number.
4. Use one of the four ports of 8051 for O/P interfaced to eight LED's. Simulate binary counter (8 bit) on LED's .
5. Program to glow the first four LEDs then next four using TIMER application.
6. Program to rotate the contents of the accumulator first right and then left
7. Program to run a countdown from 9-0 in the seven segment LED display.
8. To interface seven segment LED display with 8051 microcontroller and display 'HELP' in the seven segment LED display.
9. To toggle '1234' as '1324' in the seven segment LED display.
10. Interface stepper motor with 8051 and write a program to move the motor through a given angle in clock wise or counter clockwise direction.
11. Application of embedded systems: Temperature measurement & display on LCD

Reference Books:

1. Microprocessor Architecture Programming & applications with 8085, 2002, R.S. Goankar, Prentice Hall.
2. Embedded Systems: Architecture, Programming & Design, Raj Kamal, 2008, Tata McGraw Hill
3. The 8051 Microcontroller and Embedded Systems Using Assembly and C, M.A. Mazidi, J.G. Mazidi, and R.D. McKinlay, 2nd Ed., 2007, Pearson Education India.
4. 8051 microcontrollers, Satish Shah, 2010, Oxford University Press.
5. Embedded Microcomputer systems: Real time interfacing, J.W. Valvano 2011, Cengage Learning

B.Sc. II

BIOTECHNOLOGY

PAPER – I

MOLECULAR BIOLOGY & BIOPHYSICS

M.M. 50

UNIT-I

1. Nucleic Acid: Bases, Nucleosides and Nucleotides, DNA and RNA structure.
2. Plasmids.
3. Transposons: Repetitive elements, LINEs & SINEs, Structure of Gene.

UNIT-II

1. DNA Replication: Enzymes involved and mechanism of DNA Replication in Prokaryotes.
2. Mutation: Molecular level of Mutation, Types of Mutagens, Spontaneous and Induced Mutation.
3. DNA Repair: NER, BER and Mismatch Repair.

UNIT-III

1. Genetic Code: Features, Condon Assignment and Wobble hypothesis.
2. Transcription: Initiation, Elongation and Termination in Prokaryotes.
3. Translation: Initiation, Elongation and Termination Translation machinery in Prokaryotes. Operon-Concept of Operator, Regulator, Promoter gene, Inducer and Co-repressor.

UNIT –IV

1. Biophysics : Introduction, Scope and Application
2. Principle, Structure, Functions of the following:
   a. Microscopy b. Colorimeter and Spectroscopy c. Electrophoresis
   d. Centrifugation e. Chromatography.

UNIT –V

1. Radioisotopes techniques: Measurement of radioactivity, Ionization Chambers, Geiger Muller and Scintillation Counter.
2. Autoradiography and DNA Fingerprinting.
3. Biosensor.

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Biotechnology

List of Practical's

MOLECULAR BIOLOGY, BIOPHYSICS, RECOMBINANT DNA TECHNOLOGY AND GENOMICS

1. Isolation of DNA from Plant cell.
2. Estimation of DNA by DPA method.
3. Isolation RNA from yeast cells

Experiment based on-

4. Centrifugation
5. Spectrophotometer/Colorimeter
6. Electrophoresis
7. Paper chromatography/TLC

Experiment based on Bioinformatics -

8. Retrieve DNA /Protein sequence from Biological Data Bases (NCBI).
9. Use of tools studied

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SCHEME FOR PRACTICAL EXAMINATION

Time: 4 hrs. M.M.: 50

1. Experiment based on DNA/RNA	10 marks
2. Experiment based on Instruments	10 marks
3. Experiment based on Bioinformatics	10 marks
4. Spotting	10 marks
5. *Viva - Voce*	05 marks
6. Record / Sessional	05 marks

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BIOCHEMISTRY

PAPER - I

ENZYMOLOGY

M.M. 50

UNIT-I INTRODUCTION

History, general characteristics, nomenclature, IUB enzyme classification (rationale, over view and specific examples), significance of numbering system. Definitions with examples of holoenzyme, apoenzyme, coenzymes. cofactors, activators, inhibitors, active site (identification of groups excluded), metallo-enzymes, units of enzyme activity, specific enzymes, Isoenzymes, monomeric enzymes, oligomeric enzymes and multienzyme complexes. Enzyme specificity.

Hostorical perspective, nature of non-enzymatic and enzymatic catalysis. Measurement and expression of enzyme activity-enzyme assays. Definition of IU, Katal, enzyme turn over number and specific acitivity. Role of non-protein organic molecules and inorganic ions coenzyme, prosthetic groups. Role of vitamins as coenzymes precursors (general treatment).

UNIT-I ENZYME CATALSIS

Role of cofactors in enzyme catalysis : NAD/NADP+, FMN/FAD, coenzyme A, biocytin, cobamide, lipoamide, TPP, pyridoxal phosphate, tetrahydrofolate and metal ions with special emphasis on coenzyme functions. Acid-base catalysis, covalent, proximity and orientaton effects, strain and distortion theory. Mechanism of action of chymotrypsin, carboxypeptidase, ribonuclease and lysozyme.

UNIT-II ENZYME PURIFICATION

Methods for isolation, purification and characterization of enzymes.

UNIT-IV ENZYME KINETICS

Factors affecting enzyme activity : enzyme concentration, substrate concentration, pH and temperature. Derivation of Michaelis-Menten equation for uni-substrate reactions. Km and its significance. Line weaver-Burk plot and its limitations. Importance of K_{ca}/K_m. Bi-substrate reactions-brief introduction to sequential and ping-pong mechanism with examples.

Kinetics of zero and first order reactions. Significance and evaluation of energy of activation and free energy.

Reversible and irreversible inhibition, competitive, non-competitive and uncompetitive inhibitions. determination of K_m & V_{max} in presence and absence of inhibitor. Allosteric enzymes.

UNIT-V INDUSTRIAL AND CLINICAL APLLICATION OF ENZYME.

Immobilization of enzyme and their industrial applications. Production of glucose from starch, cellulose and dextran; use of lactase in dairy industry; production of glucose-fructose syrup from sucrose; use proteases in food, detergent and leather industry; medical application of enzymes. use of glucose oxidase in enzyme electrodes.

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Biochemistry

PAPER - II

INTERMEDIARY METABOLISM

M.M. 50

UNIT-I INTRODUCTION TO METABOLISM

General features of metabolism, experimental approaches to study metabolism; use of intact organism, becterial mutants, tissue slices, stable and radioactive isotopes.

CARBOHYDRATE METABOLISM

Reactions and energetics of glycolysis. Alcoholic and lactic acid fermentations. Entry of fructose, galactose, mannose etc. Reactions and energetics of TCA cycle. Gluconeogenesis, glycogenesis and glycogenolysis, Reactions and physiological signifacance of pentose phosphate pathway. Regulation of glycolysis and TCA cycle. Photosynthesis, a brief review.

UNIT-II ELECTRON TRANSPORT CHAIN AND OXIDATIVE PHOSPHORYLATION

Structure of mitochondria, sequence of electron carriers, sites of ATP production, inhibitors of electron transport chain. Hypothesis of mitochondrial oxidative phosphorylation (basic concepts). Inhibitors and uncouplers of oxidative phosphorylation. Transport of reducing potentials into mitochondria.

UNIT-III LIPID METABOLISM

Introduction, hydrolysis of triacylglycerols, transport of fatty acids into mitochondria. β – oxidation of saturated fatty acids, ATP yield from fatty acid oxidation. biosynthesis of saturated and unsaturated fatty acids. Metabolism of ketone bodies, oxidation of unsaturated and odd chain fatty acids. Biosynthesis of triglycerides and important phospholipids, glycolipids, sphingolipids and cholesterol. Regulation of cholesterol metabolism.

UNIT-IV AMINO ACID METABOLISM

General reactions of amino acid metabolism : transmination, oxodative deamination and decarboxylation. Urea cycle. Degradation and biosynthesis of amino acids. Glycogenic and ketogenic amino acids.

UNIT-V NUCLEOTIDE METABOLISM

Sources of the atoms in the purine and pyrimidine molecules. Biosynthesis and degradation of purines and pyrimidines. Regulation of purine and pyrimidine biosynthesis.

PORPHYRIN METABOLISM

Biosynthesis and degradation of porphyrins. Production of bile pigments.

PRECTICAL

1 Separation of Blood Plasm and Serum

a Estimation of proteins from serum by biuret and lowry methods.

b Determination of albumin and A/G ratio in serum.

2 Estimation of bilirubin (conjugated and unconjugated) in serum.

3 i Estimation of total lipids in serum by vanillin method.

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i. Estimation of cholesterol in serum.

4. Estimation of lipoproteins in plasma.

5. Estimation of lactic acid in blood before and after exercise.

6. Estimation of blood urea nitrogen from plasma.

7. Separation and identification of amino acids by (a) paper chromatography and (b) thin-layer chromatography.

8. Separation of polar and non-polar lipids by thin-layer chromatography.

9. Estimation of SGPT and SGOT in serum.

10. a. Assay of serum alkaline phosphatase activity.
    b. Inhibition of alkaline phosphatase activity by EDTA.
    c. Effect of substrate concentration on alkaline phosphatase activity and determination of its K_m value.

11. a. Effect of temperature on enzyme activity and determination of activation energy.
    b. Effect of pH on enzyme activity and determination of optimum pH.
    c. Effect of enzyme concentration on enzyme activity.

12. a. Preparation of starch from potato and its hydrolysis by salivary amylase.
    b. Determination of achromatic point in salivary amylase.
    c. Effect of sodium chloride onamylases.

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Singh BD, ***Genetics***, Kalyani Publication

Gupta, PK, ***Cell and Molecular Biology,*** Rastogi Publications, Meerut

Singh, BD, ***Biotechnology: Expanding Horizons,*** Kalyani publications

Gupta, PK, ***Elements of Plant Biotechnology,*** Rastogi Publications, Meerut

Gupta, SN, ***Concepts of Biochemistry,*** Rastogi Publications, Meeru

Jain, JL., Jain S, Jain, N, ***Fundamentals of Biochemistry***, S Chand Publishing, New Delhi

B.Sc.-III (Botany)

Practical

1. Study of host parasite relationship pf plant diseases listed above.
2. Demonstration of preparation of Czapek's Dox medium and Potato dextrose agar medium, sterilization of culture medium and pouring.
3. Inoculation in culture tubes and petriplates.
4. Gram Staining.
5. Microscopic examination of Curd.
6. Study of plant diseases as listed in the theory paper.
7. Biochemical test of carbohydrate and protein.
8. Instrumentation techniques

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PRACTICAL SCHEME

TIME: 4 Hrs. **M.M. : 50**

1.	Plant Disease/Symptoms	10
2.	Instrumentation techniques	05
3.	Staining of Microbes	05
4.	Tissue Culture techniques	05
5.	Spotting	10
6.	Project Work/ Field Study	05
5.	Viva-Voce	05
6.	Sessional	05

(Dr. J.N. Verma) (Dr. Rekha Pimpalgaonkar) (
Dr.Ranjana Shristava)

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Proff. & Head
Govt. N PG Science College
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Govt. Bilasa Girls College, Bilaspur

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B. Sc. Part III 2018-19

Zoology

Practical

The practical work in general shall be based on syllabus prescribed in theory.
The candidates will be required to show knowledge of the following:

- Estimation of population density, percentage frequency, relative density.
- Analysis of producers and consumers in grassland.
- Detection of gram-negative and gram-positive bacteria.
- Blood group detection (A,B,AB,O)
- R. B. C. and W.B.C count
- Blood coagulation time
- Preparation of hematin crystals from blood of rat
- Observation of Drosophila, wild and mutant.
- Chromatography-Paper or gel.
- Colorimetric estimation of Protein.
- Mitosis in onion root tip.
- Biochemical detection of Carbohydrate, Protein and Lipid.
- Study of permanent slides of parasites, based on theory paper.
- Working principles of pH meter, colorimeter, centrifuge and microscope.

Scheme of marks distribution **Time: 3:30hrs**

• Hematological Experiment	08
• Ecological Experiment: Grassland Ecosystem/ Population Density/Frequency/relative density	06
• Bacterial staining	05
• Biochemical experiment	06
• Practical based on Instrumentation (Chromatography/ pH meter/microscope/centrifuge.	05
• Spotting (5 spots)	10
7 Viva	05
8. Sessional	05

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CHEMISTRY

B.Sc. Part- III

PRACTICAL

Max. Marks-50

INORGANIC CHEMISTRY

Gravimetric analysis:

- Estimation of nickel (II) using Dimethylglyoxime (DMG).
- Estimation of copper as CuSCN
- Estimation of iron as Fe_2O_3 by precipitating iron as $Fe(OH)_3$.
- Estimation of Al (III) by precipitating with oxine and weighing as $Al(oxine)_3$ (aluminium oxinate).
- Estimation of Barium as $BaSO_4$

Inorganic Preparations:

- Tetraamminecopper (II) sulphate, $[Cu(NH_3)_4]SO_4.H_2O$
- Cis and trans $K[Cr(C_2O_4)_2.(H_2O)_2]$ Potassium dioxalatodiaquachromate(III)
- Tetraamminecarbonatocobalt (III) ion
- Potassium tris(oxalate)ferrate(III)/ Sodium tris(oxalate)ferrate(III)
- Cu(I) thiourea complex, Bis (2,4-pentanedionate) zinc hydrate; Double salts (Chrome alum/ Mohr's salt)

ORGANIC CHEMISTRY

1. Preparation of organic Compounds

- Acetylation of one of the following compounds: amines (aniline, o-, m-, p- toluidines and o-,m-, p-anisidine) and phenols (β-naphthol, vanillin, salicylic acid)
- Benzolyation of one of the following amines (aniline, o-, m-, p- toluidines and o-, m-, panisidine) and one of the following phenols (β-naphthol, resorcinol, p cresol) by Schotten-Baumann reaction.
- Bromination of any one of the following: a. Acetanilide by conventional methods b.Acetanilide using green approach (Bromate-bromide method)
- Nitration of any one of the following: a. Acetanilide/nitrobenzene by conventional method b. Salicylic acid by green approach (using ceric ammonium nitrate).
- Reduction of p-nitrobenzaldehyde by sodium borohydride.
- Hydrolysis of amides and esters.
- Semicarbazone of any one of the following compounds: acetone, ethyl methyl ketone, cyclohexanone, benzaldehyde.

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- Benzylisothiouronium salt of one each of water soluble and water insoluble acids (benzoic acid, oxalic acid, phenyl acetic acid and phthalic acid).
- Aldol condensation using either conventional or green method.
- Benzil-Benzilic acid rearrangement.
- Preparation of sodium polyacrylate.
- Preparation of urea formaldehyde.
- Preparation of methyl orange.

The above derivatives should be prepared using 0.5-1g of the organic compound. The solid samples must be collected and may be used for recrystallization, melting point and TLC.

2. Qualitative Analysis Analysis of an organic mixture containing two solid components using water, $NaHCO_3$, NaOH for separation and preparation of suitable derivatives.
3. Extraction of caffeine from tea leaves.
4. Analysis of Carbohydrate: aldoses and ketoses, reducing and non-reducing sugars.
5. Identification of simple organic compounds by IR spectroscopy and NMR spectroscopy. (Spectra to be provided).
6. Estimation of glycine by Sorenson's formalin method.
7. Study of the titration curve of glycine.
8. Estimation of proteins by Lowry's method.
9. Study of the action of salivary amylase on starch at optimum conditions.
10. Effect of temperature on the action of salivary amylase.

PHYSICAL CHEMISTRY

Conductometry

- Determination of cell constant
- Determination of equivalent conductance, degree of dissociation and dissociation constant of a weak acid.
- Perform the following conductometric titrations:
  - i. Strong acid vs. strong base
  - ii. Weak acid vs. strong base
  - iii. Mixture of strong acid and weak acid vs. strong base
  - iv. Strong acid vs. weak base
- To determine the strength of the given acid conductometrically using standard alkali solution.
- To determine the solubility and solubility product of a sparingly soluble electrolyte conductometrically
- To study the saponification of ethyl acetate conductometrically.

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8 Hrs. **PRACTICAL EXAMINATION** **M.M.50**

Five experiments are to be performed.

1. **Inorganic** - Two experiments to be performed. Gravimetric estimation compulsory **08 marks**. (Manipulation 3 marks)

   Anyone experiment from synthesis and analysis **04 marks**.

2. **Organic** - Two experiments to be performed. Qualitative analysis of organic mixture containing two solid components. compulsory carrying **08 marks** (03 marks for each compound and two marks for separation).

One experiment from synthesis of organic compound (Single step) **04 marks**.

3. Physical-One physical experiment **12 marks**.
4. Sessional **04 marks**.
5. Viva Voce **10 marks**.

In case of Ex-Students one mark each will be added to Gravimetric analysis and Qualitative analysis of organic mixture and two marks in Physical experiment.

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MICROBIOLOGY

BSc-3rd

Paper- I: Medical Microbiology and Immunology

UNIT-1: AIR BORNE DISEASES

Air borne diseases: Types- Tuberculosis, Pertussis, Diphtheria, Influenza, Small & Chicken pox, Mumps, Measles. Symptoms, treatment and prevention.

UNIT-2: WATER BORNE DISEASES

Concept and cause of water borne diseases; Types, Hepatitis, Dysentery, Diarrhea, Cholera, typhoid. Symptoms, treatment and prevention.

UNIT-3: CLINICAL DISEASE AND DIAGNOSIS

Clinical diseases: Diabetes, Asthma, multiple sclerosis, rheumatoid arthritis, cancer. Symptoms, Treatment and prevention.

UNIT-4: BASIC CONCEPT OF IMMUNITY

Immune system: Structure and function of the cells, tissues and organs of immune system. Types of immunity- humoral and cell-mediated, innate, acquired immunity. **Antigen- Antibody**: types, properties. Hapten, adjuvants, Immuno-globulins: Structure types, Properties and their function - Theory of antibody production.

UNIT-5: IMMUNO DISEASE DIAGNOSIS

Methods based on Ag-Ab interaction- precipitation, agglutination, ELISA, RIA, Immuno-electrophoresis, PCR based diagnosis method for infectious diseases.

Text Books Recommended:

1. Immunology: Kuby.
2. General Microbiology by Power and Daganiwala.
3. Zinssers Microbiology by K. J Wolfgang, McGraw- Hill Company.
4. Medical Microbiology; N. C. Dey and T.K. Dey, Allied agency, Calcutta.
5. Bacteriological Techniques by FJ Baker.
6. A Textbook of Microbiology; Dubey & Maheshwari; S. chand & Sons.
7. Scott's Diagnostic Microbiology by EJ Baron.

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Microbiology

PRACTICAL

M. M. 50

Isolation of bacteria from air and soil (crop fields)
Isolation of fungi from air and soil
Relationship between OD and CFU measurements.
Measurement of fungal growth by dry weight and wet weight
Study of rhizospheric and phyllospheric microbes from economically important plants.
Biodegradation study of some organic molecules
Microbial assessment of potable water.
Determination of BOD, COD and dissolved oxygen.
Determination of blood group by slide agglutination test./TLC/DLC
Determination of heamoglobin.
Determination of quality of milk by MBRT
Isolation of Rhizobium from root nodules.

Scheme of practical examination

Time 4 hour MM- 50

1. Exercise on immunological test	10
2. Exercise on water analysis	10
3. Exercise on isolation and characterization of micro organism	05
4. Spotting (1 to 5)	10
5. Viva voce	05
6. Sessional	10
	Total- 50

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B.Sc. Part-III

Paper-I

RELATIVITY, QUANTUM MECHANICS, ATOMIC MOLECULAR AND NUCLEAR PHYSICS

Unit-1 Reference systems, inertial frames, Galilean invariance propagation of light, Michelson-Morley experiment, search for ether. Postulates for the special theory of relativity, Lorentz transformations, length contraction, time dilation, velocity addition, variation of mass with velocity, mass-energy equivalence, particle with zero rest mass.

Unit-2 Origin of the quantum theory : Failure of classical physics to explain the phenomena such as black-body spectrum, photoelectric effect, Compton effect, Wave-particle duality, uncertainty principle, de Broglie's hypothesis for matter waves, the concept of Phase and group velocities, experimental demonstration of mater waves. Davisson and Germer's experiment. Consequence of de Broglie's concepts, Bohr's complementary Principle, Bohr's correspondence principle, Bohr's atomic model, energies of a particle in a box, wave packets. Consequence of the uncertainty relation, gamma ray microscope, diffraction at a slit.

Unit-3 Quantum Mechanics: Schrodinger's equation, Statistical interpretation of wave function, Orthogonality and normalization of wave function, Probability current density, Postulatory basis of quantum mechanics, operators, expectation values, Ehrenfest's theorem, transition probabilities, applications to particle in a one and three dimensional boxes, harmonic oscillator in one dimension, reflection at a step potential, transmission across a potential barrier.

Unit-4 Spectra of hydrogen, deuteron and alkali atoms spectral terms, doublet fine structure, screening constants for alkali spectra for s, p, d and f states, selection rules. Discrete set of electronic energies of moleculers, quantisation of vibrational and rotational energies, determination of inter-nuclear distance, pure rotational and rotation vibration spectra. Dissociation limit for the ground and other electronic states, transition rules for pure vibration and electronic vibration spectra. Raman effect, Stokes and anti-Stokes lines, complimentary character of Raman and infrared spectra, experimental arrangements for Raman spectroscopy.

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Unit-5 Structure of nuclei:- Basic Properties of Nuclei: (1) Mass, (2) Radii, (3) Charge, (4) Angular Momentum, (5) Spin, (5) Magnetic Moment (μ), (6) Stability and (7) Binding Energy, Nuclear Models:- Liquid Drop Model, Mass formula, Shell Model, Types of Nuclear reactions, laws of conservation, Q-value of reactions, Interaction of Energetic particles with matter, Ionization chamber, GM Counter, Cloud Chambers, Fundamental Interactions, Classification of Elementary Particles, Particles and Antiparticles, Baryons, Hyperons, Leptons, and Mesons, Elementary Particle Quantum Numbers: Baryon Number, Lepton Number, Strangeness, Electric Charge, Hypercharge and Isospin, introductory idea of discovery of Higg's Boson.

TEXT AND REFERENCE BOOKS:

1. H.S. Mani and G.K. Metha: "Introduction to Modern Physics"" (Affiliated East-West Press, 1989).
2. A Beiser, "Prospective of Modern Physics".
3. H.E. White, Introduction to Atomic Physic".
4. Barrow, "Introduction to Molecular Physics".
5. R.P. Feynman, R.B. Leighton and M Sands, "The Feynman Lectures on Physics", Vol.III (B.I. Publications, Bombay, Delhi, Calcutta, Madras).
6. T.A. Littlefield and N Thorley, "Atomic and Nuclear Physics" (Engineering Language Book Society)
7. H.A. Enge, "Introduction to Nuclear Physics", (Addision-Wesly)
8. Eisenberg and Resnick, "Quantum Physics of Atoms, Molecules, Solids, Nuclei and Particles" (John Wiley)
9. D.P. Khandelwal, "Optics and Atomic Physics", (Himalaya Publishing House, Bombay, 1988).
10. Quarks and Leptons, F. Halzen and A.D. Martin, Wiley India, New Delhi, 1984.
11. Radiation detection and measurement, G.F. Knoll (John Wiley & Sons, 2000).
12. Theoretical Nuclear Physics, J.M. Blatt & V.F.Weisskopf (Dover Pub.Inc., 1991).

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Paper-II

SOLID STATE PHYSICS, SOLID STATE DEVICES AND ELECTRONICS

Unit-1 Amorphous and crystalline solids, Elements of symmetry, seven crystal system, Cubic lattices, Crystal planes, Miller indices, Laue's equation for X-ray diffraction, Bragg's Law, Bonding in solids, classification. Cohesive energy of solid, Madelung constant, evaluation of Parameters, Specific heat of solids, classical theory (Dulong-Petit's law), Einstein and Debye theories, Vibrational modes of one dimensional monoatomic lattice, Dispersion relation, Brillouin Zone.

Unit-2 Free electron model of a metal, Solution of one dimensional Schrödinger equation in a constant potential, Density of states, Fermi Energy, Energy bands in a solid (Kronig-Penny model without mathematical details), Difference between Metals, Insulator and Semiconductors, Hall effect, Dia, Para and Ferromagnetism, Langevin's theory of dia and para-magnetism, Curie- Weiss's Law, Qualitative description of Ferromagnetism (Magnetic domains), B-H curve and Hysteresis loss.

Unit-3 Intrinsic and extrinsic semi conductors, Concept of Fermi level, Generation and recombination of electron hole pairs in semiconductors, Mobility of electrons and holes, drift and diffusion currents, p-n junction diode, depletion width and potential barrier, junction capacitance, I-V characteristics, Tunnel diode, Zener diode, Light emitting diode, solar cell, Bipolar transistors, pnp and npn transistors, characteristics of transistors, different configurations, current amplification factor, FET and MOSFET Characteristics.

Unit-4 Half and full wave rectifier, rectifier efficiency ripple factor, Bridge rectifier, Filters, Inductor filter, L and π section filters, Zener diode, regulated power supply using zener diode, Applications of transistors, Bipolar Transistor as amplifier, h-parameter, h-parameter equivalent circuit, Transistor as power amplifier, Transistor as oscillator, principle of an oscillator and Bark Hausen's condition, requirements of an oscillator, Wein-Bridge oscillator and Hartley oscillator.

Unit-5 Digital Circuits: Difference between Analog and Digital Circuits, Binary Numbers, Decimal to Binary and Binary to Decimal Conversion, AND, OR and NOT Gates (Realization using Diodes and Transistor), NAND and NOR Gates as Universal Gates, XOR and XNOR Gate, De Morgan's Theorems, Boolean Laws, Simplification of Logic Circuit using Boolean Algebra, Digital to Analog Converter, Analog to Digital Converter.

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Physics

TEXT AND REFERENCE BOOKS:

1. Introduction to solid state physics: C. Kittel.
2. Solid State Physics: A.J. Dekkar.
3. Electronic Circuits: Mottershead.
4. Electronic Circuits: Millman and Halkias.
5. Semiconductor Devices: S.M. Sze.
6. Electronic devices: T.L. Floyd.
7. Device and Circuits: J. Millman and C. Halkias.
8. Electronic Fundamental and Applications: D. Chatopadhyay and P.C. Rakshit.
9. Electricity and Magnetism: K.K. Tiwari.

PRACTICALS

Minimum 16 (Eight from each group)

Experiments out of the following or similar experiments of equal standard

1. Determination of Planck's constant.
2. Determination of e/m by using Thomson tube.
3. Determination of e by Millikan's methods.
4. Study of spectra of hydrogen and deuterium (Rydberg constant and ratio of masses of electron proton).
5. Absorption spectrum of iodine vapour.
6. Study of alkali or alkaline earth spectra using a concave grating.
7. Study of Zeeman effect for determination of a Lande g-factor.
8. Analysis of a given band spectrum.
9. Study of Raman spectrum using laser as an excitation source.
10. Study of absorption of alpha and beta rays.
11. Study of statistics in radioactive measurement.
12. Coniometric study of crystal faces.
13. Determination of dielectric constant.
14. Hysteresis curve of transformer core.
15. Hall-probe method for measurement of magnetic field.
16. Specific resistance and energy gap of semiconductor.
17. Characteristics of transistor.
18. Characteristics of tunnel diode.
19. Study of voltage regulation system.
20. Study of regulated power supply.

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B.Sc.(CS)
III Year

COMPUTTER SCIENCE

PAPER - I

(Paper Code-0909)

COMPUTER HARDWARE PART-C

AIM : The emphasis is on the design concepts & organisational details of the common PC, leaving the complicated Electronics of the system to the computer engineers.

Objective of the Course :

1. To introduce the overall organisation of the microcomputers and operating systems.
2. To introduce the interaction of common devices used with computers with operating softwares, excluding the Assembly languages, with special reference to DOS/WINDOWS.
3. To introduce the working of hardware components, Micro-Processor and various chips used in micro-computers by operating system, without the use of electronic circuitry.
4. To introduce the use of operating systems architecture with IBM-PC & clones, excluding Assembly language, with forms an important part of hardwares.

N.B. : Since the computer organisation study is very vast & complicated, so the study is restricted only to the description and understanding part, hence the paper-setter is requested to keep this important factor in mind.

UNIT-1 : ORGANISATION OF Micro-Processor & MIRCO-COMPUTER :-

1. **Introduction & organisation of Micro-Computer :**
   - (a) Basic Components of Micro-computer : Basic Block; Prom ram memory; Data memory; I/O Ports; Clock generator; Integration of functional blocks.
   - (b) Interconnecting Components in a Micro-computer : Necessary functional block; Bussed architecture for microcomputer; memory addressing; Addressing I/O ports; comparision of I/O mapped and memory mapped I/O.
   - (c) Input Output Techniques : Non-CPU devices, Program & interrupt controlled I/O; Hardware controlled I/O or DMA.
2. **An Introduction to the various as :**
   - (a) General understanding of different µP or CPU :
     Intel 8088, 286, 386, 486, 586 Pentium, P54C, MMX P55C; Motorola 6800 & 88100 series; CYRIX & AMD CPUs.
   - (b) The Registers of CPU : (Give Example of P-8088) Register organisation of 8088, Scrach pad segment, pointer, Index and Flag, Registers.
   - (c) Memory addressing modes of P-8088 : Segment offset; Data addressing modes; Addressing for branch instructions.
   - (d) I/O Addressing with P-8088 : Memory mapped I/O & I/O mapped I/O.

UNIT-2 : SYSTEM HARDWARE ORGANISATION OF COMPUTERS :

1. **Hardware Organisation of the Personal Computer :**
   - (a) Block diagram with various parts of PC.
   - (b) The Mother Board of General P.C. : 8088 CPU; ROM & RAM; Keyboard

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& its interface; System timer/counters; Hardware interrupt vectoring; DMA controller & channels; Interfacing to audio speaker; Bus slots & facture cards.

(c) The Serial I/O ports, COM-1 & COM-2.

(d) The parallel Port for Printer.

(e) Expansion Slots for RAM.

(f) Disk Controllers : For floppy, Hard disk, CD-ROM & Cassets drives.

2. **The Video Display of PCs :**

(a) Video Monitors; Monochrome and colour.

(b) Video Display Adapters & Their Video Modes; Monochrome & colour graphics adapters.

(c) Video Control Through ANSI-SYS.

(d) Video Control Through ROM-BOIS : INT 10H.

(e) Direct Video Control; Monochrom & colour graphics adapters.

(f) Installing Customized Character Sets.

UNIT-3 : ORGANISATION OF OPERTING SYSTEM WITH SYSTEM HARDWARE :

1 **The ROM-BIOS Services :**

(a) Introduction to UNIX, ENIX, SUN, solaris, DOS & MAC with special reference to DOS & Windows, its ver., as DOS becomes more popular than others in PCs.

(b) The ROM-BIOS Diskette Services, INT 13H.

(c) The ROM-BIOS Serial Port Services, INT 14H.

(d) The ROM-BIOS Keyboard Services, INT 16H.

(e) The ROM-BIOS Printer Services, INT 17H.

(f) Miscellaneous Service Provided by the ROM-BIOS : INT 05H, INT 11H, INT 12H, INT 18H, INT 19H, INT 1AH.

2 **The fundamental of Operating System viz. DOS/WINDOWS :**

(a) The loading of DOS & Its Basic Structure ; ROM bootstrap, IO.SYS, DOS.SYS & Command..COM.

(b) The Execution of the programs under DOS ; EXEC functions, program segment prefix; Features of COM & EXE program files.

(c) Device Handling by Dos ; FDD, HDD, CON, Keyboard, PRN, AUX, CLOCK and NUL devices; Block devices; Character devices; Driver installation sequence.

(d) File Structures of DOS ;

(e) The DOS Interrupts : INT 20H-2FH

(f) The DOS functions through INT 21H; Discuss only the understanding part of various other DOS function to handle hard & softwares.

(g) Installation of windows : Important system files in windows.

UNIT-4 : ORGANIZATION & HANDLING BY OPERATING SYSTEMS :

1 **Disk and Files under DOS :**

(a) Logical Structure of a Disk : Organisation of disk for use; Boot record ; FAT

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files; disk or root directory.

(b) File Organisation on a DOS disk : Logical volumes ; Sub directories; Volume lables.

(c) Manipulating Files under DOS : File attributes ; date and time, file Access; FCB functions.

2 **Memory Allocation, Program Loading and Execution :**

(a) Memory Management under DOS : EXEC loader; Memory Management & its functions; Modifying a Program's memory allocation.

(b) Loading and Executing Programs under DOS : The EXEC function ; Memory considerations; parameter blocks; calling & returning from EXEC.

(c) Loading the program overlays through EXEC.

UNIT-5 : ORGANISATION OF HARDWARE BY OPERATING SYSTEM :

1 **Interrupt Handling through DOS :**

(a) Types of interrupts.

(b) Interrupt Vector Table in PC.

(c) Interrupt Service Routines.

(d) Special Interrupts in PC : Clock Interrupt; The -C or Break Interrupt ; DOS reserved interupt INT 28H ; Patching memory resident routines.

2. **Filters for DOS :**

(a) Filters in operating systems.

(b) Redirection of I/O under DOS.

(c) The Filters Supplied with DOS.

(d) Writing Filters to run under DOS.

3. **Handling of Various Versions of Windows O.S. :**

(a) Setup Installation

(b) Trouble shooting

(c) Networking features

Text Book :

1 Hardware and Software of Personal Computers.
By Sanjay K. Bose. (Wiley Eastern Ltd. New Delhi).

Supporting Text Books :

1 Digital System from Gates to Microprocessor.
By Sanjay K. Bose. (Wiley Eastern Ltd. New Delhi).

4 Computer Fundamentals : Architecture & Organisation.
By B. Ram.. (Wiley Eastern Ltd. New Delhi).

Reference Books :

1 IBM PC-XT and Clones : By Govinda Rajalu.

2 Microprocessor and interfacing : By Douglas Hall.

3 Insight the IBM-PC : Peter Norton.

4 Micriprocessor System : 8086/8088 family architecture, programming & design : By Liu and Gibson.

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PAPER - II

(Paper Code-0910)

Atm : To introduce DBMS and RDBMS using Back-end tool and Front-end tool.

Object of the Course :

1. To introduce Data BAse Management System concepts.
2. To introduce the Relational Database Management System and Relational Database Design.
3. To introduce the RDBMS software and utility of query language.
4. To introduce basic concept of GUI Programming and database connectivity using Visual Basic.

UNIT-1 : CONCEPT OF D.B.M.S. AND DATA MODELS

(a) Introduction to DBMS :- Purpose of Data base systems, Views of data, Data Modeling Database Languages, Transaction management, Storage Management, Database Administrator and User, Database System Structure.

(b) E-R Model : Basic concepts, Constraints, Keys, Mapping Constaint, E-R Diagram, Weak and Strong Entity sets, E-R Database Schema, Reduction of an E-R Schema to Table.

UNIT-2. : RELATIONAL DATABASE MANAGEMENT SYSTEM

(a) Relational Model : Structure of Relational Database, Relational Algebra, Domain Relational Calculus, Extended Relational- Algebra Operation, Modification of database, Views.

(b) Relational Database Design : Pitfalls in Relational Database Desing, Decomposition Functional Dependencies, Normalization : 1NF, 2NF, BCNF, 3NF, 4NF, 5NF.

UNIT-3 : INTRODUCTION TO RDBMS SOFTWARE - ORACLE

(a) Introduction : Introduction to personal and Enterprises Oracle, Data Types, Commercial Query Language, SQL, SQL*PLUS.

(b) DDL and DML : Creating Table, Specifying Integrity Constraint, Modifying Existing Table, Dropping Table, Inserting Deleting and Updating Rows in as Table, Where Clause, Operators, ORDER BY, GROUP Function, SQL Function, JOIN, Set Operation, SQL Sub Queries. Views : What is Views, Create, Drop and Retrieving data from views.

(c) Security : Management of Roles, Changing Passward, Granting Roles & Privilege, with drawing privileges.

(d) PL/SQL : Block Structure in PL/SQL, Variable and constants, Running PL/SQL in the SQL*PLUS, Data base Access with PL/SQL, Exception Handling, Record Data type in PL/SQL, Triggers in PL/SQL.

UNIT-4 : G.U.I. PROGRAMMING

(a) Introduction to Visual Basic : Event Driven Programming, IDE, Introduction to Object, Controlling Objects, Models and Events, Working with Forms, MDI Form Working with standard Controls.

(b) Overview of Variables, Declaring, Scope, Arrays, User defined data types, Constants, Working with procedures : Function, Subroutine, and Property.

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Working with Data, Time, Format, String, and Math's Function. Controlling Program Execution: Comparison and Logical Operators, If...Then statements, Select Case Statement, Looping Structures, Exiting a loop. Error Trapping and Debugging.

(c) File Organization : Saving data to file. Sequential and Random access file, the desing and coding.

UNIT-5 : V DATA BASE PROGRAMMING IN VB

(a) Introduction :- Concept of DAO, RDO, ADO, input validation : field & form level validation, ADO object model : the ADO object Hierarchy, the connection object, the command object, record set object, parameter object, field object, record object, stream object, Error object, parameter object.

(b) Using Bound control to Present ADO data : Using the ADO data control, ADO data control properties, binding simple controls : Data list, data combo, Data Grid, Data Form Wizard : single form wizard, Grid form, master/Detail form. Programming the ADO data control : Refresh method, Event, Hierarchical flex Grid control.

(c) Data Environment & Data Report : Creating connection, Using command object in the data Environment, Data Environment option and operation, Binding Form to the data Environment, ADO Events in the Data report, Print Preview, Print, Export, Data report in code : Data reports Events, Binding data reports Directly.

REFERENCE BOOKS :

1 Data Base System Concept : By Hery F. Korth. Tata McGraw Hill

2 Fundamental of Data Base System Concept : Nawathe & Elmasri (Pearson educations)

3 Oracle Complete Reference : By Oracle Press

4 Introduction to OOPS & VB : By V.K. Jain, Vikas Publishing House

5 Database Programming VB 6 : By B.P.B. Publication

PRACTICALS :

1 **Practicals on Oracle :**

At least 20 practicals covering the SQL, PL/SQL, Triggers, Views.

2 **Practicals on Visual Basic :**

At least 20 pracricals on VB that covering basic and data controls components.

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21. Study of lissajous figures using CRO.
22. Study of VTVM.
23. Study of RC and TC coupled amplifiers.
24. Study of AF and RF oscillators.
25. Find roots of f(x) = 0 by using Newton-Raphson Method.
26. Find root of f(x) = 0 by using secant method.
27. Integration by Simpson rule.
28. To find the value of V at
29. String manipulations.
30. Towers of Hanoi (Non-recursive).
31. Finding first four perfect numbers.
32. Quadratic interpolation using Newton's forward-difference formula of degree two.

TEXT AND REFERENCE BOOKS:

1. B.G. Strechman, Solid state electronics devices II edition (Prentice-Hall of India New Delhi 1986)
2. W.D. Stanley, Electronics devices, circuits and applications (Prentice-Hall new jersey, USA 1988).
3. S. Lipschutz and A Poe; Schaum's outline of theory and problems of programming with Fortran (Mc Graw-Hill Book Co. Singapore, 1986).
4. C Dixon, Numerical Analysis.

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ELECTRONICS LABORATORY

The scheme of practical examination will be as follows-

Experiment	--	**30**
Viva	--	**10**
Sessional	--	**10**
Total	--	**50**

ELB 303P: INDUSTRIAL ELECTRONICS & PCB Design LAB **MM-25**
(Hardware and Circuit Simulation Software)
Max.Marks:25

1. Study of I-V characteristics of DIAC
2. Study of I-V characteristics of a TRIAC
3. Study of I-V characteristics of a SCR
4. SCR as a half wave and full wave rectifiers with R and RL loads
5. DC motor control using SCR.
6. DC motor control using TRIAC.
7. AC voltage controller using TRIAC with UJT triggering.
8. Study of parallel and bridge inverter.
9. Design of snubber circuit
10. Study of chopper circuits

Design and Fabrication of Printed Circuit Boards

1. Design automation, Design Rule Checking; Exporting Drill andGerber Files; Drills; Footprints and Libraries Adding and Editing Pins, copper clad laminatesmaterials of copper clad laminates, properties of laminates (electrical & physical),
2. Study of soldering techniques. Film master preparation, Image transfer, photo printing, Screen Printing, Plating techniques etching techniques,
3. Study of Mechanical Machining operations,Lead cutting and Soldering Techniques, Testing and quality controls.
4. Study ofLead cutting and Soldering Techniques, Testing and quality controls.

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BIOTECHNOLOGY

List of Practical's

PLANT, ENVIRONMENTAL, INDUSTRIAL AND MEDICAL BIOTECHNOLOGY

1. Preparation of Tissue culture media.
2. Sterilization of plant material.
3. Seed Germination, Root, Shoot and Callus Culture
4. Determination of total dissolved solids of water.
5. Determination of DO, BOD, COD of water.
6. Determination of Coliform by MPN Test.
7. Production of Enzymes/Antibiotics/Acids.
8. Effect of Biopesticides on microorganism
9. Antigen Antibody interaction- Determination of Blood Group and Rh factor.
10. Widal Test
11. VDRL Test.
12. ELISA Test.
13. Perform of Immuno-diffusion

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SCHEME FOR PRACTICAL EXAMINATION

Time: 4 hrs. **MM-50**

1. Experiment based on Paper - I	
(i) Plant tissue culture	08 marks
(ii) Environment / Industrial	07marks
2. Experiment based on Paper - II	15 marks
3. Spots	10marks
4. *Viva-voce*	05marks
5. Sessional/ Record	05marks

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BIOCHEMISTRY

PAPER - I

MOLECULAR BIOLOGY

UNIT-I BASIC CONCEPTS OF GENETIC INFORMATION

a Nucleic acids as genetic information carriers, experimental evidence e.g. bacterial genetic transformation, Hershey - Chase Experiment, TMV reconstitution rexperiment.

b Central dogma of molecular genetics - current version, reverse transcription and retroviruses.

c Primary structure of nucleic acids and their properties, silent features of eukaryotic, prokaryotic and viral genome; highly repetitive, moderately repretitive and unique DNA sequences.

d Basic concepts about the secondary structures of nucleic acids, 5' 3' direction antiparallel strands, base composition, base equivalence, bae pairing and base stacking in DNA molecule. and buoyant density and their.

UNIT-II STRUCTURAL LAVELS OF NUCLEIC ACIDS AND SEQUENCING

a Scondary and tertiary structure of DNA : Watson and Crick model, A.B. and Z types of DNA major and minor grooves, chirality of DNA, tertiary structure of DNA.

b Structure and properties of RNA; Classes of RNA secondary and tertiary structures.

c Nucleic acid hybridization : Cot T_m value and satellite DNA.

d Sequencing : Restriction and modification system; sequencing of DNA and RNA.

UNIT-III a DNA REPLICATION

DNA replication in prokaryotes - conservative, semi conservative and dispersive types, experimental evidence for semi conservative replication. DNA polymerases, other enzymes and protein factors involved in replication. Mechanism of replication. Inhibitors of DNA replication.

b TRANSCRIPTION

Transcription in prokaryotes RNA polymerase, promoters, initiation, elongation and termination of RNA synthesis, inhibitors of transcription. Reverse transcriptase, post transcriptional processing of RNA in eukaryotes.

UNIT-IV TRANSLATION AND REGULATION OF GENE EXPRESSION

a Genetic code : Basic feature of genetic code, biological significance of degeneracy. Wobble hypothesis, gene within genes and overlapping genes.

b Mechanism of translation : Ribosome tructure, A and P sites, charged tRNA, f-mat-tRNA initiator codon, Shine Dalgarno consensus sequence (AGGA), formation of 70S initiation complex, role of EF-Tu, EF-Ts, EF G and GTP, nonsense codons and release factors RF 1 and RF 2.

c Regulation of gene Expression in prokaryotes : Enzyme induction and repression,

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Bio-Chemistry

PRACTICAL FOR IIIrd YEAR

LABORATORY - III (BCH 305)

1. Estimation of DNA by diphenylamine method.
2. Effect of temperature on the viscosity of DNA using Ostwald's Viscometer.
3. Extraction of RNA and its estimation by Orcinol method.
4. Estimation of hemoglobin by measuring total iron in blood.
5. Estimation of calcium and phosphorus in serum & urine.
6. Estimation of creatine and creatinine in urine.
7. Estimation of immunoglobulins by precipitation with saturated ammonium sulphate.
8. Denaturation fo enzyme, studies on DNA.
9. a Separation of proteins by column chromatography.
   b Determination of proteins by dye binding assay.
10. Separation of proteins by SDS-polyacrylamide gel electrophoresis.

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b. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.

c. Apart from Question No. 1, rest of the paper shall consist of five units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 15 marks.

10. The Year wise Structure & plan of the programme shall be as follows :

SCHEME OF EXAMINATION BCA PART-I

Paper no.	Title of Paper/s	Maximum Marks		Maximum Marks	Minimum Passing Marks
		Theory	Practical		
1.	आधार पाठ्यक्रम–हिन्दी भाषा	75	--	75	26
2.	Foundation Course- English Language	75	--	75	26
3.	Environmental Studies & Human Rights **(Additional & Compulsory)**	75	25	100	33
4.	Discrete Mathematics	100	--	100	33
5.	Computer Fundamental and Concepts of Software	100	--	100	33
6.	PC Software Packages and Programming in C	100	--	100	33
7.	Data Structure	100	--	100	33
8.	Lab-1 Software Packages Lab	--	75	75	25
9.	Lab-2 Programming lab in C	--	75	75	25
	Total Marks	**650**	**150**	**800**	

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LAB-I
SOFTWARE PACKAGES LAB

The lab exercise should be based on MS Windows 7 or higher version and MS Office 2007 or higher version and comprises the theoretical paper as well as practical paper.

Section-A

WINDOWS 7 : Basic Elements of WINDOWS, My Computer, Sharing Devices, Windows Explorer, Accessories: Entertainment, Communication, System Tools, Paint Brush, Calculator, Calendar, Clock, Note Pad, Word Pad Etc., Control Panel, Changing Color and Theme, Changing the Desktop Background, Screen Saver, Adjusting Display Settings, Adjusting Sound, Adjusting the Mouse, Changing the Date and Time.

Section-B

Introduction to MS Word: Menus, Shortcuts, Document types; Working with Documents: Opening Files – New & Existing, Saving Files, Formatting page and Setting Margins, Converting files to different formats- Importing, Exporting, Sending files to others, Editing text documents- Inserting, Deleting, Cut, Copy, paste, Undo, Redo, Find, Search, Replace, Using Tool bars, Ruler- Using Icons, Using help; Formatting Documents: Setting Font Styles, Setting Paragraph style, Setting Page Style, Setting Document Styles, Creating Tables, Drawing, Tools, Printing Documents.

Section-C

Introduction to MS Power Point: Opening new Presentation, Different presentation templates, Setting backgrounds, Selecting presentation layouts, Creating a presentation, Formatting a presentation-Adding style, Color, gradient fills, Arranging objects, Adding Header & Footer, Slide Background, Slide layout, Inserting pictures, movies, tables.

Section-D

Introduction to MS Excel: Introduction: Spreadsheet & its Applications, Opening spreadsheet, Menus & Toolbars & icons, Shortcuts, Working with Spreadsheets-Opening a File, Saving Files, Setting Margins, Converting files to different formats- Importing, Exporting and Sending files to others, Spreadsheet addressing, Entering and Editing Data, Computing data- Setting Formula, Finding total in a column or row, Mathematical operations, Formulas, Formatting Spreadsheets & Printing worksheet.

Section-E:

Introduction MS Access: Database concepts: Tables, Queries, Forms, Reports, Opening & Saving database files: Creating Tables, Table Design, Indexing, Entering data, Importing data, Creating Queries: SQL statements, Setting relationship, Creating Forms: GUI, Form, Creating & printing reports.

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LAB-II
PROGRAMMING LAB IN C

1. Program to find area and circumference of circle.
2. Program to find the simple interest.
3. Program to convert temperature from degree centigrade to Fahrenheit.
4. Program to calculate sum of 5 subjects & find percentage.
5. Program to show swap of two no's without using third variable.
6. Program to reverse a given number.
7. Program to print a table of any number.
8. Program to find greatest in 3 numbers.
9. Program to show the use of conditional operator.
10. Program to find that entered year is leap year or not.
11. Program to find whether given no is even or odd.
12. Program to shift inputed data by two bits to the left.
13. Program to use switch statement. Display Monday to Sunday.
14. Program to display arithmetic operator using switch case.
15. Program to display first 10 natural no & their sum.
16. Program to print Fibonacci series up to 100.
17. Program to find GCD & HCF of given Numbers using Recursion.
18. Program to find whether given no is a prime no or not.
19. Program to display sum of series 1+1/2+1/3+.....+1/n.
20. Program to display series and find sum of 1+3+5+.....+n.
21. Program to use bitwise AND operator between the two integers.
22. Program to add two number using pointer.
23. Program to find sum, subtraction, multiplication & transpose of matrices.
24. Program to reverse a number using pointer.
25. Program to show input and output of a string.
26. Program to find square of a number using functions.
27. Program to swap two numbers using functions.
28. Program to find factorial of a number using functions.
29. Program to show table of a number using functions.
30. Program to show call by value.
31. Program to show call by reference.
32. Program to find largest of two numbers using functions.
33. Program to find factorial of a number using recursion.
34. Program to find whether a string is palindrome or not.

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The break-up of marks for second Year's Practical will be as under :			
Sr. No.	Argument	Maximum Marks	Minimum Passing Marks
1.	Lab Record	15	
2.	Viva-voce	20	
3.	Program Development and Execution	40	
Total Marks		75	25

SCHEME OF EXAMINATION

Paper no.	Title of Paper/s	Maximum Marks		Maximum Marks	Minimum Passing Marks
		Theory	Practical		
1.	आधार पाठ्यक्रम–हिन्दी भाषा	75	--	75	26
2.	Foundation Course- English Language	75	--	75	26
3.	Operating System	100	--	100	33
4.	Digital Electronics and Microprocessor	100	--	100	33
5.	Computer Networks and Cyber Technology	100	--	100	33
6.	Object Oriented Programming Using C++	100	--	100	33
7.	Computer Graphics and Multimedia	100	--	100	33
8.	Lab-1 Programming Lab Using C++	--	75	75	25
9.	Lab- 2 Multimedia Lab	--	75	75	25
	Total Marks	**650**	**150**	**800**	

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LAB-I
PROGRAMMING LAB USING C++

List of Sample Problems/Experiments:

1. Write a C++ program to find the sum of individual digits of a positive integer.
2. A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1.Subsequent terms are found by adding the preceding two terms in the sequence.Write a C++ program to generate the first n terms of the sequence.
3. Write a C++ program to generate all the prime numbers between 1 and n , where n is a value supplied by the user.
4. Write C++ programs that use both recursive and non-recursive functions
   a. To find the factorial of a given integer. b. To find the GCD of two given integers.
   c. To find the nth Fibonacci number.
5. Write a C++ program that uses a recursive function for solving Towers of Hanoi problem.
6. Write a C++ program to find both the largest and smallest number in a list of integers.
7. Write a C++ program to implement the matrix ADT using a class. The operations supported by this ADT are:
   a)Reading a matrix. c) Addition of matrices.
   b)Printing a matrix. d) Subtraction of matrices.
   e)Multiplication of matrices.

Note: Practical must be as per syllabus of theoretical paper.

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LAB-II
MULTIMEDIA LAB

Series of Practical Curriculums

Photoshop:

1. (i) Handling different file formats and interchanging them, changing the resolution, color, grayscales and size of the images
(ii) Using brushes and creating multicolor real life images
2. Cropping, rotating, overlapping, superimposing, pasting photos on a page
3. Creation of a single image from selected portions of many
4. Developing a commercial brochure with background tints
5. Creating an image with multi-layers of images and texts.
6. Applying masks and filtering on images

7. CorelDRAW X4 Part 1

- Getting Started with CorelDRAW
- Starting CorelDRAW
- Working with Command Bars
- Working with Layers
- Examining a Master Page
- Creating a Master Layer
- Working with Layers
- Using Brush Tools and Adding Objects
- Working with Interactive Tools
- Using Advanced Techniques for Text Manipulation
- Working with Paragraph Text
- The PowerClip Feature and the Envelope Tool
- Creating Bulleted Lists
- Working with Vector and Bitmap Graphics
- Converting Vector Objects to Bitmaps
- Working with Bitmap Graphics
- Introduction to CorelTRACE
- Advanced Output Options
- Preparing a Document For Printing
- Other Printing Options

The break-up of marks for Fourth Year's Practical will be as under :			
Sr. No.	Argument	Maximum Marks	Minimum Passing Marks
1.	Lab Record	15	
2.	Viva-voce	20	
3.	Program Development and Execution	40	
Total Marks		75	25

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SCHEME OF EXAMINATION

Paper no.	Title of Paper/s	Maximum Marks		Maximum Marks	Minimum Passing Marks
		Theory	Practical		
1.	आधार पाठ्यक्रम–हिन्दी भाषा	75	--	75	26
2.	Foundation Course- English Language	75	--	75	26
3.	Computer Organization and Architecture	100	--	100	33
4.	Software Engineering	100	--	100	33
5.	Database Design and RDBMS (Oracle)	100	--	100	33
6.	Web Technology	100	--	100	33
7.	Numerical Analysis	100	--	100	33
8.	Lab-1 RDBMS & Web Technology	--	75	75	25
9.	Lab-2 Minor Project	--	75	75	25
	Total Marks	**650**	**150**	**800**	
	Grand Total Marks of BCA- I, II & III			**2400**	

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LAB-I
RDBMS & WEB TECHNOLOGY
Practical as per syllabi of theoretical paper.

The break-up of marks for Third Year Practical will be as under :			
Sr. No.	Argument	Maximum Marks	Minimum Passing Marks
1.	Lab Record	15	
2.	Viva-voce	20	
3.	Program Development and Execution	40	
	Total Marks	75	25

BCA PART-III
LAB-II
Minor Project

The break-up of marks for Project will be as under :			
Sr. No.	Argument	Maximum Marks	Minimum Passing Marks
1.	Project Report	25	
2.	Viva-voce/ Presentation	25	
3.	Project Execution	50	
Total Marks		100	50

SCHEME OF EXAMINATION FOR ONE YEAR DCA PROGRAMME
w.e.f. Session 2017-18

Paper No.	Title of the Paper/s	Term End Examination Maximum marks	Total Maximum Marks	Minimum Passing Marks in Term End Examination
I	Fundamentals of Computers	100	100	33
II	Windows & PC Packages	100	100	33
III	Print Technology and Desktop Publishing	100	100	33
IV	Internet and Web Technology	100	100	33
V	Programming in C	100	100	33
VI	Introduction to Operating System	100	100	33
VII	LAB-I PC Package and DTP Lab	100	100	33
VIII	LAB-II Programming in C Lab	100	100	33
		Total Marks	**800**	

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PAPER-VII
LAB-I
PC PACKAGE AND DTP LAB

Note: - Practical should cover syllabus of respected theoretical papers.

The break-up of marks for Practical will be as under :			
Sr. No.	Argument	Maximum Marks	Minimum Passing Marks
1.	Lab Record	20	
2.	Viva-voce	30	
3.	Program Development and Execution	50	
	Total Marks	100	33

PAPER-VIII
LAB-II
PROGRAMMING IN C LAB

Note: - Practical should cover syllabus of respected theoretical papers.

The break-up of marks for Practical will be as under :			
Sr. No.	Argument	Maximum Marks	Minimum Passing Marks
1.	Lab Record	20	
2.	Viva-voce	30	
3.	Program Development and Execution	50	
	Total Marks	100	33

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प्रपत्र

विषय / संकाय / प्रश्न–पत्र का नाम– **B.Com.(Computer Application)**

कमांक	कक्षा का नाम	वर्तमान पाठ्यक्रम	नवीन संशोधित पाठ्यक्रम	नवीन संशोधित पाठ्यक्रम का औचित्य
1.	1st Year	COMPUTER FUNDAMENTALS AND OFFICE AUTOMATION	COMPUTER FUNDAMENTAL	Updation Required
2.	1st Year	COMPUTERIZED FINANCIAL ACCOUNTING	PC SOFTWARE AND MULTIMEDIA	Updation Required
3.	1st Year	PRACTICAL	PRACTICAL	Updation Required
4.	2nd Year	INTERNET APPLICATION & E-COMMERCE	INTERNET APPLICATION & E-COMMERCE	No Change
5.	2nd Year	RELATIONAL DATABASE MANAGEMENT SYSTEM	RELATIONAL DATABASE MANAGEMENT SYSTEM	No Change
6.	2nd Year	PRACTICAL	PRACTICAL	No Change
7.	3rd Year	PROGRAMMING IN VISUAL BASIC	PROGRAMMING IN VISUAL BASIC	No Change
8.	3rd Year	SYSTEM ANALYSIS, DESING & MIS	SYSTEM ANALYSIS, DESING & MIS	No Change
9.	3rd Year	PRACTICAL	PRACTICAL	No Change

केन्द्रीय अध्ययन मंडल के अध्यक्ष एवं सदस्यों का हस्ताक्षर

S.N.	Name	Designation/University/College	Signature with Date
1.	Dr. Sanjay Kumar	Head, S.o.S. in Computer Science & I.T., Pt. R.S. University, Raipur	11-06-2018
2.	Mr. Hari Shankar Prasad Tonde	Head, Dept. of Computer Science, Sarguja University, Ambikapur	11-06-18
3.	Dr. Anuj Kumar Dwivedi	Head, Dept. of Computer Science, Govt. V.B.S.D. Girls College, Jashpur Nagar, Jashpur	11/6/2018
4.	Mr. L.K. Gavel	Head, Dept. of Computer Science, Govt. G.S.G. P.G. College Balod	11/06/18
5.	Dr. J. Durga Prasad Rao	Head, Dept. of Computer Science, Shri Sankracharya Mahavidyalaya, Bhilai	11/6/18

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Practical

- At least 20 Practical based on Syllabus of Paper-I and Paper-II.

11-06-2018
(Dr. Sanjay Kumar)

11/6/2018
(Dr. A.K. Dwivedi)

11/6/18
(L.K. Gavel)

11/6/18
(Dr. J. Durga Prasad Rao)

11-06-18
Hari Shankar Prasad Tandel

B. Com II year
(Computer Application)

COMPUTER APPLICATION

MARKS DISTRIBUTION

Theory Paper — Paper - I — Total Marks - 50

Paper - II — Total Marks - 50

Every unit of theory paper will consists of 10 marks.

Practical Paper — Total Marks - 50

Practical Marks Distribution :

Viva	- 10
Internal	- 15
Practical	- 25
Total Marks	- 150

Practical Test will consist of 3 Hrs.

Syllabus of B.Com.-II (Computer Application)

PAPER - I

INTERNET APPLICATION & E-COMMERCE

(Paper Code-1139)

UNIT - I Introduction to HTML

Introduction to Internet & World Wide Web

Internet - Indian and the Internet, Profile of Indian Surfer, History of the Internet, Indian Internet History, Technological Foundation of Internet, Application in Internet Environment, Movement of files/data between two computers, TCP/IP, IP Addresses, Domain Name System, Domain Name Services, allocation of second level domains in India, Internet & India.

World Wide Web (WWW) - WWW consortium browsing and Information retrieval, exploring the WWW, address : URL.

UNIT - II

Introduction to HTML & Designing Web Page

Concept to Website, Web standards, What is HTML, HTML documents / file, HTML Editor, Explanation of the structure of Homepage, Elements in HTML Documents, HTML Elements, HTML Tags & Basic HTML Tags, viewing the source of web page & downloading the web page source, Extensible HTML, CSS, XML, XSL.

HTML Document Structure - Head Section

Illustration of Document Structure, Mark-up elements within the Head : BASE, ISINDEX, LINK, META, TITLE, SCRIPT.

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11-06-2018 (Dr. A.K. Dwivedi) (L.K. Gavel) Hari Shankar Prasad Tande (Dr. J. Dayal)

UNIT - V

(a) **Security** : Management of Roles, Changing Password, Granting Roles & Privilege, with drawing privileges.

(b) **PL/SQL** : Block Structure in PL/SQL, Variable and constants, Running PL/SQL in the SQL*PLUS, Data base Access with PL/SQL, Exception Handling, Record Data type in PL/SQL, Triggers in PL/SQL.

SUGGESTED BOOKS :

1 Data base system : Korth & Siberschatz.

2 An Introduction to Data base System : C.J. Date

PAPER - III

PRACTICAL EXERCISES BASED ON PAPER I & II

Practicals to be done :

1 Creating simple Web-pages using html.

2 Designing *business web-sites* using HTML features (e.g. html forms)

[Each student should study the existing *business web-sites* and do atleast 05 exercises to create business websites using various html features]

3 Should perform various queries using SQL.

[Each student should create ER diagrams for various business scenario, and convert it into tables, using any RDBMS Software (i.e. Oracle / Access)

4 Practical using various aspects of Oracle.

[At least 10 practical-exercises covering the contents of paper-II]

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11/06/18 (C.K. Gavel)

11-06-18 Hari Chandan Prasad Pande

11/6/18 (Dr. J. Durga Prasad)

11-06-2018 (Dr. Sanjay Kumar)

UNIT-IV Introduction to MIS & Other Subsystem-

Evolution of MIS, Need of MIS, Definition & Benefits of MIS, Characteristic, Role component of Information system, data base as a future of MIS, Decision making, logic of Management Information system. Structure of MIS.

UNIT-V Information System Concept -

Difference between Transaction Processing System (TPS) and Management Information System, How MIS works, MIS and Information Resource Management, Quality information Building Blocks for the information system, information system concept, Other system characteristic (Open & Closed System), difference between MIS & Strategic System, Adaptive system, Business function information system.

BOOK REFERENCE :

1. System Analysis and Design - Elias M. Awad.
2. System Analysis and Design - Alan Dennis & Barbara Haley Wixo.
3. Management Information systems - C.S.V. Murthy, Himalaya Publication House.

PAPER - III

PRACTICAL EXERCISES BASED ON PAPER I & II

Practicals to be done -

1. At least 20 practical - exercises covering the contents of paper - I (e.g. Designing calculator, sorting of elements, Generating Fibbonacci series)
2. Design the Project on one of the following - Application Software / Website Design/ Accounting software / Inventory control System / System Software & other (e.g. Library Management System, Medical management, Stock Management, Hotel Management, Website for your institute / Website of any Organization)
3. The Project Report cover the following topic - Objective, Hardware & Software Requirements, Analysis, Design, Coding, input forms, testing, Reports, Future enhancement of s/w.
4. Practical exam is based on the Project Demonstration & report.

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- - - - - - - -

11-06-2018
(Dr. Sanjay Kumar)

11/6/18
(Dr. A.K. Dwivedi)

11/06/18
(L.K. Gauri)

11.06.18
Hari Shankar Prasad Tande

11/6/18
(Dr. J. Durga Rao)

YEAR WISE PLAN
PGDCA

S.N.	Subject Name	End Semester Examination Maximum Marks	End Semester Examination Minimum Passing Marks
1.	Fundamentals of Computer and Information Technology	100	40
2.	PC- Packages and Computerized Accounting System	100	40
3.	Data Communication and Computer Network	100	40
4.	Programming using 'C' & C++	100	40
5.	Relational Database Management System (Oracle)	100	40
6.	System Analysis & Design	100	40
7.	PC Package and Tally ERP Lab	50	17
8.	C,C++ and Oracle Lab	50	17
9.	Project	100	40

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PC Package & Tally ERP Lab

Note: Practical should be as per syllabus of theoretical papers.

C, C++ & Oracle Lab

Note: Practical should be as per syllabus of theoretical papers.

PROJECT

Note:

01. It is compulsory, that students would have group of maximum of two students and project should be done under Government sectors/ Public Sector/ Pvt. Limited S/W Company/ Software Technology park of India/ ISO 9001 certified company etc.
02. The students should not make any project under local or private institutions.
03. The students should make project themselves and project will not be copy of other project.

Steps for Live Project

01. Getting customer's requirements
02. Designs, database and business logics.
03. Developing software application project.
04. Testing and implementing the project.
05. Troubleshooting the project application after implementation.

The break-up of marks for Practical will be as under :			
Sr. No.	**Argument**	**Maximum Marks**	**Minimum Passing Marks**
1.	Lab Record	10	
2.	Viva-voce	20	
3.	Program Development & Execution	20	
Total Marks		50	17

The break-up of marks for Practical will be as under :			
Sr. No.	**Argument**	**Maximum Marks**	**Minimum Passing Marks**
1.	Project Report	25	
2.	Viva-voce/ Presentation	25	
3.	Project Execution	50	
Total Marks		100	40

PRINCIPAL

YEAR WISE PLAN
PGDCA

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9.	Project	100	40

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PC Package & Tally ERP Lab
Note: Practical should be as per syllabus of theoretical papers.

C, C++ & Oracle Lab
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The break-up of marks for Practical will be as under :			
Sr. No.	**Argument**	**Maximum Marks**	**Minimum Passing Marks**
1.	Project Report	25	
2.	Viva-voce/ Presentation	25	
3.	Project Execution	50	
Total Marks		100	40

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Books Recommonded

1. Manual of Foreign Exchange H.E Evitt.
2. A Text book on Foreign Exchange P.Einzlti.
3. Foreign Exchange Arthmtic V.V. Keshkamat.
4. Principles and Arithmetic of Foreign Exchange O.S. Ramamurty.
5. Finance of Foreign Trade and Foreign Exchange V.V.Venkatraman
6. Foreign Exchange and Introduction .V.V. Keshkamat.
7. Finance of Foreign Trade and Foreign Exchange G S. Lall.
8. Finance of Foreign trade and Foreign Exchange B.C.Ajmera.

Procedure of Internal evaluation for the students of Diploma course of Banking.

1. Internal evaluation would be a countinuous process which may take the form of graidings for class participation and home assigement Each candidate will be required to (i) Submit two howme assignment in the form of two papers concerning each subject and (ii) Participate in class discussion and seminars.On the basis of this grading the teacher concerned would prepare the subject wise award lists.
2. The Papers submitted by the students will be returned to the dodidates after evaluation .if the papers are not found upto the standard The students if he so desires, will be advised to resubmit the paper on the lines suggested by the teacher and the papers then will be finally as sessed.
3. The award list as finalised by the head of the department of commerce of the institute would be forwarded to the Universily , through the principal of the institute.ordinarily by the 31st March.
4. Distribution of marks between examination and internal assessment will be 75/25.
5. The marks of Internal assessment obtained by student will be carried over towards his subsequent examination in which he appears as ex student if he has obtained more than 48% marks in each internal evaluations.

COURSE DETAILS FOR

P/G DIPLOMA IN BUSINESS MANAGEMENT

PAPER -1	MANAGEMENT CONCEPTS AND ORGANISATIONAL BEHAVIOUR
PAPER -2	PORTFOLIO - MANAGEMENT AND TOTAL QUALITY MANAGEMENT
PAPER - 3	HUMAN RESOURCE MANAGEMENT
PAPER - 4	PRODUCTION AND OPERATION MANAGEMENT
PAPER - 5	MARKETING RESEARCH AND CONSUMER BEHAVIOUR

Students will have to visit any industry and prepare a report under the guidence of their mead of the department The "Viva-Voce" will be held immeddiately after or before the annual Examination.

A.	Theory Paper (5 Paper)	- 500 Marks
B.	Industrial visit report	- 100 Marks
C.	Viva - Voce	- 100 Marks
D.	Internal Marks for Class activities	- 100 Marks

All students have to give three internal written tests for each theory Paper Each test will Carry 25 Marks and minimum Passing Marks will be .....12 for each test. Average of best of the three written papers will be count for annual result of internal evalution

- An external examiner will be appointed to conduct the viva-voce by University.
- The report of the Industrial visit will be valued by External Examiner.

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SEMESTER SYLLABUS

M.A. GEOGRAPHY

SCHEME OF EXAMINATION & DISTRIBUTION OF MARKS

SEMESTER – I

Paper No.	Title of the Paper(s)	Internal Assessment	Term End Exam	Total Marks
1.	Geomorphology	20	80	100
2.	Climatology	20	80	100
3.	Evolution of Geographical thoughts	20	80	100
4.	Geography of India	20	80	100
Prac-1	Instrumental Survey	-	-	100
			Total	500

SEMESTER – II

Paper No.	Title of the Paper(s)	Internal Assessment	Term End Exam	Total Marks
1.	Applied Geomorphology	20	80	100
2.	Oceanography	20	80	100
3.	Geographical Methodology	20	80	100
4.	Geography of Chhattisgarh	20	80	100
Prac-1	Cartography	-	-	100
			Total	500

SEMESTER – III

Paper No.	Title of the Paper(s)	Internal Assessment	Term End Exam	Total Marks
1.	Rural Settlement Geography	20	80	100
2.	Resource Geography	20	80	100
3.	Regional Planning & Development	20	80	100
4.	Population Geography with special reference of world	20	80	100
Prac-1	Statistical Technique & field survey			100
			Total	500

SEMESTER – IV

Paper No.	Title of the Paper(s)	Internal Assessment	Term End Exam	Total Marks
1.	Population Geography with special reference of India	20	80	100
2.	Urban Geography	20	80	100
3.	Agricultural Geography	20	80	100
4.	Resource Conservation & Management	20	80	100
Prac-1	Advanced Cartography	-	-	100
			Total	500

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SEMESTER SYLLABUS

M.A. GEOGRAPHY

M.A. I SEMESTER PRACTICAL
INSTRUMENTAL SURVEY

1. surveying- importance of instrumental surveying and application -survey instruments.
2. **Prismatic Compass-**

   Method of prism pass surveying: Radiation, inter section and traverse, correction of bearing, Elimination the closing error, Bow ditch method.
3. **Plane table-**

   Plan preparation, methods of plane table surveying - radiation, inter section, traverse & resection method.
4. **Dumpy level:-**

   Meaning of the terms used in leveling Method of leveling:- simple leveling, differential leveling. Profile.
5. **Theodolite:-**Meaning of terms used in theodolite surveying, measurement of horizontal distance & vertical height, accessible and non accessible method, digital surveying equipment- Electronic Distance measurement (EDM) instruments, total station, global positioning system (GPS).

SUGGESTED READINGS-

1.. Monk house, F.J. & H.R. Wilkinson : Map and Diagrams, methouen, London.

2. Singh, L. R. : Practical Geography.

3. शर्मा, जे.पी., :प्रायोगिक भूगोल

4.चौहान, पी.आर. : प्रयोगात्मक भूगोल

5.यादव, हीरालाल, प्रायोगिक भूगोल

6.चंद्रकारपी. सर्वेक्षण विधि तंत्र, एस. शारदा पब्लिकेशन, बिलासपुर

7.SarkarAashish Practical Geography

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ATAL BIHARI VAJPAYEE VISHWAVIDYALAYA BILASPUR (C.G.)

SEMESTER SYLLABUS

M.A. GEOGRAPHY

M.A. Geography Semester I shall consist the following papers :

1. The M.A. Semester -I examination in Geography shall consist of 500 marks.
2. The theory papers shall be of three hours duration.
3. Candidates will be required to pass separately in theory and practical examination.
4. a) In the practical examination the following shall be allotment of time and marks.

i)	Practical Record	20% Marks
ii)	Survey (up to six hours)	70% Marks
iii)	Viva on i and ii	10% Marks

b) The external and internal examiners shall jointly submit marks.

c) All the candidates shall present at the time of the practical examination their practical record regularly signed by the teachers concerned.

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ATAL BIHARI VAJPAYEE VISHWAVIDYALAYA BILASPUR (C.G.)

SEMESTER SYLLABUS

M.A. GEOGRAPHY

M.A. GEOGRAPHY
SEMESTER-II

PRACTICAL

OBEJECTIVES:

To apprise the student with latest trends in the development of cartography as a tool in mapping thematic and quantitative data to facilitate spatial analysis and synthesis. To enhance the skill of the students in field of survey and to understand the basic

1. Principles of Map making & concept of Cartography
2. Topographical information: International Series, South East Asia Series, Indexing, Classification and interpretation of topographical sheets, profiles
3. Morphometric Analysis: Hypsometric curve, Altimetry cursive, Histogram, Clinograph, Slope Analysis, Wentworth's Method, smith method.
4. Graphs and diagrams: Triangular Diagram, Ergo graph. Rainfall dispersion diagram Proportional circle, Spheres and cubes diagram.
5. Map Projection construction of world map projection.

SUGGESTED READINGS-

1.. Monk house, F.J. & H.R. Wilkinson : Map and Diagrams, methouen, London.

2. Singh, L. R. : Practical Geography.

3. शर्मा, जे.पी., :प्रायोगिक भूगोल

4.चौहान, पी.आर. : प्रयोगात्मक भूगोल

5.यादव, हीरालाल,प्रायोगिक भूगोल

6.चंद्रकारपी. सर्वेक्षणविधि तंत्र, एस. शारदा पब्लिकेशन, बिलासपुर

7.सरकारआशीष, प्रायोगिकभूगोल,

M.A. Geography Semester-II shall consist the following papers :

1. The M.A. Semester - II examination in Geography shall consist of 500 marks.
2. The theory papers shall be of three hours duration.
3. Candidates will be required to pass separately in theory and practical examination.
4. a) In the practical examination the following shall be allotment of time and marks.

i)	Lab work (up to three hours)	70% Marks
ii)	Practical Record	20% Marks
iii)	Viva	10%Marks

b) The external and internal examiners shall jointly submit marks.

c) All the candidates shall present at the time of the practical examination their practical record regularly signed by the teachers concerned.

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SEMESTER SYLLABUS

M.A. GEOGRAPHY

M.A. GEOGRAPHY
SEMESTER-III

STATISTICAL TECHNIQUE AND FIELD SURVEY

1. **Statist** :Correlation, Probability, Hypothesis testing, chi test, f test meak center, Nearest neighbor Analysis
2. Project work - Micro region basis physical, socio-economic survey about project report in 50 pages
3. Excursion

SUGGESTED READINGS-

1.. Monk house, F.J. & H.R. Wilkinson : Map and Diagrams, methouen, London.
2. Singh, L. R. : Practical Geography.
3. शर्मा, जे.पी., :प्रायोमिक भूगोल
4. चौहान, पी.आर. : प्रयोगात्मक भूगोल
5. यादव, हीरालाल, प्रायोगिक भूगोल
6. चंद्रकारपी, सर्वेक्षणविधि तंत्र, एस. शारदा पब्लिकेशन, बिलासपुर
7. सरकार आशीष, प्रायोगिक भूगोल,

M.A. Geography Semester-III shall consist the following papers :

1. The M.A. Semester - III examination in Geography shall consist of 500 marks.
2. The theory papers shall be of three hours duration.
3. Candidates will be required to pass separately in theory and practical examination.
4. a) In the practical examination the following shall be allotment of time and marks.

i)	Lab work (up to two hours)	30% Marks
ii)	Project Report	40% + 10% Marks
iii)	Excursion	10 % Marks
iv)	Viva on i and III	10 % marks

b) The external and internal examiners shall jointly submit marks.

c) All the candidates shall present at the time of the practical examination their practical record regularly signed by the teachers concerned.

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SEMESTER SYLLABUS

M.A. GEOGRAPHY

M.A. GEOGRAPHY
SEMESTER - IV

ADVANCE CORTOGRAPHY

1. **Themalic maps :**
   Choropleth, Isopleth, Dot method, flow map-
2. **Geological Maps:**
   Basic definition, Interpretation Conformable series and unconformable series
3. **Remote sensing:**
   Fundamental of Remote sensing, Components of Image Interpretation
4. **GIS :**
   An overview of GIS Software, Elements of GIS
5. **Computer Cartography :**
   Advantages of computer cartography, Creation of Graphs and Maps.

SUGGESTED READING :

1- American Society of Photogrammetry : Manual of Remote Sensing, ASP, Falls Church V.A., 1983.

2- Barett E.G. and L.F. Curits : Fundamentals of Remote sensing and AIR photo Interpretation on, Memillan, New York, 1992.

3- Compbell J. : Introduction of Remote Sensing, Guilford, New York, 1989.

4- Curran, Paul J. : Principles of Remote Sensing, Longman, London 1985.

5- Burrought P.A. Principles of Geographic Information systems of Land Reson Assessment Oxford University Press, New York 1986.

6- चैनियाल, देवीदत्त रू सुदूरसंवेदन एवं भौगोलिक सूचना प्रणाली

M.A, Geography Semester-IV shall consist the following papers :

1. The M.A. Semester - IV examination in Geography shall consist of 500 marks.
2. The theory papers shall be of three hours duration.
3. Candidates will be required to pass separately in theory and practical examination.
4. a) In the practical examination the following shall be allotment of time and marks.

i)	Lab work (up to three hours) (Lab work 25% and viva 5%)	70% Marks
ii)	Practical Record	20% Marks
iii)	Viva	10% Marks

b) The external and internal examiners shall jointly submit marks.

c) All the candidates shall present at the time of the practical examination their practical record regularly signed by the teachers concerned.

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	General Insurance			

SCHEME OF EXAMINATION & DISTRIBUTION OF MARKS

महत्वपूर्ण नोटः–

1. एम.कॉम प्रथम, द्वितीय तथा तृतीय सेमेस्टर में सभी प्रश्न–पत्र अनिवार्य होंगे। उक्त परीक्षा में वैकल्पिक प्रश्न–पत्र चयन की व्यवस्था नहीं होगी।
2. एम.कॉम चतुर्थ सेमेस्टर में विशिष्टीकरण समूह (A),(B) या (C) में से किसी भी एक वैकल्पिक समूह का चयन कर उस समूह के सभी चार प्रश्न–पत्र अनिवार्य रूप से लेने होंगे।
3. एम.कॉम. चतुर्थ सेमेस्टर में उपरोक्त विशिष्टीकरण समूह के अतिरिक्त 50 अंक की मौखिक परीक्षा तथा 50 अंक का परियोजना प्रतिवेदन (अधिकतम 50 पृष्ठों का) तैयार करना अनिवार्य होगा। यह प्रतिवेदन वाणिज्य या प्रबंध विषय से संबंधित होगा।
4. सभी प्रश्न–पत्रों में लिखित परीक्षा 80 अंकों की तथा 20 अंकों की आंतरिक मूल्यांकन परीक्षा होगी।
5. आंतरिक परीक्षा एवं बाह्य परीक्षा में प्रश्न पत्रवार न्यूनतम उत्तीर्णांक 36 प्रतिशत होगा। जो विश्वविद्यालयीन अध्यादेश के प्रावधानों के अनुसार होगा।

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सेमेस्टर पाठ्यक्रम

M.Sc. ZOOLOGY

SCHEME OF EXAMINATION & DISTRIBUTION OF MARKS

SEMESTER - I

Paper No.	Title of the Paper	Marks	
		External	Internal
I	Invertebrate structure and function, Minor Phyla	80	20
II	Animal Behaviour	80	20
III	Quantitative Biology	80	20
IV	Ecology and environmental physiology	80	20
	M.Sc. Zoology Lab Course I	100	
	M.Sc. Zoology Lab Course II	100	

SEMESTER - II

Paper No.	Title of the Paper	Marks	
		External	Internal
I	General & comparative endocrinology of vertebrates	80	20
II	Gamete biology and reproductive physiology in human beings	80	20
III	Molecular cell biology	80	20
IV	Tools and techniques for biology	80	20
	M.Sc. Zoology Lab Course I	100	
	M.Sc. Zoology Lab Course II	100	

SEMESTER - III

Paper No.	Title of the Paper	Marks	
		External	Internal
I	Comparative anatomy of vertebrates	80	20
II	Biosystematics, taxonomy & biodiversity	80	20
III	Immunology and developmental biology	80	20
IV	Population genetics & evolution	80	20
	M.Sc. Zoology Lab Course I	100	
	M.Sc. Zoology Lab Course II	100	

SEMESTER - IV

Paper No	Title of Paper	Marks	
		External	Internal
I	General physiology and neurophysiology (*compulsory*)	80	20
II	Biochemistry and metabolic regulation and cell function (*compulsory*)	80	20
Optional Group-I			

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III	Fish(Ichthyology) structure and function	80	20
IV	Applied Fisheries	80	20
Optional Group-II			
III	Cell biology	80	20
IV	Cellular organization and molecular organization	80	20
Optional Group-III			
III	Entomology	80	20
IV	Applied Entomology	80	20
Optional Group-IV			
III	Wildlife conservation	80	20
IV	Environment and biodiversity conservation	80	20
	M.Sc. Zoology Lab Course I	100	
	M.Sc. Zoology Lab Course II	100	

Student has choice to opt. For any one group out of four optional groups.(Paper III and IV in semester four)

Each theory paper will have 5 questions of equal marks. First question will be compulsory encompassing all the five units without any internal choice, whereas rest questions will be unit wise with internal choice.

Internal Assessment shall comprise of two parts- Ten marks for test and ten marks for seminar/ assignment /presentation.

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SEMESTER-I
LAB-COURSE I

Time-06 Hours
Max. Marks-100

Invertebrates

1. Study of non-chordates through museum specimen
2. Study of permanent slides of non-chordates
3. Dissection of representative types (invertebrates)
4. Squilla, Mytilus, Sepia, Aplysia, Echinus

5. Mounting-

Permanent and suitable stained micro-preparation
Earthworm-nerve ring, ovary, spermathecal, nephridia
Cockroach-mouth parts , salivary glands, trachea
Prawn appendages, statocyst
Protozoan- rhizopods, flagellates and ciliates (fresh water forms) prolozoon ullase
Porifera-spicule sand gemmules of fresh water sponges
Crustaceans and rotifers
Larval forms of the free living invertebrates

Animal behaviour-

6. Experiments related to Animal Behaviour

Feeding behaviour in house fly
Life cycle of Lac insect and honey bee (chart/model/material)
Study of structural organization of the bee hive
Learning behaviour-
Conditioned and unconditioned reflex

7. Projects-

a)Visit to study the management of following->
Fish farm, dairy farm, poultry farm, sericulture and apiculture
b) Study of Invertebrate local fauna
c) Any other relevant topic

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Student should prepare a report and submit

Note-

1. Use of animal for dissection and practical work is subject to the conditions that they are not banned under the wildlife protection act
2. External features and anatomy should be studied by digital techniques and the alternatives. Wherever live animals is studies it should be either pest or colourable species without paining them

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M.Sc. ZOOLOGY

SEMESTER-I
LAB-COURSE I

Time-06 Hours
Max. Marks-100

Distribution of marks in practical exam

1. Spotting (1-10)-invertebrates	(20)
2. Mounting	(10)
3. Dissection (virtual)	(10)
4. Exercises based on behaviour (Two exercises)	(30)
5. Viva	(10)
6. Sessional	(20)
Total =	100

M.SC. SEMESTER I
LAB-COURSE II

Quantitative Biology

1. Collection methods of different types of data
2. Data analysis- tabulation
3. Different graphical and diagrammatic methods of data presentation
4. Calculation of central tendencies based on given data
5. Application of parametric and non-parametric tests
6. ANOVA
7. Study of model types
8. Exercises based on regression
9. Exercise based on correlation

Ecology and Environmental Physiology

10. Study of animals showing adaptation to different environments
11. Soil analysis physical and chemical composition of soil
12. Effect of physical exercise on blood pressure
13. Exercise based on blood glucose level
14. Carbonates and nitrates from soil sample
15. Determination of free CO_2 and salinity in pond

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M.Sc. ZOOLOGY

M.SC. SEMESTER I

LAB-COURSE II

Time-06 Hours
Max. Marks-100

Distribution of marks in practical exam

1. Exercises based on biostatics (Three)	(30)
2. Exercises based Soil and Water analysis (Two)	(20)
3. Exercises based on Physiology (Two)	(20)
4. Viva	(10)
5. Sessional	(20)
Total =	100

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1. Introduction to instrumental analysis-Robert Braun , McGraw Hill Publication
2. A biologist guide to principles and techniques of practical biochemistry-K, Wilson and K.H.Goulding EBS Edn.
3. Clark and Swizer, Experimental Biochemistry, Freeman, 2000
4. Locquin and Langeron, Handbook of Microscopy, Butterwaths, 1983
5. Boyer, Modern Experimental Biochemistry, Benjamin, 1993

SEMESTER-II
LAB-COURSE I

General & comparative endocrinology of vertebrates

1. Dissection of various endocrine glands of vertebrates (Fishes, Amphibians, Reptiles, Birds, Mammals, any available animals/ Virtual)
2. Dissection of various endocrine glands of insects (Cockroach/any other insect, any available animals/ Virtual)
3. Study of histo-pathologic slides of endocrine and related structures
   - T.S. Pituitary, T.S. of Thyroid, T.S. of Parathyroid, T.S. of Adrenal, T.S. of Testes, T.S. of Ovary, T.S. Thymus, T.S. of Kidney, T.S. of Heart, T.S. of Stomach, T.S. of Intestine
4. Effect of epinephrine on chromatophores of fishes
5. Biochemical estimation of cholesterol content in adrenal tissue, glycogen in uterine tissue
6. Microtomy-block preparation, section cutting, stretching and straining
7. Gamete biology and reproductive physiology in human beings
8. Study of Estrous cycle in mouse or rat
9. Preparation on Blastodisc of hen's egg
10. Formation of egg window in chicken egg
11. Collection of developmental stages of eggs of Lymnea or any gastropod
12. Collection of developmental stages of insects/ fishes
13. Study of development stages of frog through slides and whole mounts.
14. Study of development stages of chick through slides and whole mounts.
15. Slide preparation (earthworm ovary, amphibian, reptiles, birds and mammals testes & ovary.)

Note-

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SEMESTER-II
LAB-COURSE I

Time-06 Hours
Max. Marks-100

Distribution of marks in practical exam.

1. Dissection of Endocrine glands /virtual	(10)
2. Spotting (Endocrine glands& Embryology)	(20)
3. Cytological preparation/preparation of estrogen cycle	(10)
4. Microtomy	(20)
5. Preparation of egg window and Blastodisc	(10)
6. Viva	(10)
7. Sessional	(20)
Total =	100

SEMESTER-II
Lab-course II

Molecular cell biology
1. Study of Prokaryotic and Eukaryotic cells
2. Study of permanent slides -Mitosis, Meiosis and cell organelles
3. Temporary squash preparation to show mitosis and meiosis
4. Preparation of giant chromosomes, barr bodies
5. Histological study of cancer cells

Tools and techniques for biology
6. Use of balance Ph meter, colorimeter, centrifuge spectrophotometer, camera Lucida etc.
7. Molecular separation by Chromatography, Electrophoresis
8. Media preparation
9. Cell culture
10. Colorimetric estimation of glucose, protein, RNA, DNA
11. Absorption spectrum of any coloured solution
12. Histochemical techniques

Note-
1. Use of animal for dissection and practical work is subject to the conditions that they are not banned under the wildlife protection act

2. External features and anatomy should be studied by digital techniques and the alternatives. Wherever live animals is studies it should be either pest or culturable species without paining them

SEMESTER-II
LAB-COURSE II

Time-06 Hours
Max. Marks-100

Distribution of marks in practical exam.

1. Spotting (mitosis and meiosis, Tools & Techniques)	(20)
2. Exercise based on cell Biology	(10)
3. Chromatography	(20)
4. Colorimetric estimation	(10)
5. Application of different instruments	(10)
6. Viva	(10)
7. Sessional	(20)
Total =	100

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M.Sc. Semester III

Zoology Practical
Lab-course I

(Comparative Anatomy)

1. Dissection of animals :- Amphioxus, Scoliodon, Electric ray, Sting ray, Calotis, Bird head, Rat (Subject to availability of material) / study through alternative methods of dissection.
2. Micro preparation of suitable and available material.
3. Study of the representative examples of different classes of Chordates.
4. Study of permanent slides showing whole mount or section as per Theory syllabus, including embryological slides of Frog and Chick.
5. Osteology of Amphibia, Reptile, Bird, Mammal.
6. Study of animal diversity by field trip and excursion, Extension activity to spread health awareness. Students have to submit project report.

Biosystematics, taxonomy & Biodiversity

1. Study of biodiversity among various invertebrates and vertebrates (Listing of all the animals found in and around your house and also try to find out their Zoological names)
2. Collection of various insect species
3. Visits to a local animal park or zoo to identify and study the captive fauna and preparation of report
4. Study of adaptive characteristics of various invertebrates and vertebrates in different climate
5. Taxonomic key formation and conversion
6. Study of biodiversity in grassland and pond water by using Shannon - Weiner index .

M.Sc. Semester III

Zoology Practical

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Lab-course I

Time-06 Hours

Max. Marks-100

Distribution of marks in practical exam.

1. Dissection of Vertebrate (virtual/other method) (10)
2. Spotting 1 to 10 (20)
3. Micro preparation (10)

4. Exercises related to Taxonomy. (Three) (30)

5. Viva (10)
6. Sessional (20)

Total = 100

M.Sc. Semester III

Zoology Practical

Lab-course II

Immunology and developmental Biology

1. Dissection of Primary and secondary immune organ from mice
a. Preparation of single suspension from bone marrow
b. Cell counting and vigbility testing of the spleenocytes prepared
2. Preparation and study of phagocytosis by spleenic peritoneal macrophase.
3. Raising polyclonal antibody in mice, serum collecton and estimating antibody titre in serum by following method-
a. Ouchterlony (double diffusion) assay for antigen-antibody specificity and titre.
b. ELISA
4. Antibody purification from the serum collected from immunized mice, affinity purification chromatography
5. Blood group testing A, B ,O ,AB AND Rh factor
6. Indused Breeding in Frog
7. Culture of chick Embryo in Vitro
8. Study of chick embryos by vital staiting
9. The Technique for the whole mount preparation of chick embryo
10. Demonstration of Cell death
11. Study of Mitosis (a) Techniques for chromosomes preparation (b) Preparation of Meiotic chromosomes for Grosshopper testies (c) Auto Rediography

Population Genetics and Evolution

a. i. An experiment related to quantitative genetics, genotypic frequencies in light of hardy weinberg law
ii. ABO blood group data
b. Numeric exercise related to-
i. Natural selection
ii. Changing gene frequency
Chromosomal Polymorphism

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M.Sc. Semester III

Zoology Practical

Lab-course II

Time-06 **Hours**

Max. Marks-100

Distribution of marks in practical exam.

1. **Dissection showing primary and secondary immune organ of mice virtual / other method (10)**
2. **Exercise related to immune response** (20)
3. **Exercise related to developmental biology/ Preparation of egg window and Blastodisc (10)**
4. **Exercises related to quantitative genetics / hardy Weinberg law** **(20)**
5. **Exercise related to natural selection (10)**
6. **Viva** **(10)**
7. **Sessional** **(20)**

Total = 100

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M.Sc. ZOOLOGY

BILASPUR UNIVERSITY, BILASPUR

M.Sc. Semester IV

Zoology Practical
Lab-course I

A. Practical based on Paper I and Paper II as per Theory

1. Estimation of Protein by the Biuret, Lowry, Brad ford and Eosine-a comparasion
2. Determination of N-terminal Amino acids by the Sangers reagent (FDND)
3. Paper chromatographic separation of Amino acids
4. Quantitative estimation of Protein, carbohydrate, Mucosaccharide, Lipids and Enzyme (Bromphenol blue, PAS, Alcian blue, aldehyde fucsin, Acetylcholinestrase technique)
5. Identification of hypothalamic nuclei histological, hystochemical and Immunocytochemical method
6. Isolation and characterization of Pituitary cell
7. Estimation of MAC, MCH and MCHC
8. Total count of WBC and RBC
9. Differetial count of WBC
10. Haemoglobin estimation and PCV estimation or ESR estimation
11. Quantitative estimation of blood serum by Colorimetry (I) Blood Urea (II) Blood glucose (III) Blood Calcium (IV) Blood Creatine (V) Blood cholesterol (VI) Blood Protein (VII) Blood Albumin
12. Blood clotting time
13. ECG Recording
14. Blood Pressure estimation
15. EEG

M.Sc. Semester IV

Zoology Practical

Lab-course I

Time-06 Hours

Max. Marks-100

Distribution of marks in practical exam.

1. Estimation of Protein	(10)
2. estimations of, carbohydrate, Mucosaccharide, Lipids and Enzyme (two exercises)	(20)
3. Exercise based on histochemical and Immuno-cytochemical method	(10)
Exercises based on haematology. (two exercises)	(20)

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M.Sc. Semester IV

Zoology Practical
Lab-course II

Practical (Special Paper – Group II Cytology)

1. Examination of different cell types in Vertebrate tissue
2. Contrast Microscopy
3. Photomichrography
4. Study of permanent cytological preparation
5. Squash preparation of chromosomes and preparing karyotype
6. Preparation of Giant Chromosomes and demonstration of puffs
7. Golgi material and Mitochondrial preparation
8. Demonstration of Barr body and drum stick
9. Histochemical demonstration of RNA DNA phospholipid and enzyme
10. Microbial culture media preparation and microbial growth
11. Molecular separation by chromatography and Electrophorasis

M.Sc. Semester IV

Zoology Practical

Lab-course II **Hours**
Time-06
Max. Marks-100

Distribution of marks in practical exam.

1. Spotting (1to 10) (20)
2. Exercise based on cytological preparation (10)
3. Exercise based on histochemical preparation (10)
4. Molecular separation by chromatography and Electrophorasis (20)
5. Exercise based on microbiology/ karyotype study (10)

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6. Viva	(10)
7. Sessional	(20)

Total = 100

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M.Sc. Semester IV

Zoology Practical
Lab-course II

Practical (Special Paper – Group III Entomology)

1. Collection, Preservationand classification of the insects of order :- Thysaneura, Collembola, Orthoptera, Hemiptera, Lepidoptera, Mallophaga, Diptera, Hymenoptera and Coleoptera
2. Dissectionof Grasshopper, Cockroach, Cricket, wasp, and honey bee, with special reference to their Nervous system, Salivary gland, Endocrine gland, Sting apparatus, of honey bee, reproductive organs of Grasshopper and cockroach.
3. Whole mounts of small insects eg Collembola, Thysaneura, bedbug, louse, stored grain pests
4. Whole mount of different types of legs, antennae, wings, mouth parts, salivary glands and scales
5. Microtomy of Insect materials
6. Simple experiment on Insect Physiology
7. Identification of common insect pests
8. Collection of life cycle of the pest of any economic crop

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M.Sc. Semester IV

Zoology Practical

Lab-course II

Time-06

Max. Marks-100

Distribution of marks in practical exam.

		Hours
1. Dissection of Available insect pests /Virtual		(10)
2. Spotting (1 to 10)	(20)	
3. Micropreparation	(10)	
4. Experiment based on insect physiology (10)		
5. Identification of common insect pests		(10)
6. Project Report and field visit		(10)
7. Viva	(10)	
8. Sessional	(20)	

Total = 100

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M.Sc. Semester IV

Zoology Practical

Lab-course II

Exercises based on paper III – Wild life conservation

Exercises based on paper IV - Environment and biodiversity conservation

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M.Sc. Semester IV

Zoology Practical

Lab-course II

Time-06

Max. Marks-100

Distribution of marks in practical exam.

		Hours
1. paper III – Wild life conservation		(35)
2. Environment and biodiversity conservation		(35)
3. Viva	(10)	

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SEMESTER-I
LAB-COURSE I

Time-06 Hours
Max. Marks-100

Invertebrates

1. Study of non-chordates through museum specimen
2. Study of permanent slides of non-chordates
3. Dissection of representative types (invertebrates)
4. Squilla, Mytilus, Sepia, Aplysia, Echinus

5. Mounting-

Permanent and suitable stained micro-preparation
Earthworm-nerve ring, ovary, spermathecal, nephridia
Cockroach-mouth parts , salivary glands, trachea
Prawn appendages, statocyst
Protozoan- rhizopods, flagellates and ciliates (fresh water forms) prolozoon ullase
Porifera-spicule sand gemmules of fresh water sponges
Crustaceans and rotifers
Larval forms of the free living invertebrates

Animal behaviour-

6. Experiments related to Animal Behaviour

Feeding behaviour in house fly
Life cycle of Lac insect and honey bee (chart/model/material)
Study of structural organization of the bee hive
Learning behaviour-
Conditioned and unconditioned reflex

7. Projects-

a)Visit to study the management of following->
Fish farm, dairy farm, poultry farm, sericulture and apiculture
b) Study of Invertebrate local fauna
c) Any other relevant topic

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Student should prepare a report and submit

Note-

1. Use of animal for dissection and practical work is subject to the conditions that they are not banned under the wildlife protection act
2. External features and anatomy should be studied by digital techniques and the alternatives. Wherever live animals is studies it should be either pest or colourable species without paining them

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SEMESTER SYLLABUS
M.Sc. MICROBIOLOGY

Scheme and Courses of Studies

SEM.	COURSES		MARKS		
	Paper	Title of the Paper	Paper wise	Internal Assessment	Univ. Exam. Marks*
First	First (MB-101)	General Microbiology and Bacterology	100	20	80
	Second (MB-102)	Virology	100	20	80
	Third (MB-103)	Phycology, Mycology and Proto-zoology	100	20	80
	Fourth (MB-104)	Biochemistry	100	20	80
	Lab. Course-	Concern with paper - I & II	100	Sessional	100
	Lab. Course-	Concern with paper - III & IV	100	Sessional	100
Second	First (MB-201)	Bioinstrumentation & Biochemical techniques	100	20	80
	Second (MB-202)	Cell biology and Microbial physiology	100	20	80
	Third (MB-203)	Microbial genetics and Molecular Biology	100	20	80
	Fourth (MB-204)	Environmental & Agriculture Microbiology	100	20	80
	Lab. Course-	Concern with paper - I & II	100	Sessional	100
	Lab. Course-	Concern with paper - III & IV	100	Sessional	100
Third	First (MB-301)	Immunology	100	20	80
	Second (MB-302)	Medical & Veterinary Microbiology	100	20	80
	Third (MB-303)	Biostatics & Bioinformatics	100	20	80
	Fourth (MB-304)	Enzymology and Industrial Microbiology	100	20	80
	Lab. Course-301	Concern with paper - I & II	100	Sessional	100
	Lab. Course-302	Concern with paper - III & IV	100	Sessional	100
Fourth	First (MB-401)	Plant pathology & Disease management	100	20	80
	Second (MB-402)	Food Microbiology	100	20	80
	Third (MB-403)	Microbial ecology & Forest microbiology	100	20	80
	Lab. Course-402	Project work (minor) at local level OR PROJECT WORK **(External)		Project Report-	60
	Fourth (MB-404)	Computer Fundamentals and Research	100	20	80

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FIRST SEMESTER
Lab Course - 101
(GENERAL MICROBIOLOGY, BACTERIOLOGY AND VIROLOGY)

Total Marks: 100
Internal assessment Marks: 20
Term end Exam Marks: 80

1. **Preparation of Glassware:** Various techniques of cleaning (discarding & washing) and sterilization of glassware for microbiological laboratory.
2. **Preparation of Culture Media:** Different types of nutrient media as per nutritional need, dehydrated, selective and differential media for autotrophic & heterotrophic microbes.
3. **Pure culture Techniques:** Preparation of slants, stab culture, sub-culturing, types of streaking.
4. **Staining Techniques:** Gram Staining, negative staining, acid-fast staining, endospore, capsule.
5. **Isolation, Identification and characterization of bacteria:** Cultural characteristics of bacteria (autotrophic & heterotrophic), using selective and differential media. Growth on NA, Blood agar, Chocolate agar, DCA, Maconkey's, EMB and Sabouraud's agar. Study of nutritional needs of bacterial growth (growth in the presence of different carbon source, N source).
6. **Biochemical tests for identification of bacteria:** IMViC, catalase, oxidase, mannitol motility test, gelatin test, urease, TSI test, coagulase, nitrate reduction. Production of acid and gas from glucose, arabinose, inositol, lactose, maltose, mannitol, rhamnose, sucrose, xylose, fructose, starch hydrolysis, casein hydrolysis, assessment of effect of metals on microbial growth.
7. **Determination of growth of bacteria:** Growth curve and generation time.
8. **Pathological examination:** Plant diseases caused by Viruses as mentioned in course of studies (a case study of any one disease).

Scheme of examination:

Lab performances	60 marks	
Spotting	20 marks	
Internal assessment -		
Oral evaluation	10 marks	
Sessional	10 marks	
Total	100 marks	Provided period- 06 hr.

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SEMESTER SYLLABUS
M.Sc. MICROBIOLOGY

FIRST SEMESTER
Lab. Course - 102
(PHYCOLOGY, MYCOLOGY, PROTOZOLOGY AND BIOCHEMISTRY)

Total Marks: 100
Internal assessment Marks: 20
Term end Exam Marks: 80

1. Isolation and identification of algae from soil and water. Isolation and identification of cyanobacteria, extraction and separation of algal pigments.
2. Isolation and identification of fungi from different substrates (saprophytic, parasitic, coprophilous, keratinophilic).
3. Study of environmental requirements of fungi (pH, temperature) by linear growth and biomass.
4. Assessment of the effect of antifungal agents (antibiotics/ chemicals/plant extracts) on isolated fungal samples.
5. Extraction and separation of amino acid and mycotoxin (aflatoxins) by paper chromatography.
6. Identification and characterization of protozoans as mentioned in course studies. Case study of any one disease.
7. Pathological examination. Human diseases caused by protozoans as mentioned in course studies (a case study of any one disease).
8. Colorimetric/ spectrophotometric estimations of proteins, pigments, DNA/RNA and sugars.
9. Study of enzyme kinetics and enzyme activity. Isolation of amylase producing microorganisms from the environment; estimation of amylase activity and determining its Km and Vmax; effect of environmental conditions (temperature, pH and substrate concentration) on the activity of amylase.
10. Estimation of enzyme activity: Phosphatase and catalase.
11. Separation of isolated phospholipids by thin layer chromatography and hemoglobin by gel filtrations.

Scheme of Examination:		
Lab performances	60 marks	
Spotting	20 marks	
Internal assessment: -		
Oral evaluation	10 marks	
Sessional	10 marks	
Total	100 marks	Provided period- 06 hrs

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SEMESTER SYLLABUS
M.Sc. MICROBIOLOGY

SECOND SEMESTER
Lab. Course - 201

(BIOINSTRUMENTATION, BIOCHEMICAL TECHNIQUES, CELL BIOLOGY AND MICROBIAL PHYSIOLOGY)

Total Marks: 100
Internal assessment Marks: 20
Term end Exam Marks: 80

1. Studies on pH titration curves of amino acids/ acetic acid and determination of pKa values and Handerson-Hasselbach equation.
2. Separation of bacterial lipids/amino acids/ sugars/organic acids by TLC or paper chromatography.
3. Separation of serum proteins by [illegible] gel electrophoresis.
4. Paper electrophoresis and separation of [illegible] or blue dextran by gel filtration.
5. Separation of bacterial DNA by agarose gel electrophoresis.
6. Preparation of mitotic plate by carmine squashing method and phase identification.
7. Preparation of Karyotype of metaphase plate.
8. Preparation of Meiotic plate and determination of phases.
9. Computation of Chaisma frequency and determination of phases
10. Micrometry and Camera lucida drawings
11. Isolation and cultivation of autotrophic microbes.
12. To study the effect of salt concentration on bacterial growth by turbidometry method.
13. Determination of thermal death point (TDP) of an organism.
14. UV absorption of proteins, DNA and RNA.

Scheme of Examination:

Lab performances	60 marks	
Spotting	20 marks	
Internal Assessment		
Oral evaluation	10 marks	
Sessional	10 marks	
Total	100 marks	Provided period- 06 hrs

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SEMESTER SYLLABUS
M.Sc. MICROBIOLOGY

SECOND SEMESTER

Lab. Course - 202

(MICROBIAL GENETICS, MOLECULAR BIOLOGY, ENVIRONMENTAL MICROBIOLOGY & AGRICULTURE MICROBIOLOGY)

Total Marks: 100
Internal assessment Marks: 20
Term end Exam Marks: 80

1. Transformation of *E. Coli*, preparation of competent cells.
2. Conjugation in *E.coli* by using plate method.
3. Isolation of plasmid DNA from *E.coli*.
4. Isolation of DNA from plant cell (Onion/ Mustard).
5. Isolation of microorganisms from different habitats, soil, water and air.
6. Potability test/potability of water (MPN and HS).
7. Physical, chemical and microbial analysis of water: pH, COD, BOD, total and dissolved solids.
8. Study of different types of microbial air samplers/ air sampling devices.
9. Study of microbial contamination of industrial products and of fabrics.
10. Production of ammonia from organic compounds (ammonification).
11. Bioconversion of ammonia to nitrate (nitrification).
12. Determination of phenol coefficient.
13. Characterization of different cells for detection of various microbial enzymes: amylase, lipase, protease and cellulase.
14. Microbiological examination of cyanobacteria, separation and determination of cyanobacterial pigments.

Scheme of examination

Lab performances	60 marks	
Spotting	20 marks	
Internal Assessment:		
Oral evaluation	10 marks	
Sessional	10 marks	
Total	100 marks	Provided period: 06 hrs

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SEMESTER SYLLABUS
M.Sc. MICROBIOLOGY

THIRD SEMESTER
Lab. Course – 301
(IMMUNOLOGY, MEDICAL AND VETERINARY MICROBIOLOGY)

Total Marks: 100
Internal assessment Marks: 20
Term end Exam Marks: 80

1. Determination of Blood groups and Rh typing.
2. Widal (slide) test for Typhoid by antigen- antibody reaction.
3. Pregnancy testing through commercially available method.
4. Rheumatoid Arthritis test (RA) by antigen- antibody reaction.
5. RPR (Rapid Plasma Reagin) test for syphilis.
6. Detection of specific antigen by using ELISA technique.
7. Separation and characterization of lymphocytes from blood and demonstration of lymphocytes Population.
8. Study of antigen and antibody reaction by immuno-diffusion.
9. Different staining techniques Acid fast staining, Giesma staining and Leishmann staining.
10. Special staining methods for [illegible] granules, capsule and spores.
11. Isolation of pathogen from [illegible], blood and urine.
12. Isolation and identification of [illegible] pathogenic bacteria and fungi:

Bacteria: *Staphylococcus aureus*, *Escherichia coli*, *Proteus vulgaris*, *Proteus mirabilis*, *Salmonella typhi*, *Salmonella paratyphi*, *Shigella dysenteriae* and *Shigella felexneri*.

Fungi: *Candida albicans*, *Microsporum* and *Trichophyton*.

13. Antibiotic sensitivity testing by disc diffusion method.

Scheme of examination

Lab performances	60 marks	
Spotting	20 marks	
Internal Assessment:		
Oral evaluation	10 marks	
Sessional	10 marks	
Total	100 marks	Provided period- 06 hrs

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SEMESTER SYLLABUS
M.Sc. MICROBIOLOGY

THIRD SEMESTER
Lab. Course - 302
(BIOSTATISTICS, BIOINFORMATICS, ENZYMOLOGY AND INDUSTRIAL MICROBIOLOGY)

Total Marks: 100
Internal assessment Marks: 20
Term end Exam Marks: 80

1. Determination of Statistical averages / Central Tendencies: a) Arithmetic mean b) Median c) Mode.
2. Determination of measures of dispersion a) Mean Deviation b) Standard Deviation c) Standard Error d) Coefficient of Variation.
3. Test of significance – Application of a) Chi-Square test b) T-test c) ANOVA
4. Studies of public domain, databases for nucleic acid and protein sequences and determination of Protein structure, Protein Data Base (PDB), genome sequence analysis.
5. Determination of Kinetic constant of Amylase activity, Vmax, Km.
6. Effect of pH and Temperature on Amylase activity.
7. Effect of inhibitor on Amylase activity.
8. Determination of Proteins, DNA and RNA concentration by Spectrophotometer.
9. Production of Protease by microorganism.
10. Demonstration of production of Ethanol by Yeast.
11. Isolation of antibiotic producing microorganism from soil.

Scheme of examination

Lab performances	60 marks	
Spotting	20 marks	
Internal Assessment:		
Oral evaluation	10 marks	
Sessional	10 marks	
Total	100 marks	Provided period- 06 hrs

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SEMESTER SYLLABUS

M.Sc. MICROBIOLOGY

Scheme and Courses of Studies

SEM.	Paper	COURSES: Title of the Paper		MARKS: Paper wise	Internal Assessment	Univ. Exam. Marks*
First	First (MB-101)	General Microbiology and Bacteriology		100	20	80
	Second (MB-102)	Virology		100	20	80
	Third (MB-103)	Phycology, Mycology and Proto-zoology		100	20	80
	Fourth (MB-104)	Biochemistry		100	20	80
	Lab. Course-101	Concern with paper - I & II		100	Sessional	100
	Lab. Course-102	Concern with paper - III & IV		100	Sessional	100
Second	First (MB-201)	Bioinstrumentation & Biochemical techniques		100	20	80
	Second (MB-202)	Cell biology and Microbial physiology		100	20	80
	Third (MB-203)	Microbial genetics and Molecular Biology		100	20	80
	Fourth (MB-204)	Environmental & Agriculture Microbiology		100	20	80
	Lab. Course-201	Concern with paper - I & II		100	Sessional	100
	Lab. Course-202	Concern with paper - III & IV		100	Sessional	100
Third	First (MB-301)	Immunology		100	20	80
	Second (MB-302)	Medical & Veterinary Microbiology		100	20	80
	Third (MB-303)	Biostatics & Bioinformatics		100	20	80
	Fourth (MB-304)	Enzymology and Industrial Microbiology		100	20	80
	Lab. Course-301	Concern with paper - I & II		100	Sessional	100
	Lab. Course-302	Concern with paper - III & IV		100	Sessional	100
Fourth	First (MB-401)	Plant pathology & Disease management		100	20	80
	Second (MB-402)	Food Microbiology		100	20	80
	Third (MB-403)	Microbial ecology & Forest microbiology		100	20	80
	Lab. Course-402	Project work (minor) at local level	OR PROJECT WORK **(External)		Project Report-	60
	Fourth (MB-404)	Computer Fundamentals and Research		100	20	80

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SEMESTER SYLLABUS

M.Sc. BOTANY

SCHEME OF EXAMINATION & DISTRIBUTION OF MARKS

SEMESTER - I

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Biology & Diversity of Virus Bacteria & Fungi	Theory	20	80	100
2.	Biology &Diversity Of Algae, Bryophytes And Pteridophytes	Theory	20	80	100
3.	Cell And Molecular Biology of Plants	Theory	20	80	100
4.	Taxonomy Of Angiosperms	Theory	20	80	100
Lab-1	Based On Paper I&II	Practical	-	-	100
Lab-2	Based On Paper III&IV	Practical	-	-	100
				Total	**600**

SEMESTER - II

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Cytology ,Genetics And Cytogenetics	Theory	20	80	100
2.	Biology & Diversity Of Gymnosperm species	Theory	20	80	100
3.	Plant Physiology	Theory	20	80	100
4.	Plant Biochemistry And Bioenergetics	Theory	20	80	100
Lab-1	Based On Paper I&II	Practical	-	-	100
Lab-2	Based On Paper III&IV	Practical	-	-	100
				Total	**600**

SEMESTER - III

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Plant Development	Theory	20	80	100
2.	Plant Reproduction	Theory	20	80	100
3.	Plant Ecology	Theory	20	80	100
4.	Elective Paper (A) Plant Pathology - I (B) Weed Biology- I	Theory	20	80	100
Lab-1	Based On Paper I&II	Practical	-	-	100
Lab-2	Based On Paper III&IV	Practical	-	-	100
				Total	**600**

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SEMESTER SYLLABUS

M.Sc. BOTANY

SEMESTER - IV

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Plant cell, Tissue and organ culture	Theory	20	80	100
2.	Plant Resource Utilization And Conservation	Theory	20	80	100
3.	Genetic Engineering Of Plant And Microbes &Biostatics	Theory	20	80	100
4.	Elective Paper (A) Plant Pathology –II (B) Weed Biology- II	Theory	20	80	100
Lab-1	Based On Paper I&II	Practical	-	-	100
Lab-2	Based On Paper III&IV	Practical	-	-	100
				Total	600
				GRAND TOTAL	2400

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SEMESTER- I
PAPER - IV
TAXONOMY OF ANGIOSPERMS

UNIT -1

Origin of Intra- Population Variation: Population & the environment, ecads & ecotypes, evolution & differentiation of species – various models.

The Species Concept: Taxonomic hierarchy ,species ,genus family & other categories , principles used in assessing relationship ,delimitations of taxa & attribution of rank salient feature of the international code of botanical nomenclature and salient features of Melbourne code

UNIT -2

Taxonomic Evidence: Morphology, anatomy, embryology, cytology, photochemistry, genome analysis & nucleic acid hybridization.

Taxonomy Tools: Herbarium, floras, histological photochemical cytology serological biochemical & molecular techniques, computers & GIS.

UNIT -3

System of Angiosperm Classification: Phonetic versus phylogenetic systems, cladistics taxonomy, relative merits & demerits of major system of classification; relevance of taxonomy to conservation, sustainable utilization of bio resource & ecosystem research.

UNIT -4

Concept of Phytogeography: Endemism, hot spots and hottest hot spots, plant exploration, invasion & introduction, local plant diversity and its socio-economic importance.

Suggested Readings:

1. Gole, A.J. ((1969) Numerical Taxonomy. academic Press London.
2. Devis ,P. H. And Heywood, V.H (1973) Principle of Angiosperm Taxonomy .Robert E. Kreiger .Pub. Co. New York.
3. Grant, V. (1971) plant Speciation .Columbia Univ.Press, New York.
4. Grant, W.F. (1984) Plant Biosystematics .Academic Press. London.
5. Heslop- Harrison, J/ (1976) Plant Taxonomy .English Language Book Assoc .and Edward Pub. Ltd. U.K.
6. Stace ,C.A. (1989)Plant Taxonomy and Biosystematic Edward Arnold Ltd.London .
7. Takhtajan, A.L. (1997) Diversity and classification of flowering plant Columbiauniv.Press.New York.
8. Woodland, D.W. (1991) Contemporary Plant Systematic. Prentice Hall new Jersey.
9. Sharma, A.K. and Sharma, R.(2007) Taxonomy .PragatiPrakashan Meerut.

Suggested Laboratory Exercise:

1. Description of specimen from representative locally available families .

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2. Description of species based on various specimen to study Intraspecific various variation ,a collective exercise.
3. Field trip within and around the campus, comppation of field notes and preparation of herbarium sheets of such plant wild or cultivated as are abundant .
4. Training in using floras and herbaria for identification of Specimen described in the class.
5. Comparison of different species of genus and different genera of a family to Calculate Similarity Coefficient and Preparation of Dendrograms
6. Demonstration of the Utility of Secondary metabolites in the taxonomy of some appropriated genera.
7. Description of various species of a genus, study of key characters and preparation of keys at generic level.
8. Location of keys and use of key at family level

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Suggested Laboratory Exercise:

1. Demonstration of plasmolysis and deplasmolysis in plant cell .
2. Demonstration of transpiration.
3. Measurement of transpiration rate photometer.
4. Study of inter-relationship between transpiration and absorption and by T/A apparatus.
5. Extraction of chloroplast pigment from green leaves.
6. Separation of chloroplast pigment through paper chromatography.
7. Separation of chloroplast pigment through solvent method.
8. Preparation of absorption spectrum of chlorophyll -a
9. Determination of chlorophyll a/ chlorophyll-b ratio in C_3 and C_4 plants.
10. Extraction of seed proteins depending upon solubility.
11. Fractionation of proteins using gel filtration chromatography using sephadex G-100 or sephadex G-200 .
12. Principal of colorimetry spectrometry and fluorimerty

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4. Kumar , H.D. (1986) Modern Concept of Ecology . Vikas Publishing House Privet Ltd New Delhi .
5. Hill M.K.(1997) Understanding Environmental Pollution . Cambridge Uni. Press, , Cambridge UK.
6. Odum ,E.P. (1971) Fundamental of Ecology .,Saunders ,Philadelphia .
7. Odum ,E.P. (1983) Basic Ecology .,Saunders ,Philadelphia
8.

Suggested Laboratory Exercise

1. To calculate mean , variance ,standard deviation ,standard error ,coefficient of variation and use of t-test for comparing ecological data .
2. To determine minimum size and number of quadrates required for reliable estimate of biomass in Grassland ecosystem.
3. To study of frequency, abundance and density of dominant plants in the local ecosystem by quadrate method.
4. To determine gross and net productivity by light and dark bottle method.
5. To determine soil moisture content, porosity and bulk density of soil collected from different location.
6. To determine percent organic carbon and organic matter in soil of grass land cropland and forests.
7. To determine the water holding capacity of various soil.

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SEMESTER-IV

PAPER I

PLANT CELL, TUSSE AND ORGAN CULTURE

UNIT -1

Biotechnology: Basic concept, principal and scope

Plant cell And Tissue Culture: General introduction, history, scope, concept of cellular differentiation, tot potency.

UNIT -2

Organogenesis and Adventive Embryogenesis: Fundamental aspects morphogenesis somatic embryogenesis and androgenizes, mechanism, techniques and utility.

Somatic Hybridization: Protoplast isolation fusion and culture hybrid selection and regeneration, possibilities achievements and limitations of protoplast research.

UNIT -3

Application of Plant Tissue Culture: Clonal propagation, artificial seed, production of hybrids and soma clones and production of secondary metabolites /natural products, cryopreservation and germ plasma storage.

UNIT -4

Biostatistics: Definition and importance of Biostatistics scope, Measurement of central tendencies –mean mode and median.

Suggested Reading :

1. Bhojwani, S.S. and Razdan ,N.K. (1996) plant Tissue Culture : Theory and Practice Elservier Science Publishers New York ,USA.
2. Collin H.A. and Edwards ,S. (1998) plant cell Culture Bios .Scientific Publishers Oxford ,U.K.
3. Kartha ,K.K. (1985) Cryopreservation of plant cells and Organs CRC Press ,Boca Raton ,Florida USA.
4. Vasil, I.K. and Thorbe ,T.A.(1994) Plant cell and tissue culture . Kluwer Academic Publishers ,Netherlands.
5. Smith R.H. (200) Plant Tissue Culture : Techniques and Experiment ,Academic Ness ,New York.

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Suggested Laboratory Exercise :

1. Preparation of Tissue culture (ms) medium .
2. Study technique s of tissue culture : sterilization of glass wares and plant materials transfer of explants on culture media ,incubation .
3. Isolation of plant protoplast by mechanical and enzymatic method.
4. Counting of protoplast in the suspension by haemocytometer method.

5. Effect of physical (example, temperature) and chemical (e.g. osmoticum) .factors on protoplast yield .
6. Demonstration of protoplast fusion employing PEG.
7. Initiation of organogenesis and embryogenesis using appropriate explants.

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Suggested Laboratory Exercise

1. Preparation of liquid and solid culture media for bacteria culture.
2. Study of growth characteristics of E .coli using plating and turbido metric method.
3. Isolation of total DNA from E. Coli by lysozyme lysis method and its quantification by spectrophotometric method .
4. Isolation of plasmid DNA from E. Coli by alkaline lysis method and its quantification by spectrophotometric method.
5. Restriction digestion of plasmid and genomic DNA and estimation of size of various DNA fragments.
6. Isolation of Rhizobium from root nodules of leguminous plants
7. Isolation of Agrobacterium tumifaciens form tumours of dicot plants.

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SEMESTER SYLLABUS

M.Sc. BOTANY

SEMESTER-IV

PAPER IV

ELECTIVE –I (B)

WEED BIOLOGY

UNIT -1

Germination, Establishment and Growth – Light Requirement for germination, Seedlongevity AndMortality. Pattern of emergence, The Safe -Site Concept.

UNIT -2

Management of Weeds- Type of weed control: Prevention, Suppression and Eradication; physical, chemical and Biological control of weeds .concept of Integrated Weed Management

UNIT -3

Classification of Herbicides Selective and non selective herbicides, contact and Trans located herbicides. Mode of Action of Herbicides. Application method of Herbicides and Precautions.

UNIT -4

Chemistry of some importance herbicides: Phenoxy acid as 2, 4-D, Pendimethalin Butachlor and Nitro fen. Critical Period for weed control,Aquatic weed management .Plant Environment and Herbicides interactions. Weed Thresholds and management.

PRACTICALS –

Exercises involving

- The study of different factors of the percentage germination of some important weed seeds.
- Measurement of seedling growth of weed plant.
- Study of a weed plant using different growth parameters.
- Measurement of effect of density on Mortality of a weed plant.
- Measurement of effect of density on competition.
- Calculation of Competition Index.

Suggested Books –

1. V.S. Rao , Principles of Weed Science – Oxford & IBH Publishing Pvt. Co. Ltd. New Delhi
2. O. P. Gupta, Modern Weed Management – AgrobiosIndia, Jodhpur.
3. N.C. Joshi, Researchco Publication Delhi.
4. Ashton &Crafts, Mode of Action of Herbicides – Wiley Interscience Publication New York.
5. U.S. Shree Ramulu –Chemistry of Herbicides – Oxford & IBH Publishing Co. Ltd. New Delhi.
6. Majid, F.Z. Aquatic Weed: Utility and Development .Agrobotanica, Bikaner, India.

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SEMESTER SYLLABUS

M.Sc. CHEMISTRY

SCHEME OF EXAMINATION & DISTRIBUTION OF MARKS

SEMESTER - I

Paper No.	Title of the Paper (s)	Internal Assessment	Term End Exam	Practical	Total Marks
1.	Inorganic Chemistry	20	80		100
2.	Organic Chemistry, Stereochemistry & Pericyclic Reaction	20	80		100
3.	Physical Chemistry- I	20	80		100
4.	Spectroscopy And Mathematics/Biology For Chemists	20	80		100
LAB-I	Organic Chemistry				100
LAB-II	Analytical Chemistry				100
				TOTAL	600

SEMESTER - II

Paper No.	Title of the Paper (s)	Internal Assessment	Term End Exam	Practical	Total Marks
1.	Inorganic Chemistry	20	80		100
2.	Organic Chemistry	20	80		100
3.	Physical Chemistry	20	80		100
4.	Spectroscopy, Diffraction Methods & Computer For Chemists	20	80		100
LAB-I	Inorganic Chemistry				100
LAB-II	Physical Chemistry				100
				TOTAL	600

SEMESTER - III

Paper No.	Title of the Paper (s)	Internal Assessment	Term End Exam	Practical	Total Marks
COMPULSORY FOR GROUP A, B & C					
1.	Applications Of Spectroscopy	20	80		100
2.	Chemistry Of Bio-Inorganic & Bio-Organic	20	80		100
LAB-I	General (Compulsory)			200	200
OPTIONAL GROUP-A INORGANIC					
3.	Organotrasition Metal Chemistry	20	80		100
4.	Photo inorganic Chemistry	20	80		100
OPTIONAL GROUP- B ORGANIC					
3.	Physical Organic Chemistry	20	80		100
4.	Chemistry Of Heterocyclic Compounds	20	80		100
OPTIONAL GROUP-C PHYSICAL					
3.	Chemistry Of Materials	20	80		100
4.	Advanced Quantum Chemistry	20	80		100
				TOTAL	600

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SEMESTER - IV

Paper No.	Title of the Paper (s)	Internal Assessment	Term End Exam	Practical	Total Marks
COMPULSORY FOR GROUP A, B & C					
1.	Photochemistry & Solid State Chemistry	20	80		100
2.	Bio-Physical & Environmental Chemistry	20	80		100
OPTIONAL GROUP-A INORGANIC					
3.	Bioinorganic Chemistry & Supra-Molecular Chemistry	20	80		100
4.	Analytical Chemistry	20	80		100
LAB-I	Special			200	200
OPTIONAL GROUP- B ORGANIC					
3.	Medicinal Chemistry	20	80		100
4.	Chemistry Of Natural Product	20	80		100
LAB-II	Special			200	200
OPTIONAL GROUP-C PHYSICAL					
3.	Liquid States	20	80		100
4.	Computation Chemistry	20	80		100
LAB-I	Special			200	200
				TOTAL	600
				GRAND TOTAL	2400

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SEMESTER I
LABORATORY COURSE - I
ORGANIC CHEMISTRY

1. **Qualitative Analysis:-**
   Separation, Purification and Identification of compounds of Binary Mixture, T.L.C. and Column chromatography. I.R. Spectra may be used for functional group identification of compound by suitable derivatives preparation and determination of their melting points.
2. **Organic Synthesis:-**
   1. Bromination - Prepration of p-Bromo Aniline from Acetanilide.
   2. Nitration - Prepration of p-Nitro Aniline from Acetanilide
   3. Hoffman Bromide Reaction. Prepration of Anthranilic Acid from Pthallic anhydride.
   4. Aldol Condensation - Dibenzal acetone from Bazaldelyde.
   5. Sandmeyer Reaction -
      - o-Chloro Benzoic Acid from Anthranilic Acid.
      - p- Chloro toluene from Toludine.
   6. Friedal Craft Reaction - □ -Benzoyl.Propionic Acid from Succinic Anhydride and Benzene.
   7. Oxidation - Adipic Acid by Chromic Acid oxidation of cyclohexanol.
   7. Diazotization:-
      - Preparation of methyl orange from Sulphanilic Acid.
      - Phenyl Azo- □. Naphthol from Aniline.
   8. Preparation of Acridone from N- Phenyl anthranilic acid.
   9. Grignard's reaction: Synthesis of tripheny lmethanol from Benzoic acid.

   Note: Two stage preparation. Preparation of pure and crystalline compound based on any two of above principals with conformation of melting point.
3. **Quantitative Analysis:-**
   1. Determination of the percentage or number of Hydroxyl group in an organic compound by Acetylation method.
   2. Estimation of Amines/Phenols using Bromate - Bromide Solution / or Acetylation method.
   3. Determination of equivalent- weight of carboxylic compound.
   4. Estimation of carboxyl group by tritration / silver salt-method.
   5. Estimation of Carbonyl group by Hydrazone method.
   6. Estimation of Glycine by titration.

Instruction to Practical Examiners in Chemistry Semester –I

1. The Board of Examiners; one external and one internal for each branch will meet to decide the exercises and other matter in connection with the conduct of practical examinations

S. No.	Lab. Course (branch)	Max. Marks	Duration
1.	I- Organic Chemistry	100	5 hrs.
2.	II- Analytical Chemistry	100	5 hrs.

2. The distribution of marks is as under. Marks of Ex-students are given in parentheses.

(a) Qualitative Analysis of mixture containing two Organic compounds	30 (40) marks
(b) Preparation	10 (15) marks
(c) Estimation	20 (25) marks
(d) Viva voice	20 (20) marks
(c) Sessional	20 (-) marks
	Total-100 (100) marks

As far as possible all the exercises as laid down in the syllabus are set. The scale of marking will be determined by examiners in accordance with the nature of exercises.

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SEMESTER I
LABORATORY COURSE II
ANALYTICAL CHEMISTRY
SECTION- A
INSTRUMENTATION AND COMPUTERS

1. Error Analysis & Statistical data Analysis:-
   Errors, types of errors, Minimization of Error, Statistical treatment for error analysis, standard deviation, Relative standard deviation, Linear least square. Calibration of volumetric apparatus burrettes pipette, standard flask, weight box etc.
2. Volumetric Analysis:-
   Basic Principles, determination of I_2 and saponification values of oil sample determination of DO, COD, BOD, Hardness of water samples.
3. Chromatography:-
   Separation of Cations and anions by (A) Paper Chromatography, (B) Column Chromatography.

SECTION- B

4. pH Metry / Potentiometry / Conductometry titration :-
   Determination of strength of acid etc.
5. Flame Photometry / AAS/FIA/Colorimetry :-
   Determination of Cations / anions and metal Ions eg. Na^+, K^+, Ca^{2+}, $SO4^{2-}$ NO_2, Fe, Mo, Ni ,Cu, Zn etc.
6. Spectro Photometry :-
   Verification of Beer - Lambert Law. Molar Absorptivity calculation, Plotting graph to obtain □max etc. effect of pH in aqueous coloured system. Determination of metal ions eg. Fe, Cu, Zn, Pb etc
7. Nephelometry / Turbidimetry :- Determination of chlorine, sulphate phosphate turbidity etc.
8. Application of Computer in Chemistry:- As Specified in Theory paper in section II (A).

For Lab. Course –II (Analytical Chemistry):

(a)Two practical exercise (one from each section) (at least one of these will be based on instrumental analysis)	60 (80) marks
(b) Viva voice	20 (20) marks
(c) Sessional	20 (-) marks
Total-	100 (100) marks

As far as possible all the exercises as laid down in the syllabus are set. The scale of marking will be determined by examiners in accordance with the nature of exercises. Sessional marks will be awarded by External Examiner in consultation with the internal Examiner

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SEMESTER-II

LABORATORY – COURSE I

INORGANIC CHEMISTRY

Note- Students is accepted to complete all exercises.

1. Qualitative analysis of mixture containing eight radical including some less common metal ions among the following by common method (Preferably semi-micro method)

Group-A

Basic Radicals : - {Ag, Pb, Hg, Cu, Cd, Bi, As, Sb, Sn, Fe, Al, Cr, Zn, Mn, co, Ni, Ba, Sr, Ca, Mg, Na, K, NH_4 ,}

Acid Radicals: - {CO_3, SO_4, SO_3, NO_3, F, Cl, Br, I, NO_2, BO_3, C_2O_4, PO_4}

Group– B

Basic Radicals: - {Ce, Th, Zr, W, Te, Ti, Mo, U, V, Be, Li, Au, Pt.}

Acid Radicals :-{SiO_4, Thiosulphate, Ferrocynide, Ferricyanide, Chromate, Arsenite , Arsenate, Permanganate }

Note – The mixture to be analysed by the students must contain at least one basic and one acid radical from Group B.

2. **Quantitative Analysis:-**
   Involving two of the following in ores, alloys or mixture in solution- one by volumetric and other by gravimetric method Ag, Cu, Fe, Cr, Mn, Ni, Zn, Ca, Mg, Chloride, Sulphate.
3. **Estimation of:-**
   (A) Phosphoric acid in Commercial ortho phosphoric acid.
   (B) Boric Acid in Borax.
   (C) Ammonium Ion in Ammonium Salt.
   (D) MnO_2 in pyrolusite
   (E) Available Chlorine in bleaching powder.
   (F) H_2O_2 in commercial sample.

   Students are expected to perform at least three exercises From above during laboratory work.
4. Preparation of selected Inorganic compounds and study of their properties by various method including IR, Electronic Spectra, Mossbaur, ESR. Spectra+ Magnetic susceptibility etc.
   (i) V0 $(acac)_2$
   (ii) cis K $[Cr(C_2O_4)_2(H_2O)_2]$, trans K $[Cr(C_2O_4)_2(H_2O)_2]$,.$2H_2O$
   (iii) $[Co(NH_3)_6]Cl_3$
   (iv) Na $[Cr(NH_3)_2(SCN)_4]$
   (v) Mn $(acac)_3$
   (vi) $K_3[Fe(C_2O_4)_3]$
   (vii) Prussian Blue Turnbull's Blue.
   (viii) $[Co(NH_3)_6][Co(NO_2)_6]$
   (ix) Hg $[Co(SCN)_4]$
   (x) $[Ni(NH_3)_4]Cl_2$, $[Ni(NH_3)_4]Cl_2$
   (xi) Ni $(DMG)_2$(xii)$[Cu(NH_3)_4]SO_4$
   (xii) $K_3[Cr(C_2O_4)_3].3H_2O$
   (xiii) $[Cu(NH_3)_4]SO_4$

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SEMESTER-II
LABORATORY COURSE- II
PHYSICAL CHEMISTRY

1. **Adsorption:-**
   a. Verification of Freundlich's Adsorption Isotherm.
   b. To study surface tension – concentration relationship for solutions. (Gibbs equation).
2. **Phase Equilibria:**
   a. Determination of congruent composition and temperature of binary system e.g. diphenylamine – benzophenone system.
   b. Determination of glass transition temperature of given salt e. g. $CaCl_2$ conductometrically.
   c. To construct the phase diagram for three component system e. g. chloroform, acetic acid and water.
3. **Chemical Kinetics**
   a. Hydrolysis of an ester/ ionic reactions.
   b. Determination of the velocity constant of hydrolysis of an ester. Determination of effect of (a)change of temperatures, (b)change of concentration of reactants and catalyst and(c)ionic strength of the media on the velocity constant of media.
   c. Determination of the rate constant for the oxidation of iodide ions by hydrogen peroxide
   d. Determination of the primary salt effect on the kinetics of ionic reaction and testing of the Bronsted relationship (iodide ions oxidized by persulphate ion).
4. **Conductometry**
   a. Determination of solubility of sparingly soluble salt (eg, $PbSO_4$, $BaSO_4$) Conductometrically.
   b. Determination of the strength of strong and weak acids in a given mixture conductometrically.
   c. Determination of dissociation constant of weak electrolyte by conductometer.
   d. Determination of velocity constant, Order of reaction and energy of activation for saponification of ethyl acetate by sodium hydroxide.
5. **pH Metry/Potentiometry**
   a. Determination of the strength of strong and weak acid in a given mixture using pH meter/potentiometer.
   b. Determination of dissociation constant of weak acid by pH meter.
   c. Determination of concentration of acid in given buffer solution by pH meter.
   d. Determination of strength of halides in a mixture potentiometrically.
   e. Determination of the valency of mercurous ions potentiometrically.
   f. Determination of the strength of strong acid, weak acids in a given mixture using a potentiometer/ pH meter.
   g. Determination of temperature dependence of EMF of a cell.
   h. Determination of the formation constant of silver- ammonia complex and stoichiometry of the complex potentiometrically.
   i. Determination of activity and activity coefficient of electrolytes.
   j. Determination of thermodynamic constant. $\Delta G, \Delta S$ and ΔH for the reaction by e.m.f. method. $Zn + H_2SO_4 = ZnSO_4 + H_2$
   k. Determination of the dissociation constant of monobasic / dibasic acid
6. **Polarimetry:-**
   Determination of rate constant for hydrolysis/inversion of sugar using a polarimeter. Enzyme kinetic – inversion of sucrose.

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SEMESTER-IV
GROUP-B
LABORATORY COURSE (SPECIAL)
ORGANIC CHEMISTRY

200 marks

Note: Laboratory course with Group 'B' will be of 12 hrs duration spread over two days. The examinee will have to perform three experiments. These experiments will be of 40 marks each. 40 marks each will be allotted for viva-voce and Sessional work.

Qualitative Analysis

Separation, Purification and identification of the components of a mixture of binary organic compounds & mixture of three organic compounds.

Multi-step synthesis of Organic compounds (Three stage preparations. Preparation of pure crystalline product. By using any two following principals Conformation by melting point determination.)-

The exercises should illustrate the use of organic reagents and may involve purification of the products by chromatographic techniques.

1. Photochemical reaction: Benzophenone- Benzopinacol- Benzpinacolone.
2. Beckmann rearrangement: Benzanilide from benzene, Benzene- benzophenone ,oxime- Benzanilide.
3. Benzilic acid rearrangement : Benzilic acid from benzoin, (Benzoin- Benzil- Benzilic acid)
4. Synthesis of heterocyclic compounds, Skraup synthesis: Preparation of quinoline from aniline, Skraup synthesis: Preparation of 2 phenyl-indole from phenyl hydrazine.
5. Sandmeyer Reaction: Preparation of o chlorobenzoic acid from anthranilic acid.
6. Ultman reaction - Preparation of N-Phenyl anthranilic acid from o-chlorobenzoic acid.
7. Preparation of Acridone from N-Phenyl anthranilic acid.
8. Prepration of p nitro aniline
9. Prepration of p bromo aniline
10. Prepration of methyl orange from aniline via sulphanilic acid.

Extraction of Organic compounds from Natural sources-

1. Isolation of caffeine from tea leaves
2. Isolation of casein from milk
3. Isolation of lactose from milk
4. Isolation of nicotine dipicrate from tobacco
5. Isolation of piperine from black pepper
6. Isolation of lycopene from tomatoes
7. Isolation of b-carotene from carrots.

Paper Chromatography

Separation and identification of the sugars, dyes and amino acids present in the given mixture of sugars, dyes and amino acids by paper chromatography and determination of RF values.

Spectroscopy:

Identification of organic compounds by the analysis of their spectral data (UV. IR. PMR, CMR & M) Spectrophotometric (UV/VIS) Estimations of

1. Amino acids
2. Proteins
3. Carbohydrates
4. Aspiri

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SEMESTER-IV
GROUP-B
LABORATORY COURSE (SPECIAL)
PHYSICIAL CHEMISTRY

1. Study of kinetics of exchange between ethyl iodide and the iodide ion.
2. Determination of the solubility product of lead iodide.
3. Determination of the dissociation constant of barium nitrate.
4. Determination of relative strength of the acids by studying the hydrolysis of an ester.
5. Study the hydrolysis of methyl acetate catalysed by HCl and equimolar urea hydrochloride and hence the degree of hydrolysis of the salt.
6. Investigate the inversion of can-sugar in presence of an acid. Determine also the energy of activation of the reaction.
7. Study in inversion of can-sugar in presence of HCL and H_2SO_4 and hence determine the relative strength of the acids.
8. Study the kinetics of hydrolysis of ethyl acetate by NaOH at two temperatures by conductance measurement, and hence the energy of activation of the reaction.
9. Study the kinetics of hydrolysis of tertiary amyl iodide, and determine the order and energy of activation of the reaction.
10. Investigate the reaction between H_2O_2 and HI.
11. Study the kinetics of decomposition of benzene diazonium chloride at different temperatures.
12. Study the kinetics of reaction between $K_2S_2O_8$ and KI.
    (a) Determine and rat constant and order of reaction.
    (b) Study of influence of ionic strength on the rate constant.
13. Investigate the kinetics of autocatalytic reaction between KMno4 and Oxalic acid.
14. Determination of order of reaction between bromic acid and hydrobromic acids.
15. Determination of concentration f iodine in a given sample (KI) by isotope dilution technique.
16. Determination of effect of-
    (a) Change of temperature,
    (b) Change of concentration.
    (c) Ionic strength of the media on the velocity constant of hydrolysis of an ester.
17. Determination of the primary salt effect on the kinetics of ionic reactions and testing of the Bronsted relationship (iodide ion is oxidised by persulphate ion.)
18. Investigate the adsorption of oxalic acid from aqueous solution by activated charcoal and verify Frenndlish and Langmuir's adospriton isotherms.
19. Determine adsoption isotherms of acetic acid from aqueous solution by charcoal.

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SEMESTER SYLLABUS

M.Sc. PHYSICS

SCHEME OF EXAMINATION & DISTRIBUTION OF MARKS

SEMESTER I

Paper No.	Title of the Paper	Internal Assessment	Term End Exam	Total Marks
1.	Mathematical Methods-I	20	80	100
2.	Classical Mechanics	20	80	100
3.	Numerical Methods and C Programming	20	80	100
4.	Electronics-I	20	80	100
LAB I	General	-	-	100
LAB II	Computer Programming	-	-	100
			TOTAL	600

SEMESTER II

Paper No.	Title of the Paper	Internal Assessment	Term End Exam	Total Marks
1.	Mathematical Methods-II	20	80	100
2.	Quantum Mechanics-I	20	80	100
3.	Thermodynamics	20	80	100
4.	Electronics-II	20	80	100
LAB I	Electronics (Devices)	-	-	100
LAB II	Electronics (Circuits) Power supply, Amplifier, Oscillators, Modulation, Detection etc.	-	-	100
			TOTAL	600

SEMESTER III

Paper No.	Title of the Paper	Internal Assessment	Term End Exam	Total Marks
1.	Quantum Mechanics II	20	80	100
2.	Statistical Mechanics	20	80	100
3.	Condensed Matter Physics I	20	80	100
4.	Electronics III	20	80	100
LAB I	Condensed Matter Physics	-	-	100
LAB II	Digital Electronics	-	-	100
			TOTAL	600

SEMESTER IV

Paper No.	Title of the Paper	Internal Assessment	Term End Exam	Total Marks
1.	Condensed Matter Physics II	20	80	100
2.	Nuclear Physics	20	80	100
3.	Atomic and Molecular physics	20	80	100
4.	Electronics IV	20	80	100
5.	Project	-	-	200
			TOTAL	600
			GRAND TOTAL	2400

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SEMESTER SYLLABUS

M.Sc. PHYSICS

SCHEME OF EXAMINATION & DISTRIBUTION OF MARKS

SEMESTER I

Paper No.	Title of the Paper	Internal Assessment	Term End Exam	Total Marks
1.	Mathematical Methods-I	20	80	100
2.	Classical Mechanics	20	80	100
3.	Numerical Methods and C Programming	20	80	100
4.	Electronics-I	20	80	100
LAB I	General	-	-	100
LAB II	Computer Programming	-	-	100
			TOTAL	600

SEMESTER II

Paper No.	Title of the Paper	Internal Assessment	Term End Exam	Total Marks
1.	Mathematical Methods-II	20	80	100
2.	Quantum Mechanics-I	20	80	100
3.	Electrodynamics	20	80	100
4.	Electronics-II	20	80	100
LAB I	Electronics (Devices)	-	-	100
LAB II	Electronics (Circuits) Power supply, Amplifier, Oscillators, Modulation, Detection etc.	-	-	100
			TOTAL	600

SEMESTER III

Paper No.	Title of the Paper	Internal Assessment	Term End Exam	Total Marks
1.	Quantum Mechanics II	20	80	100
2.	Statistical Mechanics	20	80	100
3.	Condensed Matter Physics I	20	80	100
4.	Electronics III	20	80	100
LAB I	Condensed Matter Physics	-	-	100
LAB II	Digital Electronics	-	-	100
			TOTAL	600

SEMESTER IV

Paper No.	Title of the Paper	Internal Assessment	Term End Exam	Total Marks
1.	Condensed Matter Physics II	20	80	100
2.	Nuclear Physics	20	80	100
3.	Atomic and Molecular physics	20	80	100
4.	Electronics IV	20	80	100
5.	Project	-	-	200
			TOTAL	600
			GRAND TOTAL	2400

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सेमेस्टर पाठ्यक्रम

M.Sc. COMPUTER SCIENCE

SCHEME OF EXAMINATION & DISTRIBUTION OF MARKS

SEMESTER - I

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Digital Electronics and Microprocessor	Theory	20	80	100
2.	Advance Computer Network	Theory	20	80	100
3.	OOPs using JAVA	Theory	20	80	100
4.	Advanced Operating System	Theory	20	80	100
Lab-1	Digital Electronics	Practical	-	-	100
Lab-2	Java Programming	Practical	-	-	100

SEMESTER - II

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Analysis and Design of Algorithm	Theory	20	80	100
2.	Relational Database Management System (RDBMS)	Theory	20	80	100
3.	Data Structure using C++	Theory	20	80	100
4.	Software Engineering	Theory	20	80	100
Lab-1	RDBMS	Practical	-	-	100
Lab-2	Data Structure using C++	Practical	-	-	100

SEMESTER - III

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Theory of computation and compiler design	Theory	20	80	100
2.	artificial intelligence and expert system	Theory	20	80	100
3.	soft computing techniques	Theory	20	80	100
4.	.net technology	Theory	20	80	100
Lab-1	MAT LAB	Practical	-	-	100
Lab-2	Programming through .NET	Practical	-	-	100

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SEMESTER - IV

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Advanced Trends And Technology In Computer Science	Theory	20	80	100
2.	ELECTIVE - I Data Mining and Data Warehousing ELECTIVE - II Computer Graphics and Multimedia ELECTIVE - III Embedded System ELECTIVE-IV Network Security & Cryptography	Theory	20	80	100
3.	Major Project		-	-	400

Note: Internal assessment of 20 marks will consist of two parts -

1. Unit Test (10 Marks): Two tests will be conducted and average of these tests will be the marks of Unit Test.
2. Seminar/Assignment (10 Marks): To be conducted by the Department concerned.

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UNIT–V

Advance Topics of Operating System

Embedded Operating Systems, eCos, Tiny OS, Computer Security Concepts, Threats, Attacks, and Assets, Intruders, Malicious Software Overview, Viruses, Worm, Authentication, Access Control, Intrusion Detection, Malware Defense, Dealing With Buffer Overflow Attacks, Distributed Process Management, Process Migration, Distributed Global States, Distributed Mutual Exclusion, Distributed Deadlock.

Text Books:

1. Operating System Concepts, Silbersachatz and Galvin, Pearson Education Pub.
2. Operating Systems, Madnick E., Donovan J., Tata McGraw Hill,
3. Operating Systems, A. S. Tannenbaum, PHI

Reference Books:

1. Operating Systems Internals and Design Principle, William Stallings, Prentice Hall Publishers
2. Operating Systems- AConcept-Based Approach, Dhananjay M. Dhamdhere, McGraw-Hill

SEMESTER-I

LAB 1: DIGITAL ELECTRONICS

SEMESTER-I

LAB 2: JAVA PROGRAMMING

LAB Detail

Break-up of marks for External Practical Examination			
S. No.	Argument	Maximum Marks	Minimum Passing Marks
1	Lab Record	20	36
1.	Viva-voce	40	
2.	Program Development and Execution	40	
	Total Marks	100	36

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SEMESTER-II
LAB 1: RDBMS

SEMESTER-II
LAB 2: DATA STRUCTURE

Break-up of marks for External Practical Examination			
S. No.	Argument	Maximum Marks	Minimum Passing Marks
1	Lab Record	20	36
1.	Viva-voce	40	
2.	Program Development and Execution	40	
	Total Marks	100	36

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SEMESTER-III
LAB-1
MAT LAB

LAB-2
PROGRAMMING THROUGH .NET

The break-up of marks for Practical will be as under :

Sr. No.	Argument	Maximum Marks	Minimum Passing Marks
1.	Lab Record	20	
2.	Viva-voce	40	
3.	Program Development and Execution	40	
	Total Marks	100	36

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SEMESTER - IV
MAJOR PROJECT

Note:

1. It is compulsory, that students would have group of maximum of two students and project should be done under Government Sectors/ Public Sector / Pvt. LTD. S/W Company.
2. The students should not make any project under local or private institutions.
3. The students should make project themselves and project will not be copy of other project.

Steps for Live Project

1. Getting customer's requirements
2. Preparing designs, database and business logics
3. Developing software application project
4. Testing and implementing the project
5. Troubleshooting the project application after implementation

The break-up of marks for fourth semester's Major Project will be as under:

Sr. No.	Argument	Maximum Passing Marks	Minimum Passing Marks
1.	Project Record	100	
2.	Viva-voce	100	
3.	Program Development and Execution	200	
Total Marks		400	144

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SEMESTER - IV

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Advanced Trends And Technology In Computer Science	Theory	20	80	100
2.	ELECTIVE - I Data Mining and Data Warehousing ELECTIVE - II Computer Graphics and Multimedia ELECTIVE - III Embedded System ELECTIVE-IV Network Security & Cryptography	Theory	20	80	100
3.	Major Project		-	-	400

Note: Internal assessment of 20 marks will consist of two parts -

1. Unit Test (10 Marks): Two tests will be conducted and average of these tests will be the marks of Unit Test.
2. Seminar/Assignment (10 Marks): To be conducted by the Department concerned.

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SEMESTER - IV
MAJOR PROJECT

Note:

1. It is compulsory, that students would have group of maximum of two students and project should be done under Government Sectors/ Public Sector / Pvt. LTD. S/W Company.
2. The students should not make any project under local or private institutions.
3. The students should make project themselves and project will not be copy of other project.

Steps for Live Project

1. Getting customer's requirements
2. Preparing designs, database and business logics
3. Developing software application project
4. Testing and implementing the project
5. Troubleshooting the project application after implementation

The break-up of marks for fourth semester's Major Project will be as under:

Sr. No.	Argument	Maximum Passing Marks	Minimum Passing Marks
1.	Project Record	100	
2.	Viva-voce	100	
3.	Program Development and Execution	200	
Total Marks		400	144

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2020-21

D.P. Vipra College

Old High Court Road, Bilaspur

Chhattisgarh, India 495001

Part-I

SYLLABUS FOR ENVIRONMENTAL STUDIES AND HUMAN RIGHTS FOR UNDER GRADUATE

'इन्वाहरमेंटल साईसेस' के पाठ्यक्रम को स्नातक स्तर भाग–एक की कक्षाओं में विश्वविद्यालय अनुदान आयोग के निर्देशानुसार अनिवार्य रूप से शिक्षा सत्र 2003–2004 (परीक्षा 2004) से प्रभावशील किया गया है । स्वशासी महाविद्यालयों द्वारा भी अनिवार्य रूप से अंगीकृत किया जाएगा ।

भाग 1, 2 एवं 3 में से किसी भी वर्ष में पर्यावरण प्रश्न –पत्र उत्तीर्ण करना अनिवार्य है । तभी उपाधि प्रदाय योग्य होगी ।

पाठ्यक्रम 100 अंकों का होगा, जिसमें से 75 अंक सैद्धांतिक प्रश्नों पर होगें एवं 25 अंक क्षेत्रीय कार्य (Field Work) पर्यावरण पर होगें ।

सैद्धांतिक प्रश्नों पर अंक –75 (सभी प्रश्न इकाई आधार पर रहेगें जिसमें आंतरिक विकल्प रहेगा)

(अ) लघु प्रश्नोंत्तर – 25 अंक

(ब) निबंधात्मक – 50 अंक

Field Work – 25 अंकों का मूल्याकन आतरिक मूल्यांकन पद्धति से कर विश्वविद्यालय को प्रेषित किया जावेगा । अभिलेखों की प्रायोगिक उत्तर पुस्तिकाओं के समान संबंधित महाविद्यालयों द्वारा सुरक्षित रखेगें ।

उपरोक्त पाठ्यक्रम से संबंधित परीक्षा का आयोजन वार्षिक परीक्षा के साथ किया जाएगा ।

पर्यावरण विज्ञान विषय अनिवार्य विषय है, जिसमें अनुत्तीर्ण होने पर स्नातक स्तर भाग–एक के छात्र/छात्राओं को एक अन्य विषय के साथ पूरक की पात्रता होगी । पर्यावरण विज्ञान के सैद्धांतिक एवं फील्ड वर्क में संयुक्त रूप से 33% (तैतींस प्रतिशत) अंक उत्तीर्ण होने के लिए अनिवार्य होंगे ।

स्नातक स्तर भाग–एक के समस्त नियमित/भूतपूर्व/अमहाविद्यालयीन छात्र/छात्राओं को अपना फील्ड वर्क सैद्धांतिक परीक्षा की समाप्ति के पश्चात् 10 (दस) दिनों के भीतर संबंधित महाविद्यालय/परीक्षा केन्द्र में जमा करेंगे एवं महाविद्यालय के प्राचार्य/केन्द्र अधिक्षक, परीक्षकों की नियुक्ति के लिए अधिकृत रहेंगे तथा फील्ड वर्क जमा होने के सात दिनों के भीतर प्राप्त अंक विश्वविद्यालय को भेजेंगे ।

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कृपया पर्यावरण विज्ञान व मानवाधिकार
का पाठ्यक्रम अनुमोदनार्थ प्रस्तुत है।

Dr R.G.
11/11/13

1. Prof A.K. Gupta
2. Prof C.L. Patel
3. Dr. R. Prasad

11.11.13

11-11-13

बिलासपुर विश्वविद्यालय, बिलासपुर (छ.ग.)

पुराना हाईकोर्ट भवन, बिलासपुर (छ.ग.) 495001,
फोन : 07752-220031, फैक्स 07752-260294, ई-मेल : bilaspuruniversity.2012@gmail.com,
वेबसाईट : www.bilaspuruniversity.ac.in

क्र. 1186 /अका./2014

बिलासपुर दिनांक 11/9/14

अधिसूचना

बिलासपुर विश्वविद्यालय से सम्बद्ध समस्त महाविद्यालय को सूचित किया जाता है कि केन्द्रीय अध्ययन मण्डल द्वारा अनुमोदित पर्यावरण अध्ययन के संशोधित पाठ्यक्रम "पर्यावरण अध्ययन व मानवाधिकार" स्नातक स्तर पर शिक्षा सत्र 2014-15 से प्रभावशील होगा । (अनुमोदित पाठ्यक्रम संलग्न)

आदेशानुसार,

कुलसचिव

पृ.क्रमांक 1187 /अका./2014

बिलासपुर, दिनांक 11/9/14 /

प्रतिलिपि:-

1. कुलपति के निज सहायक को माननीय कुलपति महोदय के सूचनार्थ प्रेषित।
2. परीक्षा नियंत्रक / उप-कुलसचिव (परीक्षा/गोपनीय) बिलासपुर विश्वविद्यालय, बिलासपुर को सूचनार्थ प्रेषित ।
5. प्राचार्य, समस्त सम्बद्ध महाविद्यालय, को इस आशय के साथ प्रेषित की महाविद्यालय में केन्द्रीय अध्ययन मण्डल द्वारा अनुमोदित **"पर्यावरण अध्ययन व मानवाधिकार"** विषय का अंगीकृत पाठ्यक्रम अध्ययन-अध्यापन कराना सुनिश्चित करें ।
6. संपादक, दैनिक ..... को इस अनुरोध के साथ प्रेषित की कृपया उपरोक्त अधिसूचना को अपने लोकप्रिय दैनिक समाचार पत्र में छात्रहीत में प्रकाशित करने का कष्ट करें ।

कुलसचिव

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Part-I

SYLLABUS FOR ENVIRONMENTAL STUDIES AND HUMAN RIGHTS FOR UNDER GRADUATE

(paper code - 0828)

M.M. 75

UNIT -I THE MULTI DISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES:

Definition, Scope and Importance

Natural Resources:

Renewable and Nonrenewable Resources:

Natural resources and associated problems

(a) Forest resources: Use and over-exploitation, deforestation, Timber extraction, mining, dams and their effects on forests and tribal people and relevant forest Act.

(b) Water resources: Use and over-utilization of surface and ground water, floods drought, conflicts over water, dams benefits and problems and relevant Act.

(c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources.

(d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity.

(e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources.

(f) Land resources: Land as a resource, land degradation, man induced landslides soil erosion and desertification.

UNIT-II ECOSYSTEM

(12 Lecturer)

(a) Concept, Structure and Function of an ecosystem

- Producers, consumers and decomposers.
- Energy flow in the ecosystem
- Ecological succession.
- Food chains, food webs and ecological pyramids.
- Introduction, Types, Characteristic Features, Structure and Function of Forest, Grass, Desert and Aquatic Ecossystem.

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(b) Biodiversity and its Conservation

- Introduction - Definition: genetic, species and ecosystem diversity.
- Bio-geographical classification of India.
- Value of biodiversity: consumptive use, productive use, social, ethics, aesthetic and option values.
- Biodiversity at global, National and local levels.
- India as mega-diversity nation.
- Hot spots of biodiversity
- Threats to biodiversity: habitat loss, poaching of wildlife, man-wild life conflict.
- Endangered and endemic species of India.
- Conservation of biodiversity: In situ and Ex-situ conservation of biodiversity.

UNIT-III ENVIRONMENTAL POLLUTION

Definition **(12 Lecturer)**

(a) Causes, effect and control measures of -

- Air water, soil, marine, noise, nuclear pollution and Human population.
- Solid waste management: Causes, effects and control measures of urban and industrial wastes.
- Role of an individual in prevention of pollution.
- Disaster Management: floods, earthquake, cyclone and landslides.

(b) Environmental Management

(12 Lecturer)

- From Unsustainable to sustainable development.
- Urban problems related to energy.
- Water conservation, rain water harvesting, watershed management.
- Resettlement and rehabilitation of people, its problems and concerns.
- Environmental ethics: Issues and possible solutions.
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust.

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Wasteland reclamation.

- Environment Protection Act: Issues involved in enforcement of environmental legislation.

- Role of Information Technology in Environment and Human Health.

UNIT-IV

General background and historical perspective- Historical development and concept of Human Rights. Meaning and definition of Human Rights. Kind and Classification of Human Rights.

Protection of Human Rights under the UNO Charter. Protection of Human Rights under the Universal Declaration of Human Rights, 1948

Convention on the Elimination of all Forms of Discrimination against women

Convention on the Rights of the Child, 1989

UNIT-V

Impact of Human Rights norms in India, Human Rights under the Constitution of India, Fundamental Rights under the Constitution of India, Directive Principles of State Policy under the Constitution of India, Enforcement of Human Rights in India

Protection of Human Rights under the Human Rights Act, 1993 - National Human Rights Commission, State Human Rights Commission and Human Rights court in India.

Fundamental Duties under the Constitution of India

Reference/Books Recommended:

1. SK Kapoor- Human rights under International Law and Indian Law
2. HO Agrawal- Internation Law and Human Rights
3. एस. के. कपूर – मानव अधिकार
4. जे. एन. पान्डेय – भारत का संविधान
5. एम. डी. चतुर्वेदी – भारत का संविधान
6. J. N. Pandey - Constitutional Law of India
7. Agarwal K.C. 2001 Environmental Biology, Nidi Pub. Ltd. Bikaner
8. Bharucha Erach, the Biodiversity of India, Mapin Pub. Pvt. Ltd. Ahmedabad 380013, India, Email: mapin@icenet.net(R)

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B.A. /B.Sc. Part I

PAPER - III
PRACTICAL GEOGRAPHY
Max. Marks: 50

SECTION A

CARTOGRAPHY AND STASTISTICAL METHODS (M.M. 25)

Unit I Scale: Statement Scale , Representative Fraction (R.F.), Linear scale – Simple, Diagonal, Comparative, and Time Scales.

Unit II Contour: Methods of showing relief; Hachures, Contours; Representation of different landforms by contours.

Unit III Graph and Diagram: Line graph, Bar Diagram (Simple and Compound), Circle Diagram, Pie Diagram

Unit IV Statistical Technique: Mean, Median and Mode

SECTION B

SURVEYING - (M.M. 15)

Unit V Chain and Tape Survey. Triangulation method, Open Traverse and Closed Traverse

PRACTICAL RECORD AND VIVA VOCE (M.M. 10)

Books Recommended:

1. Davis, R.E. and Foote, F.S. (1953): Surveying, 4th edition, McGraw Hill Publication, New York
2. Jones, P.A.(1968): Fieldwork in Geography, Longmans, Green and Company Ltd., First Publication, London
3. Monkhouse, F. J. and Wilkinson, F.J. (1985): Maps and Diagrams. Methuen, London
4. Natrajan, V. (1976): Advanced Surveying, B.I. Publications., Mumbai
5. Pugh, J.C. (1975): Surveying for Field Scientists, Methuen and Company Ltd., London, First Publication.
6. Raisz, E. (1962): General Cartography. John Wiley and Sons, New York. 5th edition.
7. Sarkar, A. K. (1997): Practical Geography: A Systematic Approach. Orient Longman, Kolkata.
8. Sharma, J. P. (2001): *Prayogik Bhugol.,* Rastogi Publication, Meerut 3rd. edition.
9. Singh, R.L. and Singh, Rana P.B. (1993): Elements of Practical Geography. (Hindi and English editions). Kalyani Publishers, New Delhi,.
10. Singh, L.R. (2006): Fundamentals of Practical Geography, Sharda Pustak Bhawan, Allahabad.
11. Venkatramaiah, C. (1997): A Text Book of Surveying, Universities Press, Hyderabad.

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B.A. /B.Sc. Part II

PAPER - III

PRACTICAL GEOGRAPHY

Max. Marks: 50

SECTION A

MAP INTERPRETATION, PROJECTIONS AND STATISTICAL METHODS (M.M. 25)

Unit I Distribution Maps: Dot Map, Choropleth Map and Isopleth Map.

Unit II Map Projections: Definition and classification; Conical, Zenithal, and Cylindrical Projections.

Unit III Interpretation of Weather Maps: Use of Meteorological Instruments.

Unit IV Statistical Methods: Quartile: Mean Deviation, Standard Deviation and Quartile Deviation; Relative Variability and Co-efficient of Variation.

SECTION B

SURVEYING (M.M. 15)

Unit V Surveying: Whole Circle Bearing and Reduced Bearing, Methods of Prismatic Compass Survey.

PRACTICAL RECORD AND VIVA VOCE (M.M. 10)

Books Recommended:

1. Alvi, Z. 1995 : Statistical Geography: Methods and Applications, Rawat Pub. New Delhi: .
2. Davis, R.E. and Foote, F.S. (1953): Surveying, 4th edition, McGraw Hill Publication, New York
3. Kanetker, T.P. and Kulkarni, S.V.(1967): Surveying and Levelling, Vol I and II V.G. Prakashan, Poona.
4. Natrajan, V. (1976): Advanced Surveying, B.I. Publications., Mumbai.
5. Pal, S.K. 1999 : Statistics for Geoscientists, Concept publishing Company, New Delhi
6. Punmia, B.C.(1994): Surveying, Vol I, Laxmi Publications Private Ltd, New Delhi.
7. Raisz, E. (1962): General Cartography. John Wiley and Sons, New York. 5th edition
8. Sarkar, A. K. (1997): Practical Geography: A Systematic Approach. Orient Longman, Kolkata.
9. Sharma, J. P. (2001): *Prayogik Bhugol.*, Rastogi Publication, Meerut 3rd. edition.
10. Silk, J. 1979 : Statistical techniques in Geography, George Allen and Unwin, London
11. Singh, R.L. and Singh, Rana P.B. (1993): Elements of Practical Geography. (Hindi and English editions). Kalyani Publishers, New Delhi,.
12. Singh, L.R. (2006): Fundamentals of Practical Geography, Sharda Pustak Bhawan, Allahabad.
13. Venkatramaiah, C. (1997): A Text Book of Surveying, Universities Press, Hyderabad.

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बी.ए. / बी.एस.सी. तृतीय वर्ष
प्रश्न पत्र–तृतीय
प्रायोगिक भूगोल

अधिकतम अंक : 50

खण्ड (अ)

मनचित्र पठन एवं निर्वचन **20**

इकाई –1. बैन्ड ग्राफ, हीदर ग्राफ, क्लाइमोग्राफ, पवनारेख ।

इकाई –2. भारतीय स्थलाकृतिक मानचित्र की व्याख्या प्रकार, वर्गीकरण धरतलीय मानचित्र के प्रकार एवं विष्लेषण, राष्ट्रीय एवं अन्तराष्ट्रीय, भौतिक एवं सांस्कृतिक तत्वों के आधार पर विष्लेषण ।

इकाई –3. उपग्रह बिम्ब : प्रारम्भिक सूचनाओं की व्याख्या बिम्ब निर्वाचन : चाक्षुश विधि – भूमि उपयोग भूमि आच्छादन मानचित्रण, जी0 पी0 एस0 का उपयोग एवं अनुप्रयोग ।

खण्ड (ब)

सर्वेक्षण एवं क्षेत्रीय प्रतिवेदन **20**

इकाई –4. सर्वेक्षण , समपटल सर्वेक्षण, प्रतिच्छेदन एवं स्थिति निर्धारण ।

इकाई –5. भूगोल में क्षेत्रीय कार्य का महत्व किसी छोटे क्षेत्र का भौतिक सामाजिक आर्थिक सर्वेक्षण और रिपोर्ट तैयार करना ।

प्रायोगिक पुस्तिका और मौखिक परिक्षण परीक्षा **10**

Books Recommended:

1. Archer, J.E. and Dalton, T.H. (1968): *Field Work in Geography*. William Clowes and Sons Ltd. London and Beccles.
2. Bolton, T. and Newbury, P.A. (1968): *Geography through Fieldwork*. Blandford Press, London.
3. Campell, J. B. (2003): Introduction to Remote Sensing. 4th edition. Taylor and Francis, London.
4. Chaunial, D. D. (2004): Remote Sensing and Geographical Information System(in Hindi), Sharda Pustak Bhawan, Allahabad
5. Cracknell, A. and Ladson, H. (1990): Remote Sensing Year Book. Taylor and Francis, London.
6. Curran, P.J. (1985): Principles of Remote Sensing. Longman, London.
7. Davis, R.E. and Foote, F.S. (1953): Surveying, 4th edition, McGraw Hill Publication, New York
8.
9. Deekshatulu, B.L. and Rajan, Y.S. (ed.) (1984): Remote Sensing. Indian Academy of Science, Bangalore.
10. Floyd, F. and Sabins, Jr. (1986): Remote Sensing: Principles and Interpretation. W.H. Freeman, New York.
11. Gautam, N.C. and Raghavswamy, V. (2004). Land Use/ Land Cover and Management Practices in India. B.S. Publication., Hyderabad.
12. Jensen, J.R. (2004): Remote Sensing of the Environment: An Earth Resource Perspective. Prentice-Hall, Englewood Cliffs, New Jersey. Indian reprint available.

PRINCIPAL
D.P. Vipra College
Bilaspur (C.G.)

B.Sc. I (BOTANY)

PRACTICAL

Study of external (Morphorgical) and internal (microscopic/anatomical) features of representative gerera given in the theory.

1. Algae: Gloeocapsa, Scytonema, Gloeotrichia, Volvox, Oedogonium, Vaucheria, Chara, Ectocarpus, Sargassum, Batrachosperrmum
2. Gram staining
3. Fungi: Albugo, Aspergillus, Peziza, Agaricus, Puccinia, Alternaria and Cercospora
4. Bryophyta: Riccia, Marchantia, Pellia, Anthoceros, Sphagnum, Funaria
5. Pteridophyta: Lycopodium, Selaginella, Equsetum, Marsilea.
6. Gymnosperm: Cycas, Pinus, Epherda.

PRACTICAL SCHEME

TIME: 4 Hrs. **M.M. : 50**

1.	Algae/Fungi/Gram Staining	10
2.	Bryophyta/Pteridophyta	10
3.	Gymnosperm	10
4.	Spotting	10
5.	Viva-Voce	05
6.	Sessional	05

(Dr. J.N. Verma)
Proff. & Head
Govt. D.B. Girls PG College
Raipur, (C.G.)

(Dr. Rekha Pimpalgaonkar)
Proff. & Head
Govt. N PG Science College
Raipur, (C.G.)

(Dr.Ranjana Shristava)
Proff. & Head
Govt. VYTPG Science College
Raipur, (C.G.)

(Mrs. Sanchal Moghe)
Govt. Bilasa Girls College, Bilaspur

(Mr. Shivakant Mishra)

(Mr Sudheer Tiwari)

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Bilaspur (C.G.)

Zoology
B.Sc. Part I 2018-19
Practical

The practical work will, in general be based on the syllabus prescribed in theory and the candidates will be required to show knowledge of the following:-

- Dissection of Earthworm, Cockroach, Palaemon and Pila
- Minor dissection—appendages of Prawn & hastate plate, mouth parts of insects, radulla of Pila.

(Alternative methods: By Clay/Thermacol/drawing/Model etc.)

- Adaptive characters of Aquatic, terrestrial, aerial and desert animals.
- Museum specimen invertebrate
- Slides- Invertebrates, frog embryology, Chick embryology and cytology,

Scheme of Practical Exam	**Time: 3hrs**
1. Major Dissection	10 Marks
2. Minor Dissection	05 Marks
3. Comments on Excersice based on Adaptation	04 Marks
4. Cytological Preparation	05 Marks
5. Spots-8 (Slides-4, Specimens-4)	16 Marks
6. Sessional	10 Marks

PRINCIPAL
D.P. Vipra College
Bilaspur (C.G.)

NEW CURRICULUM OF B.Sc. PART I

CHEMISTRY

The new currlculam will comprisc of Three theory papers of 33, 33 and 34 marks each and practical work of 50 marks. The curricuram is to be completed in 180 working days as per the UGC norms & conforming to the directives of the Govt. of Chhattisgarh.The theory papers are of 60 hrs each duration and the practical work of 180 hrs duration.

PAPER I

INORGANIC CHEMISTRY

M.M.33

UNIT-I

A. ATOMIC STRUCTURE

Bohr's theory, its limitation and atomic spectrum of hydrogen atom. General idea of de-Broglie matter-waves, Heisenberg uncertainty principle, Schrödinger wave equation, significance of Ψ and Ψ^2, radial & angular wave functions and probability distribution curves, quantum numbers, Atomic orbital and shapes of s, p, d orbitals, Aufbau and Pauli exclusion principles, Hund's Multiplicity rule, electronic configuration of the elements.

B. PERIODIC PROPERTIES

Detailed discussion of the following periodic properties of the elements, with reference to s and p-block. Trends in periodic table and applications in predicting and explaining the chemical behavior.

a) Atomic and ionic radii,
b) Ionization enthalpy,
c) Electron gain enthalpy,
d) Electronegativity, Pauling's, Mulliken's, Allred Rochow's scales.
e) Effective nuclear charge, shielding or screening effect, Slater rules, variation of effective nuclear charge in periodic table.

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UNIT-II

CHEMICAL BONDING I

Ionic bond: Ionic Solids - Ionic structures, radius ratio & co-ordination number, limitation of radius ratio rule, lattice defects, semiconductors, lattice energy Born- Haber cycle, Solvation

CHEMISTRY

PRACTICAL EXAMINATION

05 Hrs.
M.M. 50

Three experiments are to be performed

1. Inorganic Mixture Analysis, four radicals two basic & two acid (excluding insoluble, Interfering & combination of acid radicals) OR Two Titrations (Acid-Bases,Redox and Iodo/Iodimetry)

12 marks

2. Detection of functional group in the given organic compound and determine its MPt/BPt.

8 marks

O R
Crystallization of any one compound as given in the prospectus along with the determination of mixed MPt.
O R
Decolorisation of brown sugar along with sublimation of camphor/ Naphthlene.

3. Any one physical experiment that can be completed in two hours including calculations.

14 marks

4. Viva **10 marks**
5. Sessionals **06 marks**

In case of Ex-Students two marks will be added to each of the experiments

REFERENCE TEXT:

1. Mendham, J., A. I. Vogel's Quantitative Chemical Analysis 6th Ed., Pearson, 2009.
2. Ahluwalia, V. K., Dhingra, S. and Gulati, A. College practical Chemistry, University Press.
3. Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009)
4. Furniss, B.S.; Hannaford, A.J.; Smith, P.W.G.; Tatchell, A.R. Practical Organic Chemistry, 5th Ed., Pearson (2012)
5. Khosla, B. D.; Garg, V. C. & Gulati, A. Senior Practical Physical Chemistry, R. Chand & Co.: New Delhi (2011).
6. Garland, C. W.; Nibler, J. W. & Shoemaker, D. P. Experiments in Physical Chemistry 8th Ed.; McGraw-Hill: New York (2003).
7. Halpern, A. M. & McBane, G. C. Experimental Physical Chemistry 3rd Ed.; W.H. Freeman & Co.: New York (2003).

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D.P. Vipra College
Bilaspur (C.G.)

MICROBIOLOGY

BSc-1st

Paper- I: General Microbiology & Basic Technique

UNIT-1: Fundamental, History & Developments

Introduction to major groups of microorganisms and fields of Microbiology; Historical development, Contributions of Pioneers (Louis Pasteur, Edward Jenner, Anton Von Leewenhoeck and Alexander Flemming). Beneficial and harmful microbes and its role in daily life.

UNIT-2: Basic Microbial Techniques

Methods of studying microorganism; Sterilization Techniques (Physical & Chemical Sterilization). Pure culture isolation Technique: Streaking,Waksman serial dilution and plating methods. cultivation, maintenance and preservation of pure cultures. Culture media & conditions for microbial growth. Staining technique: simple staining, Differential (gram staining), negative staining and acid fast staining.

UNIT-3: Virology & Bacteriology

Diversity of microbial world; Principle and classification of Viruses and Bacteria. Structure, Multiplication and Economic importance of viruses (TMV, Influenza virus & T_4-Phage). Structure & Functional organization of Bacteria, Cell wall of Gram Positive & Gram Negative bacteria; Economic importance of Bacteria.

UNIT-4: Mycology

General characteristics and classification of Fungi; Structure and Reproduction of fungi (*Rhizopus, Penicillium, Aspergillus, Yeast & Agaricus*). Common fungal disease of crops (Late & Early blight of potato, Smut of Rice, Tikka and Red rot of Sugarcane). Structure, reproduction and economic aspect of Lichens.

UNIT-5: Phycology & Protozoology

General characteristics and classification of Algae and Protozoa; General account & economic importance of Cyanobacteria (*Microcystis, Ocillitoria, Nostoc & Anabaena)* and Protozoa *(Amoeba, Paramoecium, Euglena and plasmodium).*

Text Books Recommended:

1. General microbiology; Vol I & II, Powar C. B. and Daginawala H. I., Himalaypub.house, Bombay.
2. A textbook of Microbiology; Dubey &Maheshwari.
3. Microbiology: An Introduction; G. Tor tora, B. Funke, C. Benjamin Cummings.
4. General Microbiology; Seventh edition by Hans G Schlegel, CambridgeUniversity Press.
5. Practical Microbiology; Dubey and Maheshwari.
6. Handbook of Microbiology; Bisen P.S., Varma K., CBS Publishers and Distributors, Delhi. General Microbiology by Brock.
7. General Microbiology by Pelzar et al.
8. Introduction on Microbial Techniques by Gunasekaran.

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Microbiology

PRACTICAL

M. M. 50

Basic information about autoclave, hot air oven, laminar air flow and other laboratory instruments
Preparation of solid/liquid culture media.
Isolation of single colonies on solid media.
Enumeration of bacterial numbers by serial dilution and plating.
Simple and differential staining.
Measurement of microorganism (micrometry) and camera Lucida drawing of isolated organism.
Determination of bacterial growth by optical density measurement.
General and specific qualitative test for carbohydrates
General and specific qualitative test for amino acids
General and specific qualitative test for lipids
Estimation of protein
Estimation of blood glucose
Assay of the activity of amylases
Assay of the activity of Phosphates

Scheme of Practical Examination

Time - 4 hours

	M.M. 50
1. Exercise on Microbiological methods	10
2. Exercise on Biochemical tests	10
3. Exercise on staining method	05
4. Spotting (1-5)	10
5. Viva-Voce	05
6. Sessional	10
	Total 50

PRINCIPAL
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B.Sc. Part-I

Paper-I

MECHANICS, OSCILLATIONS AND PROPERTIES OF MATTER

(Paper code 0793)

Unit- 1 Cartesian, Cylindrical and Spherical coordinate system, Inertial and non-inertial frames of reference, uniformly rotating frame, Coriolis force and its applications. Motion under a central force, Kepler's laws. Effect of Centrifugal and Coriolis forces due to earth's rotation, Center of mass (C.M.), Lab and C.M. frame of reference, motion of C.M. of system of particles subject to external forces, elastic, and inelastic collisions in one and two dimensions, Scattering angle in the laboratory frame of reference, Conservation of linear and angular momentum, Conservation of energy.

Unit-2 Rigid body motion, rotational motion, moments of inertia and their products, principal moments & axes, introductory idea of Euler's equations. Potential well and Periodic Oscillations, case of harmonic small oscillations, differential equation and its solution, kinetic and potential energy, examples of simple harmonic oscillations: spring and mass system, simple and compound pendulum, torsional pendulum.

Unit-3 Bifilar oscillations, Helmholtz resonator, LC circuit, vibrations of a magnet, oscillations of two masses connected by a spring. Superposition of two simple harmonic motions of the same frequency, Lissajous figures, damped harmonic oscillator, case of different frequencies. Power dissipation, quality factor, examples, driven (forced) harmonic oscillator, transient and steady states, power absorption, resonance.

Unit-4 E as an accelerating field, electron gun, case of discharge tube, linear accelerator, E as deflecting field- CRO sensitivity, Transverse B field, 180° deflection, mass spectrograph, curvatures of tracks for energy determination, principle of a cyclotron. Mutually perpendicular E and B fields: velocity selector, its resolution. Parallel E and B fields, positive ray parabolas, discovery of isotopes, elements of mass spectrography, principle of magnetic focusing lens.

Unit-5 Elasticity: Strain and stress, elastic limit, Hooke's law, Modulus of rigidity, Poisson's ratio, Bulk modulus, relation connecting different elastic- constants, twisting couple of a cylinder (solid and hallow), Bending moment, Cantilever, Young modulus by bending of beam.

Viscosity: Poiseulle's equation of liquid flow through a narrow tube, equations of continuity. Euler's equation, Bernoulli's theorem, viscous fluids, streamline and turbulent flow. Poiseulle's law, Coefficient of viscosity, Stoke's law, Surface tension and molecular interpretation of surface tension, Surface energy, Angle of contact, wetting.

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Paper-II
ELECTRICITY, MAGNETISM AND ELECTROMAGNETIC THEORY

Unit-1 Repeated integrals of a function of more than one variable, definition of a double and triple integral. Gradient of a scalar field and its geometrical interpretation, divergence and curl of a vector field, and their geometrical interpretation, line, surface and volume integrals, flux of a vector field. Gauss's divergence theorem, Green's theorem and Stoke's theorem and their physical significance. Kirchoff's law, Ideal Constant-voltage and Constant-current Sources. Thevenin theorem, Norton theorem, Superposition theorem, Reciprocity theorem and Maximum Power Transfer theorem.

Unit-2 Coulomb's law in vacuum expressed in Vector forms, calculations of E for simple distributions of charges at rest, dipole and quadrupole fields. Work done on a charge in a electrostatic field expressed as a line integral, conservative nature of the electrostatic field. Relation between Electric potential and Electric field, torque on a dipole in a uniform electric field and its energy, flux of the electric field.
Gauss's law and its application: E due to (1) an Infinite Line of Charge, (2) a Charged Cylindrical Conductor, (3) an Infinite Sheet of Charge and Two Parallel Charged Sheets, capacitors, electrostatic field energy, force per unit area of the surface of a conductor in an electric field, conducting sphere in a uniform electric field.

Unit-3 Dielectric constant, Polar and Non Polar dielectrics, Dielectrics and Gauss's Law, Dielectric Polarization, Electric Polarization vector P, Electric displacement vector D. Relation between three electric vectors, Dielectric susceptibility and permittivity, Polarizability and mechanism of Polarization, Lorentz local field, Clausius Mossotti equation, Debye equation,

Ferroelectric and Paraelectric dielectrics, Steady current, current density J, non-steady currents and continuity equation, rise and decay of current in LR, CR and LCR circuits, decay constants, AC circuits, complex numbers and their applications in solving AC circuit problems, complex impedance and reactance, series and parallel resonance, Q factor, power consumed by an a AC circuit, power factor.

Unit-4 Magnetization Current and magnetization vector M, three magnetic vectors and their relationship, Magnetic permeability and susceptibility, Diamagnetic, paramagnetic and ferromagnetic substances. B.H. Curve, cycle of magnetization and hysteresis, Hysteresis loss.

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Physics

PRACTICALS

Minimum 16 (Eight from each group)

Experiments out of the following or similar experiments of equal standard

GROUP-A

1. Study of laws of parallel and perpendicular axes for moment of inertia.
2. Moment of inertia of Fly wheel.
3. Moment of inertia of irregular bodies by inertia table.
4. Study of conservation of momentum in two dimensional oscillations.
5. Study of a compound pendulum.
6. Study of damping of a bar pendulum under various mechanics.
7. Study of oscillations under a bifilar suspension.
8. Study of modulus of rigidity by Maxwell's needle.
9. Determination of Y, k, η by Searl's apparatus.
10. To study the oscillation of a rubber band and hence to draw a potential energy curve from it.
11. Study of oscillation of a mass under different combinations of springs.
12. Study of torsion of wire (static and dynamic method).
13. Poisson's ratio of rubber tube.
14. Study of bending of a cantilever or a beam.
15. Study of flow of liquids through capillaries.
16. Determination of surface tension of a liquid.
17. Study of viscosity of a fluid by different methods.

GROUP-B

1. Use of a vibration magnetometer to study a field.
2. Study of magnetic field B due to a current.
3. Measurement of low resistance by Carey-Foster bridge.
4. Measurement of inductance using impedance at different frequencies.
5. Study of decay of currents in LR and RC circuits.
6. Response curve for LCR circuit and response frequency and quality factor.
7. Study of waveforms using cathode-ray oscilloscope.
8. Characteristics of a choke and Measurement of inductance.
9. Study of Lorentz force.
10. Study of discrete and continuous LC transmission line.
11. Elementary FORTRAN programs, Flowcharts and their interpretation.
18. To find the product of two matrices.
19. Numerical solution of equation of motion.
20. To find the roots of quadratic equation.

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PRINCIPAL
D.P. Vipra College
Bilaspur (C.G.)

B.Sc. (CS)
I Year

B.Sc. PART - I

COMPUTER SCIENCE

PAPER - I

COMPUTER FUNDAMENTAL

(PAPER CODE - 08025)

Max Marks: 60

NOTE: The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.

UNIT - I Classification and Organization of Computers

History of computer, Generation of computer, Calculator vs. Computer, Digital and Analog computers and its evolution, Major components of digital computers, Memory addressing capability of CPU, Word length and processing speed of computer, Microprocessors, Single chipMicrocomputer, Large and small computers, Users interface, Hardware, software and firmware, multi programming multi user system, Dumb smart and intelligent terminals, computer network and distributed processing, LAN parallel processing Flynn's classification of computers, Control flow and data flow computers

UNIT - II Central Processing Unit

Parts of CPU- ALU, Control Unit, RegistersArchitecture of Intel 8085 microprocessor, Instructions for Intel 8085 microprocessor, Instruction Word size, Various addressing mode,Interrupts,some special Control signals, Instruction cycle, fetch and execute operation, Timing Diagram, Instruction flow and data flow

UNIT - III Memory

Memory hierarchy, Primary andSecondary Memory, Cache memory, Virtual Memory, Direct Access Storage Devices (DASD), Destructive and Nondestructive Readout, Program and data Memory, Memory Management Unit (MMU), PCMCIA Cards and Slot

UNIT - IV I/O Devices

I/O devices- Keyboard, Mouse, Monitor, Impact and Non-ImpactPrinters, Plotter, Scanner, other input/output devices, Scan method of Display- Raster Scan, Vector Scan, Bit Mapped Scan, CRT Controller, I/O Port- Programmable and Non Programmable I/O ports, Inbuilt I/O ports, Parallel and Serial ports, USB, IEEE 1394, AGP, Serial data transfer scheme, Micro controller, Signal Processor, I/O processor, Arithmetic Processor

UNIT-V SOFTWARE AND PROGRAMMING TECHNIQUES

Application and System Software, Introduction, Example, Difference etc., Introduction to Open Source Software such as Unix/Linux (Ubuntu), Libre office etc., Introduction to Machine Language, Assembly Language and High Level Language, Programming Techniques, Stack, Subroutine, Debugging of programs, Macro, Program Design, Software development, Flow Chart, Multi programming, Multiuser, Multitasking, Protection, Operating System and Utility programs, Application packages

TEXT BOOKS

1. Computer Fundamentals P. K. Sinha, BPB Publication, Fourth Edition
2. Computer Fundamentals: Architecture and Organization, [illegible]
3. Fundamentals of Computers, V. Rajaraman, PHI, Sixth Edition
4. Computing Fundamentals, Donald H. Sanders, McGraw-Hill, Third Edition
5. IBM PC [illegible] McGraw-Hill, Second Edition
6. DOS Concepts and [illegible] Tony McGrew, [illegible]

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11/6/18 (Dr. A.K. Dwivedi)

B.Sc. PART - I
COMPUTER SCIENCE
PAPER II
PROGRAMMING IN 'C' LANGUAGE
(Paper Code - 0806)

Max Marks: 50

NOTE: The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.

UNIT-I

Fundamentals of C Programming: Overview of C: History of 'C', Structure of 'C' program. Keywords, Tokens, Data types, Constants, Literals and Variables, Operators and Expressions: Arithmetic operators, Relational operator, Logical operators, Expressions, Operator: operator precedence and associatively, Type casting, Console I/O formatting, Unformatted I/O functions: getch(), getchar, getche(), gete(), putc(), putchar().

UNIT- II

Control Constructs: If-else, conditional operators, switch and break, nested conditional branching statements, loops: do while, while, for, Nested loops, break and continue, goto and label, exit function.

Functions: Definition, function components: Function arguments, return value, function call statement, function prototype, Types of function, Scope and lifetime of variable, Call by value and call by reference. Function using arrays, function with command line argument. User defined function: maths and character functions, Recursive function.

UNIT-III

Array: Array declaration, One and Two dimensional numeric and character arrays, Multidimensional arrays.

String: String declaration, initialization, string manipulation with/without using library function.

Structure, Union and Enum - Structure: Basics, declaring structure and structure variable, typedef statement, array of structure, array within structure, Nested structure; passing structure to function, function returning structure. **Union**: basics, declaring union and union variable, **Enum**: declaring enum and enum variable.

UNIT- IV

Pointer: Definition of pointer, Pointer declaration, Using & and * operators, Void pointer, Pointer to pointer, Pointer in math expression, Pointer arithmetic, Pointer comparison, Dynamic memory allocation functions – malloc, calloc, realloc and free, Pointer vs. Array, Array of pointer, Pointer to array, Pointers to function, Function returning pointer, Passing function as Argument to function, Pointer to structure, Dynamic array of structure through pointer to structure.

UNIT-V

File Handling and Miscellaneous Features: File handling: file pointer, File accessing functions, fopen, fclose, fputc, fgetc, fprintf, fscanf, fread, fwrite,beof, fflush, rewind, fseek, ferror. File handling through command line argument. Introduction to C preprocessor #include, #define, Conditional compilation directives: #if, #else, #elif, #endif, #ifndef etc.

TEXT BOOKS:

1. Programming in ANSI C, E Balagurusamy, Tata McGraw-Hill, Third Edition.
2. Let Us C, YashwantKanetkar, Infinity Science Press, Eighth Edition
3. Mastering C, K R Venugopal, Tata McGraw-Hill.
4. The C Programming Language, Brian W. Kernighan, Dennis M. Ritchie, Prentice Hall, Second Edition.
5. Applications Programming in ANSI C, R. Johnsonbaugh , Martin Kalin, Macmillan, Second Edition.
6. The Spirit of C, Mullish Cooper, Jaico publishing House.
7. How to solve it by Computer, R.G. Dromey, Pearson Education

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11/06/18
(Dr. A.K. Dwivedi)

11/06/18

11-06-18

11/6/18

Practical

- At least 20 Practical based on Syllabus of Paper-I and Paper-II.

11-06-2018
(Dr. Sanjay Kumar)

11/6/2018
(Dr. A.K. Dwivedi)

11/6/18
(L.K. Gavel)

11/6/18
(Dr. J. Durga Prasad Rao)

11-06-18
Hari Shankar Prasad Pande

PRINCIPAL
Vipra College
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ELECTRONICS LABORATORY

ELB 103P: NETWORK ANALYSIS AND ANALOG ELECTRONICS LAB

(Hardware and Circuit Simulation Software) **Max.Marks:25**

The scheme of practical examination will be as follows-

Experiment	--	**30**
Viva	--	**10**
Sessional	--	**10**
Total	--	**50**

AT LEAST 06 EXPERIMENTS FROM THE FOLLOWING BESIDES #1

1. To familiarize with basic electronic components (R, C, L, diodes, transistors), digital Multimeter, Function Generator and Oscilloscope.
2. Measurement of Amplitude, Frequency & Phase difference using Oscilloscope.
3. Verification of (a) Thevenin's theorem and (b) Norton's theorem.
4. Verification of (a) Superposition Theorem and (b) Reciprocity Theorem.
5. Verification of the Maximum Power Transfer Theorem.
6. Study of the I-V Characteristics of (a) p-n junction Diode, and (b) Zener diode.
7. Study of (a) Half wave rectifier and (b) Full wave rectifier (FWR).
8. Study the effect of (a) C- filter and (b) Zener regulator on the output of FWR.
9. Study of the I-V Characteristics of UJT and design relaxation oscillator..
10. Study of the output and transfer I-V characteristics of common source JFET.
11. Study of Fixed Bias and Voltage divider bias configuration for CE transistor.
12. Design of a Single Stage CE amplifier of given gain.
13. Study of the RC Phase Shift Oscillator.
14. Study the Colpitt`s oscillator.

Reference Books:

1. Electrical Circuits, M. Nahvi and J. Edminister, Schaum's Outline Series, Tata McGraw-Hill (2005)
2. Networks, Lines and Fields, J.D.Ryder, Prentice Hall of India.
3. J. Millman and C. C. Halkias, Integrated Electronics, Tata McGraw Hill (2001)
4. Allen Mottershead, Electronic Devices and Circuits, Goodyear Publishing Corporation.

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B.Sc.-I

BIOTECHNOLOGY

PAPER–II

CELL BIOLOGY, GENETICS AND MICROBIOLOGY

UNIT-I

1. Concept of life, Cell as a basic unit of living system and Cell theory.
2. Diversity of Cell shape and size.
3. Prokaryotic cell structure: Function and ultra structure of cell (Gram positive and Gram negative Bacteria), Plasma membrane, Flagella, Pilli, Endospore and Capsule.
4. Eukaryotic cell: Plant cell wall and Plasma membrane.

UNIT-II

1. Cytoplasm: Structure and Functions of Endoplasmic reticulum, Ribosome, Golgi complex, Lysosomes, Nucleus, Mitochondria and Chloroplast.
2. Cytoskeleton: Microtubules, Microfilaments and Intermediate filaments.
3. Cell division: Mitosis and Meiosis.
4. Programmed Cell Death.

UNIT-III

1. Mendel's Laws of Inheritance.
2. Linkage and Crossing over.
3. Chromosome variation in number and structure: Deletion, Duplication, Translocation, Inversion and Aneuploidy, Euploidy (Monoploidy and Polyploidy and its importance).

UNIT-IV

1. History, Scope and Development of Microbiology.
2. Basic techniques of Microbial Culture
3. Microbial Growth & Nutrition of Bacteria: Isolation, media sterilization- physical and chemical agents, pure culture-pour plate method, streak plate method and spread plate method.
4. General features and Economic importance of Fungi, Algae and Protozoa etc.

UNIT-V

1. Bacterial Reproduction: Conjugation, Transduction and Transformation.
2. Mycoplasma – History, Classification, Structure reproduction & Diseases.
3. Viruses – Basic features, Structure, Classification, Multiplication, Bacteriophages (Morphology, life cycle, infection and medicinal importance)

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List of Practical's

MICROBIOLOGY AND BIOCHEMICAL TECHNIQUES

(1) Laboratory rules, Tools, Equipment and Other requirements in Microbiological laboratory.

(2) Micrometry – Use of ocular & stage Micrometrer.

(3) Counting of bacteria by counting chamber, by plate count.

(4)Preparation of media and cultivation techniques:
- (a) Basic liquid media (broth)
- (b) Basic Solid media, (agar slants and deep tubes)
- (c) Demonstration of selective and differential media
- (d) Isolation and enumeration of micro organisms
- (e) Isolation from air and Soil

(5)Smears and staining methods:
- (a) Preparation of bacterial smear
- (b) Gram Negative & Positive staining

(6)Methods of obtaining pure cultures
- (a) Streak plate method
- (b) Pure plate method
- (c) Spread plate method
- (d) Broth cultures

(7)Growth & Biochemical techniques
- (a) Determination of bacterial growth curve
- (b) Amylase production test
- (c) Cellulose production test
- (d) Estimation of Sugar in given solution
- (e) Extraction and separation of lipids
- (f) Estimation of proteins
- (h) Mitosis and Meiosis

(8)Biostatistics:
- (a) By Manual and by computer.
- (b) Problems on mean, mode and median.

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SCHEME OF PRACTICAL EXAMINATION

Time – 4 hrs. **M. M.: 50**

1. Experiment based on culture of micro-organisms	15 Marks
2. Bacterial growth/Staining techniques	10 Marks
3. Biochemical techniques	05 Marks
4. Bio statistics	05 Marks
5. Spotting	05 Marks
6. *Viva – Voce*	05 Marks
7. Record/Sessional	05 Marks

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PRACTICAL FOR Ist YEAR
LABORATORY-I (BCH 105)

1. Preparation of standard buffers and determination of pH of a solution
2. Qualitative tests for :
   a. Carbohydrates
   b. Proteins and amino acids
   c. Lipids
3. Determination of saponification value and iodine number of fats
4. Estimation of ascorbic acid.
5. Titration curve for amino acids and determination of pKa values
6. Verification of Beer-Lambert's law.
7. Estimation of
   i) Carbohydrate by anthrone method.
   ii) Blood glucose by the methods (a) Folin-Wu, (b) Nelson-Somogyi
8. Estimation of amino acids by ninhydrin method.
9. Isolation and assay of glycogen from rat liver.
10. i) Extraction of total lipids by Folch method
    ii) Estimation of food adulterant.
11. Estimation of DNA and RNA.
12. Separation of sugars using paper chromatography.

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Singh, JS Singh SP and Gupta SR. ***Ecology and Environmental Science and Conservation***, S. Chand Publishing, New Delhi

Sharma, PD. ***Ecology and Environment,*** Rastogi Publications, Merrut

Hopkins, WG and Huner, PA. ***Introduction to Plant Physiology,*** John Wiley and Sons.

Pandey SN and Sinha BK, ***Plant Physiology,*** Vikas Publishing, New Delhi

Taiz, L and Zeiger. E. ***Plant Physiology,*** 5th edition, Sinauer Associates Inc. M.A, USA

Srivastava, HS ***Plant Physiology and Biotechnology***, Rastogi Publications, Meerut

B.Sc. II (BOTANY)

Practical

1. Taxonomy: Detailed description and identification of locally available plants of the families as prescribed in the theory paper.
2. Economic Botany: Identification and comment on the plants and plant products belonging to different economic use categories
3. Preparation of Herbarium of local wild plants.
4. Quantitative vegetation analysis of a grassland ecosystem.
5. Anatomical characteristics of hydrophytes and xerophytes.
6. Demonstration of root pressure.
7. Demonstration of transpiration.
8. Demonstration of evolution of O_2 in photosynthesis, factors affecting of photosynthesis.
9. Comparison of R.Q. of different respiratory substrates.
10. Demonstration of fermentation.
11. Determination of BOD of a water body.
12. Demonstration of mitosis.

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PRACTICAL SCHEME

TIME: 4 Hrs. **M.M. : 50**

1.	Anatomy	08
2.	Economic Botany	04
3.	Physiology	08
4.	Ecology	10
5.	Spotting	10
6.	Viva-Voce	05
7.	Project Work/ Field Study	10

(Dr. J.N. Verma
Proff. & Head
Govt. D.B. Girls PG College
Raipur, (C.G.)

(Dr. Rekha Pimpalgaonkar)
Proff. & Head
Govt. N PG Science College
Raipur, (C.G.)

(Dr.Ranjana Shristava)
Proff. & Head
Govt. VYTPG Science College
Raipur, (C.G.)

(Mrs. Sanchal Moghe)
Govt. Bilasa Girls College, Bilaspur

(Mr. Shivakant Mishra)

(Mr Sudheer Tiwari)

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Zoology
B.Sc. Part II 2018-19
Practical

The practical work in general shall be based on the syllabus prescribed and the students will be required to show the knowledge of the following:

- Study of the representative examples of the different chordates (Classified characters).
- Dissection of various systems of scoliodon-Afferent and Efferent branchial cranial nerves, internal ear.

Alternative methods: By Clay/Thermacol/ Drawing/ Model etc.)

- Simple microscopic technique through unstained or stained permanent mount.
- Study of prepared slides histological, as per theory papers.
- Study of limb girdles and vertebrae of Frog, Varanus, Fowl and Rabbit.
- Identification of species and individual of honey bee.
- Life cycle of honey bee and silkworm.
- Exercise based on Evolution and Animal behavior.

Scheme of Practical Exam **Time: 3:30hrs**

• Major dissection (Cranial nerves/efferent branchial vessel)	10
• Exercise based on evolution	05
• Exercise based on applied zoology	05
• Exercise based on animal behavior	04
• Spotting-8 (slides-4,bones-2,specimen-2)	16
• Viva	05
• Sessional marks.	05

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NEW CURRICULUM OF B.Sc. PART II

CHEMISTRY

The new curriculum will comprise of three papers of 33, 33 and 34 marks each and practical work of 50 marks. The Curriculum is to be completed in 180 working days as per UGC norms and conforming to the directives of Govt. of Chhattisgarh. The theory papers are of 60 hrs. each duration and practical work of 180 hrs duration.

Paper – I
INORGANIC CHEMISTRY

60 Hrs., Max Marks 33

UNIT-I

CHEMISTRY OF TRANSITION SERIES ELEMENTS

Transition Elements: Position in periodic table, electronic configuration, General Characteristics, *viz.*, atomic and ionic radii, variable oxidation states, ability to form complexes, formation of coloured ions, magnetic moment μ_{so} (spin only) and μ_{eff} and catalytic behaviour. General comparative treatment of 4d and 5d elements with their 3d analogues with respect to ionic radii, oxidation states and magnetic properties.

UNIT-II

A. Oxidation and Reduction: Redox potential, electrochemical series and its applications, Principles involved in extraction of the elements.

B. COORDINATION COMPOUNDS: Werner's theory and its experimental verification, IUPAC nomenclature of coordination compounds, isomerism in coordination compounds. Stereochemistry of complexes with 4 and 6 coordination numbers. Chelates, polynuclear complexes.

UNIT-III

COORDINATION CHEMISTRY

Valence bond theory (inner and outer orbital complexes), electroneutrality principle and back bonding. Crystal field theory, Crystal field splitting and stabilization energy, measurement of 10 Dq (Δ_o), CFSE in weak and strong fields, pairing energies, factors affecting the magnitude of 10 Dq (Δ_o, Δ_t). Octahedral vs. tetrahedral coordination.

UNIT-IV

A. CHEMISTRY OF LANTHANIDE ELEMENTS

Electronic structure, oxidation states and ionic radii and lanthanide contraction, complex formation, occurrence and isolation, lanthanide compounds.

B. CHEMISTRY OF ACTINIDES

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CHEMISTRY

Paper –IV

LABORATORY COURSE

INORGANIC CHEMISTRY

Qualitative semimicro analysis of mixtures containing 5 radicals. Emphasis should be given to the understanding of the chemistry of different reactions. The following radicals are suggested:

CO_3^{2-}, NO_2^- , S^{2-}, SO_3^{2-},$S_2O_3^{2-}$, CH_3COO^-, F^- ,Cl^- , Br^- , I^- , NO_3^- , BO_3^{3-}, $C_2O_4^{2-}$, PO_4^{3-}, NH_4^+ , K^+, Pb^{2+}, Cu^{2+}, Cd^{2+}, Bi^{3+}, Sn^{2+}, Sb^{3+}, Fe^{3+}, Al^{3+}, Cr^{3+}, Zn^{2+}, Mn^{2+}, Co^{2+}, Ni^{2+}, Ba^{2+}, Sr^{2+}, Ca^{2+}, Mg^{2+}.

Mixtures should preferably contain one interfering anion, or insoluble component ($BaSO_4$, $SrSO_4$, $PbSO_4$, CaF_2 or Al_2O_3) or combination of anions e.g. CO_3^{2-} and SO_3^{2-}, NO_2^- and NO_3^-, Cl^-, Br^-, and I^-.

Volumetric analysis

(a) Determination of acetic acid in commercial vinegar using NaOH.

(b) Determination of alkali content-antacid tablet using HCl.

(c) Estimation of calcium content in chalk as calcium oxalate by permanganometry.

(d) Estimation of hardness of water by EDTA.

(e) Estimation of ferrous & ferric by dichromate method.

(f) Estimation of copper using thiosulphate.

- Principles involved in chromatographic separations. Paper chromatographic separation of following metal ions: i. Ni (II) and Co (II) ii. Fe (III) and Al (III)

ORGANIC CHEMISTRY

- Detection of elements (X, N, S).
- Qualitative analysis of unknown organic compounds containing simple functional groups (alcohols, carboxylic acids, phenols, nitro, amine, amide, and carbonyl compounds, carbohydrates)
- Preparation of Organic Compounds:
  (i) m-dinitrobenzene, (ii) Acetanilide, (iii) Bromo/Nitro-acetanilide, (iv) Oxidation of primary alcohols-Benzoic acid from benzylacohol, (v) azo dye.

PHYSICAL CHEMISTRY

Transition Temperature

PRINCIPAL

- Determination of the transition temperature of the given substance by thermometric/ dialometric method (e.g. $MnCl_2.4H_2O/SrBr_2.2H_2O$).

Thermochemistry

- Determination of heat capacity of a calorimeter for different volumes using change of enthalpy data of a known system (method of back calculation of heat capacity of calorimeter from known enthalpy of solution or enthalpy of neutralization).
- Determination of heat capacity of the calorimeter and enthalpy of neutralization of hydrochloric acid with sodium hydroxide.
- To determine the solubility of benzoic acid at different temperature and to determine ΔH of the dissolution process.
- To determine the enthalpy of neutralization of a weak acid/ weak base versus strong base/ strong acid and determine the enthalpy of ionization of the weak acid/ weak base.
- To determine the enthalpy of solution of solid calcium chloride and calculate the lattice energy of calcium chloride from its enthalpy data using Born Haber cycle.

Phase Equilibrium

- To study the effect of a solute (e.g. NaCl, Succinic acid) on the critical solution temperature of two partially miscible liquids (e.g. phenol-water system) and to determine the concentration of that solute in the given phenol-water system.
- To construct the phase diagram of two component system (e.g. diphenylamine–benzophenone) by cooling curve method.
- Distribution of acetic/ benzoic acid between water and cyclohexane.
- Study the equilibrium of at least one of the following reactions by the distribution method:

  (i) $I_2(aq) + I^- \rightarrow I^-_3(aq)^{2+}$

  (ii) $Cu^{2+}(aq) + nNH_3 \rightarrow Cu(NH_3)n$

Molecular Weight Determination

Determination of molecular weight by Rast Camphor and Landsburger method.

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Note: **Experiments may be added/ deleted subject to availability of time and facilities.**

Reference Books

1. Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009)
2. Furniss, B.S., Hannaford, A.J., Smith, P.W.G. & Tatchell, A.R. Practical Organic Chemistry, 5th Ed. Pearson (2012)
3. Ahluwalia, V.K. & Aggarwal, R. Comprehensive Practical Organic Chemistry: Preparation and Quantitative Analysis, University Press (2000). 22
4. Ahluwalia, V.K. & Dhingra, S. Comprehensive Practical Organic Chemistry: Qualitative Analysis, University Press (2000).
5. Khosla, B. D.; Garg, V. C. & Gulati, A. Senior Practical Physical Chemistry, R. Chand & Co.: New Delhi (2011). Garland, C. W.; Nibler, J. W. & Shoemaker, D. P. Experiments in Physical Chemistry 8th Ed.; McGraw-Hill: New York (2003).
6. Halpern, A. M. & McBane, G. C. Experimental Physical Chemistry 3rd Ed.; W.H. Freeman & Co.: New York

Hrs.5 PRACTICAL EXAMINATION M.M.50

Three Experiments are to be performed.

1. Inorganic – Qualitative semimicro analysis of mixtures. **12 marks**

OR

One experiment from synthesis and analysis by preparing the standard solution.

2. (a) Identification of the given organic compound & determine its M.Pt./B.Pt. **6 marks**

(b) Determination of Rf value and identification of organic compounds by paper chromatography. **6 marks**

3. Any one physical experiment that can be completed in two hours including calculations. **12 marks**

4. Viva **10 marks**

5. Sessional **04 marks**

In case of Ex-Students one marks will be added to each of the experiment.

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MICROBIOLOGY

BSc-2nd

Paper- I: Molecular Biology and Genetic Engineering

UNIT-1: FUNDAMENTALS OF MOLECULAR BIOLOGY

History and scope of molecular biology, concept and mechanism of heredity. DNA as genetic material- experimental evidences. DNA replication- mechanism, process and enzymes/proteins involved in replication.

UNIT-2: CENTRAL DOGMA OF PROTEIN SYNTHESIS

Transcription- initiation, elongation, termination, RNA polymerases and sigma factor. Transcription inhibitors (antibiotics, drugs). Translation- initiation, elongation and termination. Factors involved in translation. Genetic code.

UNIT-3: MUTATION AND DNA REPAIR MECHANISM

Introduction and Types of Gene mutations- Base substitution, frame shift mutation (insertion, deletion, miss-sense, nonsense mutation.) Mutagens – physical and chemical. Reverse mutation in bacteria. DNA repair mechanism (mismatch repair, photo-reactivation, excision and SOS repair). Beneficial and harmful effect of mutation.

UNIT-4: GENE REGULATION

Concept of gene- Cistron, Recon, Muton. Operon Concept- lac Operon, tryptophan Operon, His Operon. Activator, Co-activator and Repressor. Introduction to Bioinformatics- Elementary genome Database.

UNIT-5: GENETIC ENGINEERING

Basic concept of Genetic Engineering, DNA modifying enzymes Restriction endonuclease, DNA ligase, terminal transferase. Vectors- pBR322, pUC19, BAC and YAC. Phage based vectors, expression of vector. Transformation – physical and chemical method. Bacterial Host. Screening of recombinant vector Blue white Screening, Colony Hybridization.

Text Books Recommended:

1. Gene Cloning by T.A. Brown.
2. General Microbiology by Power and Daganiwala.
3. Zinssers Microbiology by KJ Wolfgang, McGraw- HJill Company.
4. Microbial Genetics by RM Stanley, F David and EC John.
5. Bacteriological Techniques by FJ Baker.
6. .Molecular Biology of the Cell; *3rd Edition;* Bruce Alberts ,et.al; Garland Publishing.
7. Cell biology; C.B. Powar; Himalaya Publishing House; Fifth edition
8. Cell & Molecular Biology; Gerald Karp; Fourth edition
9. A Textbook of Microbiology; Dubey&Maheshwari; S.chand& Sons.
10. Cell biology & Genetics; P. K. Gupta
11. Introduction to Bioinformatics; T K Atwood and D J Parry-Smith; Pearson Education Ltd

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Microbiology

PRACTICAL

M. M. 50

Determination of antibiotic resistance by plating method.
Assaying of microbial enzymes; Catalase, Proteases, Peroxidases, Cellulase, Cellobioases, Amylase, Diastase.
Exercise on paper, thin layer, column chromatography.
Exercise on paper and gel electrophoresis.
determination of pH of various water and soil sample.
testing of lambert beer's law.
Determination of lamda max of dye by spectrophotometer
Isolation of resistant bacteria from soil and water sample

Scheme of Practical Examination

Time - 4 hours M.M. 50

1. Exercise on spectrophotometer/ pH meter	10
2. Exercise on chromatography	10
3. Exercise on genetics	05
4. Spotting (1-5)	10
5. Viva-Voce	05
6. Sessional	10
	Total 50

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B.Sc. Part-II

Paper-I

THERMODYNAMICS, KINETIC THEORY AND STATISTICAL PHYSICS

Unit-1 The laws of thermodynamics : The Zeroth law, first law of thermodynamics, internal energy as a state function, reversible and irreversible change, Carnot's cycle, carnot theorem, second law of thermodynamics. Claussius theorem inequality. Entropy, Change of entropy in simple cases (i) Isothermal expansion of an ideal gas (ii) Reversible isochoric process (iii) Free adiabatic expansion of an ideal gas. Concept of entropy, Entropy of the universe. Entropy change in reversible and irreversible processes, Entropy of Ideal gas, Entropy as a thermodynamic variable, S-T diagram, Principle of increase of entropy. The thermodynamic scale of temperature, Third law of thermodynamics, Concept of negative temperature.

Unit-2 Thermodynamic functions, Internal energy, Enthalpy, Helmholtz function and Gibb's free energy, Maxwell's thermodynamical equations and their applications, TdS equations, Energy and heat capacity equations Application of Maxwell's equation in Joule-Thomson cooling, adiabatic cooling of a system, Van der Waals gas, Clausius-Clapeyron heat equation. Blackbody spectrum, Stefan-Boltzmann law, Wien's displacement law, Rayleigh-Jean's law, Planck's quantum theory of radiation.

Unit-3 Maxwellian distribution of speeds in an ideal gas: Distribution of speeds and velocities, experimental verification, distinction between mean, rms and most probable speed values. Doppler broadening of spectral lines. Transport phenomena in gases: Molecular collisions mean free path and collision cross sections. Estimates of molecular diameter and mean free path. Transport of mass, momentum and energy and interrelationship, dependence on temperature and pressure.

Behaviour of Real Gases: Deviations from the Ideal Gas Equation. The Virial Equation. Andrew's Experiments on CO_2 Gas. Critical Constants.

Unit-4 The statistical basis of thermodynamics: Probability and thermodynamic probability, principle of equal a priori probabilities, statistical postulates. Concept of Gibb's ensemble, accessible and inaccessible states. Concept of phase space, γ phase space and μ phase space. Equilibrium before two systems in thermal contact, probability and entropy, Boltzmann entropy relation. Boltzmann canonical distribution law and its applications, law of equipartition of energy.

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Paper-II
WAVES, ACOUSTICS AND OPTICS

Unit-1 Waves in media: Speed of transverse waves on uniform string, speed of longitudinal waves in a fluid, energy density and energy transmission in waves. Waves over liquid surface: gravity waves and ripples. Group velocity and phase velocity and relationship between them. Production and detection of ultrasonic and infrasonic waves and applications.

Reflection, refraction and diffraction of sound : Acoustic impedance of a medium, percentage reflection & refraction at a boundary, impedance matching for transducers, diffraction of sound, principle of a sonar system, sound ranging.

Unit-2 Fermat's Principle of extremum path, the aplanatic points of a sphere and other applications. Cardinal points of an optical system, thick lens and lens combinations. Lagrange equation of magnification, telescopic combinations, telephoto lenses. Monochromatic aberrations and their reductions; aspherical mirrors and Schmidt corrector plates, aplanatic points, oil immersion objectives, meniscus lens.

Optical instruments: Entrance and exit pupils, need for a multiple lens eyepiece, common types of eyepieces. (Ramsdon and Hygen's eyepieces).

Unit-3 Interference of light: The principle of superpositions, two slit interference, coherence requirement for the sources, optical path retardations, Conditions for sustained interference, Theory of interference, Thin films. Newton's rings and Michelson interferometer and their applications its application for precision determinations of wavelength, wavelength difference and the width of spectral lines. Multiple beam interference in parallel film and Fabry-Perot interferometer. Rayleigh refractometer, Twyman-Green interferometer and its uses.

Unit-4 Diffraction, Types of Diffraction, Fresnel's diffraction, half-period zones, phasor diagram and integral calculus methods, the intensity distribution, Zone plates, diffraction due to straight edge, Fraunhofer diffraction due to a single slit and double slit, Diffraction at N-Parallel slit, Plane Diffraction grating, Rayleigh criterion, resolving power of grating , Prism, telescope.

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Polarized light and its mathematical representation, Production of polarized light by reflection, refraction and scattering. Polarization by double refraction and Huygen's theory, Nicol prism, Retardation plates, Production and analysis of circularly and elliptically polarized light. Optical activity and Fresnel's theory, Biquartz polarimeter.

Unit-5 Laser system: Basic properties of Lasers, coherence length and coherence time, spatial coherence of a source, Einstein's A and B coefficients, Spontaneous and induced emissions, conditions for laser action, population inversion, Types of Laser : Ruby and, He-Ne laser and. Applications of laser : Application in communication, Holography and Basics of non linear optics and Generation of Harmonic.

TEXT AND REFERENCE BOOKS:

1. A.K. Ghatak, 'Physical Optics'
2. D.P. Khandelwal, Optical and Atomic Physics' (Himalaya Publishing House, Bombay, 1988)
3. K.D. Moltev; 'Optics' (Oxford University Press)
4. Sears: 'Optics'
5. Jenkins and White: 'Fundamental of Optics' (McGraw-Hill)
6. B.B. Laud: Lasers and Non-linear Optics (Wiley Eastern 1985)
7. Smith and Thomson: 'Optics' (John Wiley and Sons)
8. Berkely Physics Courses: Vol.-III, 'Waves and Oscillations'
9. I.G. Main, 'Vibrations and Waves' (Cambridge University Press)
10. H.J. Pain: 'The Physics of Vibrations and Waves' (MacMillan 1975)
11. Text Book of Optics: B.K. Mathur
12. B.Sc. (Part III) Physics: Editor: B.P. Chandra, M.P. Hindi Granth Academy.
13. F. Smith and J.H. Thomson, Manchester Physics series: optics (John wiley, 1971)
14. Born and Wolf : 'Optics'.
15. Physical Optics: B. K. Mathur and T. P. Pandya.
16. A textbook of Optics: N. Subrahmanyam, Brijlal and M. N. Avadhanulu.
17. Geometrical and Physical Optics: Longhurst.
18. Introduction to Modern Optics: G. R. Fowels.
19. Optics: P. K. Srivastav.

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Physics

PRACTICALS

Minimum 16 (Eight from each group)

Experiments out of the following or similar experiments of equal standard

1. Study of Brownian motion.
2. Study of adiabatic expansion of a gas.
3. Study of conversion of mechanical energy into heat.
4. Heating efficiency of electrical kettle with varying voltage.
5. Study of temperature dependence of total radiation.
6. Study of temperature dependence of spectral density of radiation.
7. Resistance thermometry.
8. Thermo emf thermometry.
9. Conduction of heat through poor conductors of different geometries.
10. Experimental study of probability distribution for a two-option system using a coloured dice.
11. Study of statistical distribution on nuclear disintegration data (GM counter used as a black box).
12. Speed of waves on a stretched strings.
13. Studies on torsional waves in a lumped system.
14. Study of interference with two coherent source of sound.
15. Chlandi's figures with varying excitation and loading points.
16. Measurements of sound intensities with different situations.
17. Characteristics of a microphone-loudspeakers system
18. Designing an optical viewing system.
19. Study of monochromatic defects of images.
20. Determining the principle point of a combination of lenses.
21. Study of interference of light (biprism or wedge film).
22. Study of diffraction at a straight edge or a single slit.
23. Study of F-P etalon fringes.
24. Study of diffraction grating and its resolving power.
25. Resolving power of telescope system.
26. Polarization of light by reflection; also cos-squared law.
27. Study of optical rotation for any system.
28. Study of laser as a monochromatic coherent source.
29. Study of a divergence of laser beam.
30. Calculation of days between two dates of a year.
31. To check if triangle exists and the type of a triangles.
32. To find the sum of the sine and cosines series and print out the curve.

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33. To solve simultaneous equation by elimination method.
34. To prepare a mark-list of polynomials.
35. Fitting a straight line or a simple curve
36. Convert a given integer into binary and octal systems and vice versa .
37. Inverse of a matrix.
38. Spiral array.

TEXT AND REFERENCE BOOKS

1. D.P. Khandelwal, Optics and Atomic physics (Himalaya Publishing house, Bombay 1988).
2. D.P. Khandelwal, A Laboratory Manual for Undergraduate Classes (Vani Publishing House, New Delhi).
3. S. Lipschutz and a Poe, Schaum's outline of theory and Problems of Programming with Fortran(McGraw-hill Book Company 1986).
4. C Dixon, Numerical Analysis .

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B.Sc.(CS)
II Year

COMPUTER SCIENCE

PAPER - I

COMPUTER HARDWARE

(Paper Code - 0655)

Max.Marks 50

Duration 3 hours

AIM - The emphasis in on the desing concepts & organisational details of the common PC, leaving the complicated electronics of the system of the computer Engineers.

OBJECT OF THE COURSE -

1. To introduce the overall organisation of the microcomputers.
2. To introduce the common peripheral devices used in computers.
3. To introduce the hardware components, use of micro processor and function of various chips used in microcomputer.

N.B. : Since the computer organisation study is very vast & complicated, so the study is restricted to only the description and understanding part, fence the paper setter is requested to keep this important factor in mind.

UNIT-I CLASSIFICATION AND ORGANIZATION OF COMPUTERS

Digital and analog computers and its evolution. Major components of digital computers; Memory addressing capability of CPU; word length and processing speed of computes. Microprocessors single chip microcomputers; large and small computers. Users interface Hardware software and firmware. multi programming multi user system. Dumb smart and intelligent terminals computer network and multi processing, LAN parallel processing. Flinn's classification of computers. Computer flow and data flow computers.

UNIT-II CENTRAL PROCESSING UNIT.

CPU organization, ALU control unit registers. Instructions for INTEL 8085, Instruction word size, Various addressing mode interrupts and exceptions, some special Control signals and I/O devices. Instruction cycle fetch and execute operation, time Diagram, data flow.

UNIT-III MEMORY OF COMPUTERS.

Main memory secondary memory, backup memory, cache memory; real and virtual Memory Semiconductor memory. Memory controller and magnetic memory; RAM; disks, optical disks Magnetic bubble memory; DASD, destructive and non destructive. readout. Program of data Memory and MMU.

UNIT-IV I/O DEVICES.

I/O devices of micro controller; processors. I/O devices, printer, plotter, other out put devices, I/O port serial data transfer scheme, Micro controller, signal processor, I/O processor I/O processor arithmetic processor.

UNIT-V SYSTEM SOFTWARE AND PROGRAMMING TECHNIQUE.

ML, AL, HLL, stac subroutine debugging of programs macro, micro programming, Program Design, software development, flow & chart multi programming, multiuser, multi tasking Protection, operating system and utility program, application package.

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(Dr. J. Durga)

11.06.18

RECOMMENDED BOOKS :

1 Computer Fundamentals : Architecture and Organization - By B.Ram (Wilwy Bastem Ltd.)

2 Computers Today - By Donal H. Sanders

3 Computers Fundamental - By Rajaraman.

4 IBM PC - XT Clones - By Govinda Rajalu

PAPER - II

SOFTWARE

(Paper Code - 0856)

AIM - Introduction to the web-language-HTML & problem solving throgh the concept of object oriented programming.

OBJECT OF THE COURSE -

1 To introduce the internet & web related technology & learn the intricacies of web-page designing using HTML.

2 To introduce the object oriented programming concept using C++ language.

3 To introduce the problem solving methodology using the C++ programming features.

N.B. : Examiners are requested to prepare unit-wise Questions papers.

UNIT-I HTML BASICS & WEB SITE DESIGN PRINCIPLES

Concept of a Web Site, Web Standards, What is HTML? HTML Versions, Naming Scheme for HTML Documents , HTML document/file, HTML Editor , Explanation of the Structure of the homepage , Elements in HTML Documents ,HTML Tags, Basic HTML Tags, Comment tag in HTML, Viewing the Source of a web page, How to download the web page source? XHTML, CSS, Extensible Markup Language (XML), Extensible Style sheet language (XSL), Some tips for designing web pages, HTML Document Structure. HTML Document Structure-Head Section, Illustration of Document Structure,<BASE> Element,<ISINDEX> Element,<LINK> Element ,META, <TITLE> Element,<SCRIPT> Element ,Practical Applications, HTML Document Structure-Body Section:-Body elements and its attributes: Background; Background Color; Text; Link; Active Link (ALINK); Visited Link (VLINK); Left margin; Top margin, Organization of Elements in the BODY of the document: Text Block Elements; Text Emphasis Elements; Special Elements – Hypertext Anchors; Character-Level Elements; Character References ,Text Block Elements: HR (Horizontal Line); Hn (Headings) ; P (Paragraph); Lists; ADDRESS ; BLOCKQUOTE; TABLE; DIV (HTML 3.2 and up) ; PRE (Preformatted); FORM ,Text Emphasis Elements, Special Elements – Hypertext Anchors ,Character-Level Elements: line breaks (BR) and Images (IMG), Lists , ADDRESS Element, BLOCKQUOTE Element, TABLE Element, COMMENTS in HTML ,CHARACTER Emphasis Modes, Logical & Physical Styles, Netscape, Microsoft and Advanced Standard Elements List, FONT, BASEFONT and CENTER.

UNIT-II IMAGE, INTERNAL AND EXTERNAL LINKING BETWEEN WEBPAGES

Netscape, Microsoft and Advanced Standard Elements List, FONT, BASEFONT and CENTER Insertion of images using the element IMG (Attributes: SRC (Source),

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WIDTH, HEIGHT, ALT (Alternative), ALIGN), IMG (In-line Images) Element and Attributes; Illustrations of IMG Alignment, Image as Hypertext Anchor, Internal and External Linking between Web Pages Hypertext Anchors ,HREF in Anchors ,Links to a Particular Place in a Document ,NAME attribute in an Anchor ,Targeting NAME Anchors ,TITLE attribute, Practical IT Application Designing web pages links with each other, Designing Frames in HTML. Practical examples.

UNIT-III INTRODUCTION TO OOP

Advantages of OOP, The Object Oriented Approach, Characteristics of object oriented languages- Object, Classes, Inheritance, Reusability, Polymorphism and C++.

Function: Function Declaration, Calling Function, Function Defines, Passing Argument to function, Passing Constant, Passing Value, Reference Argument, returning by reference, Inline Function, Function Overloading, Default Arguments in function.

UNIT-IV OBJECT CLASSES AND INHERITANCE

Object and Class, Using the class, class constructor, class destructors, object as function argument ,copy constructor ,struct and classes , array as class member, Static Class Data, Static Member Functions, , Friend function, Friend class, operator overloading. Type of inheritance, Base class, Derive class. Access Specifier: protected. Function Overriding, member function, String, Template Function.

UNIT-V POINTERS AND VIRTUAL FUNCTION

pointers: & and * operator pointer variables, .pointer to pointer, void pointer,pointer and array, pointer and function, pointer and string, memory management, new and delete, pointer to object, this pointer Virtual Function: Virtual Function, Virtual member function, accesses with pointer,pure virtual function

File and Stream: C++ streams, C++ Manipulators, Stream class, string I/O, char I/O, Object I/O, I/O with multiple object, Disk I/O,

RECOMMENDED BOOKS :

1	Introduction to HTML	:	Kamlesh Agarwala, O.P.Vyas, Prateek A. Agrawala (Kitab Mahal Publication)
2	Let us C++	:	Y. Kanetkar B.P.B Publication
3	Programming in C++	:	E. Balaguruswami
4	Mastering in C++	:	Venu Gopal
5	Object Oriented Programming in C++	:	Lafore R, Galgotia Publications.

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(L.K. Gavel)

11.06.18
Hari Shankar Prasad Tade

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ELECTRONICS LABORATORY

The scheme of practical examination will be as follows-

Experiment	--	**30**
Viva	--	**10**
Sessional	--	**10**
Total	--	**50**

ELB 203P: COMMUNICATIONELECTRONICS LAB

(Hardware and Circuit Simulation Software) 60 Lectures
Max.Marks:25

1. To design an Amplitude Modulator using Transistor
2. To study envelope detector for demodulation of AM signal
3. To study FM - Generator and Detector circuit
4. To study AM Transmitter and Receiver
5. To study FM Transmitter and Receiver
6. To study Time Division Multiplexing (TDM)
7. To study Pulse Amplitude Modulation (PAM)
8. To study Pulse Width Modulation (PWM)
9. To study Pulse Position Modulation (PPM)
10. To study ASK, PSK and FSK modulators

Reference Books:

1. Electronic Communication systems, G. Kennedy, 1999, Tata McGraw Hill.
2. Electronic Communication system, Blake, Cengage, 5th edition.

ELB 204P: MICROPROCESSOR ANDMICROCONTROLLER LAB(Hardware and Circuit Simulation Software)

Max.Marks:25

At least 06 experiments each from Section-A and Section-B

Section-A: Programs using 8085 Microprocessor

1. Addition and subtraction of numbers using direct addressing mode
2. Addition and subtraction of numbers using indirect addressing mode
3. Multiplication by repeated addition.
4. Division by repeated subtraction.
5. Handling of 16-bit Numbers.
6. Use of CALL and RETURN Instruction.
7. Block data handling.
8. Other programs (e.g. Parity Check, using interrupts, etc.).

Section-B: Experiments using 8051 microcontroller:

1. To find that the given numbers is prime or not.
2. To find the factorial of a number.
3. Write a program to make the two numbers equal by increasing the smallest number and decreasing the largest number.
4. Use one of the four ports of 8051 for O/P interfaced to eight LED's. Simulate binary counter (8 bit) on LED's .
5. Program to glow the first four LEDs then next four using TIMER application.
6. Program to rotate the contents of the accumulator first right and then left
7. Program to run a countdown from 9-0 in the seven segment LED display.
8. To interface seven segment LED display with 8051 microcontroller and display 'HELP' in the seven segment LED display.
9. To toggle '1234' as '1324' in the seven segment LED display.
10. Interface stepper motor with 8051 and write a program to move the motor through a given angle in clock wise or counter clockwise direction.
11. Application of embedded systems: Temperature measurement & display on LCD

Reference Books:

1. Microprocessor Architecture Programming & applications with 8085, 2002, R.S. Goankar, Prentice Hall.
2. Embedded Systems: Architecture, Programming & Design, Raj Kamal, 2008, Tata McGraw Hill
3. The 8051 Microcontroller and Embedded Systems Using Assembly and C, M.A. Mazidi, J.G. Mazidi, and R.D. McKinlay, 2nd Ed., 2007, Pearson Education India.
4. 8051 microcontrollers, Satish Shah, 2010, Oxford University Press.
5. Embedded Microcomputer systems: Real time interfacing, J.W. Valvano 2011, Cengage Learning

B.Sc. II

BIOTECHNOLOGY

PAPER – I

MOLECULAR BIOLOGY & BIOPHYSICS

M.M. 50

UNIT-I

1. Nucleic Acid: Bases, Nucleosides and Nucleotides, DNA and RNA structure.
2. Plasmids.
3. Transposons: Repetitive elements, LINEs & SINEs, Structure of Gene.

UNIT-II

1. DNA Replication: Enzymes involved and mechanism of DNA Replication in Prokaryotes.
2. Mutation: Molecular level of Mutation, Types of Mutagens, Spontaneous and Induced Mutation.
3. DNA Repair: NER, BER and Mismatch Repair.

UNIT-III

1. Genetic Code: Features, Condon Assignment and Wobble hypothesis.
2. Transcription: Initiation, Elongation and Termination in Prokaryotes.
3. Translation: Initiation, Elongation and Termination Translation machinery in Prokaryotes. Operon-Concept of Operator, Regulator, Promoter gene, Inducer and Co-repressor.

UNIT –IV

1. Biophysics : Introduction, Scope and Application
2. Principle, Structure, Functions of the following:
   a. Microscopy b. Colorimeter and Spectroscopy c. Electrophoresis
   d. Centrifugation e. Chromatography.

UNIT –V

1. Radioisotopes techniques: Measurement of radioactivity, Ionization Chambers, Geiger Muller and Scintillation Counter.
2. Autoradiography and DNA Fingerprinting.
3. Biosensor.

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Biotechnology

List of Practical's

MOLECULAR BIOLOGY, BIOPHYSICS, RECOMBINANT DNA TECHNOLOGY AND GENOMICS

1. Isolation of DNA from Plant cell.
2. Estimation of DNA by DPA method.
3. Isolation RNA from yeast cells

Experiment based on-

4. Centrifugation
5. Spectrophotometer/Colorimeter
6. Electrophoresis
7. Paper chromatography/TLC

Experiment based on Bioinformatics -

8. Retrieve DNA /Protein sequence from Biological Data Bases (NCBI).
9. Use of tools studied

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SCHEME FOR PRACTICAL EXAMINATION

Time: 4 hrs. M.M.: 50

1. Experiment based on DNA/RNA	10 marks
2. Experiment based on Instruments	10 marks
3. Experiment based on Bioinformatics	10 marks
4. Spotting	10 marks
5. *Viva - Voce*	05 marks
6. Record / Sessional	05 marks

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BIOCHEMISTRY

PAPER - I

ENZYMOLOGY

M.M. 50

UNIT-I INTRODUCTION

History, general characteristics, nomenclature, IUB enzyme classification (rationale, over view and specific examples), significance of numbering system. Definitions with examples of holoenzyme, apoenzyme, coenzymes. cofactors, activators, inhibitors, active site (identification of groups excluded), metallo-enzymes, units of enzyme activity, specific enzymes, Isoenzymes, monomeric enzymes, oligomeric enzymes and multienzyme complexes. Enzyme specificity.

Hostorical perspective, nature of non-enzymatic and enzymatic catalysis. Measurement and expression of enzyme activity-enzyme assays. Definition of IU, Katal, enzyme turn over number and specific acitivity. Role of non-protein organic molecules and inorganic ions coenzyme, prosthetic groups. Role of vitamins as coenzymes precursors (general treatment).

UNIT-I ENZYME CATALSIS

Role of cofactors in enzyme catalysis : NAD/NADP+, FMN/FAD, coenzyme A, biocytin, cobamide, lipoamide, TPP, pyridoxal phosphate, tetrahydrofolate and metal ions with special emphasis on coenzyme functions. Acid-base catalysis, covalent, proximity and orientaton effects, strain and distortion theory. Mechanism of action of chymotrypsin, carboxypeptidase, ribonuclease and lysozyme.

UNIT-II ENZYME PURIFICATION

Methods for isolation, purification and characterization of enzymes.

UNIT-IV ENZYME KINETICS

Factors affecting enzyme activity : enzyme concentration, substrate concentration, pH and temperature. Derivation of Michaelis-Menten equation for uni-substrate reactions. Km and its significance. Line weaver-Burk plot and its limitations. Importance of K_{ca}/K_m. Bi-substrate reactions-brief introduction to sequential and ping-pong mechanism with examples.

Kinetics of zero and first order reactions. Significance and evaluation of energy of activation and free energy.

Reversible and irreversible inhibition, competitive, non-competitive and uncompetitive inhibitions. determination of K_m & V_{max} in presence and absence of inhibitor. Allosteric enzymes.

UNIT-V INDUSTRIAL AND CLINICAL APLLICATION OF ENZYME.

Immobilization of enzyme and their industrial applications. Production of glucose from starch, cellulose and dextran; use of lactase in dairy industry; production of glucose-fructose syrup from sucrose; use proteases in food, detergent and leather industry; medical application of enzymes. use of glucose oxidase in enzyme electrodes.

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Biochemistry

PAPER - II

INTERMEDIARY METABOLISM

M.M. 50

UNIT-I INTRODUCTION TO METABOLISM

General features of metabolism, experimental approaches to study metabolism; use of intact organism, becterial mutants, tissue slices, stable and radioactive isotopes.

CARBOHYDRATE METABOLISM

Reactions and energetics of glycolysis. Alcoholic and lactic acid fermentations. Entry of fructose, galactose, mannose etc. Reactions and energetics of TCA cycle. Gluconeogenesis, glycogenesis and glycogenolysis, Reactions and physiological signifacance of pentose phosphate pathway. Regulation of glycolysis and TCA cycle. Photosynthesis, a brief review.

UNIT-II ELECTRON TRANSPORT CHAIN AND OXIDATIVE PHOSPHORYLATION

Structure of mitochondria, sequence of electron carriers, sites of ATP production, inhibitors of electron transport chain. Hypothesis of mitochondrial oxidative phosphorylation (basic concepts). Inhibitors and uncouplers of oxidative phosphorylation. Transport of reducing potentials into mitochondria.

UNIT-III LIPID METABOLISM

Introduction, hydrolysis of triacylglycerols, transport of fatty acids into mitochondria. β – oxidation of saturated fatty acids, ATP yield from fatty acid oxidation. biosynthesis of saturated and unsaturated fatty acids. Metabolism of ketone bodies, oxidation of unsaturated and odd chain fatty acids. Biosynthesis of triglycerides and important phospholipids, glycolipids, sphingolipids and cholesterol. Regulation of cholesterol metabolism.

UNIT-IV AMINO ACID METABOLISM

General reactions of amino acid metabolism : transmination, oxodative deamination and decarboxylation. Urea cycle. Degradation and biosynthesis of amino acids. Glycogenic and ketogenic amino acids.

UNIT-V NUCLEOTIDE METABOLISM

Sources of the atoms in the purine and pyrimidine molecules. Biosynthesis and degradation of purines and pyrimidines. Regulation of purine and pyrimidine biosynthesis.

PORPHYRIN METABOLISM

Biosynthesis and degradation of porphyrins. Production of bile pigments.

PRECTICAL

1 Separation of Blood Plasm and Serum

a Estimation of proteins from serum by biuret and lowry methods.

b Determination of albumin and A/G ratio in serum.

2 Estimation of bilirubin (conjugated and unconjugated) in serum.

3 i Estimation of total lipids in serum by vanillin method.

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i. Estimation of cholesterol in serum.

4. Estimation of lipoproteins in plasma.

5. Estimation of lactic acid in blood before and after exercise.

6. Estimation of blood urea nitrogen from plasma.

7. Separation and identification of amino acids by (a) paper chromatography and (b) thin-layer chromatography.

8. Separation of polar and non-polar lipids by thin-layer chromatography.

9. Estimation of SGPT and SGOT in serum.

10. a. Assay of serum alkaline phosphatase activity.
    b. Inhibition of alkaline phosphatase activity by EDTA.
    c. Effect of substrate concentration on alkaline phosphatase activity and determination of its K_m value.

11. a. Effect of temperature on enzyme activity and determination of activation energy.
    b. Effect of pH on enzyme activity and determination of optimum pH.
    c. Effect of enzyme concentration on enzyme activity.

12. a. Preparation of starch from potato and its hydrolysis by salivary amylase.
    b. Determination of achromatic point in salivary amylase.
    c. Effect of sodium chloride onamylases.

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Singh BD, ***Genetics***, Kalyani Publication

Gupta, PK, ***Cell and Molecular Biology,*** Rastogi Publications, Meerut

Singh, BD, ***Biotechnology: Expanding Horizons,*** Kalyani publications

Gupta, PK, ***Elements of Plant Biotechnology,*** Rastogi Publications, Meerut

Gupta, SN, ***Concepts of Biochemistry,*** Rastogi Publications, Meeru

Jain, JL., Jain S, Jain, N, ***Fundamentals of Biochemistry***, S Chand Publishing, New Delhi

B.Sc.-III (Botany)

Practical

1. Study of host parasite relationship pf plant diseases listed above.
2. Demonstration of preparation of Czapek's Dox medium and Potato dextrose agar medium, sterilization of culture medium and pouring.
3. Inoculation in culture tubes and petriplates.
4. Gram Staining.
5. Microscopic examination of Curd.
6. Study of plant diseases as listed in the theory paper.
7. Biochemical test of carbohydrate and protein.
8. Instrumentation techniques

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PRACTICAL SCHEME

TIME: 4 Hrs. **M.M. : 50**

1.	Plant Disease/Symptoms	10
2.	Instrumentation techniques	05
3.	Staining of Microbes	05
4.	Tissue Culture techniques	05
5.	Spotting	10
6.	Project Work/ Field Study	05
5.	Viva-Voce	05
6.	Sessional	05

(Dr. J.N. Verma) (Dr. Rekha Pimpalgaonkar) (
Dr.Ranjana Shristava)

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Proff. & Head
Govt. N PG Science College
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Govt. Bilasa Girls College, Bilaspur

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B. Sc. Part III 2018-19

Zoology

Practical

The practical work in general shall be based on syllabus prescribed in theory.
The candidates will be required to show knowledge of the following:

- Estimation of population density, percentage frequency, relative density.
- Analysis of producers and consumers in grassland.
- Detection of gram-negative and gram-positive bacteria.
- Blood group detection (A,B,AB,O)
- R. B. C. and W.B.C count
- Blood coagulation time
- Preparation of hematin crystals from blood of rat
- Observation of Drosophila, wild and mutant.
- Chromatography-Paper or gel.
- Colorimetric estimation of Protein.
- Mitosis in onion root tip.
- Biochemical detection of Carbohydrate, Protein and Lipid.
- Study of permanent slides of parasites, based on theory paper.
- Working principles of pH meter, colorimeter, centrifuge and microscope.

Scheme of marks distribution **Time: 3:30hrs**

• Hematological Experiment	08
• Ecological Experiment: Grassland Ecosystem/ Population Density/Frequency/relative density	06
• Bacterial staining	05
• Biochemical experiment	06
• Practical based on Instrumentation (Chromatography/ pH meter/microscope/centrifuge.	05
• Spotting (5 spots)	10
7 Viva	05
8. Sessional	05

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CHEMISTRY

B.Sc. Part- III

PRACTICAL

Max. Marks-50

INORGANIC CHEMISTRY

Gravimetric analysis:

- Estimation of nickel (II) using Dimethylglyoxime (DMG).
- Estimation of copper as CuSCN
- Estimation of iron as Fe_2O_3 by precipitating iron as $Fe(OH)_3$.
- Estimation of Al (III) by precipitating with oxine and weighing as $Al(oxine)_3$ (aluminium oxinate).
- Estimation of Barium as $BaSO_4$

Inorganic Preparations:

- Tetraamminecopper (II) sulphate, $[Cu(NH_3)_4]SO_4.H_2O$
- Cis and trans $K[Cr(C_2O_4)_2.(H_2O)_2]$ Potassium dioxalatodiaquachromate(III)
- Tetraamminecarbonatocobalt (III) ion
- Potassium tris(oxalate)ferrate(III)/ Sodium tris(oxalate)ferrate(III)
- Cu(I) thiourea complex, Bis (2,4-pentanedionate) zinc hydrate; Double salts (Chrome alum/ Mohr's salt)

ORGANIC CHEMISTRY

1. Preparation of organic Compounds

- Acetylation of one of the following compounds: amines (aniline, o-, m-, p- toluidines and o-,m-, p-anisidine) and phenols (β-naphthol, vanillin, salicylic acid)
- Benzolyation of one of the following amines (aniline, o-, m-, p- toluidines and o-, m-, panisidine) and one of the following phenols (β-naphthol, resorcinol, p cresol) by Schotten-Baumann reaction.
- Bromination of any one of the following: a. Acetanilide by conventional methods b.Acetanilide using green approach (Bromate-bromide method)
- Nitration of any one of the following: a. Acetanilide/nitrobenzene by conventional method b. Salicylic acid by green approach (using ceric ammonium nitrate).
- Reduction of p-nitrobenzaldehyde by sodium borohydride.
- Hydrolysis of amides and esters.
- Semicarbazone of any one of the following compounds: acetone, ethyl methyl ketone, cyclohexanone, benzaldehyde.

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- Benzylisothiouronium salt of one each of water soluble and water insoluble acids (benzoic acid, oxalic acid, phenyl acetic acid and phthalic acid).
- Aldol condensation using either conventional or green method.
- Benzil-Benzilic acid rearrangement.
- Preparation of sodium polyacrylate.
- Preparation of urea formaldehyde.
- Preparation of methyl orange.

The above derivatives should be prepared using 0.5-1g of the organic compound. The solid samples must be collected and may be used for recrystallization, melting point and TLC.

2. Qualitative Analysis Analysis of an organic mixture containing two solid components using water, $NaHCO_3$, NaOH for separation and preparation of suitable derivatives.
3. Extraction of caffeine from tea leaves.
4. Analysis of Carbohydrate: aldoses and ketoses, reducing and non-reducing sugars.
5. Identification of simple organic compounds by IR spectroscopy and NMR spectroscopy. (Spectra to be provided).
6. Estimation of glycine by Sorenson's formalin method.
7. Study of the titration curve of glycine.
8. Estimation of proteins by Lowry's method.
9. Study of the action of salivary amylase on starch at optimum conditions.
10. Effect of temperature on the action of salivary amylase.

PHYSICAL CHEMISTRY

Conductometry

- Determination of cell constant
- Determination of equivalent conductance, degree of dissociation and dissociation constant of a weak acid.
- Perform the following conductometric titrations:
  - i. Strong acid vs. strong base
  - ii. Weak acid vs. strong base
  - iii. Mixture of strong acid and weak acid vs. strong base
  - iv. Strong acid vs. weak base
- To determine the strength of the given acid conductometrically using standard alkali solution.
- To determine the solubility and solubility product of a sparingly soluble electrolyte conductometrically
- To study the saponification of ethyl acetate conductometrically.

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8 Hrs. **PRACTICAL EXAMINATION** **M.M.50**

Five experiments are to be performed.

1. **Inorganic** - Two experiments to be performed. Gravimetric estimation compulsory **08 marks**. (Manipulation 3 marks)

   Anyone experiment from synthesis and analysis **04 marks**.

2. **Organic** - Two experiments to be performed. Qualitative analysis of organic mixture containing two solid components. compulsory carrying **08 marks** (03 marks for each compound and two marks for separation).

One experiment from synthesis of organic compound (Single step) **04 marks**.

3. Physical-One physical experiment **12 marks**.
4. Sessional **04 marks**.
5. Viva Voce **10 marks**.

In case of Ex-Students one mark each will be added to Gravimetric analysis and Qualitative analysis of organic mixture and two marks in Physical experiment.

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MICROBIOLOGY

BSc-3rd

Paper- I: Medical Microbiology and Immunology

UNIT-1: AIR BORNE DISEASES

Air borne diseases: Types- Tuberculosis, Pertussis, Diphtheria, Influenza, Small & Chicken pox, Mumps, Measles. Symptoms, treatment and prevention.

UNIT-2: WATER BORNE DISEASES

Concept and cause of water borne diseases; Types, Hepatitis, Dysentery, Diarrhea, Cholera, typhoid. Symptoms, treatment and prevention.

UNIT-3: CLINICAL DISEASE AND DIAGNOSIS

Clinical diseases: Diabetes, Asthma, multiple sclerosis, rheumatoid arthritis, cancer. Symptoms, Treatment and prevention.

UNIT-4: BASIC CONCEPT OF IMMUNITY

Immune system: Structure and function of the cells, tissues and organs of immune system. Types of immunity- humoral and cell-mediated, innate, acquired immunity. **Antigen- Antibody**: types, properties. Hapten, adjuvants, Immuno-globulins: Structure types, Properties and their function - Theory of antibody production.

UNIT-5: IMMUNO DISEASE DIAGNOSIS

Methods based on Ag-Ab interaction- precipitation, agglutination, ELISA, RIA, Immuno-electrophoresis, PCR based diagnosis method for infectious diseases.

Text Books Recommended:

1. Immunology: Kuby.
2. General Microbiology by Power and Daganiwala.
3. Zinssers Microbiology by K. J Wolfgang, McGraw- Hill Company.
4. Medical Microbiology; N. C. Dey and T.K. Dey, Allied agency, Calcutta.
5. Bacteriological Techniques by FJ Baker.
6. A Textbook of Microbiology; Dubey & Maheshwari; S. chand & Sons.
7. Scott's Diagnostic Microbiology by EJ Baron.

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Microbiology

PRACTICAL

M. M. 50

Isolation of bacteria from air and soil (crop fields)
Isolation of fungi from air and soil
Relationship between OD and CFU measurements.
Measurement of fungal growth by dry weight and wet weight
Study of rhizospheric and phyllospheric microbes from economically important plants.
Biodegradation study of some organic molecules
Microbial assessment of potable water.
Determination of BOD, COD and dissolved oxygen.
Determination of blood group by slide agglutination test./TLC/DLC
Determination of heamoglobin.
Determination of quality of milk by MBRT
Isolation of Rhizobium from root nodules.

Scheme of practical examination

Time 4 hour MM- 50

1. Exercise on immunological test	10
2. Exercise on water analysis	10
3. Exercise on isolation and characterization of micro organism	05
4. Spotting (1 to 5)	10
5. Viva voce	05
6. Sessional	10
	Total- 50

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B.Sc. Part-III

Paper-I

RELATIVITY, QUANTUM MECHANICS, ATOMIC MOLECULAR AND NUCLEAR PHYSICS

Unit-1 Reference systems, inertial frames, Galilean invariance propagation of light, Michelson-Morley experiment, search for ether. Postulates for the special theory of relativity, Lorentz transformations, length contraction, time dilation, velocity addition, variation of mass with velocity, mass-energy equivalence, particle with zero rest mass.

Unit-2 Origin of the quantum theory : Failure of classical physics to explain the phenomena such as black-body spectrum, photoelectric effect, Compton effect, Wave-particle duality, uncertainty principle, de Broglie's hypothesis for matter waves, the concept of Phase and group velocities, experimental demonstration of mater waves. Davisson and Germer's experiment. Consequence of de Broglie's concepts, Bohr's complementary Principle, Bohr's correspondence principle, Bohr's atomic model, energies of a particle in a box, wave packets. Consequence of the uncertainty relation, gamma ray microscope, diffraction at a slit.

Unit-3 Quantum Mechanics: Schrodinger's equation, Statistical interpretation of wave function, Orthogonality and normalization of wave function, Probability current density, Postulatory basis of quantum mechanics, operators, expectation values, Ehrenfest's theorem, transition probabilities, applications to particle in a one and three dimensional boxes, harmonic oscillator in one dimension, reflection at a step potential, transmission across a potential barrier.

Unit-4 Spectra of hydrogen, deuteron and alkali atoms spectral terms, doublet fine structure, screening constants for alkali spectra for s, p, d and f states, selection rules. Discrete set of electronic energies of moleculers, quantisation of vibrational and rotational energies, determination of inter-nuclear distance, pure rotational and rotation vibration spectra. Dissociation limit for the ground and other electronic states, transition rules for pure vibration and electronic vibration spectra. Raman effect, Stokes and anti-Stokes lines, complimentary character of Raman and infrared spectra, experimental arrangements for Raman spectroscopy.

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Unit-5 Structure of nuclei:- Basic Properties of Nuclei: (1) Mass, (2) Radii, (3) Charge, (4) Angular Momentum, (5) Spin, (5) Magnetic Moment (μ), (6) Stability and (7) Binding Energy, Nuclear Models:- Liquid Drop Model, Mass formula, Shell Model, Types of Nuclear reactions, laws of conservation, Q-value of reactions, Interaction of Energetic particles with matter, Ionization chamber, GM Counter, Cloud Chambers, Fundamental Interactions, Classification of Elementary Particles, Particles and Antiparticles, Baryons, Hyperons, Leptons, and Mesons, Elementary Particle Quantum Numbers: Baryon Number, Lepton Number, Strangeness, Electric Charge, Hypercharge and Isospin, introductory idea of discovery of Higg's Boson.

TEXT AND REFERENCE BOOKS:

1. H.S. Mani and G.K. Metha: "Introduction to Modern Physics"" (Affiliated East-West Press, 1989).
2. A Beiser, "Prospective of Modern Physics".
3. H.E. White, Introduction to Atomic Physic".
4. Barrow, "Introduction to Molecular Physics".
5. R.P. Feynman, R.B. Leighton and M Sands, "The Feynman Lectures on Physics", Vol.III (B.I. Publications, Bombay, Delhi, Calcutta, Madras).
6. T.A. Littlefield and N Thorley, "Atomic and Nuclear Physics" (Engineering Language Book Society)
7. H.A. Enge, "Introduction to Nuclear Physics", (Addision-Wesly)
8. Eisenberg and Resnick, "Quantum Physics of Atoms, Molecules, Solids, Nuclei and Particles" (John Wiley)
9. D.P. Khandelwal, "Optics and Atomic Physics", (Himalaya Publishing House, Bombay, 1988).
10. Quarks and Leptons, F. Halzen and A.D. Martin, Wiley India, New Delhi, 1984.
11. Radiation detection and measurement, G.F. Knoll (John Wiley & Sons, 2000).
12. Theoretical Nuclear Physics, J.M. Blatt & V.F.Weisskopf (Dover Pub.Inc., 1991).

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Paper-II

SOLID STATE PHYSICS, SOLID STATE DEVICES AND ELECTRONICS

Unit-1 Amorphous and crystalline solids, Elements of symmetry, seven crystal system, Cubic lattices, Crystal planes, Miller indices, Laue's equation for X-ray diffraction, Bragg's Law, Bonding in solids, classification. Cohesive energy of solid, Madelung constant, evaluation of Parameters, Specific heat of solids, classical theory (Dulong-Petit's law), Einstein and Debye theories, Vibrational modes of one dimensional monoatomic lattice, Dispersion relation, Brillouin Zone.

Unit-2 Free electron model of a metal, Solution of one dimensional Schrödinger equation in a constant potential, Density of states, Fermi Energy, Energy bands in a solid (Kronig-Penny model without mathematical details), Difference between Metals, Insulator and Semiconductors, Hall effect, Dia, Para and Ferromagnetism, Langevin's theory of dia and para-magnetism, Curie- Weiss's Law, Qualitative description of Ferromagnetism (Magnetic domains), B-H curve and Hysteresis loss.

Unit-3 Intrinsic and extrinsic semi conductors, Concept of Fermi level, Generation and recombination of electron hole pairs in semiconductors, Mobility of electrons and holes, drift and diffusion currents, p-n junction diode, depletion width and potential barrier, junction capacitance, I-V characteristics, Tunnel diode, Zener diode, Light emitting diode, solar cell, Bipolar transistors, pnp and npn transistors, characteristics of transistors, different configurations, current amplification factor, FET and MOSFET Characteristics.

Unit-4 Half and full wave rectifier, rectifier efficiency ripple factor, Bridge rectifier, Filters, Inductor filter, L and π section filters, Zener diode, regulated power supply using zener diode, Applications of transistors, Bipolar Transistor as amplifier, h-parameter, h-parameter equivalent circuit, Transistor as power amplifier, Transistor as oscillator, principle of an oscillator and Bark Hausen's condition, requirements of an oscillator, Wein-Bridge oscillator and Hartley oscillator.

Unit-5 Digital Circuits: Difference between Analog and Digital Circuits, Binary Numbers, Decimal to Binary and Binary to Decimal Conversion, AND, OR and NOT Gates (Realization using Diodes and Transistor), NAND and NOR Gates as Universal Gates, XOR and XNOR Gate, De Morgan's Theorems, Boolean Laws, Simplification of Logic Circuit using Boolean Algebra, Digital to Analog Converter, Analog to Digital Converter.

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Physics

TEXT AND REFERENCE BOOKS:

1. Introduction to solid state physics: C. Kittel.
2. Solid State Physics: A.J. Dekkar.
3. Electronic Circuits: Mottershead.
4. Electronic Circuits: Millman and Halkias.
5. Semiconductor Devices: S.M. Sze.
6. Electronic devices: T.L. Floyd.
7. Device and Circuits: J. Millman and C. Halkias.
8. Electronic Fundamental and Applications: D. Chatopadhyay and P.C. Rakshit.
9. Electricity and Magnetism: K.K. Tiwari.

PRACTICALS

Minimum 16 (Eight from each group)

Experiments out of the following or similar experiments of equal standard

1. Determination of Planck's constant.
2. Determination of e/m by using Thomson tube.
3. Determination of e by Millikan's methods.
4. Study of spectra of hydrogen and deuterium (Rydberg constant and ratio of masses of electron proton).
5. Absorption spectrum of iodine vapour.
6. Study of alkali or alkaline earth spectra using a concave grating.
7. Study of Zeeman effect for determination of a Lande g-factor.
8. Analysis of a given band spectrum.
9. Study of Raman spectrum using laser as an excitation source.
10. Study of absorption of alpha and beta rays.
11. Study of statistics in radioactive measurement.
12. Coniometric study of crystal faces.
13. Determination of dielectric constant.
14. Hysteresis curve of transformer core.
15. Hall-probe method for measurement of magnetic field.
16. Specific resistance and energy gap of semiconductor.
17. Characteristics of transistor.
18. Characteristics of tunnel diode.
19. Study of voltage regulation system.
20. Study of regulated power supply.

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B.Sc.(CS)
III Year

COMPUTTER SCIENCE

PAPER - I

(Paper Code-0909)

COMPUTER HARDWARE PART-C

AIM : The emphasis is on the design concepts & organisational details of the common PC, leaving the complicated Electronics of the system to the computer engineers.

Objective of the Course :

1. To introduce the overall organisation of the microcomputers and operating systems.
2. To introduce the interaction of common devices used with computers with operating softwares, excluding the Assembly languages, with special reference to DOS/WINDOWS.
3. To introduce the working of hardware components, Micro-Processor and various chips used in micro-computers by operating system, without the use of electronic circuitry.
4. To introduce the use of operating systems architecture with IBM-PC & clones, excluding Assembly language, with forms an important part of hardwares.

N.B. : Since the computer organisation study is very vast & complicated, so the study is restricted only to the description and understanding part, hence the paper-setter is requested to keep this important factor in mind.

UNIT-1 : ORGANISATION OF Micro-Processor & MIRCO-COMPUTER :-

1. **Introduction & organisation of Micro-Computer :**
   - (a) Basic Components of Micro-computer : Basic Block; Prom ram memory; Data memory; I/O Ports; Clock generator; Integration of functional blocks.
   - (b) Interconnecting Components in a Micro-computer : Necessary functional block; Bussed architecture for microcomputer; memory addressing; Addressing I/O ports; comparision of I/O mapped and memory mapped I/O.
   - (c) Input Output Techniques : Non-CPU devices, Program & interrupt controlled I/O; Hardware controlled I/O or DMA.
2. **An Introduction to the various as :**
   - (a) General understanding of different µP or CPU :
     Intel 8088, 286, 386, 486, 586 Pentium, P54C, MMX P55C; Motorola 6800 & 88100 series; CYRIX & AMD CPUs.
   - (b) The Registers of CPU : (Give Example of P-8088) Register organisation of 8088, Scrach pad segment, pointer, Index and Flag, Registers.
   - (c) Memory addressing modes of P-8088 : Segment offset; Data addressing modes; Addressing for branch instructions.
   - (d) I/O Addressing with P-8088 : Memory mapped I/O & I/O mapped I/O.

UNIT-2 : SYSTEM HARDWARE ORGANISATION OF COMPUTERS :

1. **Hardware Organisation of the Personal Computer :**
   - (a) Block diagram with various parts of PC.
   - (b) The Mother Board of General P.C. : 8088 CPU; ROM & RAM; Keyboard

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& its interface; System timer/counters; Hardware interrupt vectoring; DMA controller & channels; Interfacing to audio speaker; Bus slots & facture cards.

(c) The Serial I/O ports, COM-1 & COM-2.

(d) The parallel Port for Printer.

(e) Expansion Slots for RAM.

(f) Disk Controllers : For floppy, Hard disk, CD-ROM & Cassets drives.

2. **The Video Display of PCs :**

(a) Video Monitors; Monochrome and colour.

(b) Video Display Adapters & Their Video Modes; Monochrome & colour graphics adapters.

(c) Video Control Through ANSI-SYS.

(d) Video Control Through ROM-BOIS : INT 10H.

(e) Direct Video Control; Monochrom & colour graphics adapters.

(f) Installing Customized Character Sets.

UNIT-3 : ORGANISATION OF OPERTING SYSTEM WITH SYSTEM HARDWARE :

1 **The ROM-BIOS Services :**

(a) Introduction to UNIX, ENIX, SUN, solaris, DOS & MAC with special reference to DOS & Windows, its ver., as DOS becomes more popular than others in PCs.

(b) The ROM-BIOS Diskette Services, INT 13H.

(c) The ROM-BIOS Serial Port Services, INT 14H.

(d) The ROM-BIOS Keyboard Services, INT 16H.

(e) The ROM-BIOS Printer Services, INT 17H.

(f) Miscellaneous Service Provided by the ROM-BIOS : INT 05H, INT 11H, INT 12H, INT 18H, INT 19H, INT 1AH.

2 **The fundamental of Operating System viz. DOS/WINDOWS :**

(a) The loading of DOS & Its Basic Structure ; ROM bootstrap, IO.SYS, DOS.SYS & Command..COM.

(b) The Execution of the programs under DOS ; EXEC functions, program segment prefix; Features of COM & EXE program files.

(c) Device Handling by Dos ; FDD, HDD, CON, Keyboard, PRN, AUX, CLOCK and NUL devices; Block devices; Character devices; Driver installation sequence.

(d) File Structures of DOS ;

(e) The DOS Interrupts : INT 20H-2FH

(f) The DOS functions through INT 21H; Discuss only the understanding part of various other DOS function to handle hard & softwares.

(g) Installation of windows : Important system files in windows.

UNIT-4 : ORGANIZATION & HANDLING BY OPERATING SYSTEMS :

1 **Disk and Files under DOS :**

(a) Logical Structure of a Disk : Organisation of disk for use; Boot record ; FAT

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files; disk or root directory.

(b) File Organisation on a DOS disk : Logical volumes ; Sub directories; Volume lables.

(c) Manipulating Files under DOS : File attributes ; date and time, file Access; FCB functions.

2 **Memory Allocation, Program Loading and Execution :**

(a) Memory Management under DOS : EXEC loader; Memory Management & its functions; Modifying a Program's memory allocation.

(b) Loading and Executing Programs under DOS : The EXEC function ; Memory considerations; parameter blocks; calling & returning from EXEC.

(c) Loading the program overlays through EXEC.

UNIT-5 : ORGANISATION OF HARDWARE BY OPERATING SYSTEM :

1 **Interrupt Handling through DOS :**

(a) Types of interrupts.

(b) Interrupt Vector Table in PC.

(c) Interrupt Service Routines.

(d) Special Interrupts in PC : Clock Interrupt; The -C or Break Interrupt ; DOS reserved interupt INT 28H ; Patching memory resident routines.

2. **Filters for DOS :**

(a) Filters in operating systems.

(b) Redirection of I/O under DOS.

(c) The Filters Supplied with DOS.

(d) Writing Filters to run under DOS.

3. **Handling of Various Versions of Windows O.S. :**

(a) Setup Installation

(b) Trouble shooting

(c) Networking features

Text Book :

1 Hardware and Software of Personal Computers.
By Sanjay K. Bose. (Wiley Eastern Ltd. New Delhi).

Supporting Text Books :

1 Digital System from Gates to Microprocessor.
By Sanjay K. Bose. (Wiley Eastern Ltd. New Delhi).

4 Computer Fundamentals : Architecture & Organisation.
By B. Ram.. (Wiley Eastern Ltd. New Delhi).

Reference Books :

1 IBM PC-XT and Clones : By Govinda Rajalu.

2 Microprocessor and interfacing : By Douglas Hall.

3 Insight the IBM-PC : Peter Norton.

4 Micriprocessor System : 8086/8088 family architecture, programming & design : By Liu and Gibson.

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PAPER - II

(Paper Code-0910)

Atm : To introduce DBMS and RDBMS using Back-end tool and Front-end tool.

Object of the Course :

1. To introduce Data BAse Management System concepts.
2. To introduce the Relational Database Management System and Relational Database Design.
3. To introduce the RDBMS software and utility of query language.
4. To introduce basic concept of GUI Programming and database connectivity using Visual Basic.

UNIT-1 : CONCEPT OF D.B.M.S. AND DATA MODELS

(a) Introduction to DBMS :- Purpose of Data base systems, Views of data, Data Modeling Database Languages, Transaction management, Storage Management, Database Administrator and User, Database System Structure.

(b) E-R Model : Basic concepts, Constraints, Keys, Mapping Constaint, E-R Diagram, Weak and Strong Entity sets, E-R Database Schema, Reduction of an E-R Schema to Table.

UNIT-2. : RELATIONAL DATABASE MANAGEMENT SYSTEM

(a) Relational Model : Structure of Relational Database, Relational Algebra, Domain Relational Calculus, Extended Relational- Algebra Operation, Modification of database, Views.

(b) Relational Database Design : Pitfalls in Relational Database Desing, Decomposition Functional Dependencies, Normalization : 1NF, 2NF, BCNF, 3NF, 4NF, 5NF.

UNIT-3 : INTRODUCTION TO RDBMS SOFTWARE - ORACLE

(a) Introduction : Introduction to personal and Enterprises Oracle, Data Types, Commercial Query Language, SQL, SQL*PLUS.

(b) DDL and DML : Creating Table, Specifying Integrity Constraint, Modifying Existing Table, Dropping Table, Inserting Deleting and Updating Rows in as Table, Where Clause, Operators, ORDER BY, GROUP Function, SQL Function, JOIN, Set Operation, SQL Sub Queries. Views : What is Views, Create, Drop and Retrieving data from views.

(c) Security : Management of Roles, Changing Passward, Granting Roles & Privilege, with drawing privileges.

(d) PL/SQL : Block Structure in PL/SQL, Variable and constants, Running PL/SQL in the SQL*PLUS, Data base Access with PL/SQL, Exception Handling, Record Data type in PL/SQL, Triggers in PL/SQL.

UNIT-4 : G.U.I. PROGRAMMING

(a) Introduction to Visual Basic : Event Driven Programming, IDE, Introduction to Object, Controlling Objects, Models and Events, Working with Forms, MDI Form Working with standard Controls.

(b) Overview of Variables, Declaring, Scope, Arrays, User defined data types, Constants, Working with procedures : Function, Subroutine, and Property.

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Working with Data, Time, Format, String, and Math's Function. Controlling Program Execution: Comparison and Logical Operators, If...Then statements, Select Case Statement, Looping Structures, Exiting a loop. Error Trapping and Debugging.

(c) File Organization : Saving data to file. Sequential and Random access file, the desing and coding.

UNIT-5 : V DATA BASE PROGRAMMING IN VB

(a) Introduction :- Concept of DAO, RDO, ADO, input validation : field & form level validation, ADO object model : the ADO object Hierarchy, the connection object, the command object, record set object, parameter object, field object, record object, stream object, Error object, parameter object.

(b) Using Bound control to Present ADO data : Using the ADO data control, ADO data control properties, binding simple controls : Data list, data combo, Data Grid, Data Form Wizard : single form wizard, Grid form, master/Detail form. Programming the ADO data control : Refresh method, Event, Hierarchical flex Grid control.

(c) Data Environment & Data Report : Creating connection, Using command object in the data Environment, Data Environment option and operation, Binding Form to the data Environment, ADO Events in the Data report, Print Preview, Print, Export, Data report in code : Data reports Events, Binding data reports Directly.

REFERENCE BOOKS :

1 Data Base System Concept : By Hery F. Korth. Tata McGraw Hill

2 Fundamental of Data Base System Concept : Nawathe & Elmasri (Pearson educations)

3 Oracle Complete Reference : By Oracle Press

4 Introduction to OOPS & VB : By V.K. Jain, Vikas Publishing House

5 Database Programming VB 6 : By B.P.B. Publication

PRACTICALS :

1 **Practicals on Oracle :**

At least 20 practicals covering the SQL, PL/SQL, Triggers, Views.

2 **Practicals on Visual Basic :**

At least 20 pracricals on VB that covering basic and data controls components.

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21. Study of lissajous figures using CRO.
22. Study of VTVM.
23. Study of RC and TC coupled amplifiers.
24. Study of AF and RF oscillators.
25. Find roots of f(x) = 0 by using Newton-Raphson Method.
26. Find root of f(x) = 0 by using secant method.
27. Integration by Simpson rule.
28. To find the value of V at
29. String manipulations.
30. Towers of Hanoi (Non-recursive).
31. Finding first four perfect numbers.
32. Quadratic interpolation using Newton's forward-difference formula of degree two.

TEXT AND REFERENCE BOOKS:

1. B.G. Strechman, Solid state electronics devices II edition (Prentice-Hall of India New Delhi 1986)
2. W.D. Stanley, Electronics devices, circuits and applications (Prentice-Hall new jersey, USA 1988).
3. S. Lipschutz and A Poe; Schaum's outline of theory and problems of programming with Fortran (Mc Graw-Hill Book Co. Singapore, 1986).
4. C Dixon, Numerical Analysis.

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ELECTRONICS LABORATORY

The scheme of practical examination will be as follows-

Experiment	--	**30**
Viva	--	**10**
Sessional	--	**10**
Total	--	**50**

ELB 303P: INDUSTRIAL ELECTRONICS & PCB Design LAB **MM-25**
(Hardware and Circuit Simulation Software)
Max.Marks:25

1. Study of I-V characteristics of DIAC
2. Study of I-V characteristics of a TRIAC
3. Study of I-V characteristics of a SCR
4. SCR as a half wave and full wave rectifiers with R and RL loads
5. DC motor control using SCR.
6. DC motor control using TRIAC.
7. AC voltage controller using TRIAC with UJT triggering.
8. Study of parallel and bridge inverter.
9. Design of snubber circuit
10. Study of chopper circuits

Design and Fabrication of Printed Circuit Boards

1. Design automation, Design Rule Checking; Exporting Drill andGerber Files; Drills; Footprints and Libraries Adding and Editing Pins, copper clad laminatesmaterials of copper clad laminates, properties of laminates (electrical & physical),
2. Study of soldering techniques. Film master preparation, Image transfer, photo printing, Screen Printing, Plating techniques etching techniques,
3. Study of Mechanical Machining operations,Lead cutting and Soldering Techniques, Testing and quality controls.
4. Study ofLead cutting and Soldering Techniques, Testing and quality controls.

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BIOTECHNOLOGY

List of Practical's

PLANT, ENVIRONMENTAL, INDUSTRIAL AND MEDICAL BIOTECHNOLOGY

1. Preparation of Tissue culture media.
2. Sterilization of plant material.
3. Seed Germination, Root, Shoot and Callus Culture
4. Determination of total dissolved solids of water.
5. Determination of DO, BOD, COD of water.
6. Determination of Coliform by MPN Test.
7. Production of Enzymes/Antibiotics/Acids.
8. Effect of Biopesticides on microorganism
9. Antigen Antibody interaction- Determination of Blood Group and Rh factor.
10. Widal Test
11. VDRL Test.
12. ELISA Test.
13. Perform of Immuno-diffusion

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SCHEME FOR PRACTICAL EXAMINATION

Time: 4 hrs. **MM-50**

1. Experiment based on Paper - I	
(i) Plant tissue culture	08 marks
(ii) Environment / Industrial	07marks
2. Experiment based on Paper - II	15 marks
3. Spots	10marks
4. *Viva-voce*	05marks
5. Sessional/ Record	05marks

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BIOCHEMISTRY

PAPER - I

MOLECULAR BIOLOGY

UNIT-I BASIC CONCEPTS OF GENETIC INFORMATION

a Nucleic acids as genetic information carriers, experimental evidence e.g. bacterial genetic transformation, Hershey - Chase Experiment, TMV reconstitution rexperiment.

b Central dogma of molecular genetics - current version, reverse transcription and retroviruses.

c Primary structure of nucleic acids and their properties, silent features of eukaryotic, prokaryotic and viral genome; highly repetitive, moderately repretitive and unique DNA sequences.

d Basic concepts about the secondary structures of nucleic acids, 5' 3' direction antiparallel strands, base composition, base equivalence, bae pairing and base stacking in DNA molecule. and buoyant density and their.

UNIT-II STRUCTURAL LAVELS OF NUCLEIC ACIDS AND SEQUENCING

a Scondary and tertiary structure of DNA : Watson and Crick model, A.B. and Z types of DNA major and minor grooves, chirality of DNA, tertiary structure of DNA.

b Structure and properties of RNA; Classes of RNA secondary and tertiary structures.

c Nucleic acid hybridization : Cot T_m value and satellite DNA.

d Sequencing : Restriction and modification system; sequencing of DNA and RNA.

UNIT-III a DNA REPLICATION

DNA replication in prokaryotes - conservative, semi conservative and dispersive types, experimental evidence for semi conservative replication. DNA polymerases, other enzymes and protein factors involved in replication. Mechanism of replication. Inhibitors of DNA replication.

b TRANSCRIPTION

Transcription in prokaryotes RNA polymerase, promoters, initiation, elongation and termination of RNA synthesis, inhibitors of transcription. Reverse transcriptase, post transcriptional processing of RNA in eukaryotes.

UNIT-IV TRANSLATION AND REGULATION OF GENE EXPRESSION

a Genetic code : Basic feature of genetic code, biological significance of degeneracy. Wobble hypothesis, gene within genes and overlapping genes.

b Mechanism of translation : Ribosome tructure, A and P sites, charged tRNA, f-mat-tRNA initiator codon, Shine Dalgarno consensus sequence (AGGA), formation of 70S initiation complex, role of EF-Tu, EF-Ts, EF G and GTP, nonsense codons and release factors RF 1 and RF 2.

c Regulation of gene Expression in prokaryotes : Enzyme induction and repression,

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Bio-Chemistry

PRACTICAL FOR IIIrd YEAR

LABORATORY - III (BCH 305)

1. Estimation of DNA by diphenylamine method.
2. Effect of temperature on the viscosity of DNA using Ostwald's Viscometer.
3. Extraction of RNA and its estimation by Orcinol method.
4. Estimation of hemoglobin by measuring total iron in blood.
5. Estimation of calcium and phosphorus in serum & urine.
6. Estimation of creatine and creatinine in urine.
7. Estimation of immunoglobulins by precipitation with saturated ammonium sulphate.
8. Denaturation fo enzyme, studies on DNA.
9. a Separation of proteins by column chromatography.
   b Determination of proteins by dye binding assay.
10. Separation of proteins by SDS-polyacrylamide gel electrophoresis.

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b. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.

c. Apart from Question No. 1, rest of the paper shall consist of five units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 15 marks.

10. The Year wise Structure & plan of the programme shall be as follows :

SCHEME OF EXAMINATION BCA PART-I

Paper no.	Title of Paper/s	Maximum Marks		Maximum Marks	Minimum Passing Marks
		Theory	Practical		
1.	आधार पाठ्यक्रम–हिन्दी भाषा	75	--	75	26
2.	Foundation Course- English Language	75	--	75	26
3.	Environmental Studies & Human Rights **(Additional & Compulsory)**	75	25	100	33
4.	Discrete Mathematics	100	--	100	33
5.	Computer Fundamental and Concepts of Software	100	--	100	33
6.	PC Software Packages and Programming in C	100	--	100	33
7.	Data Structure	100	--	100	33
8.	Lab-1 Software Packages Lab	--	75	75	25
9.	Lab-2 Programming lab in C	--	75	75	25
	Total Marks	**650**	**150**	**800**	

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LAB-I
SOFTWARE PACKAGES LAB

The lab exercise should be based on MS Windows 7 or higher version and MS Office 2007 or higher version and comprises the theoretical paper as well as practical paper.

Section-A

WINDOWS 7 : Basic Elements of WINDOWS, My Computer, Sharing Devices, Windows Explorer, Accessories: Entertainment, Communication, System Tools, Paint Brush, Calculator, Calendar, Clock, Note Pad, Word Pad Etc., Control Panel, Changing Color and Theme, Changing the Desktop Background, Screen Saver, Adjusting Display Settings, Adjusting Sound, Adjusting the Mouse, Changing the Date and Time.

Section-B

Introduction to MS Word: Menus, Shortcuts, Document types; Working with Documents: Opening Files – New & Existing, Saving Files, Formatting page and Setting Margins, Converting files to different formats- Importing, Exporting, Sending files to others, Editing text documents- Inserting, Deleting, Cut, Copy, paste, Undo, Redo, Find, Search, Replace, Using Tool bars, Ruler- Using Icons, Using help; Formatting Documents: Setting Font Styles, Setting Paragraph style, Setting Page Style, Setting Document Styles, Creating Tables, Drawing, Tools, Printing Documents.

Section-C

Introduction to MS Power Point: Opening new Presentation, Different presentation templates, Setting backgrounds, Selecting presentation layouts, Creating a presentation, Formatting a presentation-Adding style, Color, gradient fills, Arranging objects, Adding Header & Footer, Slide Background, Slide layout, Inserting pictures, movies, tables.

Section-D

Introduction to MS Excel: Introduction: Spreadsheet & its Applications, Opening spreadsheet, Menus & Toolbars & icons, Shortcuts, Working with Spreadsheets-Opening a File, Saving Files, Setting Margins, Converting files to different formats- Importing, Exporting and Sending files to others, Spreadsheet addressing, Entering and Editing Data, Computing data- Setting Formula, Finding total in a column or row, Mathematical operations, Formulas, Formatting Spreadsheets & Printing worksheet.

Section-E:

Introduction MS Access: Database concepts: Tables, Queries, Forms, Reports, Opening & Saving database files: Creating Tables, Table Design, Indexing, Entering data, Importing data, Creating Queries: SQL statements, Setting relationship, Creating Forms: GUI, Form, Creating & printing reports.

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LAB-II
PROGRAMMING LAB IN C

1. Program to find area and circumference of circle.
2. Program to find the simple interest.
3. Program to convert temperature from degree centigrade to Fahrenheit.
4. Program to calculate sum of 5 subjects & find percentage.
5. Program to show swap of two no's without using third variable.
6. Program to reverse a given number.
7. Program to print a table of any number.
8. Program to find greatest in 3 numbers.
9. Program to show the use of conditional operator.
10. Program to find that entered year is leap year or not.
11. Program to find whether given no is even or odd.
12. Program to shift inputed data by two bits to the left.
13. Program to use switch statement. Display Monday to Sunday.
14. Program to display arithmetic operator using switch case.
15. Program to display first 10 natural no & their sum.
16. Program to print Fibonacci series up to 100.
17. Program to find GCD & HCF of given Numbers using Recursion.
18. Program to find whether given no is a prime no or not.
19. Program to display sum of series 1+1/2+1/3+.....+1/n.
20. Program to display series and find sum of 1+3+5+.....+n.
21. Program to use bitwise AND operator between the two integers.
22. Program to add two number using pointer.
23. Program to find sum, subtraction, multiplication & transpose of matrices.
24. Program to reverse a number using pointer.
25. Program to show input and output of a string.
26. Program to find square of a number using functions.
27. Program to swap two numbers using functions.
28. Program to find factorial of a number using functions.
29. Program to show table of a number using functions.
30. Program to show call by value.
31. Program to show call by reference.
32. Program to find largest of two numbers using functions.
33. Program to find factorial of a number using recursion.
34. Program to find whether a string is palindrome or not.

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The break-up of marks for second Year's Practical will be as under :			
Sr. No.	Argument	Maximum Marks	Minimum Passing Marks
1.	Lab Record	15	
2.	Viva-voce	20	
3.	Program Development and Execution	40	
Total Marks		75	25

SCHEME OF EXAMINATION

Paper no.	Title of Paper/s	Maximum Marks		Maximum Marks	Minimum Passing Marks
		Theory	Practical		
1.	आधार पाठ्यक्रम–हिन्दी भाषा	75	--	75	26
2.	Foundation Course- English Language	75	--	75	26
3.	Operating System	100	--	100	33
4.	Digital Electronics and Microprocessor	100	--	100	33
5.	Computer Networks and Cyber Technology	100	--	100	33
6.	Object Oriented Programming Using C++	100	--	100	33
7.	Computer Graphics and Multimedia	100	--	100	33
8.	Lab-1 Programming Lab Using C++	--	75	75	25
9.	Lab- 2 Multimedia Lab	--	75	75	25
	Total Marks	**650**	**150**	**800**	

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LAB-I
PROGRAMMING LAB USING C++

List of Sample Problems/Experiments:

1. Write a C++ program to find the sum of individual digits of a positive integer.
2. A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1.Subsequent terms are found by adding the preceding two terms in the sequence.Write a C++ program to generate the first n terms of the sequence.
3. Write a C++ program to generate all the prime numbers between 1 and n , where n is a value supplied by the user.
4. Write C++ programs that use both recursive and non-recursive functions
   a. To find the factorial of a given integer. b. To find the GCD of two given integers.
   c. To find the nth Fibonacci number.
5. Write a C++ program that uses a recursive function for solving Towers of Hanoi problem.
6. Write a C++ program to find both the largest and smallest number in a list of integers.
7. Write a C++ program to implement the matrix ADT using a class. The operations supported by this ADT are:
   a)Reading a matrix. c) Addition of matrices.
   b)Printing a matrix. d) Subtraction of matrices.
   e)Multiplication of matrices.

Note: Practical must be as per syllabus of theoretical paper.

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LAB-II
MULTIMEDIA LAB

Series of Practical Curriculums

Photoshop:

1. (i) Handling different file formats and interchanging them, changing the resolution, color, grayscales and size of the images
(ii) Using brushes and creating multicolor real life images
2. Cropping, rotating, overlapping, superimposing, pasting photos on a page
3. Creation of a single image from selected portions of many
4. Developing a commercial brochure with background tints
5. Creating an image with multi-layers of images and texts.
6. Applying masks and filtering on images

7. CorelDRAW X4 Part 1

- Getting Started with CorelDRAW
- Starting CorelDRAW
- Working with Command Bars
- Working with Layers
- Examining a Master Page
- Creating a Master Layer
- Working with Layers
- Using Brush Tools and Adding Objects
- Working with Interactive Tools
- Using Advanced Techniques for Text Manipulation
- Working with Paragraph Text
- The PowerClip Feature and the Envelope Tool
- Creating Bulleted Lists
- Working with Vector and Bitmap Graphics
- Converting Vector Objects to Bitmaps
- Working with Bitmap Graphics
- Introduction to CorelTRACE
- Advanced Output Options
- Preparing a Document For Printing
- Other Printing Options

The break-up of marks for Fourth Year's Practical will be as under :			
Sr. No.	Argument	Maximum Marks	Minimum Passing Marks
1.	Lab Record	15	
2.	Viva-voce	20	
3.	Program Development and Execution	40	
Total Marks		75	25

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SCHEME OF EXAMINATION

Paper no.	Title of Paper/s	Maximum Marks		Maximum Marks	Minimum Passing Marks
		Theory	Practical		
1.	आधार पाठ्यक्रम–हिन्दी भाषा	75	--	75	26
2.	Foundation Course- English Language	75	--	75	26
3.	Computer Organization and Architecture	100	--	100	33
4.	Software Engineering	100	--	100	33
5.	Database Design and RDBMS (Oracle)	100	--	100	33
6.	Web Technology	100	--	100	33
7.	Numerical Analysis	100	--	100	33
8.	Lab-1 RDBMS & Web Technology	--	75	75	25
9.	Lab-2 Minor Project	--	75	75	25
	Total Marks	**650**	**150**	**800**	
	Grand Total Marks of BCA- I, II & III			**2400**	

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LAB-I
RDBMS & WEB TECHNOLOGY
Practical as per syllabi of theoretical paper.

The break-up of marks for Third Year Practical will be as under :			
Sr. No.	Argument	Maximum Marks	Minimum Passing Marks
1.	Lab Record	15	
2.	Viva-voce	20	
3.	Program Development and Execution	40	
	Total Marks	75	25

BCA PART-III
LAB-II
Minor Project

The break-up of marks for Project will be as under :			
Sr. No.	Argument	Maximum Marks	Minimum Passing Marks
1.	Project Report	25	
2.	Viva-voce/ Presentation	25	
3.	Project Execution	50	
Total Marks		100	50

SCHEME OF EXAMINATION FOR ONE YEAR DCA PROGRAMME
w.e.f. Session 2017-18

Paper No.	Title of the Paper/s	Term End Examination Maximum marks	Total Maximum Marks	Minimum Passing Marks in Term End Examination
I	Fundamentals of Computers	100	100	33
II	Windows & PC Packages	100	100	33
III	Print Technology and Desktop Publishing	100	100	33
IV	Internet and Web Technology	100	100	33
V	Programming in C	100	100	33
VI	Introduction to Operating System	100	100	33
VII	LAB-I PC Package and DTP Lab	100	100	33
VIII	LAB-II Programming in C Lab	100	100	33
		Total Marks	**800**	

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PAPER-VII
LAB-I
PC PACKAGE AND DTP LAB

Note: - Practical should cover syllabus of respected theoretical papers.

The break-up of marks for Practical will be as under :			
Sr. No.	Argument	Maximum Marks	Minimum Passing Marks
1.	Lab Record	20	
2.	Viva-voce	30	
3.	Program Development and Execution	50	
	Total Marks	100	33

PAPER-VIII
LAB-II
PROGRAMMING IN C LAB

Note: - Practical should cover syllabus of respected theoretical papers.

The break-up of marks for Practical will be as under :			
Sr. No.	Argument	Maximum Marks	Minimum Passing Marks
1.	Lab Record	20	
2.	Viva-voce	30	
3.	Program Development and Execution	50	
	Total Marks	100	33

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प्रपत्र

विषय / संकाय / प्रश्न–पत्र का नाम– **B.Com.(Computer Application)**

कमांक	कक्षा का नाम	वर्तमान पाठ्यक्रम	नवीन संशोधित पाठ्यक्रम	नवीन संशोधित पाठ्यक्रम का औचित्य
1.	1st Year	COMPUTER FUNDAMENTALS AND OFFICE AUTOMATION	COMPUTER FUNDAMENTAL	Updation Required
2.	1st Year	COMPUTERIZED FINANCIAL ACCOUNTING	PC SOFTWARE AND MULTIMEDIA	Updation Required
3.	1st Year	PRACTICAL	PRACTICAL	Updation Required
4.	2nd Year	INTERNET APPLICATION & E-COMMERCE	INTERNET APPLICATION & E-COMMERCE	No Change
5.	2nd Year	RELATIONAL DATABASE MANAGEMENT SYSTEM	RELATIONAL DATABASE MANAGEMENT SYSTEM	No Change
6.	2nd Year	PRACTICAL	PRACTICAL	No Change
7.	3rd Year	PROGRAMMING IN VISUAL BASIC	PROGRAMMING IN VISUAL BASIC	No Change
8.	3rd Year	SYSTEM ANALYSIS, DESING & MIS	SYSTEM ANALYSIS, DESING & MIS	No Change
9.	3rd Year	PRACTICAL	PRACTICAL	No Change

केन्द्रीय अध्ययन मंडल के अध्यक्ष एवं सदस्यों का हस्ताक्षर

S.N.	Name	Designation/University/College	Signature with Date
1.	Dr. Sanjay Kumar	Head, S.o.S. in Computer Science & I.T., Pt. R.S. University, Raipur	11-06-2018
2.	Mr. Hari Shankar Prasad Tonde	Head, Dept. of Computer Science, Sarguja University, Ambikapur	11-06-18
3.	Dr. Anuj Kumar Dwivedi	Head, Dept. of Computer Science, Govt. V.B.S.D. Girls College, Jashpur Nagar, Jashpur	11/6/2018
4.	Mr. L.K. Gavel	Head, Dept. of Computer Science, Govt. G.S.G. P.G. College Balod	11/06/18
5.	Dr. J. Durga Prasad Rao	Head, Dept. of Computer Science, Shri Sankracharya Mahavidyalaya, Bhilai	11/6/18

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Practical

- At least 20 Practical based on Syllabus of Paper-I and Paper-II.

11-06-2018
(Dr. Sanjay Kumar)

11/6/2018
(Dr. A.K. Dwivedi)

11/6/18
(L.K. Gavel)

11/6/18
(Dr. J. Durga Prasad Rao)

11-06-18
Hari Shankar Prasad Tandel

B. Com II year
(Computer Application)

COMPUTER APPLICATION

MARKS DISTRIBUTION

Theory Paper — Paper - I — Total Marks - 50

Paper - II — Total Marks - 50

Every unit of theory paper will consists of 10 marks.

Practical Paper — Total Marks - 50

Practical Marks Distribution :

Viva	- 10
Internal	- 15
Practical	- 25
Total Marks	- 150

Practical Test will consist of 3 Hrs.

Syllabus of B.Com.-II (Computer Application)

PAPER - I

INTERNET APPLICATION & E-COMMERCE

(Paper Code-1139)

UNIT - I Introduction to HTML

Introduction to Internet & World Wide Web

Internet - Indian and the Internet, Profile of Indian Surfer, History of the Internet, Indian Internet History, Technological Foundation of Internet, Application in Internet Environment, Movement of files/data between two computers, TCP/IP, IP Addresses, Domain Name System, Domain Name Services, allocation of second level domains in India, Internet & India.

World Wide Web (WWW) - WWW consortium browsing and Information retrieval, exploring the WWW, address : URL.

UNIT - II

Introduction to HTML & Designing Web Page

Concept to Website, Web standards, What is HTML, HTML documents / file, HTML Editor, Explanation of the structure of Homepage, Elements in HTML Documents, HTML Elements, HTML Tags & Basic HTML Tags, viewing the source of web page & downloading the web page source, Extensible HTML, CSS, XML, XSL.

HTML Document Structure - Head Section

Illustration of Document Structure, Mark-up elements within the Head : BASE, ISINDEX, LINK, META, TITLE, SCRIPT.

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11-06-2018 (Dr. A.K. Dwivedi) (L.K. Gavel) Hari Shankar Prasad Tande (Dr. J. Dayal)

UNIT - V

(a) **Security** : Management of Roles, Changing Password, Granting Roles & Privilege, with drawing privileges.

(b) **PL/SQL** : Block Structure in PL/SQL, Variable and constants, Running PL/SQL in the SQL*PLUS, Data base Access with PL/SQL, Exception Handling, Record Data type in PL/SQL, Triggers in PL/SQL.

SUGGESTED BOOKS :

1 Data base system : Korth & Siberschatz.

2 An Introduction to Data base System : C.J. Date

PAPER - III

PRACTICAL EXERCISES BASED ON PAPER I & II

Practicals to be done :

1 Creating simple Web-pages using html.

2 Designing *business web-sites* using HTML features (e.g. html forms)

[Each student should study the existing *business web-sites* and do atleast 05 exercises to create business websites using various html features]

3 Should perform various queries using SQL.

[Each student should create ER diagrams for various business scenario, and convert it into tables, using any RDBMS Software (i.e. Oracle / Access)

4 Practical using various aspects of Oracle.

[At least 10 practical-exercises covering the contents of paper-II]

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11/06/18 (C.K. Gavel)

11-06-18 Hari Chandan Prasad Pande

11/6/18 (Dr. J. Durga Prasad)

11-06-2018 (Dr. Sanjay Kumar)

UNIT-IV Introduction to MIS & Other Subsystem-

Evolution of MIS, Need of MIS, Definition & Benefits of MIS, Characteristic, Role component of Information system, data base as a future of MIS, Decision making, logic of Management Information system. Structure of MIS.

UNIT-V Information System Concept -

Difference between Transaction Processing System (TPS) and Management Information System, How MIS works, MIS and Information Resource Management, Quality information Building Blocks for the information system, information system concept, Other system characteristic (Open & Closed System), difference between MIS & Strategic System, Adaptive system, Business function information system.

BOOK REFERENCE :

1. System Analysis and Design - Elias M. Awad.
2. System Analysis and Design - Alan Dennis & Barbara Haley Wixo.
3. Management Information systems - C.S.V. Murthy, Himalaya Publication House.

PAPER - III

PRACTICAL EXERCISES BASED ON PAPER I & II

Practicals to be done -

1. At least 20 practical - exercises covering the contents of paper - I (e.g. Designing calculator, sorting of elements, Generating Fibbonacci series)
2. Design the Project on one of the following - Application Software / Website Design/ Accounting software / Inventory control System / System Software & other (e.g. Library Management System, Medical management, Stock Management, Hotel Management, Website for your institute / Website of any Organization)
3. The Project Report cover the following topic - Objective, Hardware & Software Requirements, Analysis, Design, Coding, input forms, testing, Reports, Future enhancement of s/w.
4. Practical exam is based on the Project Demonstration & report.

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- - - - - - - -

11-06-2018
(Dr. Sanjay Kumar)

11/6/18
(Dr. A.K. Dwivedi)

11/06/18
(L.K. Gauri)

11.06.18
Hari Shankar Prasad Tande

11/6/18
(Dr. J. Durga Rao)

YEAR WISE PLAN
PGDCA

S.N.	Subject Name	End Semester Examination Maximum Marks	End Semester Examination Minimum Passing Marks
1.	Fundamentals of Computer and Information Technology	100	40
2.	PC- Packages and Computerized Accounting System	100	40
3.	Data Communication and Computer Network	100	40
4.	Programming using 'C' & C++	100	40
5.	Relational Database Management System (Oracle)	100	40
6.	System Analysis & Design	100	40
7.	PC Package and Tally ERP Lab	50	17
8.	C,C++ and Oracle Lab	50	17
9.	Project	100	40

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PC Package & Tally ERP Lab

Note: Practical should be as per syllabus of theoretical papers.

C, C++ & Oracle Lab

Note: Practical should be as per syllabus of theoretical papers.

PROJECT

Note:

01. It is compulsory, that students would have group of maximum of two students and project should be done under Government sectors/ Public Sector/ Pvt. Limited S/W Company/ Software Technology park of India/ ISO 9001 certified company etc.
02. The students should not make any project under local or private institutions.
03. The students should make project themselves and project will not be copy of other project.

Steps for Live Project

01. Getting customer's requirements
02. Designs, database and business logics.
03. Developing software application project.
04. Testing and implementing the project.
05. Troubleshooting the project application after implementation.

The break-up of marks for Practical will be as under :			
Sr. No.	**Argument**	**Maximum Marks**	**Minimum Passing Marks**
1.	Lab Record	10	
2.	Viva-voce	20	
3.	Program Development & Execution	20	
Total Marks		50	17

The break-up of marks for Practical will be as under :			
Sr. No.	**Argument**	**Maximum Marks**	**Minimum Passing Marks**
1.	Project Report	25	
2.	Viva-voce/ Presentation	25	
3.	Project Execution	50	
Total Marks		100	40

PRINCIPAL

YEAR WISE PLAN
PGDCA

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9.	Project	100	40

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PC Package & Tally ERP Lab
Note: Practical should be as per syllabus of theoretical papers.

C, C++ & Oracle Lab
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The break-up of marks for Practical will be as under :			
Sr. No.	**Argument**	**Maximum Marks**	**Minimum Passing Marks**
1.	Project Report	25	
2.	Viva-voce/ Presentation	25	
3.	Project Execution	50	
Total Marks		100	40

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Books Recommonded

1. Manual of Foreign Exchange H.E Evitt.
2. A Text book on Foreign Exchange P.Einzlti.
3. Foreign Exchange Arthmtic V.V. Keshkamat.
4. Principles and Arithmetic of Foreign Exchange O.S. Ramamurty.
5. Finance of Foreign Trade and Foreign Exchange V.V.Venkatraman
6. Foreign Exchange and Introduction .V.V. Keshkamat.
7. Finance of Foreign Trade and Foreign Exchange G S. Lall.
8. Finance of Foreign trade and Foreign Exchange B.C.Ajmera.

Procedure of Internal evaluation for the students of Diploma course of Banking.

1. Internal evaluation would be a countinuous process which may take the form of graidings for class participation and home assigement Each candidate will be required to (i) Submit two howme assignment in the form of two papers concerning each subject and (ii) Participate in class discussion and seminars.On the basis of this grading the teacher concerned would prepare the subject wise award lists.
2. The Papers submitted by the students will be returned to the dodidates after evaluation .if the papers are not found upto the standard The students if he so desires, will be advised to resubmit the paper on the lines suggested by the teacher and the papers then will be finally as sessed.
3. The award list as finalised by the head of the department of commerce of the institute would be forwarded to the Universily , through the principal of the institute.ordinarily by the 31st March.
4. Distribution of marks between examination and internal assessment will be 75/25.
5. The marks of Internal assessment obtained by student will be carried over towards his subsequent examination in which he appears as ex student if he has obtained more than 48% marks in each internal evaluations.

COURSE DETAILS FOR

P/G DIPLOMA IN BUSINESS MANAGEMENT

PAPER -1	MANAGEMENT CONCEPTS AND ORGANISATIONAL BEHAVIOUR
PAPER -2	PORTFOLIO - MANAGEMENT AND TOTAL QUALITY MANAGEMENT
PAPER - 3	HUMAN RESOURCE MANAGEMENT
PAPER - 4	PRODUCTION AND OPERATION MANAGEMENT
PAPER - 5	MARKETING RESEARCH AND CONSUMER BEHAVIOUR

Students will have to visit any industry and prepare a report under the guidence of their mead of the department The "Viva-Voce" will be held immeddiately after or before the annual Examination.

A.	Theory Paper (5 Paper)	- 500 Marks
B.	Industrial visit report	- 100 Marks
C.	Viva - Voce	- 100 Marks
D.	Internal Marks for Class activities	- 100 Marks

All students have to give three internal written tests for each theory Paper Each test will Carry 25 Marks and minimum Passing Marks will be .....12 for each test. Average of best of the three written papers will be count for annual result of internal evalution

- An external examiner will be appointed to conduct the viva-voce by University.
- The report of the Industrial visit will be valued by External Examiner.

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SEMESTER SYLLABUS

M.A. GEOGRAPHY

SCHEME OF EXAMINATION & DISTRIBUTION OF MARKS

SEMESTER – I

Paper No.	Title of the Paper(s)	Internal Assessment	Term End Exam	Total Marks
1.	Geomorphology	20	80	100
2.	Climatology	20	80	100
3.	Evolution of Geographical thoughts	20	80	100
4.	Geography of India	20	80	100
Prac-1	Instrumental Survey	-	-	100
			Total	500

SEMESTER – II

Paper No.	Title of the Paper(s)	Internal Assessment	Term End Exam	Total Marks
1.	Applied Geomorphology	20	80	100
2.	Oceanography	20	80	100
3.	Geographical Methodology	20	80	100
4.	Geography of Chhattisgarh	20	80	100
Prac-1	Cartography	-	-	100
			Total	500

SEMESTER – III

Paper No.	Title of the Paper(s)	Internal Assessment	Term End Exam	Total Marks
1.	Rural Settlement Geography	20	80	100
2.	Resource Geography	20	80	100
3.	Regional Planning & Development	20	80	100
4.	Population Geography with special reference of world	20	80	100
Prac-1	Statistical Technique & field survey			100
			Total	500

SEMESTER – IV

Paper No.	Title of the Paper(s)	Internal Assessment	Term End Exam	Total Marks
1.	Population Geography with special reference of India	20	80	100
2.	Urban Geography	20	80	100
3.	Agricultural Geography	20	80	100
4.	Resource Conservation & Management	20	80	100
Prac-1	Advanced Cartography	-	-	100
			Total	500

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SEMESTER SYLLABUS

M.A. GEOGRAPHY

M.A. I SEMESTER PRACTICAL
INSTRUMENTAL SURVEY

1. surveying- importance of instrumental surveying and application -survey instruments.
2. **Prismatic Compass-**

   Method of prism pass surveying: Radiation, inter section and traverse, correction of bearing, Elimination the closing error, Bow ditch method.
3. **Plane table-**

   Plan preparation, methods of plane table surveying - radiation, inter section, traverse & resection method.
4. **Dumpy level:-**

   Meaning of the terms used in leveling Method of leveling:- simple leveling, differential leveling. Profile.
5. **Theodolite:-**Meaning of terms used in theodolite surveying, measurement of horizontal distance & vertical height, accessible and non accessible method, digital surveying equipment- Electronic Distance measurement (EDM) instruments, total station, global positioning system (GPS).

SUGGESTED READINGS-

1.. Monk house, F.J. & H.R. Wilkinson : Map and Diagrams, methouen, London.

2. Singh, L. R. : Practical Geography.

3. शर्मा, जे.पी., :प्रायोगिक भूगोल

4.चौहान, पी.आर. : प्रयोगात्मक भूगोल

5.यादव, हीरालाल, प्रायोगिक भूगोल

6.चंद्रकारपी. सर्वेक्षण विधि तंत्र, एस. शारदा पब्लिकेशन, बिलासपुर

7.SarkarAashish Practical Geography

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ATAL BIHARI VAJPAYEE VISHWAVIDYALAYA BILASPUR (C.G.)

SEMESTER SYLLABUS

M.A. GEOGRAPHY

M.A. Geography Semester I shall consist the following papers :

1. The M.A. Semester -I examination in Geography shall consist of 500 marks.
2. The theory papers shall be of three hours duration.
3. Candidates will be required to pass separately in theory and practical examination.
4. a) In the practical examination the following shall be allotment of time and marks.

i)	Practical Record	20% Marks
ii)	Survey (up to six hours)	70% Marks
iii)	Viva on i and ii	10% Marks

b) The external and internal examiners shall jointly submit marks.

c) All the candidates shall present at the time of the practical examination their practical record regularly signed by the teachers concerned.

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ATAL BIHARI VAJPAYEE VISHWAVIDYALAYA BILASPUR (C.G.)

SEMESTER SYLLABUS

M.A. GEOGRAPHY

M.A. GEOGRAPHY
SEMESTER-II

PRACTICAL

OBEJECTIVES:

To apprise the student with latest trends in the development of cartography as a tool in mapping thematic and quantitative data to facilitate spatial analysis and synthesis. To enhance the skill of the students in field of survey and to understand the basic

1. Principles of Map making & concept of Cartography
2. Topographical information: International Series, South East Asia Series, Indexing, Classification and interpretation of topographical sheets, profiles
3. Morphometric Analysis: Hypsometric curve, Altimetry cursive, Histogram, Clinograph, Slope Analysis, Wentworth's Method, smith method.
4. Graphs and diagrams: Triangular Diagram, Ergo graph. Rainfall dispersion diagram Proportional circle, Spheres and cubes diagram.
5. Map Projection construction of world map projection.

SUGGESTED READINGS-

1.. Monk house, F.J. & H.R. Wilkinson : Map and Diagrams, methouen, London.

2. Singh, L. R. : Practical Geography.

3. शर्मा, जे.पी., :प्रायोगिक भूगोल

4.चौहान, पी.आर. : प्रयोगात्मक भूगोल

5.यादव, हीरालाल,प्रायोगिक भूगोल

6.चंद्रकारपी. सर्वेक्षणविधि तंत्र, एस. शारदा पब्लिकेशन, बिलासपुर

7.सरकारआशीष, प्रायोगिकभूगोल,

M.A. Geography Semester-II shall consist the following papers :

1. The M.A. Semester - II examination in Geography shall consist of 500 marks.
2. The theory papers shall be of three hours duration.
3. Candidates will be required to pass separately in theory and practical examination.
4. a) In the practical examination the following shall be allotment of time and marks.

i)	Lab work (up to three hours)	70% Marks
ii)	Practical Record	20% Marks
iii)	Viva	10%Marks

b) The external and internal examiners shall jointly submit marks.

c) All the candidates shall present at the time of the practical examination their practical record regularly signed by the teachers concerned.

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SEMESTER SYLLABUS

M.A. GEOGRAPHY

M.A. GEOGRAPHY
SEMESTER-III

STATISTICAL TECHNIQUE AND FIELD SURVEY

1. **Statist** :Correlation, Probability, Hypothesis testing, chi test, f test meak center, Nearest neighbor Analysis
2. Project work - Micro region basis physical, socio-economic survey about project report in 50 pages
3. Excursion

SUGGESTED READINGS-

1.. Monk house, F.J. & H.R. Wilkinson : Map and Diagrams, methouen, London.
2. Singh, L. R. : Practical Geography.
3. शर्मा, जे.पी., :प्रायोमिक भूगोल
4. चौहान, पी.आर. : प्रयोगात्मक भूगोल
5. यादव, हीरालाल, प्रायोगिक भूगोल
6. चंद्रकारपी, सर्वेक्षणविधि तंत्र, एस. शारदा पब्लिकेशन, बिलासपुर
7. सरकार आशीष, प्रायोगिक भूगोल,

M.A. Geography Semester-III shall consist the following papers :

1. The M.A. Semester - III examination in Geography shall consist of 500 marks.
2. The theory papers shall be of three hours duration.
3. Candidates will be required to pass separately in theory and practical examination.
4. a) In the practical examination the following shall be allotment of time and marks.

i)	Lab work (up to two hours)	30% Marks
ii)	Project Report	40% + 10% Marks
iii)	Excursion	10 % Marks
iv)	Viva on i and III	10 % marks

b) The external and internal examiners shall jointly submit marks.

c) All the candidates shall present at the time of the practical examination their practical record regularly signed by the teachers concerned.

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SEMESTER SYLLABUS

M.A. GEOGRAPHY

M.A. GEOGRAPHY
SEMESTER - IV

ADVANCE CORTOGRAPHY

1. **Themalic maps :**
   Choropleth, Isopleth, Dot method, flow map-
2. **Geological Maps:**
   Basic definition, Interpretation Conformable series and unconformable series
3. **Remote sensing:**
   Fundamental of Remote sensing, Components of Image Interpretation
4. **GIS :**
   An overview of GIS Software, Elements of GIS
5. **Computer Cartography :**
   Advantages of computer cartography, Creation of Graphs and Maps.

SUGGESTED READING :

1- American Society of Photogrammetry : Manual of Remote Sensing, ASP, Falls Church V.A., 1983.

2- Barett E.G. and L.F. Curits : Fundamentals of Remote sensing and AIR photo Interpretation on, Memillan, New York, 1992.

3- Compbell J. : Introduction of Remote Sensing, Guilford, New York, 1989.

4- Curran, Paul J. : Principles of Remote Sensing, Longman, London 1985.

5- Burrought P.A. Principles of Geographic Information systems of Land Reson Assessment Oxford University Press, New York 1986.

6- चैनियाल, देवीदत्त रू सुदूरसंवेदन एवं भौगोलिक सूचना प्रणाली

M.A, Geography Semester-IV shall consist the following papers :

1. The M.A. Semester - IV examination in Geography shall consist of 500 marks.
2. The theory papers shall be of three hours duration.
3. Candidates will be required to pass separately in theory and practical examination.
4. a) In the practical examination the following shall be allotment of time and marks.

i)	Lab work (up to three hours) (Lab work 25% and viva 5%)	70% Marks
ii)	Practical Record	20% Marks
iii)	Viva	10% Marks

b) The external and internal examiners shall jointly submit marks.

c) All the candidates shall present at the time of the practical examination their practical record regularly signed by the teachers concerned.

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	General Insurance			

SCHEME OF EXAMINATION & DISTRIBUTION OF MARKS

महत्वपूर्ण नोटः–

1. एम.कॉम प्रथम, द्वितीय तथा तृतीय सेमेस्टर में सभी प्रश्न–पत्र अनिवार्य होंगे। उक्त परीक्षा में वैकल्पिक प्रश्न–पत्र चयन की व्यवस्था नहीं होगी।
2. एम.कॉम चतुर्थ सेमेस्टर में विशिष्टीकरण समूह (A),(B) या (C) में से किसी भी एक वैकल्पिक समूह का चयन कर उस समूह के सभी चार प्रश्न–पत्र अनिवार्य रूप से लेने होंगे।
3. एम.कॉम. चतुर्थ सेमेस्टर में उपरोक्त विशिष्टीकरण समूह के अतिरिक्त 50 अंक की मौखिक परीक्षा तथा 50 अंक का परियोजना प्रतिवेदन (अधिकतम 50 पृष्ठों का) तैयार करना अनिवार्य होगा। यह प्रतिवेदन वाणिज्य या प्रबंध विषय से संबंधित होगा।
4. सभी प्रश्न–पत्रों में लिखित परीक्षा 80 अंकों की तथा 20 अंकों की आंतरिक मूल्यांकन परीक्षा होगी।
5. आंतरिक परीक्षा एवं बाह्य परीक्षा में प्रश्न पत्रवार न्यूनतम उत्तीर्णांक 36 प्रतिशत होगा। जो विश्वविद्यालयीन अध्यादेश के प्रावधानों के अनुसार होगा।

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सेमेस्टर पाठ्यक्रम

M.Sc. ZOOLOGY

SCHEME OF EXAMINATION & DISTRIBUTION OF MARKS

SEMESTER - I

Paper No.	Title of the Paper	Marks	
		External	Internal
I	Invertebrate structure and function, Minor Phyla	80	20
II	Animal Behaviour	80	20
III	Quantitative Biology	80	20
IV	Ecology and environmental physiology	80	20
	M.Sc. Zoology Lab Course I	100	
	M.Sc. Zoology Lab Course II	100	

SEMESTER - II

Paper No.	Title of the Paper	Marks	
		External	Internal
I	General & comparative endocrinology of vertebrates	80	20
II	Gamete biology and reproductive physiology in human beings	80	20
III	Molecular cell biology	80	20
IV	Tools and techniques for biology	80	20
	M.Sc. Zoology Lab Course I	100	
	M.Sc. Zoology Lab Course II	100	

SEMESTER - III

Paper No.	Title of the Paper	Marks	
		External	Internal
I	Comparative anatomy of vertebrates	80	20
II	Biosystematics, taxonomy & biodiversity	80	20
III	Immunology and developmental biology	80	20
IV	Population genetics & evolution	80	20
	M.Sc. Zoology Lab Course I	100	
	M.Sc. Zoology Lab Course II	100	

SEMESTER - IV

Paper No	Title of Paper	Marks	
		External	Internal
I	General physiology and neurophysiology (*compulsory*)	80	20
II	Biochemistry and metabolic regulation and cell function (*compulsory*)	80	20
Optional Group-I			

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III	Fish(Ichthyology) structure and function	80	20
IV	Applied Fisheries	80	20
Optional Group-II			
III	Cell biology	80	20
IV	Cellular organization and molecular organization	80	20
Optional Group-III			
III	Entomology	80	20
IV	Applied Entomology	80	20
Optional Group-IV			
III	Wildlife conservation	80	20
IV	Environment and biodiversity conservation	80	20
	M.Sc. Zoology Lab Course I	100	
	M.Sc. Zoology Lab Course II	100	

Student has choice to opt. For any one group out of four optional groups.(Paper III and IV in semester four)

Each theory paper will have 5 questions of equal marks. First question will be compulsory encompassing all the five units without any internal choice, whereas rest questions will be unit wise with internal choice.

Internal Assessment shall comprise of two parts- Ten marks for test and ten marks for seminar/ assignment /presentation.

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SEMESTER-I
LAB-COURSE I

Time-06 Hours
Max. Marks-100

Invertebrates

1. Study of non-chordates through museum specimen
2. Study of permanent slides of non-chordates
3. Dissection of representative types (invertebrates)
4. Squilla, Mytilus, Sepia, Aplysia, Echinus

5. Mounting-

Permanent and suitable stained micro-preparation
Earthworm-nerve ring, ovary, spermathecal, nephridia
Cockroach-mouth parts , salivary glands, trachea
Prawn appendages, statocyst
Protozoan- rhizopods, flagellates and ciliates (fresh water forms) prolozoon ullase
Porifera-spicule sand gemmules of fresh water sponges
Crustaceans and rotifers
Larval forms of the free living invertebrates

Animal behaviour-

6. Experiments related to Animal Behaviour

Feeding behaviour in house fly
Life cycle of Lac insect and honey bee (chart/model/material)
Study of structural organization of the bee hive
Learning behaviour-
Conditioned and unconditioned reflex

7. Projects-

a)Visit to study the management of following->
Fish farm, dairy farm, poultry farm, sericulture and apiculture
b) Study of Invertebrate local fauna
c) Any other relevant topic

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Student should prepare a report and submit

Note-

1. Use of animal for dissection and practical work is subject to the conditions that they are not banned under the wildlife protection act
2. External features and anatomy should be studied by digital techniques and the alternatives. Wherever live animals is studies it should be either pest or colourable species without paining them

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M.Sc. ZOOLOGY

SEMESTER-I
LAB-COURSE I

Time-06 Hours
Max. Marks-100

Distribution of marks in practical exam

1. Spotting (1-10)-invertebrates	(20)
2. Mounting	(10)
3. Dissection (virtual)	(10)
4. Exercises based on behaviour (Two exercises)	(30)
5. Viva	(10)
6. Sessional	(20)
Total =	100

M.SC. SEMESTER I
LAB-COURSE II

Quantitative Biology

1. Collection methods of different types of data
2. Data analysis- tabulation
3. Different graphical and diagrammatic methods of data presentation
4. Calculation of central tendencies based on given data
5. Application of parametric and non-parametric tests
6. ANOVA
7. Study of model types
8. Exercises based on regression
9. Exercise based on correlation

Ecology and Environmental Physiology

10. Study of animals showing adaptation to different environments
11. Soil analysis physical and chemical composition of soil
12. Effect of physical exercise on blood pressure
13. Exercise based on blood glucose level
14. Carbonates and nitrates from soil sample
15. Determination of free CO_2 and salinity in pond

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M.Sc. ZOOLOGY

M.SC. SEMESTER I

LAB-COURSE II

Time-06 Hours
Max. Marks-100

Distribution of marks in practical exam

1. Exercises based on biostatics (Three)	(30)
2. Exercises based Soil and Water analysis (Two)	(20)
3. Exercises based on Physiology (Two)	(20)
4. Viva	(10)
5. Sessional	(20)
Total =	100

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1. Introduction to instrumental analysis-Robert Braun , McGraw Hill Publication
2. A biologist guide to principles and techniques of practical biochemistry-K, Wilson and K.H.Goulding EBS Edn.
3. Clark and Swizer, Experimental Biochemistry, Freeman, 2000
4. Locquin and Langeron, Handbook of Microscopy, Butterwaths, 1983
5. Boyer, Modern Experimental Biochemistry, Benjamin, 1993

SEMESTER-II
LAB-COURSE I

General & comparative endocrinology of vertebrates

1. Dissection of various endocrine glands of vertebrates (Fishes, Amphibians, Reptiles, Birds, Mammals, any available animals/ Virtual)
2. Dissection of various endocrine glands of insects (Cockroach/any other insect, any available animals/ Virtual)
3. Study of histo-pathologic slides of endocrine and related structures
   - T.S. Pituitary, T.S. of Thyroid, T.S. of Parathyroid, T.S. of Adrenal, T.S. of Testes, T.S. of Ovary, T.S. Thymus, T.S. of Kidney, T.S. of Heart, T.S. of Stomach, T.S. of Intestine
4. Effect of epinephrine on chromatophores of fishes
5. Biochemical estimation of cholesterol content in adrenal tissue, glycogen in uterine tissue
6. Microtomy-block preparation, section cutting, stretching and straining
7. Gamete biology and reproductive physiology in human beings
8. Study of Estrous cycle in mouse or rat
9. Preparation on Blastodisc of hen's egg
10. Formation of egg window in chicken egg
11. Collection of developmental stages of eggs of Lymnea or any gastropod
12. Collection of developmental stages of insects/ fishes
13. Study of development stages of frog through slides and whole mounts.
14. Study of development stages of chick through slides and whole mounts.
15. Slide preparation (earthworm ovary, amphibian, reptiles, birds and mammals testes & ovary.)

Note-

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SEMESTER-II
LAB-COURSE I

Time-06 Hours
Max. Marks-100

Distribution of marks in practical exam.

1. Dissection of Endocrine glands /virtual	(10)
2. Spotting (Endocrine glands& Embryology)	(20)
3. Cytological preparation/preparation of estrogen cycle	(10)
4. Microtomy	(20)
5. Preparation of egg window and Blastodisc	(10)
6. Viva	(10)
7. Sessional	(20)
Total =	100

SEMESTER-II
Lab-course II

Molecular cell biology
1. Study of Prokaryotic and Eukaryotic cells
2. Study of permanent slides -Mitosis, Meiosis and cell organelles
3. Temporary squash preparation to show mitosis and meiosis
4. Preparation of giant chromosomes, barr bodies
5. Histological study of cancer cells

Tools and techniques for biology
6. Use of balance Ph meter, colorimeter, centrifuge spectrophotometer, camera Lucida etc.
7. Molecular separation by Chromatography, Electrophoresis
8. Media preparation
9. Cell culture
10. Colorimetric estimation of glucose, protein, RNA, DNA
11. Absorption spectrum of any coloured solution
12. Histochemical techniques

Note-
1. Use of animal for dissection and practical work is subject to the conditions that they are not banned under the wildlife protection act

2. External features and anatomy should be studied by digital techniques and the alternatives. Wherever live animals is studies it should be either pest or culturable species without paining them

SEMESTER-II
LAB-COURSE II

Time-06 Hours
Max. Marks-100

Distribution of marks in practical exam.

1. Spotting (mitosis and meiosis, Tools & Techniques)	(20)
2. Exercise based on cell Biology	(10)
3. Chromatography	(20)
4. Colorimetric estimation	(10)
5. Application of different instruments	(10)
6. Viva	(10)
7. Sessional	(20)
Total =	100

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M.Sc. Semester III

Zoology Practical
Lab-course I

(Comparative Anatomy)

1. Dissection of animals :- Amphioxus, Scoliodon, Electric ray, Sting ray, Calotis, Bird head, Rat (Subject to availability of material) / study through alternative methods of dissection.
2. Micro preparation of suitable and available material.
3. Study of the representative examples of different classes of Chordates.
4. Study of permanent slides showing whole mount or section as per Theory syllabus, including embryological slides of Frog and Chick.
5. Osteology of Amphibia, Reptile, Bird, Mammal.
6. Study of animal diversity by field trip and excursion, Extension activity to spread health awareness. Students have to submit project report.

Biosystematics, taxonomy & Biodiversity

1. Study of biodiversity among various invertebrates and vertebrates (Listing of all the animals found in and around your house and also try to find out their Zoological names)
2. Collection of various insect species
3. Visits to a local animal park or zoo to identify and study the captive fauna and preparation of report
4. Study of adaptive characteristics of various invertebrates and vertebrates in different climate
5. Taxonomic key formation and conversion
6. Study of biodiversity in grassland and pond water by using Shannon - Weiner index .

M.Sc. Semester III

Zoology Practical

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Lab-course I

Time-06 Hours

Max. Marks-100

Distribution of marks in practical exam.

1. Dissection of Vertebrate (virtual/other method) (10)
2. Spotting 1 to 10 (20)
3. Micro preparation (10)

4. Exercises related to Taxonomy. (Three) (30)

5. Viva (10)
6. Sessional (20)

Total = 100

M.Sc. Semester III

Zoology Practical

Lab-course II

Immunology and developmental Biology

1. Dissection of Primary and secondary immune organ from mice
a. Preparation of single suspension from bone marrow
b. Cell counting and vigbility testing of the spleenocytes prepared
2. Preparation and study of phagocytosis by spleenic peritoneal macrophase.
3. Raising polyclonal antibody in mice, serum collecton and estimating antibody titre in serum by following method-
a. Ouchterlony (double diffusion) assay for antigen-antibody specificity and titre.
b. ELISA
4. Antibody purification from the serum collected from immunized mice, affinity purification chromatography
5. Blood group testing A, B ,O ,AB AND Rh factor
6. Indused Breeding in Frog
7. Culture of chick Embryo in Vitro
8. Study of chick embryos by vital staiting
9. The Technique for the whole mount preparation of chick embryo
10. Demonstration of Cell death
11. Study of Mitosis (a) Techniques for chromosomes preparation (b) Preparation of Meiotic chromosomes for Grosshopper testies (c) Auto Rediography

Population Genetics and Evolution

a. i. An experiment related to quantitative genetics, genotypic frequencies in light of hardy weinberg law
ii. ABO blood group data
b. Numeric exercise related to-
i. Natural selection
ii. Changing gene frequency
Chromosomal Polymorphism

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M.Sc. Semester III

Zoology Practical

Lab-course II

Time-06 **Hours**

Max. Marks-100

Distribution of marks in practical exam.

1. **Dissection showing primary and secondary immune organ of mice virtual / other method (10)**
2. **Exercise related to immune response** (20)
3. **Exercise related to developmental biology/ Preparation of egg window and Blastodisc (10)**
4. **Exercises related to quantitative genetics / hardy Weinberg law** **(20)**
5. **Exercise related to natural selection (10)**
6. **Viva** **(10)**
7. **Sessional** **(20)**

Total = 100

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M.Sc. ZOOLOGY

BILASPUR UNIVERSITY, BILASPUR

M.Sc. Semester IV

Zoology Practical
Lab-course I

A. Practical based on Paper I and Paper II as per Theory

1. Estimation of Protein by the Biuret, Lowry, Brad ford and Eosine-a comparasion
2. Determination of N-terminal Amino acids by the Sangers reagent (FDND)
3. Paper chromatographic separation of Amino acids
4. Quantitative estimation of Protein, carbohydrate, Mucosaccharide, Lipids and Enzyme (Bromphenol blue, PAS, Alcian blue, aldehyde fucsin, Acetylcholinestrase technique)
5. Identification of hypothalamic nuclei histological, hystochemical and Immunocytochemical method
6. Isolation and characterization of Pituitary cell
7. Estimation of MAC, MCH and MCHC
8. Total count of WBC and RBC
9. Differetial count of WBC
10. Haemoglobin estimation and PCV estimation or ESR estimation
11. Quantitative estimation of blood serum by Colorimetry (I) Blood Urea (II) Blood glucose (III) Blood Calcium (IV) Blood Creatine (V) Blood cholesterol (VI) Blood Protein (VII) Blood Albumin
12. Blood clotting time
13. ECG Recording
14. Blood Pressure estimation
15. EEG

M.Sc. Semester IV

Zoology Practical

Lab-course I

Time-06 Hours

Max. Marks-100

Distribution of marks in practical exam.

1. Estimation of Protein	(10)
2. estimations of, carbohydrate, Mucosaccharide, Lipids and Enzyme (two exercises)	(20)
3. Exercise based on histochemical and Immuno-cytochemical method	(10)
Exercises based on haematology. (two exercises)	(20)

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M.Sc. Semester IV

Zoology Practical
Lab-course II

Practical (Special Paper – Group II Cytology)

1. Examination of different cell types in Vertebrate tissue
2. Contrast Microscopy
3. Photomichrography
4. Study of permanent cytological preparation
5. Squash preparation of chromosomes and preparing karyotype
6. Preparation of Giant Chromosomes and demonstration of puffs
7. Golgi material and Mitochondrial preparation
8. Demonstration of Barr body and drum stick
9. Histochemical demonstration of RNA DNA phospholipid and enzyme
10. Microbial culture media preparation and microbial growth
11. Molecular separation by chromatography and Electrophorasis

M.Sc. Semester IV

Zoology Practical

Lab-course II **Hours**
Time-06
Max. Marks-100

Distribution of marks in practical exam.

1. Spotting (1to 10) (20)
2. Exercise based on cytological preparation (10)
3. Exercise based on histochemical preparation (10)
4. Molecular separation by chromatography and Electrophorasis (20)
5. Exercise based on microbiology/ karyotype study (10)

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6. Viva	(10)
7. Sessional	(20)

Total = 100

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M.Sc. Semester IV

Zoology Practical
Lab-course II

Practical (Special Paper – Group III Entomology)

1. Collection, Preservationand classification of the insects of order :- Thysaneura, Collembola, Orthoptera, Hemiptera, Lepidoptera, Mallophaga, Diptera, Hymenoptera and Coleoptera
2. Dissectionof Grasshopper, Cockroach, Cricket, wasp, and honey bee, with special reference to their Nervous system, Salivary gland, Endocrine gland, Sting apparatus, of honey bee, reproductive organs of Grasshopper and cockroach.
3. Whole mounts of small insects eg Collembola, Thysaneura, bedbug, louse, stored grain pests
4. Whole mount of different types of legs, antennae, wings, mouth parts, salivary glands and scales
5. Microtomy of Insect materials
6. Simple experiment on Insect Physiology
7. Identification of common insect pests
8. Collection of life cycle of the pest of any economic crop

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M.Sc. Semester IV

Zoology Practical

Lab-course II

Time-06

Max. Marks-100

Distribution of marks in practical exam.

		Hours
1. Dissection of Available insect pests /Virtual		(10)
2. Spotting (1 to 10)	(20)	
3. Micropreparation	(10)	
4. Experiment based on insect physiology (10)		
5. Identification of common insect pests		(10)
6. Project Report and field visit		(10)
7. Viva	(10)	
8. Sessional	(20)	

Total = 100

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M.Sc. Semester IV

Zoology Practical

Lab-course II

Exercises based on paper III – Wild life conservation

Exercises based on paper IV - Environment and biodiversity conservation

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M.Sc. Semester IV

Zoology Practical

Lab-course II

Time-06

Max. Marks-100

Distribution of marks in practical exam.

		Hours
1. paper III – Wild life conservation		(35)
2. Environment and biodiversity conservation		(35)
3. Viva	(10)	

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SEMESTER-I
LAB-COURSE I

Time-06 Hours
Max. Marks-100

Invertebrates

1. Study of non-chordates through museum specimen
2. Study of permanent slides of non-chordates
3. Dissection of representative types (invertebrates)
4. Squilla, Mytilus, Sepia, Aplysia, Echinus

5. Mounting-

Permanent and suitable stained micro-preparation
Earthworm-nerve ring, ovary, spermathecal, nephridia
Cockroach-mouth parts , salivary glands, trachea
Prawn appendages, statocyst
Protozoan- rhizopods, flagellates and ciliates (fresh water forms) prolozoon ullase
Porifera-spicule sand gemmules of fresh water sponges
Crustaceans and rotifers
Larval forms of the free living invertebrates

Animal behaviour-

6. Experiments related to Animal Behaviour

Feeding behaviour in house fly
Life cycle of Lac insect and honey bee (chart/model/material)
Study of structural organization of the bee hive
Learning behaviour-
Conditioned and unconditioned reflex

7. Projects-

a)Visit to study the management of following->
Fish farm, dairy farm, poultry farm, sericulture and apiculture
b) Study of Invertebrate local fauna
c) Any other relevant topic

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Student should prepare a report and submit

Note-

1. Use of animal for dissection and practical work is subject to the conditions that they are not banned under the wildlife protection act
2. External features and anatomy should be studied by digital techniques and the alternatives. Wherever live animals is studies it should be either pest or colourable species without paining them

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SEMESTER SYLLABUS
M.Sc. MICROBIOLOGY

Scheme and Courses of Studies

SEM.	COURSES		MARKS		
	Paper	Title of the Paper	Paper wise	Internal Assessment	Univ. Exam. Marks*
First	First (MB-101)	General Microbiology and Bacterology	100	20	80
	Second (MB-102)	Virology	100	20	80
	Third (MB-103)	Phycology, Mycology and Proto-zoology	100	20	80
	Fourth (MB-104)	Biochemistry	100	20	80
	Lab. Course-	Concern with paper - I & II	100	Sessional	100
	Lab. Course-	Concern with paper - III & IV	100	Sessional	100
Second	First (MB-201)	Bioinstrumentation & Biochemical techniques	100	20	80
	Second (MB-202)	Cell biology and Microbial physiology	100	20	80
	Third (MB-203)	Microbial genetics and Molecular Biology	100	20	80
	Fourth (MB-204)	Environmental & Agriculture Microbiology	100	20	80
	Lab. Course-	Concern with paper - I & II	100	Sessional	100
	Lab. Course-	Concern with paper - III & IV	100	Sessional	100
Third	First (MB-301)	Immunology	100	20	80
	Second (MB-302)	Medical & Veterinary Microbiology	100	20	80
	Third (MB-303)	Biostatics & Bioinformatics	100	20	80
	Fourth (MB-304)	Enzymology and Industrial Microbiology	100	20	80
	Lab. Course-301	Concern with paper - I & II	100	Sessional	100
	Lab. Course-302	Concern with paper - III & IV	100	Sessional	100
Fourth	First (MB-401)	Plant pathology & Disease management	100	20	80
	Second (MB-402)	Food Microbiology	100	20	80
	Third (MB-403)	Microbial ecology & Forest microbiology	100	20	80
	Lab. Course-402	Project work (minor) at local level OR PROJECT WORK **(External)		Project Report-	60
	Fourth (MB-404)	Computer Fundamentals and Research	100	20	80

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FIRST SEMESTER
Lab Course - 101
(GENERAL MICROBIOLOGY, BACTERIOLOGY AND VIROLOGY)

Total Marks: 100
Internal assessment Marks: 20
Term end Exam Marks: 80

1. **Preparation of Glassware:** Various techniques of cleaning (discarding & washing) and sterilization of glassware for microbiological laboratory.
2. **Preparation of Culture Media:** Different types of nutrient media as per nutritional need, dehydrated, selective and differential media for autotrophic & heterotrophic microbes.
3. **Pure culture Techniques:** Preparation of slants, stab culture, sub-culturing, types of streaking.
4. **Staining Techniques:** Gram Staining, negative staining, acid-fast staining, endospore, capsule.
5. **Isolation, Identification and characterization of bacteria:** Cultural characteristics of bacteria (autotrophic & heterotrophic), using selective and differential media. Growth on NA, Blood agar, Chocolate agar, DCA, Maconkey's, EMB and Sabouraud's agar. Study of nutritional needs of bacterial growth (growth in the presence of different carbon source, N source).
6. **Biochemical tests for identification of bacteria:** IMViC, catalase, oxidase, mannitol motility test, gelatin test, urease, TSI test, coagulase, nitrate reduction. Production of acid and gas from glucose, arabinose, inositol, lactose, maltose, mannitol, rhamnose, sucrose, xylose, fructose, starch hydrolysis, casein hydrolysis, assessment of effect of metals on microbial growth.
7. **Determination of growth of bacteria:** Growth curve and generation time.
8. **Pathological examination:** Plant diseases caused by Viruses as mentioned in course of studies (a case study of any one disease).

Scheme of examination:

Lab performances	60 marks	
Spotting	20 marks	
Internal assessment -		
Oral evaluation	10 marks	
Sessional	10 marks	
Total	100 marks	Provided period- 06 hr.

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SEMESTER SYLLABUS
M.Sc. MICROBIOLOGY

FIRST SEMESTER
Lab. Course - 102
(PHYCOLOGY, MYCOLOGY, PROTOZOLOGY AND BIOCHEMISTRY)

Total Marks: 100
Internal assessment Marks: 20
Term end Exam Marks: 80

1. Isolation and identification of algae from soil and water. Isolation and identification of cyanobacteria, extraction and separation of algal pigments.
2. Isolation and identification of fungi from different substrates (saprophytic, parasitic, coprophilous, keratinophilic).
3. Study of environmental requirements of fungi (pH, temperature) by linear growth and biomass.
4. Assessment of the effect of antifungal agents (antibiotics/ chemicals/plant extracts) on isolated fungal samples.
5. Extraction and separation of amino acid and mycotoxin (aflatoxins) by paper chromatography.
6. Identification and characterization of protozoans as mentioned in course studies. Case study of any one disease.
7. Pathological examination. Human diseases caused by protozoans as mentioned in course studies (a case study of any one disease).
8. Colorimetric/ spectrophotometric estimations of proteins, pigments, DNA/RNA and sugars.
9. Study of enzyme kinetics and enzyme activity. Isolation of amylase producing microorganisms from the environment; estimation of amylase activity and determining its Km and Vmax; effect of environmental conditions (temperature, pH and substrate concentration) on the activity of amylase.
10. Estimation of enzyme activity: Phosphatase and catalase.
11. Separation of isolated phospholipids by thin layer chromatography and hemoglobin by gel filtrations.

Scheme of Examination:		
Lab performances	60 marks	
Spotting	20 marks	
Internal assessment: -		
Oral evaluation	10 marks	
Sessional	10 marks	
Total	100 marks	Provided period- 06 hrs

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SEMESTER SYLLABUS
M.Sc. MICROBIOLOGY

SECOND SEMESTER
Lab. Course - 201

(BIOINSTRUMENTATION, BIOCHEMICAL TECHNIQUES, CELL BIOLOGY AND MICROBIAL PHYSIOLOGY)

Total Marks: 100
Internal assessment Marks: 20
Term end Exam Marks: 80

1. Studies on pH titration curves of amino acids/ acetic acid and determination of pKa values and Handerson-Hasselbach equation.
2. Separation of bacterial lipids/amino acids/ sugars/organic acids by TLC or paper chromatography.
3. Separation of serum proteins by [illegible] gel electrophoresis.
4. Paper electrophoresis and separation of [illegible] or blue dextran by gel filtration.
5. Separation of bacterial DNA by agarose gel electrophoresis.
6. Preparation of mitotic plate by carmine squashing method and phase identification.
7. Preparation of Karyotype of metaphase plate.
8. Preparation of Meiotic plate and determination of phases.
9. Computation of Chaisma frequency and determination of phases
10. Micrometry and Camera lucida drawings
11. Isolation and cultivation of autotrophic microbes.
12. To study the effect of salt concentration on bacterial growth by turbidometry method.
13. Determination of thermal death point (TDP) of an organism.
14. UV absorption of proteins, DNA and RNA.

Scheme of Examination:

Lab performances	60 marks	
Spotting	20 marks	
Internal Assessment		
Oral evaluation	10 marks	
Sessional	10 marks	
Total	100 marks	Provided period- 06 hrs

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SEMESTER SYLLABUS
M.Sc. MICROBIOLOGY

SECOND SEMESTER

Lab. Course - 202

(MICROBIAL GENETICS, MOLECULAR BIOLOGY, ENVIRONMENTAL MICROBIOLOGY & AGRICULTURE MICROBIOLOGY)

Total Marks: 100
Internal assessment Marks: 20
Term end Exam Marks: 80

1. Transformation of *E. Coli*, preparation of competent cells.
2. Conjugation in *E.coli* by using plate method.
3. Isolation of plasmid DNA from *E.coli*.
4. Isolation of DNA from plant cell (Onion/ Mustard).
5. Isolation of microorganisms from different habitats, soil, water and air.
6. Potability test/potability of water (MPN and HS).
7. Physical, chemical and microbial analysis of water: pH, COD, BOD, total and dissolved solids.
8. Study of different types of microbial air samplers/ air sampling devices.
9. Study of microbial contamination of industrial products and of fabrics.
10. Production of ammonia from organic compounds (ammonification).
11. Bioconversion of ammonia to nitrate (nitrification).
12. Determination of phenol coefficient.
13. Characterization of different cells for detection of various microbial enzymes: amylase, lipase, protease and cellulase.
14. Microbiological examination of cyanobacteria, separation and determination of cyanobacterial pigments.

Scheme of examination

Lab performances	60 marks	
Spotting	20 marks	
Internal Assessment:		
Oral evaluation	10 marks	
Sessional	10 marks	
Total	100 marks	Provided period: 06 hrs

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SEMESTER SYLLABUS
M.Sc. MICROBIOLOGY

THIRD SEMESTER
Lab. Course – 301
(IMMUNOLOGY, MEDICAL AND VETERINARY MICROBIOLOGY)

Total Marks: 100
Internal assessment Marks: 20
Term end Exam Marks: 80

1. Determination of Blood groups and Rh typing.
2. Widal (slide) test for Typhoid by antigen- antibody reaction.
3. Pregnancy testing through commercially available method.
4. Rheumatoid Arthritis test (RA) by antigen- antibody reaction.
5. RPR (Rapid Plasma Reagin) test for syphilis.
6. Detection of specific antigen by using ELISA technique.
7. Separation and characterization of lymphocytes from blood and demonstration of lymphocytes Population.
8. Study of antigen and antibody reaction by immuno-diffusion.
9. Different staining techniques Acid fast staining, Giesma staining and Leishmann staining.
10. Special staining methods for [illegible] granules, capsule and spores.
11. Isolation of pathogen from [illegible], blood and urine.
12. Isolation and identification of [illegible] pathogenic bacteria and fungi:

Bacteria: *Staphylococcus aureus*, *Escherichia coli*, *Proteus vulgaris*, *Proteus mirabilis*, *Salmonella typhi*, *Salmonella paratyphi*, *Shigella dysenteriae* and *Shigella felexneri*.

Fungi: *Candida albicans*, *Microsporum* and *Trichophyton*.

13. Antibiotic sensitivity testing by disc diffusion method.

Scheme of examination

Lab performances	60 marks	
Spotting	20 marks	
Internal Assessment:		
Oral evaluation	10 marks	
Sessional	10 marks	
Total	100 marks	Provided period- 06 hrs

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SEMESTER SYLLABUS
M.Sc. MICROBIOLOGY

THIRD SEMESTER
Lab. Course - 302
(BIOSTATISTICS, BIOINFORMATICS, ENZYMOLOGY AND INDUSTRIAL MICROBIOLOGY)

Total Marks: 100
Internal assessment Marks: 20
Term end Exam Marks: 80

1. Determination of Statistical averages / Central Tendencies: a) Arithmetic mean b) Median c) Mode.
2. Determination of measures of dispersion a) Mean Deviation b) Standard Deviation c) Standard Error d) Coefficient of Variation.
3. Test of significance – Application of a) Chi-Square test b) T-test c) ANOVA
4. Studies of public domain, databases for nucleic acid and protein sequences and determination of Protein structure, Protein Data Base (PDB), genome sequence analysis.
5. Determination of Kinetic constant of Amylase activity, Vmax, Km.
6. Effect of pH and Temperature on Amylase activity.
7. Effect of inhibitor on Amylase activity.
8. Determination of Proteins, DNA and RNA concentration by Spectrophotometer.
9. Production of Protease by microorganism.
10. Demonstration of production of Ethanol by Yeast.
11. Isolation of antibiotic producing microorganism from soil.

Scheme of examination

Lab performances	60 marks	
Spotting	20 marks	
Internal Assessment:		
Oral evaluation	10 marks	
Sessional	10 marks	
Total	100 marks	Provided period- 06 hrs

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SEMESTER SYLLABUS

M.Sc. MICROBIOLOGY

Scheme and Courses of Studies

SEM.	Paper	COURSES: Title of the Paper		MARKS: Paper wise	Internal Assessment	Univ. Exam. Marks*
First	First (MB-101)	General Microbiology and Bacteriology		100	20	80
	Second (MB-102)	Virology		100	20	80
	Third (MB-103)	Phycology, Mycology and Proto-zoology		100	20	80
	Fourth (MB-104)	Biochemistry		100	20	80
	Lab. Course-101	Concern with paper - I & II		100	Sessional	100
	Lab. Course-102	Concern with paper - III & IV		100	Sessional	100
Second	First (MB-201)	Bioinstrumentation & Biochemical techniques		100	20	80
	Second (MB-202)	Cell biology and Microbial physiology		100	20	80
	Third (MB-203)	Microbial genetics and Molecular Biology		100	20	80
	Fourth (MB-204)	Environmental & Agriculture Microbiology		100	20	80
	Lab. Course-201	Concern with paper - I & II		100	Sessional	100
	Lab. Course-202	Concern with paper - III & IV		100	Sessional	100
Third	First (MB-301)	Immunology		100	20	80
	Second (MB-302)	Medical & Veterinary Microbiology		100	20	80
	Third (MB-303)	Biostatics & Bioinformatics		100	20	80
	Fourth (MB-304)	Enzymology and Industrial Microbiology		100	20	80
	Lab. Course-301	Concern with paper - I & II		100	Sessional	100
	Lab. Course-302	Concern with paper - III & IV		100	Sessional	100
Fourth	First (MB-401)	Plant pathology & Disease management		100	20	80
	Second (MB-402)	Food Microbiology		100	20	80
	Third (MB-403)	Microbial ecology & Forest microbiology		100	20	80
	Lab. Course-402	Project work (minor) at local level	OR PROJECT WORK **(External)		Project Report-	60
	Fourth (MB-404)	Computer Fundamentals and Research		100	20	80

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SEMESTER SYLLABUS

M.Sc. BOTANY

SCHEME OF EXAMINATION & DISTRIBUTION OF MARKS

SEMESTER - I

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Biology & Diversity of Virus Bacteria & Fungi	Theory	20	80	100
2.	Biology &Diversity Of Algae, Bryophytes And Pteridophytes	Theory	20	80	100
3.	Cell And Molecular Biology of Plants	Theory	20	80	100
4.	Taxonomy Of Angiosperms	Theory	20	80	100
Lab-1	Based On Paper I&II	Practical	-	-	100
Lab-2	Based On Paper III&IV	Practical	-	-	100
				Total	**600**

SEMESTER - II

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Cytology ,Genetics And Cytogenetics	Theory	20	80	100
2.	Biology & Diversity Of Gymnosperm species	Theory	20	80	100
3.	Plant Physiology	Theory	20	80	100
4.	Plant Biochemistry And Bioenergetics	Theory	20	80	100
Lab-1	Based On Paper I&II	Practical	-	-	100
Lab-2	Based On Paper III&IV	Practical	-	-	100
				Total	**600**

SEMESTER - III

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Plant Development	Theory	20	80	100
2.	Plant Reproduction	Theory	20	80	100
3.	Plant Ecology	Theory	20	80	100
4.	Elective Paper (A) Plant Pathology - I (B) Weed Biology- I	Theory	20	80	100
Lab-1	Based On Paper I&II	Practical	-	-	100
Lab-2	Based On Paper III&IV	Practical	-	-	100
				Total	**600**

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SEMESTER SYLLABUS

M.Sc. BOTANY

SEMESTER - IV

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Plant cell, Tissue and organ culture	Theory	20	80	100
2.	Plant Resource Utilization And Conservation	Theory	20	80	100
3.	Genetic Engineering Of Plant And Microbes &Biostatics	Theory	20	80	100
4.	Elective Paper (A) Plant Pathology –II (B) Weed Biology- II	Theory	20	80	100
Lab-1	Based On Paper I&II	Practical	-	-	100
Lab-2	Based On Paper III&IV	Practical	-	-	100
				Total	600
				GRAND TOTAL	2400

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SEMESTER- I
PAPER - IV
TAXONOMY OF ANGIOSPERMS

UNIT -1

Origin of Intra- Population Variation: Population & the environment, ecads & ecotypes, evolution & differentiation of species – various models.

The Species Concept: Taxonomic hierarchy ,species ,genus family & other categories , principles used in assessing relationship ,delimitations of taxa & attribution of rank salient feature of the international code of botanical nomenclature and salient features of Melbourne code

UNIT -2

Taxonomic Evidence: Morphology, anatomy, embryology, cytology, photochemistry, genome analysis & nucleic acid hybridization.

Taxonomy Tools: Herbarium, floras, histological photochemical cytology serological biochemical & molecular techniques, computers & GIS.

UNIT -3

System of Angiosperm Classification: Phonetic versus phylogenetic systems, cladistics taxonomy, relative merits & demerits of major system of classification; relevance of taxonomy to conservation, sustainable utilization of bio resource & ecosystem research.

UNIT -4

Concept of Phytogeography: Endemism, hot spots and hottest hot spots, plant exploration, invasion & introduction, local plant diversity and its socio-economic importance.

Suggested Readings:

1. Gole, A.J. ((1969) Numerical Taxonomy. academic Press London.
2. Devis ,P. H. And Heywood, V.H (1973) Principle of Angiosperm Taxonomy .Robert E. Kreiger .Pub. Co. New York.
3. Grant, V. (1971) plant Speciation .Columbia Univ.Press, New York.
4. Grant, W.F. (1984) Plant Biosystematics .Academic Press. London.
5. Heslop- Harrison, J/ (1976) Plant Taxonomy .English Language Book Assoc .and Edward Pub. Ltd. U.K.
6. Stace ,C.A. (1989)Plant Taxonomy and Biosystematic Edward Arnold Ltd.London .
7. Takhtajan, A.L. (1997) Diversity and classification of flowering plant Columbiauniv.Press.New York.
8. Woodland, D.W. (1991) Contemporary Plant Systematic. Prentice Hall new Jersey.
9. Sharma, A.K. and Sharma, R.(2007) Taxonomy .PragatiPrakashan Meerut.

Suggested Laboratory Exercise:

1. Description of specimen from representative locally available families .

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2. Description of species based on various specimen to study Intraspecific various variation ,a collective exercise.
3. Field trip within and around the campus, comppation of field notes and preparation of herbarium sheets of such plant wild or cultivated as are abundant .
4. Training in using floras and herbaria for identification of Specimen described in the class.
5. Comparison of different species of genus and different genera of a family to Calculate Similarity Coefficient and Preparation of Dendrograms
6. Demonstration of the Utility of Secondary metabolites in the taxonomy of some appropriated genera.
7. Description of various species of a genus, study of key characters and preparation of keys at generic level.
8. Location of keys and use of key at family level

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Suggested Laboratory Exercise:

1. Demonstration of plasmolysis and deplasmolysis in plant cell .
2. Demonstration of transpiration.
3. Measurement of transpiration rate photometer.
4. Study of inter-relationship between transpiration and absorption and by T/A apparatus.
5. Extraction of chloroplast pigment from green leaves.
6. Separation of chloroplast pigment through paper chromatography.
7. Separation of chloroplast pigment through solvent method.
8. Preparation of absorption spectrum of chlorophyll -a
9. Determination of chlorophyll a/ chlorophyll-b ratio in C_3 and C_4 plants.
10. Extraction of seed proteins depending upon solubility.
11. Fractionation of proteins using gel filtration chromatography using sephadex G-100 or sephadex G-200 .
12. Principal of colorimetry spectrometry and fluorimerty

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4. Kumar , H.D. (1986) Modern Concept of Ecology . Vikas Publishing House Privet Ltd New Delhi .
5. Hill M.K.(1997) Understanding Environmental Pollution . Cambridge Uni. Press, , Cambridge UK.
6. Odum ,E.P. (1971) Fundamental of Ecology .,Saunders ,Philadelphia .
7. Odum ,E.P. (1983) Basic Ecology .,Saunders ,Philadelphia
8.

Suggested Laboratory Exercise

1. To calculate mean , variance ,standard deviation ,standard error ,coefficient of variation and use of t-test for comparing ecological data .
2. To determine minimum size and number of quadrates required for reliable estimate of biomass in Grassland ecosystem.
3. To study of frequency, abundance and density of dominant plants in the local ecosystem by quadrate method.
4. To determine gross and net productivity by light and dark bottle method.
5. To determine soil moisture content, porosity and bulk density of soil collected from different location.
6. To determine percent organic carbon and organic matter in soil of grass land cropland and forests.
7. To determine the water holding capacity of various soil.

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SEMESTER-IV

PAPER I

PLANT CELL, TUSSE AND ORGAN CULTURE

UNIT -1

Biotechnology: Basic concept, principal and scope

Plant cell And Tissue Culture: General introduction, history, scope, concept of cellular differentiation, tot potency.

UNIT -2

Organogenesis and Adventive Embryogenesis: Fundamental aspects morphogenesis somatic embryogenesis and androgenizes, mechanism, techniques and utility.

Somatic Hybridization: Protoplast isolation fusion and culture hybrid selection and regeneration, possibilities achievements and limitations of protoplast research.

UNIT -3

Application of Plant Tissue Culture: Clonal propagation, artificial seed, production of hybrids and soma clones and production of secondary metabolites /natural products, cryopreservation and germ plasma storage.

UNIT -4

Biostatistics: Definition and importance of Biostatistics scope, Measurement of central tendencies –mean mode and median.

Suggested Reading :

1. Bhojwani, S.S. and Razdan ,N.K. (1996) plant Tissue Culture : Theory and Practice Elservier Science Publishers New York ,USA.
2. Collin H.A. and Edwards ,S. (1998) plant cell Culture Bios .Scientific Publishers Oxford ,U.K.
3. Kartha ,K.K. (1985) Cryopreservation of plant cells and Organs CRC Press ,Boca Raton ,Florida USA.
4. Vasil, I.K. and Thorbe ,T.A.(1994) Plant cell and tissue culture . Kluwer Academic Publishers ,Netherlands.
5. Smith R.H. (200) Plant Tissue Culture : Techniques and Experiment ,Academic Ness ,New York.

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Suggested Laboratory Exercise :

1. Preparation of Tissue culture (ms) medium .
2. Study technique s of tissue culture : sterilization of glass wares and plant materials transfer of explants on culture media ,incubation .
3. Isolation of plant protoplast by mechanical and enzymatic method.
4. Counting of protoplast in the suspension by haemocytometer method.

5. Effect of physical (example, temperature) and chemical (e.g. osmoticum) .factors on protoplast yield .
6. Demonstration of protoplast fusion employing PEG.
7. Initiation of organogenesis and embryogenesis using appropriate explants.

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Suggested Laboratory Exercise

1. Preparation of liquid and solid culture media for bacteria culture.
2. Study of growth characteristics of E .coli using plating and turbido metric method.
3. Isolation of total DNA from E. Coli by lysozyme lysis method and its quantification by spectrophotometric method .
4. Isolation of plasmid DNA from E. Coli by alkaline lysis method and its quantification by spectrophotometric method.
5. Restriction digestion of plasmid and genomic DNA and estimation of size of various DNA fragments.
6. Isolation of Rhizobium from root nodules of leguminous plants
7. Isolation of Agrobacterium tumifaciens form tumours of dicot plants.

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SEMESTER SYLLABUS

M.Sc. BOTANY

SEMESTER-IV

PAPER IV

ELECTIVE –I (B)

WEED BIOLOGY

UNIT -1

Germination, Establishment and Growth – Light Requirement for germination, Seedlongevity AndMortality. Pattern of emergence, The Safe -Site Concept.

UNIT -2

Management of Weeds- Type of weed control: Prevention, Suppression and Eradication; physical, chemical and Biological control of weeds .concept of Integrated Weed Management

UNIT -3

Classification of Herbicides Selective and non selective herbicides, contact and Trans located herbicides. Mode of Action of Herbicides. Application method of Herbicides and Precautions.

UNIT -4

Chemistry of some importance herbicides: Phenoxy acid as 2, 4-D, Pendimethalin Butachlor and Nitro fen. Critical Period for weed control,Aquatic weed management .Plant Environment and Herbicides interactions. Weed Thresholds and management.

PRACTICALS –

Exercises involving

- The study of different factors of the percentage germination of some important weed seeds.
- Measurement of seedling growth of weed plant.
- Study of a weed plant using different growth parameters.
- Measurement of effect of density on Mortality of a weed plant.
- Measurement of effect of density on competition.
- Calculation of Competition Index.

Suggested Books –

1. V.S. Rao , Principles of Weed Science – Oxford & IBH Publishing Pvt. Co. Ltd. New Delhi
2. O. P. Gupta, Modern Weed Management – AgrobiosIndia, Jodhpur.
3. N.C. Joshi, Researchco Publication Delhi.
4. Ashton &Crafts, Mode of Action of Herbicides – Wiley Interscience Publication New York.
5. U.S. Shree Ramulu –Chemistry of Herbicides – Oxford & IBH Publishing Co. Ltd. New Delhi.
6. Majid, F.Z. Aquatic Weed: Utility and Development .Agrobotanica, Bikaner, India.

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SEMESTER SYLLABUS

M.Sc. CHEMISTRY

SCHEME OF EXAMINATION & DISTRIBUTION OF MARKS

SEMESTER - I

Paper No.	Title of the Paper (s)	Internal Assessment	Term End Exam	Practical	Total Marks
1.	Inorganic Chemistry	20	80		100
2.	Organic Chemistry, Stereochemistry & Pericyclic Reaction	20	80		100
3.	Physical Chemistry- I	20	80		100
4.	Spectroscopy And Mathematics/Biology For Chemists	20	80		100
LAB-I	Organic Chemistry				100
LAB-II	Analytical Chemistry				100
				TOTAL	600

SEMESTER - II

Paper No.	Title of the Paper (s)	Internal Assessment	Term End Exam	Practical	Total Marks
1.	Inorganic Chemistry	20	80		100
2.	Organic Chemistry	20	80		100
3.	Physical Chemistry	20	80		100
4.	Spectroscopy, Diffraction Methods & Computer For Chemists	20	80		100
LAB-I	Inorganic Chemistry				100
LAB-II	Physical Chemistry				100
				TOTAL	600

SEMESTER - III

Paper No.	Title of the Paper (s)	Internal Assessment	Term End Exam	Practical	Total Marks
COMPULSORY FOR GROUP A, B & C					
1.	Applications Of Spectroscopy	20	80		100
2.	Chemistry Of Bio-Inorganic & Bio-Organic	20	80		100
LAB-I	General (Compulsory)			200	200
OPTIONAL GROUP-A INORGANIC					
3.	Organotrasition Metal Chemistry	20	80		100
4.	Photo inorganic Chemistry	20	80		100
OPTIONAL GROUP- B ORGANIC					
3.	Physical Organic Chemistry	20	80		100
4.	Chemistry Of Heterocyclic Compounds	20	80		100
OPTIONAL GROUP-C PHYSICAL					
3.	Chemistry Of Materials	20	80		100
4.	Advanced Quantum Chemistry	20	80		100
				TOTAL	600

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SEMESTER - IV

Paper No.	Title of the Paper (s)	Internal Assessment	Term End Exam	Practical	Total Marks
COMPULSORY FOR GROUP A, B & C					
1.	Photochemistry & Solid State Chemistry	20	80		100
2.	Bio-Physical & Environmental Chemistry	20	80		100
OPTIONAL GROUP-A INORGANIC					
3.	Bioinorganic Chemistry & Supra-Molecular Chemistry	20	80		100
4.	Analytical Chemistry	20	80		100
LAB-I	Special			200	200
OPTIONAL GROUP- B ORGANIC					
3.	Medicinal Chemistry	20	80		100
4.	Chemistry Of Natural Product	20	80		100
LAB-II	Special			200	200
OPTIONAL GROUP-C PHYSICAL					
3.	Liquid States	20	80		100
4.	Computation Chemistry	20	80		100
LAB-I	Special			200	200
				TOTAL	600
				GRAND TOTAL	2400

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SEMESTER I
LABORATORY COURSE - I
ORGANIC CHEMISTRY

1. **Qualitative Analysis:-**
   Separation, Purification and Identification of compounds of Binary Mixture, T.L.C. and Column chromatography. I.R. Spectra may be used for functional group identification of compound by suitable derivatives preparation and determination of their melting points.
2. **Organic Synthesis:-**
   1. Bromination - Prepration of p-Bromo Aniline from Acetanilide.
   2. Nitration - Prepration of p-Nitro Aniline from Acetanilide
   3. Hoffman Bromide Reaction. Prepration of Anthranilic Acid from Pthallic anhydride.
   4. Aldol Condensation - Dibenzal acetone from Bazaldelyde.
   5. Sandmeyer Reaction -
      - o-Chloro Benzoic Acid from Anthranilic Acid.
      - p- Chloro toluene from Toludine.
   6. Friedal Craft Reaction - □ -Benzoyl.Propionic Acid from Succinic Anhydride and Benzene.
   7. Oxidation - Adipic Acid by Chromic Acid oxidation of cyclohexanol.
   7. Diazotization:-
      - Preparation of methyl orange from Sulphanilic Acid.
      - Phenyl Azo- □. Naphthol from Aniline.
   8. Preparation of Acridone from N- Phenyl anthranilic acid.
   9. Grignard's reaction: Synthesis of tripheny lmethanol from Benzoic acid.

   Note: Two stage preparation. Preparation of pure and crystalline compound based on any two of above principals with conformation of melting point.
3. **Quantitative Analysis:-**
   1. Determination of the percentage or number of Hydroxyl group in an organic compound by Acetylation method.
   2. Estimation of Amines/Phenols using Bromate - Bromide Solution / or Acetylation method.
   3. Determination of equivalent- weight of carboxylic compound.
   4. Estimation of carboxyl group by tritration / silver salt-method.
   5. Estimation of Carbonyl group by Hydrazone method.
   6. Estimation of Glycine by titration.

Instruction to Practical Examiners in Chemistry Semester –I

1. The Board of Examiners; one external and one internal for each branch will meet to decide the exercises and other matter in connection with the conduct of practical examinations

S. No.	Lab. Course (branch)	Max. Marks	Duration
1.	I- Organic Chemistry	100	5 hrs.
2.	II- Analytical Chemistry	100	5 hrs.

2. The distribution of marks is as under. Marks of Ex-students are given in parentheses.

(a) Qualitative Analysis of mixture containing two Organic compounds	30 (40) marks
(b) Preparation	10 (15) marks
(c) Estimation	20 (25) marks
(d) Viva voice	20 (20) marks
(c) Sessional	20 (-) marks
	Total-100 (100) marks

As far as possible all the exercises as laid down in the syllabus are set. The scale of marking will be determined by examiners in accordance with the nature of exercises.

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SEMESTER I
LABORATORY COURSE II
ANALYTICAL CHEMISTRY
SECTION- A
INSTRUMENTATION AND COMPUTERS

1. Error Analysis & Statistical data Analysis:-
   Errors, types of errors, Minimization of Error, Statistical treatment for error analysis, standard deviation, Relative standard deviation, Linear least square. Calibration of volumetric apparatus burrettes pipette, standard flask, weight box etc.
2. Volumetric Analysis:-
   Basic Principles, determination of I_2 and saponification values of oil sample determination of DO, COD, BOD, Hardness of water samples.
3. Chromatography:-
   Separation of Cations and anions by (A) Paper Chromatography, (B) Column Chromatography.

SECTION- B

4. pH Metry / Potentiometry / Conductometry titration :-
   Determination of strength of acid etc.
5. Flame Photometry / AAS/FIA/Colorimetry :-
   Determination of Cations / anions and metal Ions eg. Na^+, K^+, Ca^{2+}, $SO4^{2-}$ NO_2, Fe, Mo, Ni ,Cu, Zn etc.
6. Spectro Photometry :-
   Verification of Beer - Lambert Law. Molar Absorptivity calculation, Plotting graph to obtain □max etc. effect of pH in aqueous coloured system. Determination of metal ions eg. Fe, Cu, Zn, Pb etc
7. Nephelometry / Turbidimetry :- Determination of chlorine, sulphate phosphate turbidity etc.
8. Application of Computer in Chemistry:- As Specified in Theory paper in section II (A).

For Lab. Course –II (Analytical Chemistry):

(a)Two practical exercise (one from each section) (at least one of these will be based on instrumental analysis)	60 (80) marks
(b) Viva voice	20 (20) marks
(c) Sessional	20 (-) marks
Total-	100 (100) marks

As far as possible all the exercises as laid down in the syllabus are set. The scale of marking will be determined by examiners in accordance with the nature of exercises. Sessional marks will be awarded by External Examiner in consultation with the internal Examiner

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SEMESTER-II

LABORATORY – COURSE I

INORGANIC CHEMISTRY

Note- Students is accepted to complete all exercises.

1. Qualitative analysis of mixture containing eight radical including some less common metal ions among the following by common method (Preferably semi-micro method)

Group-A

Basic Radicals : - {Ag, Pb, Hg, Cu, Cd, Bi, As, Sb, Sn, Fe, Al, Cr, Zn, Mn, co, Ni, Ba, Sr, Ca, Mg, Na, K, NH_4 ,}

Acid Radicals: - {CO_3, SO_4, SO_3, NO_3, F, Cl, Br, I, NO_2, BO_3, C_2O_4, PO_4}

Group– B

Basic Radicals: - {Ce, Th, Zr, W, Te, Ti, Mo, U, V, Be, Li, Au, Pt.}

Acid Radicals :-{SiO_4, Thiosulphate, Ferrocynide, Ferricyanide, Chromate, Arsenite , Arsenate, Permanganate }

Note – The mixture to be analysed by the students must contain at least one basic and one acid radical from Group B.

2. **Quantitative Analysis:-**
   Involving two of the following in ores, alloys or mixture in solution- one by volumetric and other by gravimetric method Ag, Cu, Fe, Cr, Mn, Ni, Zn, Ca, Mg, Chloride, Sulphate.
3. **Estimation of:-**
   (A) Phosphoric acid in Commercial ortho phosphoric acid.
   (B) Boric Acid in Borax.
   (C) Ammonium Ion in Ammonium Salt.
   (D) MnO_2 in pyrolusite
   (E) Available Chlorine in bleaching powder.
   (F) H_2O_2 in commercial sample.

   Students are expected to perform at least three exercises From above during laboratory work.
4. Preparation of selected Inorganic compounds and study of their properties by various method including IR, Electronic Spectra, Mossbaur, ESR. Spectra+ Magnetic susceptibility etc.
   (i) V0 $(acac)_2$
   (ii) cis K $[Cr(C_2O_4)_2(H_2O)_2]$, trans K $[Cr(C_2O_4)_2(H_2O)_2]$,.$2H_2O$
   (iii) $[Co(NH_3)_6]Cl_3$
   (iv) Na $[Cr(NH_3)_2(SCN)_4]$
   (v) Mn $(acac)_3$
   (vi) $K_3[Fe(C_2O_4)_3]$
   (vii) Prussian Blue Turnbull's Blue.
   (viii) $[Co(NH_3)_6][Co(NO_2)_6]$
   (ix) Hg $[Co(SCN)_4]$
   (x) $[Ni(NH_3)_4]Cl_2$, $[Ni(NH_3)_4]Cl_2$
   (xi) Ni $(DMG)_2$(xii)$[Cu(NH_3)_4]SO_4$
   (xii) $K_3[Cr(C_2O_4)_3].3H_2O$
   (xiii) $[Cu(NH_3)_4]SO_4$

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SEMESTER-II
LABORATORY COURSE- II
PHYSICAL CHEMISTRY

1. **Adsorption:-**
   a. Verification of Freundlich's Adsorption Isotherm.
   b. To study surface tension – concentration relationship for solutions. (Gibbs equation).
2. **Phase Equilibria:**
   a. Determination of congruent composition and temperature of binary system e.g. diphenylamine – benzophenone system.
   b. Determination of glass transition temperature of given salt e. g. $CaCl_2$ conductometrically.
   c. To construct the phase diagram for three component system e. g. chloroform, acetic acid and water.
3. **Chemical Kinetics**
   a. Hydrolysis of an ester/ ionic reactions.
   b. Determination of the velocity constant of hydrolysis of an ester. Determination of effect of (a)change of temperatures, (b)change of concentration of reactants and catalyst and(c)ionic strength of the media on the velocity constant of media.
   c. Determination of the rate constant for the oxidation of iodide ions by hydrogen peroxide
   d. Determination of the primary salt effect on the kinetics of ionic reaction and testing of the Bronsted relationship (iodide ions oxidized by persulphate ion).
4. **Conductometry**
   a. Determination of solubility of sparingly soluble salt (eg, $PbSO_4$, $BaSO_4$) Conductometrically.
   b. Determination of the strength of strong and weak acids in a given mixture conductometrically.
   c. Determination of dissociation constant of weak electrolyte by conductometer.
   d. Determination of velocity constant, Order of reaction and energy of activation for saponification of ethyl acetate by sodium hydroxide.
5. **pH Metry/Potentiometry**
   a. Determination of the strength of strong and weak acid in a given mixture using pH meter/potentiometer.
   b. Determination of dissociation constant of weak acid by pH meter.
   c. Determination of concentration of acid in given buffer solution by pH meter.
   d. Determination of strength of halides in a mixture potentiometrically.
   e. Determination of the valency of mercurous ions potentiometrically.
   f. Determination of the strength of strong acid, weak acids in a given mixture using a potentiometer/ pH meter.
   g. Determination of temperature dependence of EMF of a cell.
   h. Determination of the formation constant of silver- ammonia complex and stoichiometry of the complex potentiometrically.
   i. Determination of activity and activity coefficient of electrolytes.
   j. Determination of thermodynamic constant. $\Delta G, \Delta S$ and ΔH for the reaction by e.m.f. method. $Zn + H_2SO_4 = ZnSO_4 + H_2$
   k. Determination of the dissociation constant of monobasic / dibasic acid
6. **Polarimetry:-**
   Determination of rate constant for hydrolysis/inversion of sugar using a polarimeter. Enzyme kinetic – inversion of sucrose.

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SEMESTER-IV
GROUP-B
LABORATORY COURSE (SPECIAL)
ORGANIC CHEMISTRY

200 marks

Note: Laboratory course with Group 'B' will be of 12 hrs duration spread over two days. The examinee will have to perform three experiments. These experiments will be of 40 marks each. 40 marks each will be allotted for viva-voce and Sessional work.

Qualitative Analysis

Separation, Purification and identification of the components of a mixture of binary organic compounds & mixture of three organic compounds.

Multi-step synthesis of Organic compounds (Three stage preparations. Preparation of pure crystalline product. By using any two following principals Conformation by melting point determination.)-

The exercises should illustrate the use of organic reagents and may involve purification of the products by chromatographic techniques.

1. Photochemical reaction: Benzophenone- Benzopinacol- Benzpinacolone.
2. Beckmann rearrangement: Benzanilide from benzene, Benzene- benzophenone ,oxime- Benzanilide.
3. Benzilic acid rearrangement : Benzilic acid from benzoin, (Benzoin- Benzil- Benzilic acid)
4. Synthesis of heterocyclic compounds, Skraup synthesis: Preparation of quinoline from aniline, Skraup synthesis: Preparation of 2 phenyl-indole from phenyl hydrazine.
5. Sandmeyer Reaction: Preparation of o chlorobenzoic acid from anthranilic acid.
6. Ultman reaction - Preparation of N-Phenyl anthranilic acid from o-chlorobenzoic acid.
7. Preparation of Acridone from N-Phenyl anthranilic acid.
8. Prepration of p nitro aniline
9. Prepration of p bromo aniline
10. Prepration of methyl orange from aniline via sulphanilic acid.

Extraction of Organic compounds from Natural sources-

1. Isolation of caffeine from tea leaves
2. Isolation of casein from milk
3. Isolation of lactose from milk
4. Isolation of nicotine dipicrate from tobacco
5. Isolation of piperine from black pepper
6. Isolation of lycopene from tomatoes
7. Isolation of b-carotene from carrots.

Paper Chromatography

Separation and identification of the sugars, dyes and amino acids present in the given mixture of sugars, dyes and amino acids by paper chromatography and determination of RF values.

Spectroscopy:

Identification of organic compounds by the analysis of their spectral data (UV. IR. PMR, CMR & M) Spectrophotometric (UV/VIS) Estimations of

1. Amino acids
2. Proteins
3. Carbohydrates
4. Aspiri

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SEMESTER-IV
GROUP-B
LABORATORY COURSE (SPECIAL)
PHYSICIAL CHEMISTRY

1. Study of kinetics of exchange between ethyl iodide and the iodide ion.
2. Determination of the solubility product of lead iodide.
3. Determination of the dissociation constant of barium nitrate.
4. Determination of relative strength of the acids by studying the hydrolysis of an ester.
5. Study the hydrolysis of methyl acetate catalysed by HCl and equimolar urea hydrochloride and hence the degree of hydrolysis of the salt.
6. Investigate the inversion of can-sugar in presence of an acid. Determine also the energy of activation of the reaction.
7. Study in inversion of can-sugar in presence of HCL and H_2SO_4 and hence determine the relative strength of the acids.
8. Study the kinetics of hydrolysis of ethyl acetate by NaOH at two temperatures by conductance measurement, and hence the energy of activation of the reaction.
9. Study the kinetics of hydrolysis of tertiary amyl iodide, and determine the order and energy of activation of the reaction.
10. Investigate the reaction between H_2O_2 and HI.
11. Study the kinetics of decomposition of benzene diazonium chloride at different temperatures.
12. Study the kinetics of reaction between $K_2S_2O_8$ and KI.
    (a) Determine and rat constant and order of reaction.
    (b) Study of influence of ionic strength on the rate constant.
13. Investigate the kinetics of autocatalytic reaction between KMno4 and Oxalic acid.
14. Determination of order of reaction between bromic acid and hydrobromic acids.
15. Determination of concentration f iodine in a given sample (KI) by isotope dilution technique.
16. Determination of effect of-
    (a) Change of temperature,
    (b) Change of concentration.
    (c) Ionic strength of the media on the velocity constant of hydrolysis of an ester.
17. Determination of the primary salt effect on the kinetics of ionic reactions and testing of the Bronsted relationship (iodide ion is oxidised by persulphate ion.)
18. Investigate the adsorption of oxalic acid from aqueous solution by activated charcoal and verify Frenndlish and Langmuir's adospriton isotherms.
19. Determine adsoption isotherms of acetic acid from aqueous solution by charcoal.

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SEMESTER SYLLABUS

M.Sc. PHYSICS

SCHEME OF EXAMINATION & DISTRIBUTION OF MARKS

SEMESTER I

Paper No.	Title of the Paper	Internal Assessment	Term End Exam	Total Marks
1.	Mathematical Methods-I	20	80	100
2.	Classical Mechanics	20	80	100
3.	Numerical Methods and C Programming	20	80	100
4.	Electronics-I	20	80	100
LAB I	General	-	-	100
LAB II	Computer Programming	-	-	100
			TOTAL	600

SEMESTER II

Paper No.	Title of the Paper	Internal Assessment	Term End Exam	Total Marks
1.	Mathematical Methods-II	20	80	100
2.	Quantum Mechanics-I	20	80	100
3.	Thermodynamics	20	80	100
4.	Electronics-II	20	80	100
LAB I	Electronics (Devices)	-	-	100
LAB II	Electronics (Circuits) Power supply, Amplifier, Oscillators, Modulation, Detection etc.	-	-	100
			TOTAL	600

SEMESTER III

Paper No.	Title of the Paper	Internal Assessment	Term End Exam	Total Marks
1.	Quantum Mechanics II	20	80	100
2.	Statistical Mechanics	20	80	100
3.	Condensed Matter Physics I	20	80	100
4.	Electronics III	20	80	100
LAB I	Condensed Matter Physics	-	-	100
LAB II	Digital Electronics	-	-	100
			TOTAL	600

SEMESTER IV

Paper No.	Title of the Paper	Internal Assessment	Term End Exam	Total Marks
1.	Condensed Matter Physics II	20	80	100
2.	Nuclear Physics	20	80	100
3.	Atomic and Molecular physics	20	80	100
4.	Electronics IV	20	80	100
5.	Project	-	-	200
			TOTAL	600
			GRAND TOTAL	2400

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SEMESTER SYLLABUS

M.Sc. PHYSICS

SCHEME OF EXAMINATION & DISTRIBUTION OF MARKS

SEMESTER I

Paper No.	Title of the Paper	Internal Assessment	Term End Exam	Total Marks
1.	Mathematical Methods-I	20	80	100
2.	Classical Mechanics	20	80	100
3.	Numerical Methods and C Programming	20	80	100
4.	Electronics-I	20	80	100
LAB I	General	-	-	100
LAB II	Computer Programming	-	-	100
			TOTAL	600

SEMESTER II

Paper No.	Title of the Paper	Internal Assessment	Term End Exam	Total Marks
1.	Mathematical Methods-II	20	80	100
2.	Quantum Mechanics-I	20	80	100
3.	Electrodynamics	20	80	100
4.	Electronics-II	20	80	100
LAB I	Electronics (Devices)	-	-	100
LAB II	Electronics (Circuits) Power supply, Amplifier, Oscillators, Modulation, Detection etc.	-	-	100
			TOTAL	600

SEMESTER III

Paper No.	Title of the Paper	Internal Assessment	Term End Exam	Total Marks
1.	Quantum Mechanics II	20	80	100
2.	Statistical Mechanics	20	80	100
3.	Condensed Matter Physics I	20	80	100
4.	Electronics III	20	80	100
LAB I	Condensed Matter Physics	-	-	100
LAB II	Digital Electronics	-	-	100
			TOTAL	600

SEMESTER IV

Paper No.	Title of the Paper	Internal Assessment	Term End Exam	Total Marks
1.	Condensed Matter Physics II	20	80	100
2.	Nuclear Physics	20	80	100
3.	Atomic and Molecular physics	20	80	100
4.	Electronics IV	20	80	100
5.	Project	-	-	200
			TOTAL	600
			GRAND TOTAL	2400

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बिलासपुर विश्वविद्यालय, बिलासपुर (छत्तीसगढ़)

सेमेस्टर पाठ्यक्रम

M.Sc. COMPUTER SCIENCE

SCHEME OF EXAMINATION & DISTRIBUTION OF MARKS

SEMESTER - I

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Digital Electronics and Microprocessor	Theory	20	80	100
2.	Advance Computer Network	Theory	20	80	100
3.	OOPs using JAVA	Theory	20	80	100
4.	Advanced Operating System	Theory	20	80	100
Lab-1	Digital Electronics	Practical	-	-	100
Lab-2	Java Programming	Practical	-	-	100

SEMESTER - II

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Analysis and Design of Algorithm	Theory	20	80	100
2.	Relational Database Management System (RDBMS)	Theory	20	80	100
3.	Data Structure using C++	Theory	20	80	100
4.	Software Engineering	Theory	20	80	100
Lab-1	RDBMS	Practical	-	-	100
Lab-2	Data Structure using C++	Practical	-	-	100

SEMESTER - III

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Theory of computation and compiler design	Theory	20	80	100
2.	artificial intelligence and expert system	Theory	20	80	100
3.	soft computing techniques	Theory	20	80	100
4.	.net technology	Theory	20	80	100
Lab-1	MAT LAB	Practical	-	-	100
Lab-2	Programming through .NET	Practical	-	-	100

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SEMESTER - IV

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Advanced Trends And Technology In Computer Science	Theory	20	80	100
2.	ELECTIVE - I Data Mining and Data Warehousing ELECTIVE - II Computer Graphics and Multimedia ELECTIVE - III Embedded System ELECTIVE-IV Network Security & Cryptography	Theory	20	80	100
3.	Major Project		-	-	400

Note: Internal assessment of 20 marks will consist of two parts -

1. Unit Test (10 Marks): Two tests will be conducted and average of these tests will be the marks of Unit Test.
2. Seminar/Assignment (10 Marks): To be conducted by the Department concerned.

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UNIT–V

Advance Topics of Operating System

Embedded Operating Systems, eCos, Tiny OS, Computer Security Concepts, Threats, Attacks, and Assets, Intruders, Malicious Software Overview, Viruses, Worm, Authentication, Access Control, Intrusion Detection, Malware Defense, Dealing With Buffer Overflow Attacks, Distributed Process Management, Process Migration, Distributed Global States, Distributed Mutual Exclusion, Distributed Deadlock.

Text Books:

1. Operating System Concepts, Silbersachatz and Galvin, Pearson Education Pub.
2. Operating Systems, Madnick E., Donovan J., Tata McGraw Hill,
3. Operating Systems, A. S. Tannenbaum, PHI

Reference Books:

1. Operating Systems Internals and Design Principle, William Stallings, Prentice Hall Publishers
2. Operating Systems- AConcept-Based Approach, Dhananjay M. Dhamdhere, McGraw-Hill

SEMESTER-I

LAB 1: DIGITAL ELECTRONICS

SEMESTER-I

LAB 2: JAVA PROGRAMMING

LAB Detail

Break-up of marks for External Practical Examination			
S. No.	Argument	Maximum Marks	Minimum Passing Marks
1	Lab Record	20	36
1.	Viva-voce	40	
2.	Program Development and Execution	40	
	Total Marks	100	36

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SEMESTER-II
LAB 1: RDBMS

SEMESTER-II
LAB 2: DATA STRUCTURE

Break-up of marks for External Practical Examination			
S. No.	Argument	Maximum Marks	Minimum Passing Marks
1	Lab Record	20	36
1.	Viva-voce	40	
2.	Program Development and Execution	40	
	Total Marks	100	36

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SEMESTER-III
LAB-1
MAT LAB

LAB-2
PROGRAMMING THROUGH .NET

The break-up of marks for Practical will be as under :

Sr. No.	Argument	Maximum Marks	Minimum Passing Marks
1.	Lab Record	20	
2.	Viva-voce	40	
3.	Program Development and Execution	40	
	Total Marks	100	36

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SEMESTER - IV
MAJOR PROJECT

Note:

1. It is compulsory, that students would have group of maximum of two students and project should be done under Government Sectors/ Public Sector / Pvt. LTD. S/W Company.
2. The students should not make any project under local or private institutions.
3. The students should make project themselves and project will not be copy of other project.

Steps for Live Project

1. Getting customer's requirements
2. Preparing designs, database and business logics
3. Developing software application project
4. Testing and implementing the project
5. Troubleshooting the project application after implementation

The break-up of marks for fourth semester's Major Project will be as under:

Sr. No.	Argument	Maximum Passing Marks	Minimum Passing Marks
1.	Project Record	100	
2.	Viva-voce	100	
3.	Program Development and Execution	200	
Total Marks		400	144

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SEMESTER - IV

Paper No.	Title of the Paper (s)	Nature	Internal Assessment	Term end Exam	Total Marks
1.	Advanced Trends And Technology In Computer Science	Theory	20	80	100
2.	ELECTIVE - I Data Mining and Data Warehousing ELECTIVE - II Computer Graphics and Multimedia ELECTIVE - III Embedded System ELECTIVE-IV Network Security & Cryptography	Theory	20	80	100
3.	Major Project		-	-	400

Note: Internal assessment of 20 marks will consist of two parts -

1. Unit Test (10 Marks): Two tests will be conducted and average of these tests will be the marks of Unit Test.
2. Seminar/Assignment (10 Marks): To be conducted by the Department concerned.

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SEMESTER - IV
MAJOR PROJECT

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2. The students should not make any project under local or private institutions.
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Steps for Live Project

1. Getting customer's requirements
2. Preparing designs, database and business logics
3. Developing software application project
4. Testing and implementing the project
5. Troubleshooting the project application after implementation

The break-up of marks for fourth semester's Major Project will be as under:

Sr. No.	Argument	Maximum Passing Marks	Minimum Passing Marks
1.	Project Record	100	
2.	Viva-voce	100	
3.	Program Development and Execution	200	
Total Marks		400	144

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