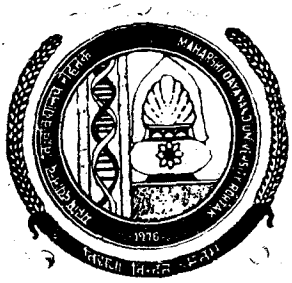
Maharshi Dayanand University
Rohtak



Ordinances, Syllabus and Courses of Reading for B.A./B.Sc.-II Examination

Session—1997-98

Available from :
Deputy Registrar (Publication)
Maharshi Dayanand University
Rohtak-124001 (Haryana)

Price :
At the Counter : Rs. 25/-
By Regd. Parcel : Rs. 35/-
By Ordinary Post : Rs. 30/-

ORDINANCE

B.A./B.Sc./B.Com./B.Sc. (Home Science) Examinations—1997-98

1. The duration of the course of instruction for the B.A./B.Sc./B.Com./B.Sc. (Home Science) shall be three years and the examination shall be held in three parts. Part-I examination shall be held at the end of Ist year, Part-II examination at the end of 2nd year and Part-III examination at the end of 3rd year. The examination in Part-I and Part-II shall be held once a year ordinarily in the month of April on such dates as may be fixed by the Vice-Chancellor.

   The examination in Part-III shall be held twice a year ordinarily in the month of April and September on such dates as may be fixed by the Vice-Chancellor.

2. The date of commencement of the examination as well as the last date for the receipt of examination forms and fee as fixed by the Vice-Chancellor, shall be notified by the Registrar/Controller of Examinations to all the colleges admitted to the privileges of the University.

3. A candidate's admission form and fee may be accepted after the last date on payment of late fee of Rs.105/- up to the period notified by the University.

4. No one shall be eligible to join the first year (part-I) class of B.A./B.Sc./B.Com /B.Sc. (Home Science) unless.

   i) he/she has passed one of the following examinations with 33% marks in aggregate for admission to B.A. Part-I, 35% for admission to B.Sc. (Home Science) Part-I. 40% for admission to B.Com. Part-I and 45% for admission to B.Sc. Part-I.

   a) Senior Secondary Certificate Examination of Haryana Education Board, Bhiwani.

   OR

   b) B.A./B.Sc. (Home Science) Part-I examination under old scheme of this University.

   OR

   c) Diploma in Pharmacy Course. (For B.A./B.Sc.-I only)

OR

d) Any other examination recognised by the Academic Council as equivalent to (a) or (b) or (c) above.

Note:—

1. The candidate seeking admission to B.Sc. (Non-Medical Group) Part-I should have passed the above examination with English, Physics, Chemistry and Mathematics and those seeking admission to B.Sc. (Medical Group) Part-I should have passed the above examination with English, Physics, Chemistry and Biology.

2. The admission to B.Sc. (Home Science) Course shall be open to Women candidates only.

3. If a candidate of another Board did not pass in the subject of English at 10+2 level, he/she may be allowed provisionally to join the B.A./B.Sc./B.Com./B.Sc. (Home Science) Part-I class as the case may be under new scheme of this University subject to his/her qualifying in the subject of English of 10+2 examination at the Supplementary Examination of the same year or in the next annual examination held in March from the Board concerned. Such a candidate shall have to furnish to the University proof of his/her having cleared the subject of English before the declaration of result of B.A./B.Sc./B.Com./B.Sc (Home Science) Part-I examination failing which his/her result of B.A./B.Sc./B.Com./B.Sc. (Home Science) Part-I examination shall be withheld.

5. No one shall be eligible to join the second year (Part-II) class of B.A./B.Sc./B.Com./B.Sc. (Home Science) course unless he/she has passed :

(a) B A./B.Sc./B.Com./B.Sc. (Home Science) Part-I Exam. as the case may be, under new scheme of this University.

Or

(b) B.A./B.Sc./B.Com./B Sc. (Home Science) Part-II examination as the case may be, under old scheme of this University.

Or

BA/BSC. II
1997-98
(10)

ion recognised as equivalent to (a) or (b)

) wishes to seek admission/migration to after passing the Senior Secondary Certifi- under (10+2 system) or an examination uivalent thereto and also after having examination of any statutory Univer- this University as equivalent to Ist this University under new scheme o so provided that he/she has secured or 35% marks, as the case may be in r Secondary Certificate examination examination and the minimum the Ist year examination of the to the percentage of marks as

6. A p ...ed one of the following examinations shall ...ible to join III year (i.e. Part-III) class of B.A / B.Sc /B Com./B Sc. (Home-Science) course :

(a) B.A./B.Sc./B.Com /B.Sc. (Home-Science) Part-II examination as the case may be, under new scheme of this University.

(b) B.A./B.Sc./B.Com./B.Sc. (Home-Science) Part-II Examination as the case may be, under new scheme of other statutory Universities. Provided that the subjects offered for B.A./B.Sc./B.Com./B.Sc. (Home Science) Part-II were the same as are available at this University and the syllabi were not materially different.

In case the subjects/papers offered for the B.A./B.Sc./ B.Com /B.Sc. (Home Science) Part-II were not the same as are available at this University, the candidate may be given exemption in the part-III for the subject(s)/paper(s) already studied/passed by the student and the subject(s)/ paper(s) which the candidate has not studied/passed in Part-I & II shall have to be studied/passed alongwith remaining subject(s)/paper(s) of Part-III.

7. The examination in Part-I, II & III shall be open to a student who :—

(a) has passed not less than one academic year previously the requisite examination as laid down in Clause-4, 5 & 6 above.

In case of a candidate who passed the requisite exam. under the rule relating to compartment the period of one academic year shall be counted from the examination in which he/she is first placed under compartment.

7(a). A candidate who is placed under compartment in one subject only in 10+2 examination of the Board of School Education Haryana, Bhiwani or of any other Board/University recognised by this University may be allowed provisionally to read for TDC-I exam. and to clear the compartment subject in **two consecutive chances.** If he/she fails to produce/submit the proof of having passed the compartment subject even at the second chance to be held simultaneously with TDC-I exam. his/her candidature/result for the TDC-I exam. shall stand automatically cancelled.

Provided that a candidate who joins Part-I of B.A., B.Sc. (Home Science), B.Com., B.Sc., as the case may be, must have obtained atleast 33%, 35%, 40%, 45% marks respectively in the aggregate (by adding minimum qualifying marks in the compartmental subject) in the Sr. Secondary Certificate examination (+2 examination) or an examination recognised equivalent thereto.

A candidate who is placed under compartment/reappear in upto 50% subjects in TDC-I exam. of this University may be allowed promotion to TDC-II. Similarly, a candidate who is placed under compartment/re-appear in upto 50% subjects TDC-II examination of this University may be allowed promotion to TDC-III. Two additional consecutive chances for each of three parts of TDC exam. shall be admissible for passing/clearing compartment this is however, subject to clause 9.2.

b) has his/her name submitted to the Controller of Examitions by the Principal of the College he/she has most

recently attended and produces the following certificates signed by the Principal of that college.

i) of having remained on the rolls of a recognised college for the academic year preceding the exam.

ii) of having satisfactorily performed the work of his/her class;

iii) of having attended not less than:

1. 75% of the full course of lectures delivered to his/her class in each of the subjects offered, (the course to be counted from the date of admission upto the last date when the classes break up for preparatory holidays, viz. 21 working days before the commencement of the examination); and

2. 75% of the periods assigned to Practical Work in each of the Science subject or Psychology or in the case of Geography Map Work and Practical(the minimum number of periods of Practical Work and in the case of Geography Map Work and Practical required to be arranged by each college shall not be less than 40% in each subject).

iv) of having obtained not less than 25% marks in the aggregate of all the subjects in the result of half yearly house examination held in November/December with 100 marks for each subject.

8.a) A student who is unable to appear in the annual examination due to shortage in attendance and has complied with the requirement in Clause-7 (b) (iv) above may be exempted from this requirement while taking the examination in the following year as an ex-student in terms of Clause 9.1

b) A student who has completed the required percentage of lectures but has failed to comply with the requirements in Clause-7(b) (iv) may be allowed on the recommendation of the Principal of the College concerned to appear as an ex-student in the following year.

9.1 A student who has completed the prescribed course of instruction in recognised college for-I, II, III Examination, but does not appear in it or, having appeared fails, may be allowed on

the recommendation of the Principal of the College concerned, to appear in the examination as an ex-student without attending a fresh course of instruction. This is however, subject to Clause 9.2 below.

9.2 The period of passing TDC Final year examination shall be 6 years from the year of joining the TDC-I for the first time i.e. within six academic years.

10. A candidate who re-appears in B.A. Part-I examination as an ex-student (in full subjects) may change one of his subjects.

11. The amount of examination fee to be paid by a candidate for each part shall be as under :

	B.A. Part-I,II & III	B.Sc. Part-I,II&III	B.Sc. (Home Science) Part-I, II & III	B.Com. Part-I,II & III
College Candidates	Rs 90/-	Rs. 110/-	Rs. 90/-	Rs. 90/-
Ex-students	Rs. 100/-	Rs. 120/-	Rs. 110/-	Rs. 110/-

A candidate taking up a subject which includes a practical examination shall pay an additional fee of Rs. 10/- per subject.

12. i) The medium of instruction shall be Hindi/English.

ii) The question papers will be set in :

a) Hindi in case of Sanskrit.

b) the language concerned in case of other languages.

c) in both Hindi and English in case of other subjects.

iii) The candidates shall write their answer in :

a) the language concerned in case of English and Modern Indian and oriental language except Sanskrit in which case the answer may be written in Hindi; and

b) Hindi, English, Punjabi or Urdu in case of other subjects.

13.1 The examination shall be held according to the Syllabus prescribed by the Academic Council, A candidate who fails in an

examination, or having been eligible fails to appear in an examination shall unless approved otherwise by the Academic Council take the examination as an ex-student or as a private candidate according to the Syllabus prescribed by University for regular students appearing for that examination, provided that the Syllabus for the candidates for the compartment/ Re-appear examination to be held in September/April as the case may be shall be the same as was in force for the regular student in the last Annual Examination.

13.2 A candidate for B.A. Examination shall take up English and Hindi/Punjabi/Sanskrit/Urdu as compulsory subjects and two elective subjects in each of three parts. Two elective subjects may be selected from the subjects prescribed for the examination as per syllabus, subject to the following :

a) A candidate shall

Offer Military Science if he is a regular student.

(b) A candidate shall offer Statistics if he/she offers it alongwith Mathematics/Computer Applications.

(c) Every candidate shall offer Hindi either as a compulsory subject or as an elective subject.

(d) Language offered as compulsory subject cannot be offered a an elective subject.

(e) A candidate shall offer Computer Application with Math. Statistics for B.A. only.

13.3 A candidate for B.Sc. examination shall offer one paper of English in the Ist year and one paper of Hindi/Punjabi/ Sanskrit/Urdu in the 2nd year. In addition he/she shall be required to offer the subjects of B.Sc. as the case may be, according to the scheme of examination and syllabus approved by the Academic Council.

13.4 A candidate for B.Com. examination shall offer the papers according to the scheme of examination and the syllabus approved by the Academic Council.

13.5 A candidate for B.Sc. (Home-Science) examination shall offer one paper of English in the 2nd year and the subject of B.Sc. (Home-Science) in the first year, 2nd year and 3rd year, according to the scheme of examination and the syllabus approved by the Academic Council.

NOTE :

A candidate coming from a Non-Hindi speaking area shall if he/she did not offer Hindi/Punjabi/Sanskrit/Urdu in the examination qualifying for admission, offer in lieu of compulsory Hindi/Punjabi/Sanskrit/Urdu, the subject of Additional English which shall carry the same marks as for Hindi/Punjabi/Sanskrit/Urdu.

14. College students offering a U.G.C. Scheme of restructured/vocational courses, shall be required to take up the combination of traditional and compulsory subjects in each of the TDC Part-I, II & III as mentioned against each course in the Sscheme of Examination.

15. The minimum number of marks required to pass the examination shall be 35% in each subject in case of B.A./B.Sc./B.Sc. (Home-Science) examination. 35% marks in each paper in case of B.Com. examination. Provided that in a subject in which there is a practical examination, this percentage shall be required separately in written and practical parts (Including map work in case of Geography) of the examination. (A candidate of the University who fails in theory or practical or both parts of subject may be allowed to re-appear/compartment in the theory or practical or both parts, as the case may be of that subject).

16. The successful candidates shall be classified in three divisions as under :-

i) those who obtain 60% or more of the aggregate number of marks in all the subjects including the Compulsory subjects in Part I, II and III. Examination taken together shall be placed in the First Division.

ii) those who obtain less than 60% but not less than 50 marks in all the subjects including the Compulsory subjects in Part-I, II and III examinations taken together, shall be placed in the Second Division.

iii) those who obtain below 50% marks in all the subjects including the Compulsory subjects in Part-I, II and III examination taken together, shall be placed in the Third Division.

A student who has passed B A./B.Sc./B.Com./B.Sc. (Hom-Science) Part-I and or Part-II examination under new scheme from other University, the marks obtained in B.A./B.Sc./B.Com /B.Sc. (Home-Science) Part-I and/or Part-II shall be counted towards division of successful candidates at Part-III examination by increasing or decreasing the marks obtained in accordance with the maximum marks prescribed for Part-I and II by the M.D. University, Rohtak.

17. A candidate while appearing in the supplementary examination or the next Annual Examination shall be required to pay examination fee as for the whole examination and shall not be eligible for a scholarship, a prize or a medal.

18. Six weeks after the termination of the examination or as soon thereafter as is possible the Registrar/Controller of Examinations shall publish a list of successful candidates. Each successful candidate of B.A./B.Sc./B.Com./B.Sc. (Home Science) Part-III examination shall be awarded a degree mentioning the division.

19. A candidate

(i) who has passed B.A./B.Sc. Examiation of this University :

(ii) who resides within the territorial jurisdiction of this University and has passed and examination declared equivalent to the B.A./B.Sc. examination of this University may appear in a subsequent B.A./B.Sc. examination in additional subjects prescribed for the examination except the subject in which he/she has already passed the examination.

iii) A candidate appearing under this Clause shall sit for Part-I and Part-II in annual examination and for Part-III in supplementary examination. Such a candidate shall apply on one examination form available at Rs. 125/-. In case, he/she fails in Part-I/II/III he/she may appear in the immediate next annual examination. Such a candidate shall submit one examination form for Part-I and II or Part-I,II,III (in case of failure). In case, he/she fails to pass any of the part(s) in next annual examination, he/she shall appear in all the parts denovo. Provided that if the candidate is appearing in the subject(s) involving practical, he/she shall study in a college admitted to the privileges of this University for Part-I, II & III classes and submit a certificate from the Principal for having completed the prescribed course of lectures, one month before the commencement of examination. However a candidate who has passed B.Sc. examination may appear in subsequent examination in additional subject of Hindi (Elective) of B.A. (pass course) and a candidate who has Passed B.Com. examination may appear in an additional subject of Hindi (Elective) and Mathematics in subsequent examinations of B.A. (Pass Course).

iv) The minimum marks required to pass in each subject shall be 35% in theory and practical separately.

20. i) The candidates who have passed the B.A./B.Sc./B.Com./B.Sc. (Home-Science) examination in the second or third division be allowed to re-appear in one or more subject(s)/in theory papers only of the Part-I, II and Part-III examinations for improvement of division. The candidate may also be allowed to improve their score of marks upto 45% in the same manner. However for improvement of division from III to II and II to I as well as improvement of score of marks upto 45% only one chance shall be allowed Such a candidate, after his/her passing the B A./B.Sc./B Com /B Sc. (Home-Science) in the annual examination held in April/May shall appear for Part-III in the immediate supplementary examination and Part-I and/or II in April/May next. His/her result of improvement of Part-III supplementary examination shall be finalized by taking into consideration the marks obtained by him/her in Part-I

and/or Part-II in April/May next. Provided that the result of the said Part-III supplementary examination shall be declared if the candidate had furnished undertaking at the time of submission of examination admission form to the effect that he/she is not interested in the improvement of Part-I & II. Likewise a candidate passing his/her Part-III in September of the following calendar year. However, if such candidate gives an undertaking at the time of submission of examination admission form of Part-I and/or Part-II for improvement in the next annual examination that he/she is not interested in improvement of Part-III, his/her result of improvement shall be finalized on the basis of Part-I and II.

ii) The higher score in the paper(s)/subject(s) in which he/she reappears for improvement will be taken into account towards the final result and the marks already obtained by the candidate in the paper/subject(s) in which he/she has not opted to improve his/her result shall be carried forward. In case the candidate does not improve the division his/her result shall be declared as Previous Result Stands.

21(1) In order to provide opportunity for women candidates who have already passed B.A. examination of this University with) Home-Science as a subject to join the M.Sc. (Home-Science Course an examination of B.Sc. standard in the following subjects shall ordinarily be held once a year in the month of April on a date fixed by the Vice-Chancellor :-

a) Nutrition and Foods.
b) Textiles and Clothing
c) Art and Everyday Life
d) Home-Management
e) Biology
f) Psychology and Human Relationship
g) Household Chemistry
h) Sociology
i) Principles of Economics

2) Every candidate for this examination shall be required to produce the following certificates signed by the Head of a colloge recognised for B.Sc. Home-Science course:-

   a) of having attended not less than 75% of the lectures delivered to the class in theory and practical of each subject during the academic year preceding the exam.

   b) of having completed the sessional work in each subject prescribed in Clause-21 (1).

3) The last date for receipt of admission forms and fees shall be the same as for the B.Sc. Home-Science examination. The amount of admission fee to be paid by a candidate shall be Rs 110/- and additional fee of Rs. 10/- per practical subject. Every candidate shall be examined according to the syllabus prescribed for these subjects by the Academic Council.

4) The Minimum number of marks required to pass the examination shall be 40% in each theory and practical examination separately.

5) Candidates who obtained pass marks in all the subject shall be admitted to the degree of B.Sc. Home-Science and shall be eligible to join the M.Sc. Home-Science Course.

22. Notwithstanding the integrated nature of the B.A./B.Sc./ B.Com./B.Sc. (Home-Science) course which is spread over more than one academic year, the Ordinance in force at the time a student join course shall hold good only for the examination(s) held during or at the end of the academic year and nothing in these ordinances shall be deemed to debar the University from amending the ordinances subsequently and the amended ordinances, if any, shall apply to all students whether old or new.

SCHEME OF EXAMINATION

B.A. Part-I,II and III

Compulsory Subjects

1. English	Two paper of 50 marks each in Part-I, Part-II & Part-III
2. Hindi/Panjabi/Sanskrit/Urdu	

Note:1. Every Candidate must offer Hindi either as a Compulsory subject or as an Elective subject.

2. Language offered as compulsory subject shall not be offered as an Elective subject.

3. A candidate coming from a Non-Hindi speaking area shall if he/she did not offer Hindi/Panjabi/Sanskrit/Urdu in the examination qualifying for admission, offer in lieu of compulsory Hindi/Panjabi/Sanskrit/Urdu, the subject of additional English which shall carry the same marks for Hindi/Panjabi/Sanskrit/Urdu.

Elective Subjects

Any two of the following subjects, in each part, subject to restrictions as given in the Ordinance :-

1. Hindi or Punjabi or Urdu or Sanskrit or French	
2. Ancient Indian History, Culture and Archaeology	One paper of 100 marks each except for French where there will be one paper of 75 marks and one Practical (Dictation and Oral of 25 marks).
3. Economics	
*4. Education	
5. History	
*6. Linguistics	
7. Pol. Science	
8. Philosophy	
9. Public Administration	
10. Sociology	
11. Mathematics	Two paper of 50 marks each.
12. Art OR	One paper of 30 marks and three Practicals of 20 marks each and 10 marks for sessional work.

	History of Art OR Clay Modelling	One Paper of 100 marks One paper of 30 marks and two practicals of 30 marks each and 10 marks for sessional work.
13.	Applied Art	One paper of 25 marks & three practicals of 20 marks each & 15 marks for sessional work.
14.	Music (Vocal)	One paper of 40 marks and one practical of 60 marks.
15.	Music (Instrumental) OR Music (Tabla)	One paper of 40 marks and one practical of 60 marks One paper of 40 marks and one practical of 60 marks
16.	Indian Classical Dance	One paper of 40 marks and practical of 60 marks
17.	Geography	One paper of 50 marks and one practical of 50 marks in case of part-III two Theory papers of 40 and 20 marks and one Practical of 40 marks.
18.	Psychology	One paper of 70 marks and one practical of 30 marks.
19.	Military Science	One paper of 70 marks and one practical of 30 marks.
20.	Home Science	One paper of 60 marks and One practical of 40 marks.
21.	Statistics	Two papers of 35 marks each and one practical of 30 marks
22.	Computer Applications	

Note The following combinations of the elective subjects shall not be allowed :

a) i) History and Ancient Indian History, Culture & Archaeology.

ii) Education and Mathematics.

iii) Education and Art and History of Art.

iv) Home Science and Geography.

v) Music (Vocal) and Sociology.

vi) Clay Modelling and Psychology.

vii) Linguistics and Indian Classical Dance.

viii) Military Science and Music (Instrumental/Tabla)

b) A candidate shall :-

i) Offer Military Science if he is regular student.

ii) Computer Applications only if he offers it alongwith Mathematics/Statistics.

A candidate shall offer the elective subjects mentioned above, subject to the following :-

a) A candidate may offer Psychology, Home Science and/or Geography, if he/she produces a certificate from the Head of Institution recognised to teach this/these subjects or an Institution approved for this purpose by the Board of Studies concerned, to the effect that he/she has completed the course prescribed for practical work in these subjects.

Exception :-A candidate who has obtained :-

i) Two Year Home-Science Diploma or one year Teachers Training Diploma from the Institute of Home Economics New Delhi.

OR

ii) Home-Science Diploma (2 Year Course) from Lady Irvin College New Delhi.

May be taken as having completed the prescribed course in Home-Science.

Note :- The Syllabus of Applied Art is the same as that of Commercial Art. Painting & Designing under the scheme of Restructured Course.

SCHEME OF EXAMINATION

B.Sc. Part-I, II and III

Compulsory Subjects

B.Sc. Part-I	One Papers of 50 marks.
1.English	
B.Sc. Part-II	One paper of 50 marks
Hindi/Panjabi/Sanskrit/Urdu	

Note :- A Candidate coming from a Non-Hindi speaking area shall if he/she did not offer Hindi/Panjabi/Sanskrit/Urdu in the Examination qualifying for admission, offer, in lieu of compulsory Hindi/Panjabi/ Sanskrit/Urdu, the Subject of Additional English which shall carry the same marks as for Hindi/ Panjabi/Sanskrit/Urdu.

Elective Subjects

Any three of the following subjects in each part, subject to restriction given in the Ordinance :-

1.	Physics	Two papers of 55 marks each and one practical of 40 marks.
2.	Chemistry	Three papers of 35 marks each and one practical of 45 marks.
3.	Botany	Two papers of 55 marks each and one practical of 40 marks.
4.	Zoology	Two papers of 55 marks each and one practical of 40 marks.
5.	Mathematics	Two papers of 75 marks each.
6.	Statistics	Two papers of 50 marks each and one practical of 50 marks.
7.	Geology	Two papers of 45 marks each and one practical of 60 marks.
8.	Home Science	One paper of 100 marks and one practical of 50 marks.
9.	Geography	One paper of 100 marks and one practical of 50 marks, in case of part-III two papers of 60 and 30 marks and one practical of 60 marks.
10.	Anthropology	Two papers of 50 marks each and one practical of 50 marks.

11. Bio-Chemistry 12. Human Anatomy 13. Physiology 14. Micro Biology	The scheme of papers will be notified later, if required.

A candidate for B.Sc. Part-I examination shall not offer any subject (except Geology, Geography, Home Science and Statistics or a subject which is not included in the scheme of examination for the+2 stage of the Sr. Secondary Certificate Examination) unless he offered the corresponding subject in the lower examination.

Provided that-

i) A candidate who did not take up physiology in the XII class of Sr. Secondary Certificate examination may if he took up Biology, offer Physiology for B.Sc. examination.

ii) A candidate who took up Agriculture as one of his Elective group subjects for XII class of Sr. Secondary Certificate Examination may offer Botany or Zoology or both for the B.Sc. Examination.

iii) A candidate who took up Biology or Physiology as one of his Elective Group subjects for XII class of Sr. Secondary Examination may offer Zoology/Botany/Physiology for B.Sc. Examination.

The following combination of subjects at B.Sc. Part-I,II and III be allowed w.e.f. the Session 1996-97, 97-98 and 1998-99 respectively:-

I Computer Science/Computer Applications with any two of the following subjects:-

i) Mathematics	**ii)Statistics**	**iii)Physics**
iv) Chemistry	**v)Botany**	**vi)Zoology**

Subject to the condition that Botany and Zoology should be offered together. Those who opt for the above combination must have studied Mathematics at 10+2 level.

2. Electronics alongwith Physics and any one of the following subjects:-

(i) Computer Science/Computer Applications

(ii) Mathematics

(iii) Chemistry

(iv) Statistics

Subject to the condition that the students opting for the above combination must have studied Mathematics at 10+2 level.

Students offering Industrial Chemistry as an elective subject in B.Sc. Pass Course should be required to offer Chemistry and Mathematics as other two subjects, besides offering English (Compulsory) in B.Sc. Part-I and Hindi/ Punjabi/ Sanskrit/Urdu (Compulsory in B.Sc. Part-II.)

SCHEME OF EXAMINATION FOR B.A.PARTS-I, II & III (GENERAL) Of RESTRUCTURING COURSES (UNDER THE U.G.C. SCHEME) FOR STUDENTS IN COLLEGES

Candidates offering a restructured course, shall be required to take up combination of traditional and compulsory subjects in each of the part-I, II and III as mention below against each course; subject to the restriction given in the Ordinance :

Sr. No.	Name of the Restructured Course	Combination of Traditional subjects (any two of the following)	Compulsory Subjects
1	2	3	4
1.	Office Management	English or Hindi, Commerce, Economics, Political Sc. History, Sociology, Geography, Public Administration.	(a) If a candidate Offers English as an Elective subject, he will take up Hindi as compulsory in Part-I, II of 100 marks each. If he takes Hindi as elective, he will take English as compulsory in Part-I, and II of 100 marks each. (b) If a candidate does not take English/Hindi as Elective then he will have one paper of English of 100 marks in Part-I and one paper of Hindi of 100 marks in Part-II.
2.	Archaeology, Museum and Tourism	English or Hindi or Sanskrit, History, Pol. Sc. Sociology, Geography, Economics.	-do-

3.	Commercial Art, Designing & Painting	English or Hindi or Sanskrit or Punjabi/Urdu, History or Economics, Commerce Pol. Sc. Sociology, Music or Dance, Psychology.	-do-
4.	Rural Industrialisation	English or Hindi, Economics, Commerce; Public Administration, Sociology, Pol. Sc. Geography.	-do-
5.	Local Self Government	English or Hindi Pol. Sc. Economics, History, Sociology, Geography, Public-Administration.	-do-
6.	Marketing	English or Hindi, Economics, Commerce, Pub. Adm., Pol.Sc. Sociology, History, Geography.	-do-
7.	Labour Welfare	English or Hindi, Economics, Pol. Sc., Sociology, Pub. Adm., Commerce, History, Psychology.	-do-
8.	Fruit Preservation, Applied Nutrition, Bakery, Tailoring and Hoisrv	Home Science and any one of the following : English/Hindi, History Commerce, Economics Pol. Sc. Chemistry and Music (Instrumental and Vocal)	

9.	Insurance and Commerce, Mathematics/Actual Science, Economics	English of 100 marks in Part-I and Hindi of 100 marks in Part-II

Note :-

1. *In addition to the above combination the candidate shall be required to offer a compulsory subject of Hindi/English as per Scheme of Examination.*
2. *The syllabus of English elective if any for the students of Restructured course will be the same as for English compulsory for all correponding class of B.A.*
3. *A candidate coming from a Non-Hindi speaking area shall, if he/she did not offer Hindi in the Examination qualifying for admission, offer in lieu of compulsory Hindi, the subject of Additional English which shall carry the same marks as for Hindi.*

SCHEME OF EXAMINATION FOR B.Sc. PARTS-I,II&III OF RESTRUCTURING COURSES (UNDER THE U.G.C. SCHEME) FOR STUDENTS IN COLLEGES

A candidate shall be required to offer English Compulsory in B.Sc. Part-I, Hindi Compulsory in B.Sc. Part-II and any one of the following subjects alongwith two subjects mentioned in the Scheme of Examinations or traditional subjects (subjects to restrictions given in the Ordinance) in each Parts-I, II and III.

1. Electronics
2. Computer Science
3. Micro-biology
4. Plant and Crop Genetics
5. Fish and Fisheries
6. Pest control
7. Horticulture and Vegetable Cultivation
8. Pharmacy
9. Industrial Chemistry
10. Analytical methods
11. Agricultural Chemicals and Fertilizers
12. Soils and Soils Conservation
13. Animal Husbandary and Poultry
14. Textile Chemistry
15. Farm Management

Note: A candidate coming from a Non-Hindi speaking area shall if he/ she did not offer Hindi in the examination qualifying for admission offer in ieu of Compulsory Hindi the subject of Additional English which shall carry same marks as for Hindi.

ENGLISH (Compulsory)

Paper-A M.M.:100

Prescribed Books Time : 3 Hours

1. An Anthology of Poems edited by Mrs. K. Mohan and Published by Macmillan India.
2. Facets of Life : An Anthology of Prose and One Act Plays edited by Shri Y.K.Kahal and published by Oxford University Press.

SCEHEME OF EXAMINATION

Q. 1 Reference to the context; Two excepts with internal choice, one from each book to be attempted. 10 marks

Q. 2. Two essay-type comprehension questions on the poetry books, each with internal choice 2x10=20 marks

Q. 3. Two essay type comprehension questions one the book of Prose and one Act Plays, each with internal choice 2x10=20 marks

Paper-B M.M. 50

Prescribed Books Time:3 Hours

1. The Guide by R.K. Narayan.
2. A Book of Composition by Dr. R.S. Malik and Dr. D.V.Dagar Published by Macmillan

SCHEME OF EXAMINATION

Q. 1.	Precis of a passage of not more than 250 words	8 marks
Q. 2.	Comprehension	7 marks
Q. 3.	Letter	5 Marks
Q. 4.	Translation of a brief passage from English to Hindi Alternate question in lieu of Translation (Q.4) a Paragraph of 100 to 250 words for Foreign students only.	8 marks
Q. 5.	Short Composition of 200 words on a topic	7 marks
Q. 6&7	Two essay-type comprehension questions on the prescribed Novel, each with internal choice-one on incidents, the other on characters.	8+7 marks

Note:- Question No. 1 to 5 would be set on the lines suggested in the prescribed composition book mentioned above.

ADDITIONAL ENGLISH

One Paper Max. Marks : 100

Time : 3 Hours

A. Part - I Text 60 Marks

The candidates will be required to study the following text: Following Essays from English Essayists Ed. Susanta K. Sinha (O.U.P. 1978). 20 Marks

1.	A.C. Benson	The Art of the Essayist
2.	Francis Bacon	Of Studies
3.	Joseph Addision	Sir Roger at Church
4.	Richard Steel	The Spectator Club
5.	Charles Lamb	The Two Races of Man
6.	William Hazlitt	On Femiliar Style

7.	R. L. Stevenson	Walking Tours	
8.	E.V. Lucas	A Funeral	
8.	Hilaire Belloc	In Praise of Ignorance	
II	Fragrance (A Poetry Anthology) ed. K. Sreenivasan (O.U.P.) excluding the following poems		20 Marks

i) Ode to a Skylark by P.B. Shelley
ii) Ode on a Grecian Urn by John Keats
iii) A Prayer for my Daughter by W.B.Yeats

III Lord of the Flies by Williams Golding — 20 Marks

The following types of questions will be asked:

Q.1 Explanation with reference to the context from I and II above. — 5X2=10 marks

Q.2 One general essay type question with internal choice on I above. — 15 Marks

Q.3 One question with internal choice on theme argument, summary, development of thought , incident, etc, on II above. — 15 Marks.

Q.4 One general essay type question with internal choice requiring a first hand study of the prescribed Novel at III above. — 20 Marks.

B. Part - B General — 40 Marks.

1. Essay (about 400 words on any one of the four/five given topics which may be of reflective, descriptive and/ or literary type). — 20 Marks

2. Precis : Reducing a given passage of about 275 words to about one third of its lenght (in the candidates' own words) and giving it a suitable heading. — 20 Marks

PUNJABI (COMPULSORY)

One Paper — Max. Marks : 100
Time : 3 Hours

Outlines of Test

1.	A selection of Punjabi Poetry from 1700-1850.	40 marks
2.	A Book of Short Stories by Single Author.	20 marks
3.	Essay	20 marks
4.	Applied Grammar (Pair of words and one words substitution)	20 marks

Syllabus and Courses of Reading

1. Kav-Rang (Ed. Diwan Singh), Amritsar, Guru Nanak Dev University, 1988.

Note: Only the following seven poets to be studied:-

Bulleh Shah, Hasham (Sufi Poet), Varis Shah, Kadar Yaar, Shah Muhammad Naajabat, Peer Muhammad.

3. Dvadshi, Kulwant Singh Virk, Delhi, Arsee Publishers.

Note:*The Syllabi is common for B.Sc. - II Punjabi Compulsory.*

PUNJABI (ELECTIVE)

One Paper — Max. Marks: 100
Time : 3 Hours

Outlines of Test

1.	A selection Punjabi Poetry from 1700-1850	20 Marks
2.	History of Punjabi Literature 1700-1850	20 marks
3.	Collection of Short Stories le Author	20 Marks
4.	Chhand : Dohra, Sortha, Korra, Sirkhandi, Baint. Sawayia, kabit, Chaupai, Deodh.	10 Marks
5.	Alankar : Upma, Rupak, Anthakathni, Drishtant Anupras, Virodh, Vakrokti, Pradhokti Lesh, Lokokti	10 Marks
6.	Applied Grammar : (Pair of words and one word substitution)	10 marks
7.	Literary Terminology from English to Punjabi 200 words.	10 marks

Syllabus and Courses of Reading

1. Kav-Tarang Kurukshetra University Publication.
2. Punjabi Sahit da Itihas, Dr. R.S. Jaggi, Patiala, Punjabi University.
3. Katha Yatra-Kurukshetra University Publication.
4. Naveen Punjabi Pingal, Dr. Kartar Singh Suri, Ludhiana, Lahore Book Shop.
5. Literary Terminology ; From English to Punjabi:-

1.	Abstract	ਸੂਖਮ
2.	Absurd	ਅਸੰਗਤ
3.	Accent	ਸੁਰਦਬਾ, ਲਹਿਜਾ

4. Actor	ਅਦਾਕਾਰ
5. Adoption	ਅਪਨਾਉਣਾ
6. Adaptation	ਅਨੁਕੂਲਤਾ, ਰੁਪਾਂਤਰਨ
7. Aestheticism	ਸੁਹੱਜ
8. Aestheticism	ਸੁਹਜਵਾਦ
9. Analysis	ਵਿਸ਼ਲੇਸ਼ਨ
10. Annotation	ਟੀਕਾ
11. Anthologist	ਸੰਗ੍ਰਹਿਕਰਤਾ
12. Anthology	ਸੰਗ੍ਰਹਿ
13. Aptitude	ਰੁਚੀ
14. Architect	ਸ਼ਿਲਪਕਾਰ
15. Artistically	ਕਲਾ ਪੱਖ ਤੋਂ
16. Atheism	ਨਾਸਤਿਕਤਾ
17. Assonance	ਦੁੰਦ ਸਮਾਨਤਾ
18. Auditorium	ਸਰੋਤਾ ਭਵਨ
19. Autobiography	ਸਵਜੀਵਨੀ
20. Ballad	ਗਾਥਾ
21. Bibliography	ਪੁਸਤਕ-ਸੂਚੀ
22. Biography	...ਵਨੀ
23. Blank verse	ਮੁਕਤ-ਕਾਵਿ
24. Brevity	ਸੰਖੇਪਤਾ
25. Brochure	ਪੁਸਤਿਕਾ
26. Catharsis	ਭਾਵ ਵਿਵੇਚਨ
27. Characterisation	ਪਾਤਰ ਚਿਤਰਨ
28. Chorus	ਸੰਗੀਤ ਮੰਡਲੀ

29. Chronology	ਕਾਲ ਕ੍ਰਮ
30. Clarification	ਸਪਸ਼ਟੀਕਰਨ
31. Climax	ਸਿਖਰ
32. Comedy	ਸੁਖਾਂਤ
33. Commentary	ਭਾਸ਼
34. Communism	ਸਾਮਵਾਦ
35. Conception	ਸੰਕਲਪ
36. Consonant	ਵਿਅੰਜਨ
37. Contemporary	ਸਮਕਾਲੀ
38. Content	ਵਸਤੂ
39. Criterion	ਕਮਸੁਚੀ
40. Critic	ਆਲੋਚਕ
41. Critical	ਆਲੋਚਨਾਤਮਕ
42. Cnicism	ਸਨਕੀ ਹੋਣਾ
48. Conflict	ਦਵੰਦ
44. Definition	ਪਰਿਭਾਸ਼ਾ
45. Dialect	ਉਪ ਭਾਸ਼ਾ
46. Dialogue	ਵਾਰਤਾਲਾਪ
47. Director	ਨਿਰਦੇਸ਼ਕ
48. Drama	ਨਾਟਕ
49. Dramatist	ਨਾਟਕਕਾਰ
50. Duet Song	ਦੁਗਾਨਾ
51. Ego	ਸਉਮੈਂ
52. Elegy	ਮੋਤ ਗੀਤ
53. Element	ਤੱਤ

54. Eloquence	ਸੁਭਾਵਨ
55. Emotional	ਜਜਬਾਤੀ
56. Epic	ਮਹਾਕਾਵਿ
57. Essay	ਨਿਬੰਧ
58. Etymology	ਨਿਰੁਕਤੀ
59. Example	ਮਿਸਾਲ
60. Existentialism	ਹੋਂਦਵਾਦ
61. Expression	ਪਗਟਾ
62. Expressionism	ਆਵਿਅੰਜਨ
63. Facility	ਸਹੂਲਤ
64. Fantasy	ਕਲਪਨਾ
65. Fatalism	ਭਰੋਸਾਵਾਦ
66. Farce	ਸ਼ਾਂਗ
67. Feudalism	ਭੂਮਵਾਦ
68. Fiction	ਗਲਪ
69. Figure of Speech	ਅਲੰਕਾਰ
70. Folk Lore	ਲੋਕਯਾਨ
71. Folk Song	ਲੋਕਗੀਤ
72. Free Verse	ਮੁਕਤ ਕਾਵਿ
73. Form	ਰੁਪ
74. Genius	ਪ੍ਰਤਿਭਾਸ਼ੀਲ
75. Genealogy	ਵੰਸਾਵਲੀ
76. Glossary	ਸ਼ਬਦ ਸੁਚੀ
77. Hereditery	ਪਿਤਾ ਪੁਰਖੀ
78 Histrionics	ਸਵਾਂਗਕਲਾ

79. Humanism	ਮਾਨਵ ਵਾਦ
80. Idea	ਵਿਚਾਰ
81. Idealism	ਆਦਰਸਵਾਦ
82. Ideology	ਵਿਚਾਰਧਾਰਾ
83. Illusion	ਭਰਮ
84. Imagery	ਬਿੰਬਾਵਲੀ
85. Imagination	ਕਲਪਨਾ
86. Imitation	ਨਕਲ
87. Impressionism	ਪ੍ਰਭਾਵਵਾਦ
88. Impulse	ਮਨੋਤਰੰਗ
89. Indvidual	ਵਿਅਕਤੀ
90. Individualism	ਵਿਅਕਤੀਵਾਦ
91. Inferiority Complex	ਹੀਣਤਾ ਭਾਵ
92. Instinct	ਪ੍ਰਵਿਰਤੀ
93. Journalism	ਪੱਤਰਕਾਰੀ
94. Legend	ਦੰਤ ਕਥਾ
95. Liberalism	ਉਦਾਰਵਾਦ
96. Linguistic Continuity	ਭਾਸ਼ਾ ਦੀ ਅਖੰਡਤਾ
97. Linguistics	ਭਾਸ਼ਾ ਵਿਗਿਆਨ
98. Literal	ਸ਼ਾਬਦਿਕ
99. Literature	ਸਾਹਿਤ
100. Lyrical Poerty	ਸੁਰਦੀ ਕਵਿਤਾ
101. Morphology	ਰੂਪ ਵਿਗਿਆਨ
102. Maxim	ਕਹਾਵਤ
103. Melodious	ਮਧੁਰ

104. Metaphor	ਰੂਪਕ
105. Metaphysical	ਪ੍ਰਾਭੌਤਿਕ
106. Meter	ਛੰਦ
107. Modernity	ਆਧੁਨਿਕਤਾ
108. Model	ਆਧੁਨਿਕਤਾਵਾਦ
109. Monologue	ਇਕਵਰਨੀ
110. Mystical	ਰਹਸਮਈ
111. Mysticism	ਰਹਸ਼ਵਾਦ
112. Mythology	ਮਿਥਿਹਾਸ
113. Nationalism	ਰਾਸ਼ਟਰਵਾਦ
114. Naturalism	ਪ੍ਰਾਕਿਤੀਵਾਦ
115. Note	ਟਿਪਨੀ
116. Novelist	ਨਾਟਕਕਾਰ
117. Novelettee	ਛੋਟਾ ਨਾਵਲ
118. Obsolete	ਅਪ੍ਰਗਲਿੰਤ
119. Obscence	ਅਸ਼ਲੀਲ
120. Opera	ਸੰਗੀਤ ਨਾਟਕ
121. Optimist	ਆਸ਼ਵਾਦੀ
122. Originality	ਮੌਲਿਕਤਾ
123. Orthodox	ਕੱਟੜ ਪੰਥੀ
124. Paradox	ਵਿਰੋਧਾਭਾਸ
125. Paragraph	ਪੈਰਾ
126. Parody	ਨਕਲ, ਵਿਅੰਗਕਾਵਿ
127. Pathetic Fallacy	ਭਾਵ ਭਰਮ
128. Pathos	ਕਰੁਨਾ ਰਸ

129. Personality	ਵਿਅਕਤਿਤਵ
130. Personification	ਸਮੂਰਤੀਕਰਨ
131. Pessimist	ਨਿਰਾਸਵਾਦੀ
132. Philologist	ਭਾਸ਼ਾ ਸ਼ਾਸਤਰੀ
133. Phoneme	ਧੁਨੀ ਵਿਰਾਮ
134. Phonetic Law	ਧੁਨੀ ਨਿਯਮ
135. Phonoly	ਧੁਨੀ ਵਿਗਿਆਨ
136. Plywright	ਨਾਟਕਕਾਰ
137. Poetical insight	ਕਾਵਿਕ ਸੂਝ
138. Poetical Effect	ਕਾਵਿਕ ਪ੍ਰਭਾਵ
139. Polyglot	ਬਹੁਭਾਸ਼ੀ
140. Suffix	ਪਿਛੇਤਰ
141 Prefix	ਅਗੇਤਰ
142. Progressive	ਪ੍ਰਗਤੀਸ਼ੀਲ
143. Prose	ਵਾਰਤਕ
144. Producer	ਨਿਰਮਾਤਾ
145. Prosody	ਪਿੰਗਲ
146. Production	ਧੰਦੇਕਾਰੀ ਪੈਦਾਵਾਰ
147. Psyco-analysis	ਮਨੋਵਿਸ਼ਲੇਸ਼ਨ
148. Realism	ਯਥਾਰਥਵਾਦ
149. Rhetorics	ਅਲੰਕਾਰ ਸ਼ਾਸਤਰ
150. Rhyme	ਬਾਲਗੀਤ
151. Rhythm	ਲੈਅ
152. Romanticism	ਰੁਮਾਂਸਵਾਦ
153. Satire	ਵਿਅੰਗ

154. Secreticism	ਸ਼ੰਕਾਵਾਦ
155. Script	ਲਿਪੀ
156. Secularism	ਧਰਮ ਨਿਰਪੇਖਤਾ
157. Semantics	ਅਰਥ ਵਿਗਿਆਨ
158. Sansibility	ਸੰਵੇਦਨਾ
159. Sansitivity	ਸੰਵੇਦਨਸ਼ੀਲਤਾ
160. Simile	ਉਪਮਾ
161. Size	ਆਕਾਰ
162. Socialism	ਸਮਾਜਵਾਦ
163. Soliloquy	ਮਨੋਕਥਨੀ
164. Spiritualism	ਅਧਿਆਤਮਵਾਦ
165. Stage	ਰੰਗ-ਮੰਚ
166. Steam of Consciousness	ਚੇਤਨਾ ਪ੍ਰਵਾਹ
167. Structure	ਸੰਰਚਨਾ, ਬਨਤਰ
168. Style	ਸ਼ੈਲੀ
169. Sublime	ਉੱਦਾਤ
170. Syllable	ਅੱਖਰ
171. Symbolism	ਪ੍ਰਤੀਕਵਾਦ
172. Sy nopsis	ਰੂਪ-ਰੇਖਾ
173. Syntax	ਵਾਕ ਰਚਨਾ ਵਾਕ ਵਿਚਾਰ, ਵਾਕ ਵਿਗਿਆਨ
174. Tactile Image	ਸਪਰਜ਼ ਬਿੰਬ
175. Synthesis	ਸੰਸ਼ਲੇਸ਼ਨ
176. Technique	ਵਿਧੀ
177. Terminology	ਪਰਿਭਾਸ਼ਕ-ਸ਼ਬਦਾਵਲੀ
178. Tradition	ਧਰੰਪਰਾ
179. Traditionalism	ਪਰੰਪਰਾਵਾਦ

180. Translation	ਅਨੁਵਾਦ
181. Treatise	ਨਿਬੰਧ
182. Unities	ਏਕਤਾਵਾਂ
183. Unity of action	ਕਾਰਜ ਦੀ ਏਕਤਾ
184. Unity of Impression	ਪ੍ਰਭਾਵ ਦੀ ਏਕਤਾ
185. Unity of space	ਸਥਾਨ ਦੀ ਏਕਤਾ
186. Unity of time	ਸਮੇਂ ਦੀ ਏਕਤਾ
87. Utilitarianism	ਉਪਯੋਗਤਾਵਾਦ
188. Varse	ਪਦ
189. Versain	ਸਰਬਾਂਗੀ
190. Villaion	ਖਲਨਾਇਕ
191. Vision	ਅੰਤਰ-ਦ੍ਰਿਸ਼ਟੀ
192. Visual Image	ਦ੍ਰਿਸ਼ਟੀ ਪਰਕ ਬਿੰਬ
193 [illegible]ulary	ਸ਼ਬਦ ਕੋਸ਼
194. Vowel	ਸ੍ਵਰ
95. Vulgaity	ਅਸ਼ਲੀਲਤਾ
196. Work	ਕਾਰਜ, ਕੰਮ

URDU (Compulsory)

One Paper Max.Marks : 100
Time : 3 Hours

a)	Text-Explanation and paraphrase	50
b)	Elementary knowledge of Ilam-e-bayn and kinds of Prose & Poetry.	25
c)	Character Analysis Critical Appriciation and summary of literary portions.	25

Text :-

1. Khyaban-i-Adab (Prose) Published by Educational Book House, Aligarh. Only the following prescribed Mohd. Husain Azad-Nazeer Ahmad-Hali Shibli-Sharser Imtiaz Ali Taj Rashid-ul-Kheri-Sharar.
2. Urdu Ke Terah Afsane by Athar Parvaiz. Only the short strories. Kafan (Prem Chand) Mahalakshmi Kapul (Krishan Chander) Anandi (Gulam Abbas) Apne Dukh Mujhe Dedo (Bedi) Toba Tek Singh (Minto) Chauthi Ka Jora (Isamt Chugtai).

URDU (Elective)
Outlines of Test

One Paper Max.Marks : 100
Time : 3 Hours

Syllabus & Courses of Reading

Paper-II Text, Explanation and Elementary History of Urdu Literature.

Max.Marks : 60
Time : 3 Hours

Text

Books Prescribed

Khayaban-i-Adab (Published by Educational Book House, Aligarh).

Only the following prescribed :

Mohd. Hussain Azad-Nazeer Ahmad
Hali-Sarshar-Imtiaz Ali Taj
Rashid-ul-Khari-Sharar

History of Urdu Literature 30 Marks

Scope : Fort-William College-Sir Syed Tarraqi
Rasand Tehreek Dilli aur Lucknow Ke
Dabistan-i-Shairi

Define :- 10 Marks

Ghazal-Marsia-Masnawi-Qasida-Novel Afsana

Books Recommended

1. Tareekh-i-Adab-i-Urdu : By Syed Ejaz Hussain.
2. Tareekh-i-Adab-i-Urdu : By Azim ul Haq Junedi.

FRENCH

Max.Marks : 100
Time : 3 Hours

Theory		75 marks
Viva-Voce		25 marks
1.	Translation from :- Complementary Texts of three prescribed books+prescribed poems.	20 marks
2.	Translation from English into French.	10 marks
3.	Letter writing/Essay in French about 250 words.	15 marks
4.	Questions on advanced Grammar, Sentence Analysis, Logical Analysis Transformation : Rewriting of Paragraphs as suggested	20 marks
5.	Comprehension of unseen Passage (Questions to be answered in French)	10 marks
		75 marks
	Viva Dictation : From complementary Texts of the prescribed Text Book	10 marks
	Conversation on the topics of daily life.	15 marks
		25 marks

Prescribed Texts

1. Complementary Texts of Manager, IInd including poems suggested :
2. Le francais acceleare (Manager).

Note : Internal Choice may be given in each question.

HISTORY

Outlines of Test

		Max. Marks	Time
Option-I	History of India (From A.D. 1526 to 1947)	100	3 Hours
Option-II	History of Indian Freedom Movement (1857-1947)	100	3 Hours

Syllabus & Courses of Reading

Option-I History of India (From A.D. 1526-1947)

Max.Marks : 100
Time : 3 Hours

Note :1. At least ten questions, spread over the entire syllabus more or less proportionately, shall be set in the paper out of which the candidates shall be required to attempt five questions in all. All questions shall carry equal marks.

2. There shall be a compulsory question on map carrying 20 marks (12 for map work and 8 for explanatory notes).

3. There shall be one Objective type question. This question will be divided into three sections. Section-I will have snapshort type questions of 10 marks. Section-II will have multiple choice quetions of 5 marks. Section-III will have matching type questions of 5 marks.

4. Blind candidates may not attempt the map question which is compusory for all other candidates. In lieu of the map question they may attempt any other question. However, in case they wish to attempt the map question the part relating to the explanatory aspect will carry full marks.

The foundation of the Mughal Rule; Sher Shah Suri and his administration; Akbar and his role as a National Ruler; Aurangzeb and his responsibility towards the downfall of the Mughal Empire, Religion and State with particular reference to Akbar and Aurangzeb; the Deccan and N.W. Frontier Policy of the Mughals, the Mughal Administration; Concept of Kingship, Justice, Revenue Mansabadari and Jagirdari, Social and Cultural life under the Mughals; Education, Literature, Art and Architecture; religious Movements; Shivaji and his Administration; the break-up of the Mughal Empire; Coming of the European Powers; British Occupation of Bengal; Warren Hastings, Wellesley. Hastings, Dalhousie; Causes of the failure of Indian Powers; The uprising of 1857 and its aftermath:Social and Educational Changes during the Company's Rule; Economic conditions to 1858; Social Reform Movements: Brahmo Samaj, Arya Smaj, Theosophical Society, Rama Krishna Mission and the Aligarh Movement; Causes of the origin and growth of Nationalism, the first phase of the National Movement, 1886-1905; the rise of the militant Nationalism, the Ist World War, the second phase of the Freedom Movement, 1905-1919; the Revolutionaries; Trade Unions and Peasants Movements; the Revolutionaries: the Rise and growth of Communism; Netaji and INA: the final phase of Freedom Movement, 1920-1947: Partition.

Maps

1. Political conditions of India in 1526.
2. The Mughal Empire at the death of Akbar(1695).
3. Indian Powers and Kingdoms around 1765.
4. India in 1818.
5. India in 1856.
6. Centres of Uprising in 1857-58.

Books Recommended

1.	A.L.Srivastava	Mughal Empire (Agra 1972).
2.	S.R.Sharma	Crescent in India (Bombay 1954).
3.	-do-	Mughal Empire (Agra, 1972).
4.	Ishwari Prasad	History of Medieval India (Allahabad 1970).
5.	P.E Roberts	History of British India (Oxford 1967).
6.	Majumdar, Datta & Roy Chaudhary	Advanced History of India, Part-II and Part-III (London, 1960).
7.	P.L.Sharma	History of Modern India (Agra, 1973).
8.	Hariparsad, Thapliyal, Tripathi	Bharat Ki Itihasik Manchitrawali, (Delhi, 1971).
9.	R.P. Tripathi	Rise and Fall of the Mughal Empire.
10.	J.N.Sarkar	Mughal Administration.
11.	S.Sarkar	Mordern India 1885 , 1947 (Delhi, 1984).

Option-II History of Indian Freedom-Movement(1857-1947)

Max.Marks : 100
Time : 3 Hours

Note: 1. Atleast ten questions,spread over the entire syllabus more or less proportionately, shall be set in the paper out of which the candidates shall be required to attempt five questions in all. All questions shall carry equal marks.

2. There shall be compulsory question on map carrying 20 marks (12 for map work and 8 for explanatory notes).

3. There shall be one objective type question. This question will be divided into three sections: Section-I will have snapshort type questions of 10 marks. Section-II will have multiple choice questions of 5 marks, Section-III will have matching type questions of 5 marks.

4. Blind candidates may not attempt the map question which is compulsory for all other candidates. In lieu of the map question they may attempt any other question. However, in case they wish to attempt the map question the part relating to the explanatory aspect will carry full marks.

The impact of the British rule the Uprising of 1857; the rise and growth of the feeling of Nationalism; the foundation of the Indian National Congress and its programme; the Home Rule Movement; the Revolutionaries Emergence of Gandhi ji; the Khilafat Movement; the Non-Cooperation Movement; Congress and the left, Trade Union and Peasant Movements, the Civil Disobedience Movement, the B[illegible]h response to the

National Movement the Revolutionaries the Quit India Movent : The constitutional developments (Acts of 1909, 1919 and 1935); the rise and growth of Nationalism; State People's Movement; Netaji and INA, Muslim League and its demand for partition; The last phase of Freedom Struggle (1945-47) and partition.

Maps:

1. Important places connected with the Uprising of 1857.
2. Areas where the Home Rule Movement was popular.
3. Important Places connected with the Anti-Rawlatt. Act.
4. Agitation and the Non-Cooperation Movement 1919-23.
5. Important places connected with the Civil Disobedience Movement.
6. Places where very important pleanary session of the Indian National Congress were held 1885-1947 (Like the Bombay, Surat, Lucknow, Amritsar, Nagpur, Lahore etc.)
7. Important places connected with Revolutionary Movement (like Kakori, Lahore, Allahabad, Calcutta).

Books Recommended :

Majumdar, R.C.	:	History and Culture of the Indian people. Vol. XI Struggle for Freedom (Vidya Bhawan, Bombay. 1964).
Tara Chand	:	History of Freedom Movement in India. (Vol.II, III & IV Govt. Publication Division, Delhi, 1971).
V.P.S. Raghuvanshi	:	Bhartiya Swadheenta Tatha Rashtriya Vikas (Rattan Prakashan Mandir Agra, 1760).
Ranjit Singh	:	Bharatiya Swantantrata Andolan Evam Samvaidhanik Vikas, (Jaipur).
Gurumuksh Nihal Singh	:	Bharat Ka Samvaidhanik Evam Rashtriya Vikas (Atma Ram, Delhi 1961).
Ayodhya Singh	:	Bharat ka Mukti Sangram (Macmillan, Delhi, 1980).
Sumit Sarkar	:	Modern India, (1885-1947) Mac-Millan, Delhi 1984.

Political Science

There will be two optional papers. The students will have to opt only one paper out of two.

Option(i) **Political Theory Concepts** Max. Marks : 100
Time : 3 Hrs.

Note: Out of 10 questions 5 questions will have to be attempted. There will be one objective type (multiple choice) question.

Syllabus and Courses of Reading

1. Nature and Significance of Political Theory
2. Power, Authority and Legitimacy.
3. Elite and Theories of Elite.
4. Bureaucracy
5. Political Culture and Political Socialisation
6. Political Participation and Political Communication.
7. Modernisation and Political Development.
8. Alienation and Theories of Alienation.
9. Nation Building and National Integration.
10. Social Conflict and Revolution.
11. Consumer Protection with special reference to India.

Books Recommended

1.	Amal Ray and Mohit Bhattacharya	Political Theory: Institutions and Ideas.
2.	A.K. Mukhopadhyaya	Political Sociology: An Introductory Analysis.
3.	T.B.Bottomore.	Elites and Society.
4.	R.Blauner	Alienation and Freedom.
5.	J. La Palombara	Bureaucracy and Political Development.
6.	Michael Rush and Philip Althoff	An Introduction to Political Sociology
7.	Lucian W.Pye and Sidney Verba, Eds,	Political Culture and Political Development.
8.	L.S. Rathore, ed.	Political Sociology
9.	R.Flathman, ed.	Concepts in Social and Political Philosophy.
10.	S.P.Verma	Modern Political Theory.
11.	Anthony M. Orun	Introduction to Political Sociology.
12.	Rajni Kothari	State and Nation-Building.
13.	Ralph Miliband	Marxism and Politics
14.	Giddens and Held, eds.	Class, Power and Conflict.
15.	Lee Ann Osborn	The Problem of Participation

Option(ii) **Political Theory** Max. Marks : 100
Time : 3 Hrs.

Note: Out of 10 questions 5 questions will have to be attempted. There will be one objective type (multiple choice) question.

Syllabus and Courses of Reading

1. Nature and Significance of Political Theory.
2. Power, Politics and Society.
3. (a) What is Politics?
   (b) Different dimensions of Power.
   (c) Theories of Power in Society.
4. The State
   (a) The concept of the Modern State, Sovereignty, Citizenship and Rights.
   (b) Dominant perspectives of modern state; alternate perspectives.
5. The concepts of Freedom, Liberty, Equality and Property.
6. Justice and the Common Good.
   (a) Theories of Distributive Justice
   (b) Notions of the Common Good.
7. Democracy and Political Participation; Dominant Theories of Democracy.
8. Political Process and Social change.
   (a) Theories of Social Change -Revolutionary Change.
   (b) Development: Concepts of Development, Socialist, Liberal, Gandhian and others, Critiques of development models, the debate on welfare state.
   (c) Development and Environment-The contemporary debates.

BOOKS RECOMMENDED

1.	David Held	**Political Theory and the Modern State.**
2.	George Mcennan, David Held and Staurt Hall, eds.	**The Idea of the Modern State.**
3.	T.W.Hinsley	**Sovereignty.**
4.	J.M.Barbalet	**Citizenship**
5.	Sygmunt Baumann	**Freedom**
6.	Jermy Waldrom, ed.	**Theories of Rights**
7.	Bryan S. Turner	**Equality**
8.	Ellen Frank, Paul Miller and J.Paul (eds.)	**Liberty and Equality.**
9.	Graeme Duncan ed.	**Democratic Theory and Practice**
10.	V.I.Lenin	**State and Revolution**
11.	Thomas Pantham	**Political Theories and Social Reconstruction**

ECONOMICS

Paper-I Max.Marks : 100
Time : 3 Hours

Unit-I Macro Economics

Salient features and assumptions of Macro Economic Analysis; National Income : Alternative Concepts; Components and Methods of Measurement; difficulties in National Income Measurement.

Determinants of Income and Employment; The Classical and the Keynesian Approaches; Say's Law of Market; Principle of Effective Demand. Consumption Function; Saving and Investment equality; investment Multiplier, Marginal Efficiency of Capital, Business Expectations and Secular or Stagnation, Concept of Accelerator; Applicability of Keynesian Approach to developing economies, Wages and Employment.

Unit-II Money–

Nature, types and functions of Money, Monetary Standards (Gold, paper and bimotallism); Demand and Supply of Money; Quantity Theory of money (Fishers' Cambridge and Keynes' Versions) Inflation : meaning, types, causes, consequences and policies to control.

Banking

Functions and working of Commercial Banks; Credit Creation, Functions of a Central Bank; Instruments of Credit Control.

Unit IINational Income of India

Trends in the growth of national and per capital income in India; Sectoral composition of National Income.

Money & Banking in India

Alternative measures of money supply in India; Trends in the growth of monthly supply; trends in the growth of commercial banking in India; Reserve Bank of India : functions and credit control policies. Inflation in India; causes and control.

Note : In all there will be eight questions, two compulsory and six optional. Two questions will be set from each Unit, out of whcih one question from each Unit shall have to be attempted. One compulsory question will be set from first two units and one from the third. Each compulsory question will be divided into five parts of five marks each of which four parts each are to be attempted.

Books Recommended :-

1. R.D. Gupta : Keynes and Post Keynesian Economics
2. M.L. Seth : Macro Economics
3. M.C. Vasisth : Monetary Theory

4.	S.B. Gupta	:	Monetary Economics Theory, Policy and Institutions
5.	Rudder Dutt and KPM Sondrasam	:	Indian Economy
6.	A.N. Aggarwal	:	Indian Economy (Latest Edition)
7.	A.L. Hansen	:	Guide to Keynes
8.	D. Dillard	:	Economics of J.N. Keynes
9.	Stonier & Hague	:	A text Book of Economic Theory Part-III
10.	E. Shapiro	:	Macro Economics
11.	Questions Bank in Economics	:	Association of Indian Universities
12.	R.B.I.	:	Functions and Working of the RBI.

PUBLIC ADMINISTRATION

Max.Marks : 100
Time : 3 Hours

Outlines of Test

One Paper

Syllabus and Courses of Reading

Indian Administration

Features of Indian Administration its role in the context of democratic system and socio-economic development. Major problems and Remedies of Human Environment, Features and Implementation of Environmental Protection Act.

Indian Federalism : Administrative and Financial relations between the Centre and States.

Role of the President, Prime Minister and Cabinet in Indian Administration. Cabinet Secretariate, Organisation and Functions of Union Ministries of Finance and Home.

Preparation of the Indian Budget, its enactment, Parliamentary control over public finance in India. Role of Comptroller and Auditor-General over financial administration, Compositition and Functions of Public Accounts Committee and Estimates Committee at the Centre.

Role of the Governor, Chief Minister and State Cabinet in State Administration. Organisation and Functions of State Secretariat, Role of the Chief Secretary in the State Administration.

Civil Services : Recruitment, Training, Promotion, Discipline, Morale, Union Public Service Commission.

District Administration ; its features, role and position of the Deputy Commissioner. The Superintendent of Police in district administration.

Accountability of Indian Administration to the Parliament and Judiciary, Administration and Citizen. Lokpal and Lok-Ayukt. Consumer Protection Act-Features and Implementation.

Note : There shall be one objective type (multiple choice) question in the paper.

Note : Ten questions in all will be set, out of which only five are to be attempted by the examinees. Objective type (Multiple Choice) question shall be compulsory .

Books Recommended :

1.	Ashok Chanda	Indian Administration
2.	S.R. Maheshwari	Indian Administration (Hindi & English)
3.	C.P. Bhambhari	Public Administration in India
4.	P. Sharan	Public Administration in India
5.	K.K. Puri	Indian Administration (Hindi)
6.	D.R. Sachdeva and others	Indian Administration (Hindi)
7.	S.K. Sharma	Indian Administration
8.	R.L. Khanna	Public Administration in India
9.	Virender Sharma	Bharat Main Lok Prashasan.
10.	P.D. Sharma	Bharat Main Lok Prashasan.
11.	A. Avasthi	Central Administration
12.	Paul H. Appleby	Report of Survey on Public Administration in India
13.	R.B. Jain	Contemporary Issues of Indian Administration
14.	A.D. Gorwala	Report on Public Administration, Govt. of India
15.	Swinder Singh	Public Administration in India
16.	G.P. Pilania & Hoshiar Singh	Administration and Social Change.

PHILOSOPHY

Outlines of Test

Either of the following two options:

Option-I:	**Problems of Ethics**	Max. Marks : 100 Time : 3 Hrs.
Option.II:	**Ethical Theories**	Max. Marks: 100 Time : 3 Hrs.
Option.I :	**Problems of Ethics**	Max. Marks : 100 Time : 3 Hrs.

Syllabus and Courses of Reading

Note:(i) Ten questions in all will be set.

(ii) Out of the ten questions, two will be of objective type.

(iii) The questions will be distributed equitably over all the units of the syllabus.

(iv) All questions will be of equal marks.

(v) Out of the ten questions, examinees will have to attempt only five questions.

Unit-I The Nature of Ethics: The definition, Problems and Methods of Ethics. The uses of Ethics.

Unit-II Relation of Ethics to other Studies : Psychology, Sociology, Political Science and Religion.

Unit-III Evolution of Moral Life:Customary morality, factors responsible for the breakdown of customary morality, Reflective morality, differences between customary and reflective morality.

Unit-IV: Nature and object of moral judgement.

Unit-V: Plato's and Aristotle's Conception of Virtues.

Unit-VI: Utilitarianism: Bentham and Mill; Rationalism: Kant; Perfectionism: Bradley.

Unit-VII:Emotivism:C.L.Stevenson; Prescriptivism: R.M.Hare.

Unit-VIII:Moral Progress: The meaning and criteria of Moral Progress Freedom of Will, Moral Responsibility and Theories of Punishment.

Unit-IX: Indian Ethics: Ethics of Budha: Eight-fold Path; Ethics of Gita: Karma Yoga; Ethics of Gandhi: (Ahimsa (Non-Violence) and Satyagraha(Firmness in Truth), Sarvodaya.

Unit-X: Social Evils: Environmental Ethics: Nature & Importance; Euthansia (Mercy Killing) Untouchability.

Books Recommended:

1.	Pandeya, Sangamalal	Nitishastra Ka Sarvekahana..
2.	Sinha, J.	Manual of Ethics (English & Hindi Versions).
3.	Machenizie, J.S.	Outlines of Social Philosphy.
4.	Pandey, S.L.	Samaj Darshan Ki Ek Pranali
5.	Sharma, Ram Nath	Social Philosophy (English & Hindi Versions).
6.	Thompson and Lewis	Population Problems.
7.	Charles, B. Walker	Modern Technoloy and Civilization.
8.	Singh, B.N.	Nitisastra.
9.	Mishra, H.N.	Nitisastra

Option-II : **Ethical Theories**

Max. Marks : 100
Time : 3 Hours

Note: (i) Ten questions in all will be set.

(ii) Out of the ten questions, two will be of objective type.

(iii) The questions will be distributed equitably over all the units of the syllabus.

(iv) All questions will be of equal marks.

(v) Out of the ten questions, examinees will have to attempt only five questions.

Unit-I Moral Philosophy : Definition and Scope; Nature of Moral Consciousness; Relation of Ethics to Metaphysics, Religion and Law.

Unit-II Moral Sense Theory of Shaftesbury and Butler's Theory of Conscience.

Unit-III Hedonistic Theories of Bentham, Mill and Sidgwick.

Unit-IV Kant's Theory of Categorical Imperative.

Unit-V Evolutionary Ethics of Herbert Spencer and Samuel Alexander.

Unit-VI Theories of Self Realization: Eudaemonism of Aristotle; T.H. Green's view of self-realisation and Bradley's Doctrine of "My station and its duties".

Unit-VII The Ethics of Nietzche Power as a highest Ideal; Difference between Darwin and Nietzche; Good and Evil; Theory of Superman; Criticism of Christianity, Democracy, Hedonism and Romanticism; Master Morality and Slave Morality; Revaluation of Values; Relativity of Values; Superman Beyond Good and Evil; Criticism; Value of Nietsche's Principle.

Unit-VIII Ethics of Marxical Metaphysical and Sociolog: Background, Basic Principles and Evaluation.

Unit-IX Emotivism of C.L. Stevenson and Prescriptivism of R.M.Hare.

Unit-X Indian Ethics: Eight Fold Path of Budha; Karma Yoga of the Gita and Satyagraha and Ahimsa of Gandhi.

Books Recommended

1.	J.N.Sinha	Nitishastra (Eng. version also)
2.	H.N.Mishra	Nitishastra Ke Pramukha Siddhanta.
3.	B.N.Singh	Nitishastra.
4.	R.N.Sharma	Outlines of Ethics (Hindi & English versions).
5.	S.N.Gupta	Outlines of Ethics and Social Philosophy (Hindi version).

MILITARY SCIENCE

Outlines of Test

Paper-I(Theory)	Max.Marks	Time
Option-A World Military History(Modern)	70	3 Hours
Option-BStudy of War	70	3 Hours
Paper-IIPractical	30	3 Hours

Syllabus and Courses of Reading

Note: 1. There will be one theory paper of 70 marks and one paper of practical having 30 marks.

2. Two theory papers (Opt.-A and Opt.-B) have been prescribed. The candidates will offer any one of them.

3. Examiner should set at least ten questions including one objective type multiple choice question; covering the entire syllabus.

Candidates are required to attempt any five questions. No question is compulsory.

4. The candidates are required to pass separately both in theory and in practical papers.

Opt.-A World Military History (Modern) Max.Marks:70 Time : 3 Hrs.

1. Industrial Revolution and its Impact on Military Power.
2. American Civil War (1862-65)
   (a) Introduction.
   (b) Causees.
   (c) Main Events (in brief).
   (d) Effects on Warfare.
3. Russo-Japanese War (1904-05)
   a) Introduction.
   b) Causes.
   c) Events (in brief).
   d) Political Consequences.
4. World War Ist and its Origin
   (a) Causes of the World War-I.
   (b) Trench Warfare and Armour with Spepcial reference to the battle of Somme.
   (c) Naval Warfare;(i)Element of Sea power, (ii) Naval strategy and tactics during World War-I
   (d) Air Warfare
      (i) Birth and concept of Air Power and its development.
      (ii) Role of Air Craft during World War-I.
5. **Second World War**
   a) Causes and Origin of World War-II.
   b) Armoured Warfare; Concepts of J.F.C.Fuller, Guderian and Liddell Art.
   c) Air Warfare; Concepts of Douhet, Mitchell.
   d) Sea Power: Contribution of A.T. Mahan on Naval Warfare.

Nuclear Warfare:

i) Beginning of Nuclear Era.
ii) Main destructive effects of nuclear energy, flash, heat thermal radiation, blast and nuclear radiation.
iii) Theories of Nuclear Warfare, Deterrance and massive retaliation.

Books Recommended :

1. Quimcy Wright ; A Study of War.
2. J.F.C.Fuller: Armament and History.

3. -do- : The Conduct of War.
4. E.M. Earle : Makers of Modern Strategy.
5. J.F.C.Fuller: The American Civil War, 1861-65.
6. Monotogomry:History of Warfare.
7. Indu Prakash: Science of War.
8. D.K. Palit: War in Deterent Age.
9. -do- : Essentials of Military Knowledge.
10. K.S.Tripathi; Evolution of Nuclear Strategy.

Option-B **Study of War** M.M.:70
Time : 3 Hrs.

Part-A

1. Nature of War

a) Definition of War, its scope, advantages and disadvantages.
b) Evolution of War: Feudal, Dynastic, Peoples, Total and Nuclear Wars.
c) Cold War: Psychological, Economic and Diplomatic Aspects.
d) Guerilla War.
e) Features of Modern War.
f) Future of War.

2. Principles of War

a) Selection and Maintenance of Aim.
b) Offensive action.
c) Concentration.
d) Economy of Force.
e) Co-operation.
f) Security.
g) Surprise.
h) Mobility.
i) Maintenane of Moral and
j) Administration.

3. Strategy Tactics

Various definition, distinction between Strategy and Grand Strategy, Evolution of Tactics during 19th and 20th Century. Evolution of Strategy during 19th and 20th Century. Strategy of Indirect-Approch-Strategy of Annihilation and Strategy of Exhaustion.

Part-B

1) Indo-Pak War 1965 and 1971 A.D. with reference to the following:
   i) Causes of War.
   ii) Study of War in Outline.
   iii) Political and Military lessons learnt.
2) Origin and Causes of World War-I and II.

Suggested Books

1. Essentials of Military Knowledge: Maj. Gen. Palit.
2. Nature of Modern War:Cyril Falls.
3. Samrik Sidhant: M.P. Verma
4. The Art of Land Warfare: B.N.Maliwal.
5. India Wins the War: S.N.Rampal.
6. An Introducttion of the Art of War; S.T.Das.
7. The Study of Military History: Sheppered.
8. The Study of Indirected Approach; Hiffle Hart.
9. Yuddh Mimansa by Prof. M.C. Maheshwari.

Paper-II(Practical)

Map-Reading Max. Marks : 20
Time : 3 Hours

Practical Test	20 marks
Practical Record	5 marks
Viva Voce	5 marks

1. SCALE: Construction of Time-Scale and Diagonal Scale.
2. Bearing and Inter-Conversion of Bearing,with I.C.E.
3. Finding Positions on the gridded Map by Intersection Method and Resection Method.
4. Relief Features and their representation on the map.
5. Types of slope and their representation on the map by CONTOUR Lines.
6. Gradient and slope in Degrees.
7. To determine Inter-visibility between two point; gradient method, sum proportion method and Section Drawing method.
8. To draw a field sketch from a given Route Report.
9. Enlargement and Reduction of Maps.
10 To prepare a Route Report from a given narrative data.

Note:-Above mentioned exercise should be carried out on topo-sheets.

SOCIOLOGY

Paper: Research Methodology M.M. : 100
Time : 3 Hours

I Basic Concepts in Social Research; Concept, hypothesis, fact, Theory.

II Significance of Social Research: Social Survey, Social Research steps in Social Research, Formulation of Research problem; Research design.

III Methods and Techniques of data collection: Interview; Schedule; Observation; Questionnaire:Survey and Case Study.

IV Sampling and its types: Probability and non-probability' types and sources of data, Primary and Seecondary, Tabulation, Classificaiton and analysis of data.

V Statistical methods in Social Research:Measures of Central Tendency: Mean, Mode, Median, Measures of Dispersion; Mean Deviation, Standard Deviation.

Note: Ten questions will be set, two questions from each section. The candidates will be required to attempt five questions in all selecting one question from each Section.

References:

Jahoda, Selfiz, Cook, et. al.	:	Research Methods in Social Relations, Halt, Rinehart and Winston, New York. 1959.
Modge, John	:	Tools of Social Sciences, Long mans, London, 1953.
Meser, C.A.& C.Kalton	:	Survey, Methods in Social Investigation: Hetnemann Educational Books, London, 1971.
Goode, W.J. & Hatt, P.K.	:	Methods in Social Research, Mc Graw Hill, New York, 1952.
Muller, J.F.Karl F. Schuesaler and Herbet T. Castener	:	Statistical Reasoning in Society Houghton, Bosten, 1977.
Champion. D.J.	:	Basic Statistics for Social Research Chandler Publishing Co.Seranton.
Lazrsfold Paul & Morris Resenberg (ed.)	:	The Language of Social Research, Free Press, New York, 1955.

GEOGRAPHY

Outlines of test

	Max.Marks B.A.	B.Sc	Time
Paper-I Economic Geography	50	100	3 Hrs.
	Max.Marks		Time
Paper-II Practicals			
Map Work & Surveying	B.A.	B.Sc	
	50	50	4 Hrs.

Syllabus & Courses of Reading

Paper-I Economic Geography	Max. Marks B.A.	B.Sc.	Time 3 Hrs.
	50	100	

Part-IGeneral Introduction

a) Nature and Scope of Economic Geography; Trends in the development of Economic Geography before and after the Second World War.

b) Major Sectors of Economic activity - primary, secondary and tertiary a detailed discussion of their nature and basic principles.

c) Transportation as a factor in the choice and location of Economic activities; Ullman's Model of Spatial Inter-action.

Part-IIAgriculture:

a) Factors affecting Agricultural Development Physical Institutional and Technological; Role of Technology in Farm organization and cropping pattern, Green Revolution its nature and consequences for the Third World Countries.

b) World Agricultural types; nomadic herding; intensive subsistance agriculture; plantation, Commerical dairy farming. Their distribution and characteristics.

c) Factors affecting Agricultural Location-Von-Thunen's Theory of Agricultural location; a critical appraisal.

d) Population-Food balance a World Picture.

Part-IIIManufacturing Industries.

a) Factors influencing industrial location (with special reference to procurement and distribution costs).

b) Weber's Theory of Industrial Location-a critical appreciation.

b) Weber's Theory of Industrial Location-a critical appreciation.

c) Trends in location and World distribution of the following Industries: Iron and Steel, Cotton Textile, Automobiles, Petroleum Refineries, Aluminium.

d) Major industrial Regions of the World.

Note:The question paper shall contain 10 questions in all, including three each on parts-I and II and four questions on Part-III. Candidates shall attempt five questions in all, selecting atleast one form each part.

Paper-II(Practical) (Map Work and Surveying)

Part-I Study and Interpretation of Topographical Sheets of India Scale I : 50,000.

Part-II Map projections; construction, properties, Uses and choice Cylindericals Simple Equal-area, Mercater's Conicals: One standard parallel, two standard parallel, Bonne' Polyconic

Zenithals: Gnomonic Stereographic, Orthographic, Equidistant and equal-area (polar cases only)

Conventionals: Sinusiodal and Moldweld's

Part-IIIInterpretation of Weather Maps of India

Note: There will be 7 questions in all. Two questions on Part-I, 3 questions on part-II, and 2 questions on Part-III. Candidate will be required to attempt 3 questions in all, selecting one question from each part.

Theory and practice of Plane: Table and Survey-Sketch and traverse (open and closeed) Surveys (four exercises).

Note: A) The practical works done by the candidates during the course of study, duly signed by the teacher, will be evaluated at the time of Examination.

B) Accuracy and neatness in drafting in Practical work will be emphasized, irrespective whether it is done in ink or pencil.

C) The University will arrange to supply Topographical map and Weather Maps at all examination centres alongwith the question paper.

List of Exercises for Map Work and Practical:

Section(1) (a) The study and interpretation of Topographical Maps of India (1:50,000 scale).

The above maps should be studied with reference to land forms drainage, Vegetation, agricultural land use; settlements and transport. Atleast 4 sheets must be studied.

b) Merits, defects uses and construction of graticule by simple graphic method of the projections prescribed in the course. One exercise on each projection. Sketches of different countires to be drawn on the network.

c) Weather maps exercise on interpretation of Weather map.

ELECTRONICS
Outlines of Test

There will be two theory papers of 45 marks each and a practical Examination of 60 marks. The paper-wise instructions shall be as follows:

Paper-I (Theory)	Max. Marks : 45 Time 3 Hrs.
Paper-II (Theory)	Max. Marks : 45 Time : 3Hrs.
Paper-III (Practicals)	Max. Marks : 60 Time : 3+3 Hrs. (on two days)

Note:- (Theory)

1. The syllabus in each theory paper is divided in five Units only five questions are to be set, one from each Unit. Each question is to be provided with an alternate question also from the same Unit. A student is to attempt five questions in all.
2. Each question should contain two or more parts.
3. 20% numerical problems are to be set.

Note:- (Practical)

1. The practical examination will be held in two sessions 3 hours each (first session starting in the evening of first day and the second session in the following).
2. Distribution of Marks

Two Experiments	20+20	=40 marks
Laboratory records		8 marks
Viva-voce only on experiments alloted from section A&B	4+4	=8 marks
Viva-voce only on the experiment from Section-C		4 marks

3. The Laboratory record will be assessed by both the external Examiners. Distribution of marks of each experiment, Lab record and Viva-Voce, oral examination, concerning the experiments in the syllabus are indicated above.

4. Use of simple (non-programmable) Calculator is permissible,

Syllabus and Courses of Reading

Paper-I(Theory) Max. Marks : 45
Time : 3 Hrs.

Unit-I: Feedback in amplifier, tyes of feedback, principles of operation of oscillator circuits. Inductance, capacitance, types oscillators, high frequency sinuscidal oscillators Hartly and Colpilt's oscillator circuits, crystal oscillator resistance-capacitence type oscillator-phase shifts and Wein Bridge oscillators.

Unit-II :Relaxation oscillators, triangular wave from generator, multivibrators bistable, monostable and astable, controlled oscillators with sinuscidal or square wave outputs.

Unit-III Integrated circuits technology, d.c. coupled amplifiers: diffrential amplifiers, common-mode rejection ratio, operational amplifier, ideal operational amplifer feedback in operational amplifier effects of negative feedback on input resistance output resistancce, frequency response distortion.

Unit-IV Operational amplifier in the inverting configuration: Buffer summing amplifier, integrating circuit using and ideal op-amp input bias currents input off set voltage, error introduced by effect voltage influence of bias currents integrating circuit using a practical op-amp, differntiating circuits using op-amp, amplifier, multiplication and differnce, division, threshold discriminator.

Unit-V Transducers, classification of transducers, Displacement transducers microphone, Resistance thermometer thermo-couple and thermistars, Phtotomultiplier tube, photoemissive cell, photovolttaic cell and Strain Gauge.

Paper-II (Theory) Max.Marks : 45
Time : 3 Hours

Unit-I : Power supply regualation using op-amp, lead regulations stability, zener diods regulator, regulation with operational amplifier and zener reference sources, short-circuit protection, current regulation using op-amp IC regulators (IC 723 and 3 Terminal regulators).

Unit-II : Boolean functions, quality principle, Demergen's laws some important identities of Boolean Algebra, precedence of opetators Venu diagram.

Unit-III : Truth tables for various Boolean functions, simplification of Boolean functions, simplification using [illegible], four variable map, in completely specified functions.

Combinational circuit design procedure, design of railway track switching system, design of an analog to digital convertor.

Unit-IV :Binary operators and logic gates integrated NAND NOR gates relization of Boolean expression with NAND gates propagation delay and number of levels of gating fan-in-fan out and loading.

Unit-V : 1. Characteristics of Electroninc Instruments, accuracy precision, sensitivity resolution and errors of different types.

2. Detailed Design Principles of the following :
   - i) Solid State Variac using thyristors
   - ii) Transformerless, out-put amplifier stage.
   - iii) Design of an under/over voltage cut-off circuit
   - iv) Function generator using IC
   - v) Electronic timer with alarm.
   - vi) Electronic multimeter using IC

References (for both papers I & II)

1. Electronics for Scientists & Engineers by Vishwanathan, Mehta & Rajaraman (Prentice Hall, India).
2. Electronic instrumentation and Measurement Techniques by W.D. Cooper and A.D. Holfrick.
3. Electronic Fundamentals and Applications by John D. Ryder

HEALTH AND PHYSICAL EDUCATION

Syllabus and Courses of Reading

Note : The syllabus is divided into two parts. Ten queations will set, atleast five from each part, covering all the parts of the syllabus and five questions will have to be attempted by examinees selecting not more than three from each part.

Theory Max.Marks : 60
Time : 3 Hours

PART-I

1. Concept of Health, Factors influencing health. Biological Factors, Environmental Factors, Socio-cultural factors, Health and Physical Fitness.
2. Health Hazards of the modern age :-
   a) Air Pollution, (b) Water Pollution, (c) Soil Pollution, (d) Food Pollution, (e) Measures to check Pollution
3. Food and Nutrition :
   a) Balance Diet.

b) Functions of the following: Fact Carbohydrates, Proteins Mineral, Vitamins and Water.

4. Communicable and Non-communicable diseases; Cholera Measles. Diphtheria, Tuberculosis, Influenza. Dysentery, Typhoid and Malaria.

5.1 First-aid : General Principles of first-aid, common first-aid measures for :

a) Snake biting; b) Choking; c) Drowning
d) Fainting; e) Fracture; f) Burns
g) Poision and unconsciousness.

5.2 Contribution of WHO, and UNICEF and CARE.

6. Skelton system, Bones and their types, joints and their types, Functions of Bones.

7. Muscles-Types of Muscles and their structural classification Physical properties of muscles.

Part - II

8. **Physical Education**-Meaning of Physical Education, place of physical Education in General Education. Aims and objectives of physical Education. Contribution of Physical Educaltion to the goals of General Education.

9. Biological aspect of Physical Education :
   a) Growth and Development.
   b) Heridity and Environment.
   c) Differences in males and females.
   d) Body type.

10. Physical Fitness : Meaning and its components, speed; Strength, Endurance, Flexibility and Ability, Factors affecting Physical fitness, Sources of fitness.

11. Warming up and Cooling Down :
   a) Types of warming up.
   b) Guiding principles of warming up.
   c) Importance of warming up and cooling down.

12. **Yoga**: Meaning of Yoga and its importance in Physical Education, Assna, its types and physiological affects.

13. **Recreation** : Meaning, Importance and objectives of recreation.

14. **Camping** : Meaning, types of camping and edcational values of camping.

15. Promotion of Games and Sports :

a) All India Council of Sports;
b) Indian Olympic Association;
c) Sports Authority of India;
d) N.S., N.I.S. National Games.

Practical Max.Marks : 40
Time : 3 Hours

Part-A :The examinee is required to take two Events : one out of the following two groups :-

1. Track Events.
2. Field Events. 10+10

Part-B : The examinee is required to take one game out of the following games :-

(1)Hockey : (2) Football : (3) Cricket : (4) Basket Ball : (5) Volley-ball : (6) Hand-ball and (7) Wrestling.

Note :-The Assessment will be based on the basis of their performance (individual skill test and games situation.)

Reference Books

1.	Asanas	:	Swami Kevalayanada.
2.	Pranayama	:	Swami Kevalyanada, Kevalyadhama, (Lonavala, 410403).
3.	Charles, A. Bucher	:	Foundations of Physical Education (The C.V. Mosby Company 1973 St. Luois).
4.	Stainbaus, A.H.	:	Towards an Understanding of Health and Physical Education, W.M.C. Brown Co. 1963.
5.	Parrot, J.	:	Anatomy and Physiology for Physical Education Teachers, London, Edward or Arnold.
6.	Kilander, H.F.	:	School Health Education, Mac Millan Co.
7.	Bogart, L.J.	:	Nutrition and Physical Fitness, Sauners.
8.	Verma. K.K.	:	Health and Physical Education, Prakash Publication, Jalandhar.

9. Kamlesh, M.L. & Sangral, M.S. : Principles and History of Physical Education. (Prakash Brothers, 1978).

10. W.H. Aykroid : The Nutritive Value of Indian Foods and Planning and Satisfactory diet. New Delhi Indian Council of Medical Research 1963.

11. Butler, G.D. : Introduction to Community Recreation, New Delhi Indian Council of Medical New York, Mc Graw Hill Book Co.

12. M.M. Gora : Anatomy and Physiology of Yogic Practices, Kanchan Praksahan, Lonavala-410403.

PSYCHOLOGY
Outlines of Test

	Max.Marks	Time
Paper-IExperimental Psychology	70	3 Hrs.
Practicals	30	3 Hrs.

Syllabus and Courses of Reading

Paper-I Experimental Psychology and Statistics

Notes :

1. *In total ten questions including one objective type would be set in such a way that there are three questions each from Units I & III and two questions each from Units II & IV.*
2. *Total number of questions to be attempted=5 (at least one question from each Unit).*
3. *One objective type multiple choice (four choices) question would be set from any of the Units*

It will, however, have atleast seven subparts.

Unit-I

Introduction: Nature and subject matter, Experimental method, Distinction between population and sample.

Designs : (a) Before-after

(b) Two groups-(i) randomized
(ii) matched

Sensation : Nature, theories of colour vision and hearing.

Psychophysics : Nature, problems, methods : Average error, Limits and Constant Stimuli.

Unit-II

Preception :Nature figure-ground relationship, Depth preception Geometrical illusions : Types and Theories.

Learning :Nature, paradigms, classical conditioning, instrumental conditioning : Types : Appetitive and aversive conditioning, Transfer of Learning.

Unit-III

Memory : Nature, stages : encoding, storage and retrieval STM & LTM Forgetting : Theories.

Motivation :Nature, instincts, needs, drives and incentives, measurement

Emotions :Nature Physiological correlates, Theories : Canon-Bards, Thalemic and activation.

Unit-IV

Statistics : Meaning, Frequency Distribution, Graphical presentation of data : Histogram and Polygon, Measures of Central Tendency, Variability, Correlation : Rank Difference Method and Product Moment Method (for ungrouped data).

Books Recommended :

1. Atkinson, R.L., Atkinson, R.C., Smith, E.E., Hilgard, E.R. (1987) : Introduction to Psychology New York : Harcourt Brace Jovanovi Ch.
2. Amir Singh, and Umed Singh (1984) : Prayogatmak Manovigyan. Bhiwani, Vaidik Prakashan.
3. Gerrett, H.E. (1979) : Statistics in Psychology and Education. Bombay : Vakils.
4. Postmen, L. & Egan, J.P. (1949) : Experimental Psychology : An Introduction Ludhiana; Kalyani.
5. Morgan, C.T. et al. (1979) : Introduction to Psychology, New Delhi, T.M.H.

Paper-II **Practicals** Max.Marks : 30
Time : 3 Hours

Experimental Psychology and Statistics

Notes : 1. Any ten to be performed in the Class room.

2. One practical to be performed by the students at the time of examination:

1. Determination of R.L. by Method of Limits.
2. Determination of D.L. by the Method of constant stimuli.
3. Study of illusion by Method of Average Error.
4. Experiment on STM.

5. Experiment on LTM.
6. Two hand coordination.
7. Problem solving.
8. Knowledge of results.
9. Phi-Phenomenon
10. Retroactive Inhibition
11. Depth perception
12. Transfer of training.

Books Recommended

1. Postman, L. and Egan, J.P. (1949) **Experimental Psychology, Ludhiana Kalyani.**
2. Parameswaran A.G. and Ravichandra, K. (1933) **Experimental Psychology, Seema.**

MUSIC (VOCAL)

Outlines of Test

	Max.Marks	Time
Paper-I (Theory)	40	3 Hours
Paper-II (Practical)	60	20 to 30 mts.

Note : a) Harmonium will not be allowed as accompaniment in Vocal Music

b) The candidate will be required to sing Vilambit and Drut Khayal in Ragas of the examiner's choice

Syllabus and Courses of Reading

Paper-I (Theory) Max.Marks : 40
Time : 3 Hours

a) Notation of the Talas and the compositions in the prescribed Ragas is compulsory :

Ragas: 1) Chhyanant 2) Sohani 3) Sudh-Kalyan 4) Gaudsarang 5)Jaijaivanti.

b) Types of Nibandh Gans and their descriptions :
Drupad, Dhamar, Khyal, Thumri, Thappa, Chaturang, Tarana, Geet, Gazal, Bhajan.

c) Description of : 1) Jaties of Ragas 2) Ten Rag Lukshanas 3) Avirhbava 4) Tirobhava

d) Placement of Swaras on Shruties according to Bharant Lochan Pundrik Bitthal, Ramamtya.

e) Tanpura and Sahayak Nad.

f) Different Gharanas of Khyal Gayaki.

g) Contribution towards Music by Matang, Sriniwas, Onkar Nath Thakur, Vinayak Rao Patwardhan.

h) Description of the prescribed Ragas and Tals.

i) Full description of Tanpura.

j) Method of Tuning of Tanpura.

Paper-II (Practicals) Max.Marks : 60
Time : 20 to 30 minutes

a) One Drut Khyal with Alaps, Bol Tanas, Bol Alaps in each of the following Ragas :

1) Chhayant 2) Sohni 3) Shudh Kalyan 4) Gaud Sarang 5)Jai-Jaivanti. Out of five drut Khyals one may be set to any Tal other than teen tala.

b) Two slow Khyal with extempore Alaps and Tanas in any of the prescribed Ragas.

c) One Dhrupad with Dugun, Tigun and Chaugun and one Dhamar with Dugun in prescribed Ragas.

d) One Tarana in any of the prescribed Ragas.

e) Ability to demonstrate Ada, Chautal, Deepchandia. Tilwara Tivra with reciting Bols by hands in Thah and Dugun Layakarives and ability to play Chautal and Ektal on Tabla.

Books Recommended :

Paper-I (Theory)

1.	Sulab Sangeet Shastra, Part-II	:	R.N. Talegaonkar 30/143 Raja-Mandi, Agra.
2.	Raga Prichaya Part-II & III	:	H.C. Srivastava, 88 South Malka Allahabad.
3.	Sangeet Shastra Darpan, Part-II	:	Shanti Goverdhan. 27 Mahajani Tola, Allahabad.
4.	Sangeet Visharad	:	Basant Sangeet Karyalaya Hathras.

Books Recommended :

Paper-II (Practical)

1.	Sulabh Sangeet Visharad, Parts-I & II	:	R.N. Talegaonkar, 30/48 Rajamandi Agra.
2.	Raga Miranya	:	J.N. Pathak, 27, Mahajani Tola Allahabad.
3.	Raga Parbhakar	:	R.K. Viyas-Sarla Parkashan 91(South Kalyani Devi, Allahabad.

MUSIC (TABLA)
Outlines of Test

	Max.Marks	Time
Paper-I (Theory)	40	3 Hours
Paper-II (Practical)	60	20 Minutes.

Syllabus and Courses of Reading

Paper-I(Theory) Max.Marks : 40
Time : 3 Hours

a) Definitions with full explanations of Uthan, Pharma Shee Paran, Nagma, Peskar, Chakardar.
b) Ten Varanaas of Tala.
c) Full Knowledge of Dakshani Tala System.
d) Writing Method of Dugun, Tigun and Chaugun, Layakries. Toras, Parans and Tihaies.
e) Life sketches of Sh. Shanta Prashad and Sh. Anokhelal.
f) Ability to write Nothern Talas in Karnatak Tala Padhti.

Paper-II(Practical) Max.Marks : 60
Time : 20 Minutes

a) Talas prescribed : Rupak, Tivra Jhap, Sul, Deepchandi, Jhumra with proper Barhat on hand and Tabla. At least ten Laggies each in Kehrava and Dadra.
b) Practice to playing the above mentioned Talas, with Vocal and Instrumental items.
c) Knowledge of Shudh and Vikrit Swaras.
d) Tunning of Tabla.
e) Practice of Khol Playing.

Books Recommended :

1.	Tal Parichaya Parts-I & II	:	Grish Chander Srivastava, 88 South Malaka Ganj Allahabad.
2.	Sangeet Nibandh Mala	:	J.N. Pathak, 27 Mahajani Toia Allahabad.
3.	Sulbh Dangeet Shastra, Part-II.	:	R.N. Telegaonkar, 30/148, Rajamandi, Agra.
4.	Shastra Rag Parichaya, Parts II & III.	:	Parkash Narain, Munshi Ram Parkash Bagh, Muthi Ganj, Allahabad.
5.	Rag Parichaya Parts-II & III.	:	H.C. Srivastava, 88, South Malaka : Allahabad.

6. Tabla Shastra : M.G. Godbole Pathak Publications 27, Mahajani Tola, Allahabad.
7. Tal Deepka : M.G. Godbole, 27 Mahajani Tola, Allahabad.

MUSIC (INSTRUMENTAL)
Outlines of Test

Paper-I (Theory) Max. Marks : 40 Time : 3 Hrs.

Paper-II (Practical) 60 20 to 30 minutes

Note : The Candidates have the Option to take any one of the following Instruments.

Sitar, Sarangi, Sarod, Dilruba, Violin, Bansuri, Shahanai and Tabla.

Syllabus and Courses of Reading

Paper-I (Theory) Max. Marks : 40
Time : 3 Hrs.

a) Notation of the talas and the composition in the prescribed ragas is compulsory.

Ragas :1. Khamaj 2. Bahar 3. Purvi 4. Multani 5. Deshkar.

b) Difference between :
   1. Laya and Tala
   2. Avirbhava and Tirobhava
   3. Alpatva Bahutva

c) Classification of Indian Musical Instruments.

d) Swayambhu-Nada.

e) Different Gharanas of your Instrument.

f) Contribution towards Music by Pundrik Bithal, Pandit Ravi Shankar Nikhal Banerjee, Abdul Hallem-Jafer Khan.

g) Description of the prescribed Ragas and Talas.

h) Knowledge of the following.
   1. Methods of tuning of the Instruments and the full description of its various parts.

i) Description of any five instruments other than yours.

j) Detailed study of Sarana Chatushtayee as stated by Bharat.

Paper-II (Practical) Max. Marks : 60
Time : 20 to 30 minutes

a) One Drut Gat with Alap-Jor, Toras and Jhala in the following Ragas:
1) Khamaj 2) Bahar 3)Purvi 4) Multani 5) Deshkar.

b) Two slow gats with Extempore Alaps and Toras in any of the prescribed ragas.

c) One Dhun in Bhairvi Raga.

d) One Gat in Ektala in medium Tampre, with Toras and Jhala in any of the Prescribed Ragas.

e) Ability to demonstrate Ada-Chautal,. Deepchandi, Tivra, Chautal with reciting Bols by hands, Thah and Dugun Layakaries and ability to play Ektal and Jhaptal on Tabla.

INDIAN CLASSICAL DANCE
(KATHAK)
Outlines of Test

	Max.Marks :	Time :
Paper-A : (Theory)	40	3 Hours.
Paper-B : (Practical)	60	30 Minutes

Syllabus and Courses of Reading

Paper-I (Theory) Max. Marks : 40
Time : 3 Hours

1. Origin of Tal and its application in Dance.
2. Histroy of Indian Stage.
3. Comparative study of the different Gharanas in Kathak.
4. Study of growing popularity of Indian Dances in the West.
5. Detailed knowledge of Navras and its application in Dance.
6. Knowledge of Costumes, background music used in different Classical Dances.
7. Detailed Knowledge of use of Hast Mudras in Dance.
8. Life sketches of exponents of different Gharanas in Kathak and their contribution to their own Gharanas.
9. Notation of all the Bols prescribed in practical course.
10. Detailed knowledge of Folk Dances of North India, their origin background music and Costumes.

Note : 1. There will be eight questions set out of the syllabus as given above.

2. One question on notation will be compulsory.

Paper-B (Practical) Max. Marks :60
Time : 30 minutes

1. Systematic performance in Teen Tal.
   a) Advanced Tatkars with Paltas, Ladis and Tihais in different Layakari.
   b) That
   c) Two varieties of Amads.
   d) Guru Vandana, Ganesh Vandana.
   e) Parn 4), Chakkardar Paran (2), 1 Tishra Jati Paran, 2 Kavit, Parmalu.
   f) Gat Nikas
   g) Gat Bhav on any one of the following :-
   Kalia Daman, Panghat, Goverdhan Lila, Makhan Chori.
2. Ability to dance skillfully in Jhaptal, Ektal.
   a) That
   b) Ahmada-I
   c) Karan
   d) I-Chakkardar Paran
   e) Kavit
3. Dhamaar (14 matra)
   Tatkar in Tha, Dugun
   Simple Tora 4 Amad-I
4. Ability to demonstrate Toras of different Gharans of Kathak.
5. Ability to Dance any folk form of dancing of the candidates choice.
6. Ability to play Nagma and Thheka on Tabla of the Tals prescribed in the Syllabus.
7. Ability to do Padhant of Bols in the prescriibed Tals.

Note : Distribution of Marks in practical will be as under:

a) Choice of the Student	15 marks
b) Choice of the examiner	20 marks
c) Thheka on Tabla	5 marks
d) Playing Nagma	5 marks
e) Padhant	10 marks
f) Viva	5 marks

ANCIENT INDIAN HISTORY, CULTURAL ARCHAEOLOGY
Outlines of Test

Max. Marks : 100
Time : 3 Hours

One Paper

Note : At least ten question shall be set in the paper spread over the entire syllabus more or less proportionately out of which the candidates shall be required to attempt five questions in all. All questions shall carry equal marks.

There shall be one objective type question in the paper.

This question will be divided into three sections. Section-I will have snap-short type questions of 10 marks. Section-II will have matching type questions of 5 marks. Section-III will have matching type questions 5 marks.

Syllabus and Courses of Reading

Paper **Socio Economic History of India** Time : 3 Hours

(From earliest times to c-1200 AD)

Indus Valley Civilization : Social Life; The Vedic Society : the Varnas, Origin and Development of Caste System; The Society at the time of the Budha, Foreign influence on Indian Society; Social Life during the Gupta period; Social Change in early Medieval Period (700-1200 A.D.); First Urbanisation (Indus Valley Civilization); Economic conditions during the Vedic Period Gangas Valley Urbanizations Economic Conditions during the Mauryas and the Guptas; Trade and Commerce in Ancient India; Foregn contacts; Origin and growth of Feudalism; Economic conditions of the Deccan and the South; a general survey.

Books Recommended:

१. त्रिपाठी, डॉ० रामनरेश. प्राचीन भारत का आर्थिक विकास इलाहाबाद १९८१

२- उपाध्याय, रामजी —प्राचीन भारत की सामाजिक संस्कृति, इलाहाबाद १९६३।

३- मोतीचन्द सार्थवाह, पटना, १९५३।

4.Sharma, R.S. Material Culture and Social Formation in Ancient India Delhi 1983.

Perspective in Social and Economic History of early India, Delhi, 1983 Sudras in Ancient India Delhi, 1958.

शूद्रों का प्राचिन इतिहास दिल्ली, १९७६।

भारतीय सामन्तवाद, दिल्ली १९७३।

५- झा. डी. एन. : मौर्योत्तर तथा गुप्तकालीन राजस्व व्यवस्था दिल्ली, १९७७

६- पाण्डेय राजबलि-हिन्दू संस्कार, वाराणसी, १९५७.

7. Jairabhoy, R.A. Foreign Influence in Ancient India, New Delhi, 1963.

8. Das, S.K.	The Economic History of Ancient India, Calcutta, 1947.
9. Maity, S.K.	Economic life of Northern India in the Gupta Period (A.D. 300-500), Calcutta, 1958.
10. Thakur, V.K.	Urbanisation in Ancient India. New Delhi, 1981.
11. Gopal Zalanji	The Economic Life of North India (A.D. 700-1200) Varanasi, 1965.
12. Praphu, P.H.	Hindu Social Organization, Bombay 1958.
13. Sharma, B.N.	Social Life in North India (600-1000 A.D), Delhi 1966.
14. Kher, N.K.	Agraian and Fiscal Economy in Maurya and Post- Mauryan Age Delhi, 1973.
१५ जयशंकर मिश्र	: प्राचीन भारत का सामाजिक इतिहास, पटना १९७४ ।
१६ राय विजय बहादुर	: उत्तर वैदिक समाज एवं संस्कृति, वाराणसी १९६६ ।
१७ मदन मोहन सिंह	: बुद्ध कालीन समाज व धर्म ।

ART

Outlines of Test		Max. Marks	Time
Paper-I (Theory) History & Appreciation of Art		30	3 Hours.
(a) History of Art	18}	30	
(b) Appreciation of Art	12}		
Paper-II(Practical) Landscape on the Spot	20}		6Hrs.
Paper-III (Practical)Poster	20}		6Hrs.
Paper-IV (Practical) Composition	20}	70	6Hrs.
Sessional Work	10}		

Syllabus and Courses of Reading M.M. : 30

Paper-I History and Appreciations of Art Time : 3 Hours.

(a) History of Art 18 marks

Early Indian Paintings : Ajanta paintings; the Paintings of Bagh Badami, Sattanavasal and Tanjore; the Regional School of Painting in Eastern and Western India, the Rajasthani School of painting the Mughal School, the Pahari Paintings.

(b) Appreciation of Art 12 marks

Definition of Mural, Miniature, Fresco, Composition, Perspective, Fore-shortening: Cronical Background of Indian Painting the six Limbs (shadanga) of painting and their application in Indian Painting, Indian concept of Primary Colours (Varana) and the symbolic meaning of each of the colours.

Paper-II (Practical) Landscape on the Spot

Max. Marks : 20
Time : 6 Hours.

Landscape to be painted on the spot, adding two or more figure from Memory.

Medium : Oil/Water colour
Size : Half-sheet

Note : More emphasis is to be given to composition both regarding drawing and colour, proportion, perspective and light and shade.

Paper-III (Practical) Poster

Max. Marks : 20
Time : 6 Hours

Poster should be in bold lay out using flat colours using not more than five colours.

Medium : Poster colours
Size: Half sheet

Paper-IV (Practical) Composition

Max. Marks : 20
Time : 6 hours

Composition, using still-life objects not more than four in number. Drapery may be used in the background.

Medium : Oil or Water Colour
Size : Half sheet

Note : The total effects of the painting should appear, less a representation of the objects placed before the candidates and besides this a well organised area of colours and forms. To achieve the effect simplification and distortion is allowed.

Sessional Work	10 Marks
1. Sketches	60
2. Landscape	4
3. Poster	4
4. Composition	4

Note : The students must submit specimens of his/her work during the course duly attested by the teacher concerned. The pieces of work include drawing, painting related to the executed by the students and also private candidates are required Sessional Work duly attested, by the teacher concerned.

Note : 1. Each theory paper shall be divided in two Sections A & B Section A will carry six questions out of which the candidates shall be required to attempt any three. Section-B will contain four questions out of which the candidates will be required to attempt any two questions.

2. Questions are to be set so as to test the broad survey of the topics and not minute details.

CLAY MODELLING

Outlines of Test

		Max. Marks :	Time	
Paper-I	(Theory) History and Appreciation of Art	30	3 hrs.	
	(a) History of Art	18}		
		}	30	
	(b) Appreciation of Art	12}		
Paper-II	(Practical) Head Study		30	6 hrs.
Paper-III	(Practical)Imaginative Composition		30	6 hrs.
	Sessional Work		10	

Syllabus and Courses of Readings

Paper-I (Theory) History and Appreciation of Art — Max. Marks : 30, Time : 3 hours

A) History of Art — 18 Marks

Early Indian Paintings : Ajanta Paintings; the Paintings of Bagh, Badami, Sattanavasli and Tanjore; the Regional School of Paintings in Eastern and Wastern India; the Rajasthani School of Paintings; the Mughal School; the Pahari Paintings.

B) Apprection of Art — 12 Marks

Definition of Mural, Miniature, Fresco, Composition, Perspective Fore-shortening; Cannocical Background of Indian Painting; the Six Limbs (shadanga) of painting and their application in Indian Painting; Indian concept of primary colours (Varana) and the Symbolic meaning of each of the colours.

Paper-II (Practical) Head Study — Max. Marks : 30, Time : 6 Hours

Paper-III(Practical) Imaginative Composition — Max. Marks : 30, Time : 6 Hours

Clay Modelling as medium of imaginative presentation of human form showing movement and group formation

Sessional Work 10 Marks

Three each specific model related with practical paper IInd & IIIrd.

Note : The students must submit specimens of his/her work done during the course duly attested by the teacher concerned. The piece of work include drawing, Paintings related to the executed by the students and also private candidates are required Sessional Work duly attested by the teacher concerned.

Note : 1. Each theory paper shall be divided into two Section-A & B.Section-A will carry six questions out of which the candidate shall be required to attempt any three. Section-B will contain four questions out of which the candidate will be required to attempt any two questions. All the questions shall carry equal marks.

2. Questions are to be set so as to test the broad survey of the topics and not minute details.

HISTORY OF ART

One paper of three hours duration carrying 100 marks.
History of Indian Sculpture and Painting.
(From the Post-Classical Period to A.D. 1800)

Part-A Post-Classical Indian Sculpture of different styles and Dynasties: Chalukya, Pallav, Chole and Hoysalo; Pala and Sena Ganga and Gajpati.

Part-B Medieval Painting : The Sultante Period: the Mughal School; the Rajasthani Schools; the Pahari School; the Deccani School.

Note : Each theory paper shall be divided into two Sections-A & B Section-A will carry six questions out of which the candidate shall be required to attempt any three. Section-B will contain four questions out of which the candidate will be required to attempt any two questions. All the questions shall carry equal marks.

Questions are to be set so as to test the broad survey of the topics and not minutes details.

MATHEMATICS
Outlines of Test

		Max. Marks B.A.	B.Sc	Time
Paper-I	Calculus and Analytical Geometry	50	75	3 Hrs.
Paper-II	Mechanics and Numerical Analysis	50	75	3 Hrs.

Paper-I Calculus and Analytical Geometry Max. Marks Time :
B.Sc. :75 3 Hours.
B.A. : 50

Unit-I

Derivative of functions defined parametrically. Derivative of logarithmic, exponential, trignometric, inverse trignometric and hyperbolic functions. Derivatives of higher orders, Successive differentiation. Leibnitz's Theorem, Tangents and Normals.

Unit-II

Taylor's theorem and Maclaurin's theorem, Expansion of exponential, Trignometric, binomial functions. Indeterminate forms, function of more than one variables and its continuity.

Unit-III

Partial derivatives of first and second order. The notion of total Idifferential, extreme values, Lagrange's Method of Multipliers. Euler's theorem on homogeneous functions, differentiation of composite and implicit functions, Statements of implicit function theorm and inverse function theorem.

Unit-IV

Asymptotes, curvature, singular points, tracing of curves.

Unit-V

Reduction formulae, Length of curves area of surfaces of revolution, Double and triple integration and its simple applications to determination of volumes and surfaces.

Unit-VI

Equation and simple properties of spheres, cones and cylinder equations in standard forms and simple properties of Ellipsoids, Paraboloids and Hyperboloids.

Note : The examiner is requested to set 12 questions in all, two questions from each unit. The candidate will be required to attempt six questions selecting one from each unit.

Paper-II: **Mechanics and Numerical Analysis**

Max. Marks : B.Sc.: 75
B.A. : 50
Time : 3 hours

Unit-I

Velocity, Acceleration. Newton's Laws of Motion Rectilinear motion including motion under Gravity and simple harmonic motion.

Unit-II

Composition and resolution of velocities, accelerations and forces in a plane. Simple cases of motion in a plane with acceleration parallel to a fixed direction. Projectiles. Relative Motion. Angular Velocity. Motion in Horizontal and Vertical circles simple Pendulum.

Unit-III

Work, energy, power and impulse. Motion of a system of particles. Principles of conservation of linear momentum and energy Impact.

Unit-IV

Location of roots, solution of algebraic and transcendental equations. Iterative Method, bisection method, Regula Falsi Method Newton-Raphson method.

Unit-V

Interpolation, Newton's forward and backward formulae. Central differences, Gauss, Striling, Everett and Bessel formulae.

Unit-VI

Divided difference, Newtons divided difference and Lagrange's formulae. solution of system of simultaneous equations in three unkonwns Gauss elimination method, triangularization and Crout's method.

Note : 1. The examiner is requested to set 12 questions in all, two from each Unit. The candidate will be required to attempt six questions selecting one from each unit.

2. Scientific calculators are not allowed, however ordinary calculators are allowed.

STATISTICS

Outlines of Test

		Max. Marks B.A.	Max. Marks B.Sc.	Time
Paper-I	Statistical Methods	35	50	3 Hours.
Paper-II	Elementary Inference	35	50	3 Hours.
Paper-III	Practicals	30	50	3 Hours

Syllabus and Courses of Reading

Paper-I Statistical Methods

Max. Marks B.A.	Max. Marks B.Sc.	Time
35	50	3 Hours

Note : Paper will comprise of six units, each consisting of two questions. Candidates will be required to attempt six questions selecting one question from each unit.

Continuous Distributions

Unit-1. Normal distribution as a limiting case of Binomial and Poisson distributions, properties. Area under normal curve with its applications.

Unit-2. Exponential, Uniform and Cauchy Distributions, Properties of these Distributions.

Unit-3. Beta, Gamma and Log Normal Distributions with their Properties.

Correlation and Regression

Unit-4. Linear correlation, Karl Pearson's and Spearman's correlation coefficient Fitting of Straight Line, Parabola, Logarithmic and Exponential Curves by the Method of Least Squares.

Unit-5. Linear Regression, Linear of Regression, Regression coefficients, Properties of Regression Coefficients, Angle between two lines of regression.

Unit-6. Multiple and partial correlation (For three varibles only), Yule's Notation, Plan of regression, Properties of residuals, Variance of the Residual, Coeficient of Multiple and Partial Correlation with their properties.

Paper-II Elementary Inference

Max. Marks : B.A./B.Sc. (35/50)
Time : 3 hrs.

Estimation

Note : Paper will comprise of six units each consist of two questions, candidate will be required to attempt six questions selecting one question from each Unit.

Unit-1. Concept of Population, Sample parameter and Statistic, Sampling Distribution, Estimation of Mean and Variance, Criteria for a good estimator, unbiasedness, Efficiency, Consistency and Sufficiency (def. only).

Unit-2. The method of Moments, Least Squares, maximum likelyhood, minimum variance, Estimates and Statements of their properties. Concept of Confidence Interval.

Testing of Hypothesis

Unit-3. Null and alternative hypothesis, simple hypothesis, two types of errors, level of significance concept of power of a test.

Unit-4. Tests for a simple hypothesis against a simple alternative in case of Binomial, Poisson and Normal Distributions.

Unit-5. Large sample tests of Mean, Variance and Proportion.

Unit-6. Simple properties of Chi-squares, students' and Snedecor's F distribution with their applications in tests of significances.

Paper-III **(Practicals)** Max. Marks : B.A.: 30
B.Sc. : 50
Time : 3 Hrs.

The paper will consists of five questions and the candidates will be asked to attempt three questions.

The allotment of marks will be as follows:

i) Experiments (B.A.24 marks. B.Sc. : 40 Marks).

ii) Record of practical work and oral test (B.A. 6 marks, B.Sc. 10 marks)

The following topics are prescribed for the practical work :

1. Fitting of Normal distribution : Estimating Mean and Pearson's Standard Deviation from a normal population.
2. Karl Pearson's Coefficent for Bivariate Frequency Distribution.
3. Fitting of following Curves by Least Square Methods.
   i) Straight line ii) Second degree parabolae iii) Exponential Curve.
4. Fitting of Linear Regression in case of three variables.
   Computation of Partial and Multiple Correlation for three variables.
5. Confidence Intervals.
6. Tests of Significance
   i) Large Sample Test for propotion Mean and Variance.
   ii) Chi-squeare Tests for proportion Mean and Variance.
   iii) Tests for Hypothesis $p=o, p=po, p_1=p_2$
   iv) t-test for hypothesis $\mu=\mu o$ and $\mu_1=\mu_2$
   v) F-test for equality of two variances.
7. Testing a simple hypothesis against simple alternative in the case of Binomial, Poisson and Normal distribution.

* The students are allowed to use calculators in the Examination.

HOME SCIENCE

Paper-I **Clothing & Textiles**

Max. Marks
B.A. : 30
B.Sc. : 45

Time :
2 Hours

Note : 1. The examiner will set six questions in all two questions from each Unit.

2. *The candidates shall attempt three questions in all selecting one from each Unit.*
3. *All questions carry equal marks.*

UNIT-I

Definition and Classification of Fibres.

Manufacture and properties of different Fibres : Cotton, Silk, Wool and Nylon.

UNIT-II

Finishing processes in Fabrics.

(a) Meaning and objectives and applications of Finishes.

(b) Different type of Finishes-Calendering, Bleaching, Sizing, Mercerizing, Pre-shrinking, Crease resistant, Dyeing and Printing.

UNIT-III

Supplies/Necessary for laundry :

(a) Soaps & Detergents, Starches, blues & bleaches.

(b) Other reagents :Acids, Alkalies, Solvents & Absorbants.

Different Methods of Laundary.

Stain removel Classification of stains, Methods of removing different types of stains.

Paper-II PHYSIOLOGY

Max. Marks Time :
B.A. :30
B.Sc.:45 2 Hours

Note : 1. The examiner will set six questions in all, two questions from each Unit.

2. *The candidate shall attempt three questions in all, selecting one from each Unit.*
3. *All questions carry equal marks.*

UNIT-I

Cell Structure of an Animal Cell, Cell division in brief. (Mitosis & Meiosis).

Skeletal System :Functions of skeletal system, Names of the bones and joints.

Digestive System : Digestion & absorption of food-Parts of Elementary Canal (only the structure), Mouth, Pharynx, oesophagus, Stomach, Small Intestine & large Intestine.

UNIT-II

Circulatory System :

(a) Blood composition and functions of blood.

(b) coagulation of blood.

(c) Heart : Structure and working of heart.

(d) Blood pressure.

Excretory System :

Structure and functions of Kidney, Skin and Lungs.

UNIT-III

Reproductive System :

(a) Sex glands (Male & Famale)

(b) Menstruation, Fertilization, Pregnancy & Lactation. Endocrine Glands: Functions of different glands. The Pitutary, The Thyroid, Parathyroid, The Addrenal Glands, Islets of Langerhans in pancreas.

Nervous System :

(a) Parts and functions of Brain.

(b) Spinal Cord-function and reflex action.

(Practical) **CLOTHING & TEXTILES**

Max. Marks Time :
B.A. : 40 3 Hours
B.Sc.: 60

1. Study of different parts of sewing machine ,its care, defects and remedies.
2. Preparations of Samples :
   (a) Basic Stitches-Tacking, running stitches, back stitches hemming, button hole stitch.
   (b) Seams-Plain Seam, French Seam, Run and Fell Seam.
   (c) Processes-Gathers into bond, dart, pleats (knife and box), placket opening (continuous wrap & two piece placket opening), pin tucks. (minimum 12-15 samples).
3. Taking body measurement.
4. Drafting of the following :
   (a) Child's bodice-block and/its adaptation to a gathered frock.
   (b) Drafting of Collars (Baby Collar, Peter Pancollar)
   (c) Adult's bodice-block and its adaptation to their choice garment.

5. drafting and stitching of following garments :
   (a) Gathered frock with sleaves (3 to 8 years old).
   (b) Salwar and Kamiz.
   (c) Blouse and Paticoat.
6. Embroidery-One article of fancy embroidery using atleast four stitches.

OR

Five Fancy embroidered handkerchiefs with different stitches.

7. Knitting :
   (a) Following of Knitting instructions
   (b) Preparation of two samples of different designs (minimum size 6"x6")
8. Stain removal : Curry, Tea or Coffee, Blood, Lipstick, Nail Polish, Paint, Greese, Blue ink, Rust and Ball pen.
9. Tie and Dye.

B.Sc. Part-II(Industrial Chemistry)
Vocational Course

Scheme of Examination

The students of B.Sc. II shall be required to appear in two theory papers and one practical examination at the end of the session. In addition to this, the students will submit "Project Report" of 30 marks.

The distribution of marks shall be as under:-

Paper-I		Max Marks	Time Allowed
Unit-1	Material Science	40	3 Hrs.
Unit-2	Unit Processes Inorganic Chemicals Manufacture-I		
Unit-3	Unit Processes in organic Chemicals Manufacture-II		
Paper-II			
Unit-1	Pollution	40	3 Hrs.
Unit-2	Effluent Treatment and Waste management		
Unit-3	Process Instrumentation		
Paper-III	**Practicals**	40	6 Hrs
Paper-IV	Project Report	30	

(In the "Project Work" of 30 marks, the students will be required to undergo " on the Job Training" in an industry for period of four weeks and submit a report of the same to the University).

SECOND YEAR B.Sc. (Industrial Chemistry)

Paper-I

Unit-I: **Material Science** Max. Marks : 40
Time : 3 Hrs.

IC 201 Mechanical properties of materials and change with respect to temperature 2L

Materials of Constructions used in Industry

Metals and Alloys : Important metals and alloys; iron, copper, aluminium, lead, nickel, titanium and their alloys - Mechanical and chemical properties and their applications 6L

Cement: Types of cement, Composition, Manufacturing process, setting of cement. 4L

Ceramics - Introduction, Types, Manufacturing processes, Applications. Refractories 4L

Polumeric Materials : Industrial polymer and composite material- 6L

Their constitution, chemical and physical properties, Industrial applications.

Glass - Types, composition, manufacture, physical and chemical properties, application. 4L

Corrosion- Various types of corrosion relevant to chemical industry-Mechanism, Preventive methods.

Books:

1. Science of Ceramics Chemicals Processing, Hench, L.L.
2. Chemistry and Physics of Clays other Ceramics.
3. Science of Ceramics, Stewart, G.H
4. Chemistry of Cement
5. Properties of Glass, Morey, G.W.
6. Chemistry of glasses, Paul, A.
7. Corrosion: Causes and prevention, Spellur, F.N.
8. Corrosion and Corrosion Engineering Fontana M.G. and Green N.D., Mc. Graw-Hill Book Co.
9. Experiments in Materials Technology, a Laboratory Text for Engineering, Manufacturing Metallurgy and Materials Testing Govt. of India; East West Publications.
10. Selecting Materials for Process Equipment Mc. Maughton K.J., Mc, Graw-Hill Book Co.,

Unit-2 Unit Processes in Organic Chemicals Manufacturer-I

IC 203 Nitration: Introduction-Nitrating agents. kinetics and mechanism of nitration processes such as nitration of: 12L

i) Paraffinic hydrocarbons
ii) Benzene to nitrobenzene and m-dinitrobenzene
iii) Chlorobenzene to o and p nitrochlorobenzenes
iv) Acetanilide to p nitroacetanilide
v) Toluene

Continuous vs batch nitration

IC 204 Halogenation : Introduction - kinetics of halogenation reactions, Reagents for halogenation, Halogenation of aromatics - side chain and nuclear halogenations, commericial manufactures - chlorobenzenes, chloral, monochloracetic and chloromethanes, dichlorofluoromethanes, 9L

IC 205 Sulphonation ; Introduction - sulphonating agents, chemical and physical factors in sulphonation , kinetics and mechanism of sulphonation reaction, commercial sulponation of benzene, naphthalene, alkyl benzene, Batch vs continuous sulphonation. 9L

Books

1. Unit Process in Organic Synthesis P.M. Grogging, Mc Graw-Hill Book Co, New York.

Unit-3 **Unit Processes in Organic chemicals Manufacture-II**

IC 206 Oxidation; Introduction-Types of oxidation reactions, Oxidizing agents, kinetics and mechanism of oxidation of organic compounds Liquid phase oxidation, Vapor phase oxidation, Commerical manufacture of benzoic acid maleic anhydride, phthallic anydride, acrolein, actaldehy acetic acid. 7L

IC 207 Hydrogenation : Introduction-kinetics and thermodynamics of hydrogenation reactions, Catalysts for hydrogenation reactions, Hydrogenation of vegetable oil, Manufacture of methanol from carbon monozide and hydrogen, hydrogenation of acids and esters to alcohols, catalytic reforming. 7L

IC 208 Alkylation: Introduction: Types of alkylation, Alkylating agents, Thermodynamics and mechanism of alkylation reactions, Manufacture of-alkyl benzenes (for detergent manufacture), ethyl benzene phenyl ethyl) alcohol, N-alkyl anilines (mono and di-methyl and ethyl anilines). 7L

Esterification : Introduction : Hydrodynamics and kinetics of esterification reactions, Esterification by organic acids, by addition of unsaturated compounds, esterification by organic acids, by addition of unsaturated compounds, esterification of carbony acid derivaives, commercial manufacture of-ethyl acetate, dioctyl phthalate, vinyl acetate, cellulose acetate.

IC 209 Amination ; (A) By reduction ; Introduction, methods of reduction-metal and acid, catalytic, sulfide, electrolytic, metal and alkali sulfites, metal hydrides, sodium metal, concentrated caustic oxidation, reduction, commercial manufacture of aniline, m-nitroaniline, p-amino phenol.

(B) By aminolysis : Introduction, aminating agents, factors affecting.

Hydrolysis: Introduction; hydrosying agents, kinetics, thermodynamics and mechanism of hydolysis. 2L

Books

1. Unit Processes in Organic synthesis, P.H. Groggings, Mc Graw- Hill Book Co.,New York.

Paper-II Max. Marks : 40
Time : 3 Hours

Unit-I-POLLUTION

IC 210 Air, Oxygen, nitrogen cycle, water, Biosphere, Flora and Fauna, Energy Soil 8L

IC 211 Pollutants and their statutory limits. Pollution evaluation methods. 7L

IC 212 Air pollution-various pollutants. 15 L

Noise pollution

Sewage analysis

Pesticide pollution

Radiation pollution, Green house effect, Future.

Water pollution-Organic/inorganic pollution

Books

1. Pollution control in chemical and allied industries, Mahajan S.P.
2. Pollution control in industries. A series of books by Jones H.R.

3. System's Approach to Air Pollution Control, R.J. Bibbero and I.G. Young.
4. Air Pollution-Vol. I-IV Editor, A.C. Stern, Academic Press, New York.
5. Gas Purification Process for Air Pollution Control, G. Nonhebel Newnes Butterworths, London.
6. Air Pollution Technology, Painter D.E., Reston Publishing Co.

Unit-2 Effluent Treatment and Waste management

IC 213	Principles and equipments for aerobic, anaerobic treatment, adsorption, filtration, sedimentation,	10L
	Bag filters, electrostatic precipitator mist eliminator, wet scrubbers.	8L
	Absorbers	4L
	Solid Waste Management	4L
	Industry Safety	4L

Books

1. Effluent Treatment in Process Industries of Chem. Engg.
2. Effluent Treatment and Waste disposal-inst. of Chem. Engg.
3. Effluent Treatment and disposal inst. of Chem. Engg.
4. System's Approach to Air Pollution control, R.J.Bibbero and I.G. Young.
5. Air Pollution-Vol. I-IV, Editor, A.C.Stern, Academic Press, New York.
6. Gas Purification Process for Air Pollution Control, G. Nonhebel Newnes-Butterworths, London.
7. Air Pollution Technology, Painter D.E., & Reston Publishing Co.

Unit-3 Process Instrumentation

	Concept of measurement and accuracy	2L
	Principle, construction and working of following measuring instruments	10L
	Temperature-glass thermometers, bimetallic thermometer pressure spring thermometer, vapour filled thermometers resistance thermometers. radiation pyrometers.	7L

Pressure-Manometers, barometers, burdon pressure guage; bellow type, diaphragm type pressure guages, macleod guages, pirani gauges, etc.

Liquid level: Direct-indirect liquid level measurement, float type liquid level gauge, ultrasonic level gauges; Bubbler system. 8L

Density Measurement and Viscocity Measurement 4L

Books

1. Industrial Instrumentation
D.P.Eckman, John-Wileys & Sons.
2. Applied Instrumentation in procedes industries.
Vol.I,II & III W.G. Andrews, Gulf Publication.
3. Instrumentation and Control for the process Industries.
S. Borer, Elsevier Applied Science Publishers.
4. Chemical Engineers' and book. J.H. Perry and D Greenb, Mc Graw-Hill, Publishing Co., New York.

Practicals Max. Marks ; 40
Time : 6 Hours

1. One to two examples of each of the process. Nitration, Sulphanation, Friedel crafts reaction, esterification, Hydrolysis, Oxidation, Halogenation, Chlorousulphonation, Reduction, Polymerization, reactions, of diazonium salts..
2. Use of Transducers for measuring flow control.
3. Determination of flash point and ignition points of liquids.
4. Water analysis-solid content, Hardness, COD, and other tests as per industrial specifications.
5. Flow measuring devices-floats
6. Monographs of representative raw materials such as sulphuric acid, toluene, sodium carbonate, sodium hyroxide, carbon tetrachloride Benzoic acid. (5-6 compounds)
7. Limit tests for heavy metals Pb. As., Hg. Fe and ash content.
8. Instrumental Methods of Annalysis - Use of colourimeter, pH, meter, potentiometer, conductometer, refractometer, polarimeter.
9. Material testing: Testing of alloys Identification of plastics/rubber Estimation of yield point, young's modulus, flaredness; Optical, thermal mechanical and electrical properties.

   Process Instrumentation - transducers of different types.

हिन्दी (अनिवार्य)

समय : ३ घण्टे
पूर्णांक : १००
४० अंक

१ काव्य संग्रह

इसमें निम्नलिखित ८ कवि होंगे।

१) कबीर २) सूरदास ३) तुलसीदास ४) जायसी ५) निर्गानन्द ६) घनानन्द ७) मतिराम ८) भूषण।

निर्देश :

व्याख्या के लिए दिए गए ४ अंशों में से किन्हीं दो की व्याख्या लिखनी होगी। आठ-आठ के हिसाब से दोनों व्याख्याएं सोलह अंकों की होंगी। प्राचीन कवियों के बारे में पूछे गए चार प्रश्नों में से किन्हीं दो प्रश्नों के उत्तर लिखने होंगे। आठ-आठ के हिसाब से १६ अंकों के होंगे। दिए गए दो या तीन कवियों में से किसी एक कवि का साहित्यिक परिचय हो लिखना होगा यह प्रश्न आठ अंकों का होगा।

२ उपन्यास

सारा आकाश — राजेन्द्र यादव

निदश :—

दिए गए दो गद्यावतरणों में से किसी एक की व्याख्या लिखनी होगी जो आठ अंकों की होगी। उपन्यास पर दो समीक्षात्मक प्रश्न पूछे जाएगे। जिनमें से एक का उतर देना होगा जो १२ अंकों का होगा।

३—हिन्दी साहित्य के इतिहास की रूपरेखा (भक्तिकाल और रीतिकाल)

निर्देश :— २० अंक

काव्य धाराओं एवं उनके प्रमुख कवियों (कबीर, जायसी, नानक सूर, तुलसी नन्ददास, मीराबाई, रहीम, केशव बिहारी, पदमाकर, देव, आलम, घनानन्द) से सम्बन्ध साहित्य के परिचय पर ५ अंक के चार प्रश्न करने होगे।

४- व्यावहारिक हिन्दी—कार्यालय पत्र सूचना। २० अंक

प्रस्ताव, टिप्पणी, अधिसूचना आदि और तकनीकी शब्दावली।

निर्देश —

नकनीकी शब्दावली के अन्तंगत दस शब्द पूछे जायेंगे जिनमें से किन्ही पांच का उतर देना होगा। यह पांच अंकों का होगा शेष खण्डों पर एक-एक प्रश्न पूछा जायेगा। जिनमें से किन्ही तीन का उतर देना होगा जो पांच-पांच अंकों के होंगे।

पाठ्य पुस्तक—१) काव्य संग्रह:- महर्षि दयानन्द विश्वविद्यालय, रोहतक प्रकाशन।

सारा आकाश - राजेन्द्र यादव, राधा कृष्ण प्रकाशन, अंसारी रोड, दिल्ली

प्रस्तावित पुस्तकें:—

१- हिन्दी साहित्य का संक्षिप्त इतिहास —लक्ष्मी सागर वार्ष्णेय, लोक भारती प्रकाशन, महात्मा गांधी मार्ग, इलाहाबाद।

२- हिन्दी साहित्य का विवेचनात्मक इतिहास 'प्रथम तथा द्वितीय खण्ड" तिलक राज शर्मा आर्य बुक डिपो, ३० नाई वाला, करोल बाग नई दिल्ली।

३- हिन्दी का साधान्य ज्ञान, भाग-२—डॉ० हरदेव बाहरी लोक भारती प्रकाशन, १५-ए महात्मा गांधी मार्ग, इलाहाबाद।

हिन्दी (ऐच्छिक)

समय : ३ घण्टे पूर्णांक १००

१ खण्ड काव्य प्राचीन २५ अंक

निर्देश :—

व्याख्या के लिए खण्ड काव्य में से दो अंश दिए जाएंगे जिनमें से एक अंश की व्याख्या करनी होगी। जो दस अंक की होगी। खण्ड काव्य से सम्बन्धित दो समीक्षात्मक प्रश्न पूछे जायेंगे जिनमें से एक का उत्तर देना होगा जो पन्द्रह अंकों का होगा।

२ नाटक २५ अंक

निर्देश :—

व्याख्या के लिए नाटक में से दो अंश दिये जायेंगे जिनमें से एक अंश की व्याख्या करनी होगी जो दस अंकों की होगी नाटक से सम्बन्धित दो समीक्षात्मक प्रश्न पूछे जायेंगे जिनमें से एक का उत्तर देना होगा जो १५ अंकों का होगा।

३ काव्य शास्त्र २० अंक

काव्य, परिभाषा भेद, तत्व, शब्द-शक्ति, गुण, दोष रस।

निर्देश :—

इस भाग में २ प्रश्न होंगे। पहला प्रश्न १० अंकों का होगा। दूसरे प्रश्न के दो भाग होंगे। पहले में ५ अंक की टिप्पणी तथा दूसरे में एक एक अंक के ५ वस्तुनिष्ठ प्रश्न होंगे। प्रत्येक प्रश्न में शत-प्रतिशत विकल्प रहेंगे।

४ हिन्दी साहित्य का इतिहास (आदिकाल और भक्तिकाल) ३० अंक

निर्देश :—

इसमें दो प्रश्न दस-दस अंकों के होंगे। एक प्रश्न विकल्प सहित (एक आदिकाल व एक भक्तिकाल) तथा दस अंकों का दूसरा प्रश्न वस्तुनिष्ठ होगा। जिसमें पेपर सैटर १५ खण्ड देगा और परीक्षार्थी कोई दस खण्ड करेगा।

पाठ्यपुस्तक

१ खण्डकाव्य—सुदामा चरित-नरोत्तम दास।

२ नाटक—लहरों के राजहंस-मोहन राकेश।

३ हिन्दी साहित्य चिन्तन—ले० डा० श्रीमती पुष्पा बंसल।

प्रस्तावित पुस्तकें—

१ संक्षिप्त काव्यशास्त्र—डा० रामलाल वर्मा

२ समीक्षा सिद्धांत—डा० राम प्रकाश

३ हिन्दी साहित्य का संक्षिप्त इतिहास—लक्ष्मी सागर वार्ष्णेय १५ ए लोक भारती प्रकाशन,—महात्मा गांधी मार्ग, इलाहाबाद।

४— हिन्दी साहित्य का विवेचनात्मक इतिहास (प्रथम तथा द्वितीय खण्ड) तिलक राज शर्मा आर्य बुक डिपो, ३० नाई वाला करोल बाग, दिल्ली।

संस्कृत (अनिवार्य)

पूर्णांक : १००
समय : ३ घण्टे

१ क) भासः चारुदत्त ५० अंक

१) सप्रसंग व्याख्या—तीन खण्ड ८×३=२४

२) अनुवाद/सरलार्थ—दो खण्ड ५×२=१०

२ चारुदत्त नाटक की कथावस्तु, पात्र तथा भाषा शैली से सम्बन्धित प्रश्न १० अंक

३ सूत्रधार, नान्दी, स्थापना, जनान्तिकम्, आत्मगत् आकाश भाषित तथा भरत् वाक्यम् का सामान्य परिचय। परिभाषा (दो) ३×२=६ अंक

ख) व्याकरण :—१) कृदन्त, शतृ, शानच, तव्यत्, अनीयर, यत्, तुमुन, क्त्वा, क्त, क्तवतु, ण्वुल, (आठ प्रयोग) ८×२=१६ अंक

२ णिच् तथा सन् प्रत्ययान्त प्रयोग

क) निम्न धातुओं में णिच् प्रत्यय के लट् लकार प्रथम पुरुष एक वचन के रूप—

भू, पठ्, गम्, पा, लिख, श्रु, भू, दा, स्था, हृम (५ प्रयोग) ५×१=५ अंक

ख) निम्न धातुओं में सन् प्रत्यय के लट् लकार प्रथम पुरुष में रूप—

भू, पठ्, गम्, पा, लिख, श्रु, स्या, हृम् (पाँच प्रयोग) ५ अंक

(iii) समास—अव्ययी भाव, तत्पुरुष (द्विगु तथा कर्मधारय सहित) द्वन्द्व तथा बहुव्रीहि-सामान्य परिचय एवं नाम सहित प्रयोग— ७×२=१४ अंक

(iv) दस सरल हिन्दी वाक्यों का संस्कृत में अनुवाद १० अंक

सारा आकाश—राजेन्द्र यादव

सारा आकाश—राजेन्द्र यादव, राधा कृष्ण प्रकाशन, अंसारी रोड, दिल्ली।

संस्कृत (ऐच्छिक)

कुल अंक : १००
समय : ३ घण्टे

पाठ्यक्रम की रूपरेखा

१	पद्य	१५ अंक
२	गद्य	१५ अंक
३	नाटक	२० अंक
४	व्याकरण	३० अंक
५	काव्य शास्त्र	१० अंक
६	अनुवाद	१० अंक

पद्य :

कुमारसम्भव-पंचम सर्ग

गद्य :

शिवराजविजय तथा दशकुमारचरितम् में से चुने हुए पाठ १५ अंक

नाटक :

पंचरात्रम् भासकृत २० अंक

व्याकरण :

धातुरूप निम्नलिखत लकारों में—

लिट, लुट, आर्शीलिड, लुड, लृड

धातुय यज्, नी, नम्, पा (पाने), वद, पठ, गृह, क्री, लिख

खाद— १० अंक

कारक प्रकरण—लघुकोमुदी में से २० अंक

अलंकार अनुप्रास: (छेक) यमक, श्लेष, उपमा, पूर्णोपमा उत्प्रेक्षा, रुपक: (सांग), अतिशयोक्ति, भ्रांतिमान, अर्थान्तरान्यास, दृष्टांत १० अंक

अनुवाद— १० अंक

पाठ्य पुस्तक :

संस्कृत संग्रह —कुरुक्षेत्र विश्वविद्यालय कुरुक्षेत्र प्रकाशन।

संस्कृत अनिवार्य

(For B.Sc. Part-II)

प्रश्न-पत्र : एक

कुल अंक : ५०
समय : ३ घण्टे

क) संस्कृत चयनिका —कुरुक्षेत्र विश्वविद्यालय प्रकाशन। अंक ३०

ख) व्याकरण

१) शब्दरूप---बालक, रोजन विद्वस, शाशिन, सर्व, नदी, युष्मद् अस्मद् तद्, इदम्, अद्स । अंक ६

२) धातुरूप-लट् लोट, लृट लकार में भू, वद्, गम् पठ्, स्था, लभ्, दा, कृ, भृ, चुर । अंक ६

३) सन्धि-स्वर-सन्धि, सकार तवर्ग को सकार चवर्ग, सकार, तवर्ग को सकार स्वर्ग । अंक ४

४) कारक तथा विभक्तियों पर आधारित हिन्दी से संस्कृत में सरल वाक्यों का अनुवाद । अंक ४

बी० एस० सी० (द्वितीय), हिन्दी (अनिवार्य)

पूर्णांक : 50
समय : 3 घण्टे

1. काव्य

सप्रसंग व्याख्यार्थ दिए गए चार अंशों में से दो की व्याख्या करनी होगी। पूछे गए दो कवियों में से एक कवि का साहित्यिक परिचय लिखना होगा। व्याख्या के लिए बारह तथा कवि परिचय के लिए आठ अंक नियत हैं।

2. निबन्ध लेखन **10 अंक**

पाठ्यक्रम में निर्धारित निम्नलिखित पन्द्रह विषयों में से पूछे गए पांच विषयों में से किसी एक पर निबन्ध लिखना होगा। इसके लिए दस अंक नियत हैं।

(i) मानवाधिकार (ii) महिलाधिकार (iii) नैतिक शिक्षा (iv) गांधी–दर्शन (v) मद्य–निषेध (vi) पर्यावरण–संरक्षण और अमृतादेवी (vii) विज्ञान का महत्त्व (viii) विज्ञान वरदान या अभिशाप (ix) विज्ञान और औद्योगिकीकरण (x) विज्ञान और पर्यावरण–प्रदूषण (xi) वैज्ञानिक प्रगति में भारत का योगदान (xii) विश्वविख्यात वैज्ञानिक और उनके आविष्कार (xiii) समाचार–पत्र (xiv) आकाशवाणी (xv) दूरदर्शन।

3. पत्र-लेखन **10 अंक**

सरकारी पत्र, अर्द्ध सरकारी पत्र और तार में से पूछे गए दो पत्रों में से एक पत्र लिखना होगा। इसके लिए दस अंक नियत हैं।

4. वैज्ञानिक शब्दावली **10 अंक**

पाठ्यक्रम में निर्धारित निम्नलिखित सौ अंग्रेजी शब्दों में से पूछे गए किन्हीं दस शब्दों के हिन्दी–तकनीकी अर्थ लिखने होंगे। इनके लिए दस अंक नियत हैं।

1.	Aeronautics	वैमानिकी	14.	Central Axis	केन्द्रीय अक्ष
2.	Afforestation	वनरोपण	15.	Cerebrum	प्रमस्तिष्क
3.	Alloy	मिश्रधातु	16.	Chromosomes	गुणसूत्र
4.	Amplifiers	प्रवर्धक	17.	Cluster	गुच्छ
5.	Analysis	विश्लेषण	18.	Coefficient	गुणांक
6.	Atmosphers	वायुमंडल	19.	Compound	मिश्र
7.	Bicomex Lens	उभयोतल लैंस	20.	Condensation	संघनन
8.	Calculating Machine	परिकलन यंत्र	21.	Convection	संवहन
			22.	Convex	अवतल
9.	Calibration	अंशन	23.	Comet	धूमकेतु
10.	Calination	निस्तापन	24.	Decomposition	विच्छेदन
11.	Capillary	कोशिका	25.	Deflection	विक्षेप
12.	Catalyst	उत्प्रेरक	26.	Dehydration	निर्जलीकरण
13.	Caustic Alkali	दाहक क्षार	27.	Deffusion	विसरण

28.	Distillation	आसवन	66.	Nucleus	नाभिक
29.	Ecology	परिस्थिति विज्ञान	67.	Nutrition	पोषण
			68.	Observation	प्रेक्षण
30.	Elasticity	प्रत्यास्थता	69.	Obtuse Angle	अधिक कोण
31.	Electro Osmories	विद्युत परासरण	70.	Orbital	कक्षाकार
32.	Equilibrium	सन्तुलन	71.	Osmosis	परासरण
33.	Equivalent	तुल्यांक	72.	Ovary	अंडाशय
34.	Endothermic	ऊष्माशोषी	73.	Parasite	परजीवी
35.	Extraction	निष्कर्षण	74.	Pendulam	लोलक
36.	Fermentation	किण्वन	75.	Pesticides	नाशकारक रसायन
37.	Fertilization	निषेचन			
38.	Freezing	जमना	76.	Pharmaceutical	औषध रसायनक्ष
39.	Fission	खंडन	77.	Photo-catalyst	प्रकाशिक उत्प्रेरक
40.	Formula	सूत्र			
41.	Fossil	जीवाश्म	78.	Physiology	शरीर–क्रिया विज्ञान
42.	Friction	घर्षण			
43.	Galvanometer	धारामापी	79.	Phenomenon	घटना
44.	Germicide	जीवाणुनाशी	80.	Plasma	जीव–द्रव्य
45.	Gland	ग्रंथि	81.	Pollution	प्रदूषण
46.	Graft	कलम रोपना	82.	Precipitate	अवक्षेप
47.	Heater	तापक	83.	Projectile	प्रक्षेप्य
48.	Homologous	समजात	84.	Projection	प्रक्षेपण
49.	Hybrid	संकर	85.	Qualitation	गुणात्मक
50.	Hydration	जलयोजना	86.	Quantile	विभाजक
51.	Ignition	ज्वलन	87.	Radiation	विकिरण
52.	Indicator	सूचक	88.	Reflection	परावर्तन
53.	Inertia	जड़त्व	89.	Refractive Index	अपवर्तनांक
54.	Infection	संक्रमण	90.	Refrigeration	प्रशीतन
55.	Insulation	रोधन	91.	Remainder Theorem	शेषफल प्रमेय
56.	Intensity	तीव्रता			
57.	Intestine	आन्त्र	92.	Resonance	अनुवाद
58.	Latent Heat	गुप्त ऊष्मा	93.	Relic	अवशेष
59.	Magnetism	चुम्बकत्व	94.	Antibiotics	प्रतिजैविकी
60.	Melting Point	गलनांक	95.	Spectrum	वर्णक्रम
61.	Membranee	झिल्ली	96.	Thermoscope	ऊर्ध्वपातन
62.	Metamorphosis	कायांतरण	97.	Sublimation	तापदर्शी
63.	Microscope	सूक्ष्मदर्शी	98.	Velocity	वेग
64.	Momentum	संवेग	99.	Vibration	कंपन
65.	Multiplier	गुणक	100.	Virus	विषाणु

PUNJABI (COMPULSORY)
(For B.Sc. Part-II)

Paper-I

Max. Marks : 50
Time : 3 Hrs.

Outlines of Test

1.	A Selection of Punjabi Poetry from 1700 to 1850	20 Marks
2.	A Book of Short stories by Single Author	10 Marks
3.	Essay	10 Marks
4.	Applied Grammar (Pair of words and one word substitution)	10 Marks

Syllabus and Courses of Reading

1. Kav-Rang (Ed. Diwan Singh), Amritsar, Guru Nanak Dev University, 1988.

Note :1. *Only the following seven poets to be studied :-*
Bulleh Shah Hasham (Sufi Poet), Varis Shah, Kadar Yaar, Shah Muhammad Naajabat, Peer Muhammad.

2. Dvadashi, Kulwant Singh Virk, Delhi, Arsee Publishers.

URDU (COMPULSORY)

(For B.sc. II)

Paper-I Text, Essay, Translation/Letter writting, Idioms.

	Max. Marks : 50	Time 3 Hrs.
a) Text	25 marks	
b) Essay	10 marks	
c) Translation from English into Urdu	10 marks	
OR		
Letter Writing		
d) Idioms	5 marks	

Detailed Courses of Reading

1. Khyaban-i-Adab (Poetry), Published by Educational Book House, Aligarh (only the following prescribed) :

   Ghazalyat : Hasrat-Fani-Tiger-Asghar-Shah-Firaq.

   Jadsed Shairi : Chakbast-Josh-Faiz, Akhtar Sheerani.

2. Khayabani-i-Adab (Prose) Published by Educational Book House, Aligarh.

   Only the following Selections:

   Mear Amman Ghalib-Sir Syed Farhat Ullah

   Baig-Prem Chand-Rasid Ahmad Siddiqui.

PHYSICS

		Max. Marks	Time
Paper-I	(Theory) Waves oscillation	55	3 Hrs.
Paper-II	(Theory) Elements of Modern Physics	55	3 Hrs.
Paper-III	(Practicals)	40	3+3 Hrs. (on two days)

Distribution of Marks for Practical paperwill be as under :

Experiments	12+12=24 marks
Lab Record	6 marks
Viva-voce	5+5=10 marks

Special Notes

1. Instructions should be imparted using SI system of Units but CGS System of Units should also be mentioned.
2. Use of Simple (Non-programmable) Calculator is permissible.
3. Each question should contain two or more parts.
4. 20 percent numerical problems are to be set.

Paper-I (Theory) **Waves Oscillations** Max.marks : 55
Time : 3 Hrs.

Unit-I : Fourier Series and Fourier Transforms: Fourier Analysis of complex wave and its application for the solution of triangular and ractangular waves, half and full wave rectifier outputs, fourier transforms of :

(i) $f(x)=e^{-x^2/2}$

(ii) $f(x)=\begin{cases} & x<a \\ & x>a \\ =0, & \end{cases}$

Unit-II : Matrix Methods in Paraxial optics : Effect of Translation and refrection. Derivation of thin lens and thick lens formulae, unit plane, nodal planes, system of thin lenses. Abberations: Chromatic, spherical, coma, astigmatism and distortion and their removal.

Unit-III Interference by Division of Wavefront: Fresnel biprism and its applications to determination of λ of sodium light and thickness of a mica sheet, Lloyd mirror, phase change on reflection.

Interference by Division of Amplitude : Colour of thin films, wedge shaped film, Newton's rings.

Interferrometers Micheison's interferrometer and its applications to (i) standardisation of a meter (ii) determination of N.

Unit-IV : Fresnel Diffraction: Fresnel's half period Zones, Zone plate, diffraction at a straight edge, rectangular slit and circular aperature.

Fraunhoffer diffraction : Single slit diffraction, Two slit diffraction, N-slitdiffraction, Plane transmission granting spectrum, Dispersive power of granting. Limit of resolution, Rayleigh's criterion, Resolving power of telescope and a grating.

Unit-V : Polarisation and Double Refraction : Polarization by reflection, Polarization by scattering, Malus, Law, Phenomenon of double refraction (Normal and oblique incidence), Analysis of polarized light, Nicol prism, Quarter wave plate and half wave plate, production and detection of (i) Plane polarized light (ii) circularly polarized light and elliptically polarized light, optical activity, fresnel's theory of rotaion, specific rotation, Polarimeters (half shade and Biquartz).

References :

Unit-I
1. Mathematical Physics by B.S. Rajput and Yog Prakash Pragati Prakashan.
2. Theory and Problems of Laplace Transforms by Murrari R. Spiegel, Mcgraw-Hill Book Company.

Unit-IIto V
1. Optics by Ajay Ghatak Tata Mc Graw Hill, 1977.
2. Introduction to Optics by Frank L. Pedrotti and Leno S. Pedrotti, Prentice Hall, 1987.

Paper-II (Theory) Electronics and Nuclear Physics M.M. : 55

Time : 3 hrs.

Unit-I : Elementary ideas of Semiconductors : Zener diode characteristics, Zener diode as voltage regulator, Mechanism of LED, Half and full wave wave rectifier-efficiency and ripple factor, filter circuits (L,C,), Low pass and high pass RC filter analysis-amplitude and phase response, PNP and NPN transistor amplifier characteristics in common base, common emitter and common collector configuration (excluding h Parameter analysis).

Unit-II : Classification of Amplifiers, concept of feed back and advantages of negative feed back, circuit diagram and working principle of RC-coupled amplifier-concept of band width (No derivation), feed back in oscillator, tuned transistor oscillator & Hartley oscillator (Basic principle only), Amplitude & Frequency modulation characteristic and applications.

Unit-III : Structure of Nuclei: Structure of Nuclei, properties of Nuclei and their determination, charge by Moreley's law, size by particle scattering, mass by Wein Bridge mass spectrometer, magnetic moment by atomic beam resonance experiment, electric quadrupole moment by Coulomb excitation. Forms of nuclear potential shapes and relation between nuclear potential depth and nuclear range).

Unit-IV : Intraction and detection of Nuclear Radiations Interaction of charged particles with matter, energy loss (No derivation) and range concept, Interaction of gamma rays with matter (qualitative discription of, photoelectric, compton scattering and pair production) absorption coefficient of gamma rays and its applications. Detection of nuclear radiations using gas filled counters: Ionization, proportional and GM counters.

Unit-V : Radioactivity & Accelerators: Laws of radioactive decay, half life and meanlife, successive decay, radioactive Equilibrium conditions, age of Earth using radioactive dating, basic principle of nuclear accelerators; Tandon accelerator, Linear accelerator & cyclotron.

References:

Unit I & II 1. Electronics Fundamental and Application by J.D. Ryder.
2. Electronics for Scientists and Engineers by T.R. Viswanathan, G.K. Metha and V. Rajaraman,

Unit-III-V 1. Nuclear Physics-W.E. Buraham.
2. Nuclear Physics- D.C. Tayal, Umesh Prakashan, Khurja (UP).

Paper-III (Practical) Max. Marks : 40
Experiments : 12+12=24
Lab record : 6 marks
Viva-Voce : 5+5=10 Marks.

Special Notes:

1. Do any eight experiments from each Section.
2. The students are required to calculate the errors involved in a particular experiment, (like propagation of error, permissible errors, standard deviation etc.).

Section-A

1. To measure the (a) Area of a window (b) Height of an inaccessible object.
2. π and dispersive power of a prism material by Spectrometer.
3. To draw a graph between wave length and minimum deviation for Prism for various lines from a Mercury discharge source.
4. Determination of wave length of a Na light and the number of lines per centimeter using a differaction gratings.
5. Wave length by Newton's Rings.
6. Resolving power of a telescope.
7. Resolving power of a plan transmission gratings.
8. Measurement of (a) specific Rotation (b) concentration of Sugar solution using polarimeter.
9. Ordinary and extraordinary refractive indices for calcite or quartz.
10. To find the equivalent total length of a lens system by nodal assembly.

Section-B

11. To draw static characteristics curve of a teriode and find x gm. and r.

12. To draw characteristics curves of a tetrade valve.
13. To draw common base and common emitter characteristics of a transistor and calculate transistor currents.
14. To draw forward and reverse bias of a semiconductor diode.
15. To study the ripple factor in a.d.c. power supply.
16. Zener diode voltage regulating characteristics.
17. Verification of inverse square law by photo cell.
18. To draw the Ch. Curves of pentode valve.
19. To draw frequency response curve of an R.C. coupled amplifier.
20. To find out the frequency of a tonning fork by Meld's experiment.

CHEMISTRY

Outlines of Test

	Max. Marks	Time Allowed
Paper-I(Theory) Inorganic Chemistry	37	3 Hrs.
Paper-II(Theory) Physical Chemistry	37	3 Hrs.
Paper-III(Theory) Organic Chemistry	36	3 Hrs.
Paper-IV(Practicals)	40	7 Hrs.
	150	

Paper-I (Theory) **Inorganic Chemistry** Max. Marks : 37
Time : 3 hrs.

Note : Ten questions will be set two questions from each Section. The candidate will be required to attempt five questions in all, selecting one question from each Section. As far as possible questions will be short answer type and not essay type.

Section-I

General Principles of metallurgy, occurrence of metals with special emphasis on mineral wealth of India, calcination, roasting smelting, bessimerization; various methods of concentration, purification and refining (such as parting process, zone refining oxidation refining, electrolytic refining and solvent extraction metallurgy of important metals like Ag, Au, Zn, Cu, Ni.

(8 Hrs.)

Section-II

General characteristics of s & p block elements and their important compounds with special reference to metallic and non-metallic character, oxidizing and reducing capabilities, electronic configuration, atomic radii, ionization potential, electron affinity, electronegativity, inert pair effect, anomalous behaviour of (Li, Be and B) diagonal relationship.

(8 Hrs.)

Section-III

Nuclear Chemistry; Fundamental particles of nucleus (nucleons) : concept of nuclides, representation of nuclides, isobars, isotopes and isotones with specific examples, The 'size' concept of nucleus and atoms. The possible forces between (n-n, p-p, n-p) and the magnitude of nuclear forces (short range); qualitative idea of the stability of nucleus (n/p ratio), shell and liquid drop models (qualitative ideas), packing fraction, nuclear binding energy, mass defect, Einstein's mass energy relation, calculation of mass defect and binding energy, Q value, artificial transmutation-nuclear reactions, spellation, nuclear fission and fusion, Radioactive isotopes, separation of isotopes, some typical applications of radioisotopes in industry, agriculture, medicine and biochemistry, therapeutic uses of isotopes.

(8 Hrs.)

Section-IV

Detailed study of the following compounds : Preparation, properties, bonding and structure of boric acid, borates, diborane, borazines, silicates (General Types with simple examples) and silicones; Bonding and structure of exides and oxyacids of N,P, S and chlorine.

(8 Hrs.)

Section-V

Detailed study of the following compounds : Preparation, properties, bonding and structure of hydrazine, hydroxylamine, hydrazoic acid, halides and oxyhalides of phosphorus, Inter-halogen & compounds(Ax, Ax3 & Ax7 types, their reactions and structure only) pseudo-halogens and psedo-halides.

Synthesis, properties and structures of organometallic compounds of lithium, beryllium, magnesium, aluminium and boron.

(8 Hrs.)

Paper-II (Theory) **Physical Chemistry** Max. Marks : 37
Time : 3 Hrs.

Note : Ten questions will be set, two questions from each section. The candidates will be required to attempt five questions in all, selecting one question from each Section.As far as possible, questions will be short answer type and not essay type. SI units should be used. Use of non-programmable calculator is allowed.

Section-I

Thermodynamics

Second law of thermodynamics, Carnot cycle, Carnot theorem, concept of entrophy, entropy changes in different processes, work function and free energy, variation of free energy with temperature and pressure, total differential equation (dc=VdP- SdT), Maxwell relations, various criteria of spontaneity of a process, Gibbs-Helmbeltz equation, Clapeyron equation, Clausius-Clapeyron equation and its integrated form, thermodynamic derivation of the relationship between elevation in boiling point, depression in freezing point and molality of dissolved solute.

Nernst heat theorem, third law of thermodynamics, its importance in the calculation of absolute entropies.

(8 Hrs.)

Section-II

Partial Molar Quantities

Partial Molar free enery (Chemical Potential)

Gibbs-Duhem equation, variation of chemical potential with temperature and pressure, criteria of phase equilibria for multicomponent systems, Gibbs Adsorption equation and its application.

ymers

Homopolymers, copolymers, natural and synthetic polymers, linear, branched and cross-linked polymers, addition and condensation polymers, number average, weight average and viscosity average, molecular weights of polymers, molecular weight determination by viscosity and osmometric methods.

(8 Hrs.)

Section-III

Electro-chemistry

Arrhenius theory, Ostwald's dilution law, Debye-Huckel theory of strong electrolytes, discussion of Debye-Huckel Onsager equation (without derivation), concept of activity and activity co-efficients.

Migration of ions, transport number and its experimental determination using Hittorif's method and moving boundry method. Applications of conductance measurements in the calculation of ionic product of water, solubility of sparingly soluble salts, conductometric titrations.

Buffer solutions, calculation of pH of solutions, salt hydrolysis, expression for hydrolysis constant, degree of hydrolysis and pH of solutions of different types of salts.

Section-IV

Electrochemistry

E.M.F. of a cell and its measurement, standard cell, reversible and irreversible cells, reversible electrodes, relationship between electrical energy and chemical energy, measurement of electrode potentials, Nernst equation for e.m.f. of cells (without transference only), liquid-junction potential (derivation excluded), applications of e.m.f. measurements in the determination of solubility of sparingly soluble salts and pH of solutions and potentiometric titrations, elementary idea of polarography and its applications.

(8 Hrs.)

Section-V

Photochemistry

Difference between photochemical and thermal reactions, laws governing absorption of light, Lambert's law, Beer's law, Stark-Einsteins law of photochemical equivalence, quantum efficiency and its experimental determination for a photochemical reaction (using chemical actionometer), study of photo-synthesis of HCl and HBr and photolysis of ammonia and acetone, chemiluminescence fluorescence phosphorescence and photosensitisation, photoinhibitors and photochemical equilibrium.

(8 Hrs,)

Paper-III **Organic Chemistry** Max. Marks: 36
Time : 3 Hrs.

Note : Ten questions will be set, two questions from each Section. The candidate will be required to attempt five questions in all selecting one question from each Section. As far as possible questions will be short answer type and not essay type.

Section-I

Alcohols :Preparation, comparison and mechanism of formation of alcohols by hydration, hydroboration-oxidation and oxymercuration-reduction of alkenes. Reaction of alcohols with halogen halides, carboxylic acids, thionyl chloride and phosphorus halides alongwith mechanism. Oxidative cleavage of glycols with lead tetra-acetate and periodic acid. Pinacol-pinacolone rearrangement and its mechanism.

(3 Hrs.)

Phenols :Effect of substituents on the acidity of phenols, electrophilic substritution reactions of phenols, mechanism of Kolbe's reaction, Reimer-Tiemann reaction, fries rearrangement and Claisen rearrangement.

(3 Hrs.)

Ethers: Preparation of ethers by Williamson's synthesis and epoxidation of alkenes by peracids. Cleavage of ethers by acids and hydrolysis of epoxides to glycols.

Section-II

Aldehydes and Ketones : Preparation of aliphatic and aromatic aldehydes and ketones from alcohols, acids and acid chlorides, advantage of oxidation of alcohols with chromium trioxide (Sarett reagent), pyridinium chlorochromate (PCC) and pyridinium dichromate (PDC), comparison of reactivity of aldehydes & ketones. Mechanism of nucleophilic addition and nucleophilic addition elimination reactions. Mechanism of Addol condensation, Claisen-Schmidt, Cannizzaro reaction, Benzoin condensation, Perkin reaction, Knoevengel condensation, Mannich reaction, haloform and Witting reactions. Reduction of aldehydes and ketones with sodium borohydride and lithium aluminium hydride, Clemmensen reduction, Wolf-Kishner reduction and Meerwein-Ponndorf and Varley reduction.

(8 Hrs.)

Section-III

Carboxylic Acids and their derivatives : Effect of substituents on the acidity of aliphatic and aromatic acids. Mechanism of esterification and hydrolysis. Comparison of the reactivities of acid chlorides, anhydrides, amides and esters towards nucleophilic acyl substitution reactions. **Reformatsky reaction and its mechanism.** Preparation and synthetic applications of diethyl malonate and acetoacetic ester. Mechanism of Claisen ester Condensation and Keto-enol tautomerism. (6 Hrs.)

Sulphonic acids and their derivatives : Sulphonation of alkanes and arenes. comparison of properties of benzoic acid and benzene sulphonic acid. Derivatives of sulphonic acids-benzene sulphonyl chloride, benzene sulphonamides and Saccharin, Long chain alkene sulphonic acids as detergents.

(2 Hrs.)

Section-IV

Nitro Compounds: Preparation of nitroalkanes (vapour-phase nitration) and nitroarenes. Reduction of aromatic nitro compounds under neutral, acidic, basic media and electrolytic reduction. Selective reduction of dinitrobenzenes. Effect of nitro group on the reactivity of halogens in halonitroarenes.

(2 Hrs.)

Amines :Preparation of aliphatic and aromatic amines by reduction of nitro compounds, nitriles, reductive amination of aldehydes and ketones. Cabriel phthalimide reaction and Hofmann-bromamide reaction alongwith its mechanism. Effect of substituents on the basicity of aliphatic and aromatic amines, pKb values. Distinction and separation of primary,

secondary and tertiary amines. Reactions of amines with nitrous acid, mechanism of carbylamine reaction, Hofmann elimination and Cope eliminations.

(4 Hrs.)

Diazonium salts : Mechanism of diazotisation, structure of benzene diazonium chloride. Replacement of diazo group by H, OH, F,Cl, Br, I, NO_2 and CN groups, reduction of diazonium salts to hydrazines, coupling reaction and its synthetic application.

(2 Hrs.)

Section-V

Ultra-violet spectroscopy

Basic theory and instrumentation, chromophores and auxochromes, bathochromic shift and hypsochromic shift, hyperchromic effect and hypochromic effect, absorption laws and absorption intensity, types of electronic transitions. Application of ultra violet spectroscopy in structure elucidation of organic compounds.

(4 Hrs.)

Infrared spectroscopy

Basic theory and instrumentation, Infrared spectrum-functional group and finger-print regions, absorption of infrared radiation and molecular vibrations. Frequency of vibration of a diatomic molecule, number of fundamental vibrations and selection rules, intensity and position of infrared bands. Spectral features of the follwing classes of compounds. Hydrocarbons (saturated and unsaturated), hydroxy compounds aldehydes, ketones, esters, anhydrides, amides, amines and nitro compounds. Applications of IR spectroscopy in structure elucidation of organic compounds.

(4 Hrs.)

Paper-IV (Practicals)

Max. Marks : 40
Time : 7 Hrs
(Spread over two days)

Section-I (Inorganic)

1. Oravimetric Analysis : Quantitative estmations of
   -Ba^{2+}as $BaSO_4$,Fe^{3+}as Fe_2O_3, Al^{3+} as aluminium oxinate,
   Cu^{2+}as | Cu (SCN) | and Ni 2+ as Ni-dimethylglyoxime.
2. **Preparations** :Preparation of cuprous chloride, prussion blue from iron fillings, tetra-mine cupric sulphate, chrome alum, potassium trioxalatochromate (III).

Section-II (Physical)

1. To determine the absorption of acetic acid from aqueous solution by activeted charcoal at room temperature.

2. To determine the solubility of a given sparingly soluble salt by conductance method (cell constant to be determined).
3. To study the conductometric titration of a strong acid/strong base.
4. To study the conductometric titration of a weak acid/strong base.
5. To determine the molecular weight of a given polymer by viscosity method.

Section-III (Organic)

Preparation and characterization (through determination of melting point) of the follwing derivatives :

(i) S-Benzyisothiuronium salts of benzoic acid, salicylic acid, cinnamic acid and aspirin.

(ii) Picrates of naphthalene, anthracene, acenaphthene P-toluidine, B-naphthol and -naphthol.

(iii)Oxime of benzophenone.

(iv) Acetyl derivative of glycine, P-toluidine, vanillin and hydroquinone.

(v) Nitro derivatives of P-dichlorobenzene, P-nitrotoluene and nitrobenzene.

(vi) Anhydrides of phthalic acid and succinic acid.

(vii)Osazone of Glucose.

Distribution of Marks

1. Section-I	(6+3)	9 marks
2. Section-II (only one experiment)		9 marks
3. Section-III (Two experiments only)	(4 1/2+4 1/2)=	9 marks
4. Viva-voce		5 marks
5. Lab. Record		8 marks

BOTANY

Outlines of Test

Paper-I (Theory)	Physiology and Applied Botany	M.M. :55	Time : 3 Hrs.
Paper-II (Theory)	Biochemistry and Biotechnology	55	3 Hrs.
Paper-III (Practicals)		40	6 Hrs.
		(in two session of 3 hrs. each)	

Paper-I (Theory) Physiology and Applied Botany

UNIT-I

Importance of water to plant life; movement of water across the memberanes; ascent of sap; transpiration. Methods of study of macro-and microelement nutrition availability role and up take. Enzymes : general account of structure and function.

History and mechanism of photosynthesis; role of light; carbon fixation in C_3, and C_4 plants; photorespiration; structure of chloroplasts as related to photo synthetic functions.

General principles and mechanisms of translocation of organic substances.

UNIT-II

Nitrogen metabolism-nitrate assimilation, nitrogen, fixation, amino acid synthesis (glutamic and aspartic acid only) and nitrogen cycle. Significance and mechanism of respiration, release and utilization of biochemical energy; ATP synthesis; structure of mitochnodria as related to oxidative function. Mechanism of synthesis and break down of fats.

UNIT-III

Physiology of dormancy and seed germination, vegetative and reproductive growth; role of light in plant development; vernalization; senescence growth regulators (auxins, gibberellins cytokinins); differentiation and morphogenesis, applications of plant physiology.

UNIT-IV

Origin of cultivated plants; Centres of origin-criteria and Vavilov's centres of origin.

Botany, origin cultivation and improvement of the following : -

Wheat, Rice, Maize; potato; sugercane, Cotton, Jute Groundnut, rape/mustard; coconut, common pulses.

General account of spices, vegetables, fruits.

UNIT-V

History, Botany, cultivation & processing of Tea, Tobacco, Rubber Characterstics and use of important timber yielding plants:

Teak, Shisham, Sal, Chir.

Characteristics and use of following :-

Medicinal plants: Cinchona, Rauwolfia, Withania, Ephedra, Diqitails, Atropa. General account of halhicinogenic plants: Cannabis, Opium Plants as insecticides with special reference to pyrethrum and Neem.

Paper-II (Theory) Biochemistry & Biotechnology

UNIT-I

1. Defination of life; matter, energy and life, origin of life.

2. Electronic configuration of biologically important atoms such as C,H,O,N,S : free radicals and ionic reactions, bonds.
3. Fatty acids, anhydrides, halides, amides, esters and salts, Classification of liquids and their composition.
4. Enzymes as biological catalysts, coenzymes and vitamins; classification and regulation of enzyme action.

UNIT-II

5. Laws of thermodynamics and their relevance to organism; oxidation and reduction levels of reactions, intermediate and terminal acceptors of electrons; sugars; organic acids; redox potentials and electrochemical gradients; storage of energy; high energy compounds as biological currency; principles of chemiosmotic synthesis of ATP.
6. Transformation of chemical energy: oxidation of organic acids and fatty acids; metabolic cycles and their advantages over open chain reaction sequences; fermentation.
7. Reduction of nitrate, sulphate; fixations of dinitrogen; evolution and uptake of hydrogen; nif genes and their transfer.

UNIT-III

8. Occurrence, properties and functions of biologically important secondary products of metabolism; bile pigments, phytochrome chlorophyll, carotenoids, anthocyanins betacyanins, phenolics, terpenoids, steroids and alkaloids.
9. Proteins: classification based on composition solubility, shape and function. Structure primary, secondary, tertiary Physical and chemical properties. Principles of isolation and purification of plant proteins. Biochemistry of amino acids. Determination of amino acid composition biosynthesis of polypeptides.
10. Nucleic acids, nucleotides in DNA and RNA. Physical properties; hypochromacity, optical rotation and viscosity studies of double helical structure of DNA. Isolation of ribosomal and mRNAs, their structure and functions.

UNIT-IV

Role of plant tissue culture in Biotechnology. Concept of differentiation, dedifferentiation, redifferentiation. Organigenesis and plant regeneration.

Somatic embryogenesis, cell culture techniques for production of secondary and other useful products. Another culture and production of haploids, significance and use of haploids. Selection for nutritional quality, disease resistance salt and drought tolerance.

UNIT-V

A brief account of gene manipulation through protolist culture, somatic hybrids and cybrids. Genetic transformation, direct DNA uptake by protoplast, Agrobacterium-mediated gene transfer, electroportation, shot-gun method of DNA introdution into cells, Cloning vehicles; plasmids, bacteriophages and cosmid, vectors; cloning strategies, genomic DNA libraries, C-DNA libraries, transgenic plant.

Paper-III Practicals	Max.Marks	Time allowed
Physiology, Applied Botany	40	6 hrs.
	(in two sessions of 3 hrs. each)	

Biochemistry & Biotechnology

Scheme of Examination :

1.	Physiological experiments to be performed as per given list of experimensts in the syllabus.	8
2.	Identify, classify and write illustrated notes on given materials (from Economic Botany)	6
3.	Biochemical experiment to be performed or demonstrated (as per given list of biochemistry experiments)	4
4.	Comments on spots 1-5. (Physiology, Biochemistry. Economic Botany and Biotechnology)	10
5.	Note Book and Collection.	8
6.	Viva-Voce.	4

PHYSIOLOGY

Paper-III (Practical)

Experiments to be performed by students:

1. D.P.D of union scale/Rheo leaf peel by the plasmolytic method.
2. (a) Determination of stomatal index and frequency.
   (b) to determine the rate of transpiration rate.
3. Effect of light and water content of soil on transpiration rate.
4. Extraction of cholorophyll pigments from leafy vegetable.
5. Separation of plant pigment by thin-layer paper chromatography.
6. Hill reaction.
7. Rate of photosynthsis under varying Co_2 concentration in a water plant.
8. Effect of intensity of light on oxygen evolution during photosynthesis

9. Location of Starch during photosynthesis.
10. Determination of water absorption and transpiration ratio.
11. Evolution of carbondioxide during respiration.
12. Evolution of heat during respiration.
13. Measurement of growth of germinating pea seeds.
14. paper chromatographic separation of amino acids.
15. Simple tests for carbohydrates, Proteins, and fats.

Demonstration only : (any four)

1. Colorimetric estimation of sugers and starch.
2. Manometric determination of R.Q.
3. Effect of auxin on etiolated stem sections of pea.
4. Determination of peroxidase activity.
5. Hydrolysis of starch and separation of glucose by paper chromatography.
6. Experiments on geotropism, phototropism and hydrotropism.
7. Gibberellin-induced internode elegation.
8. Trace element deficiency and symptoms.

APPLIED BOTANY

For the successful implementation of this laboratory course, it is essential that the departments procure herbarium materials, raw and finished products, as well as relevant photographs.

Study :

1. Demonstration of the common starchy food materials, Wheat/Rice, Potato;
2. Common Pulses Cicer, Pisum, Cajanus, Phaseolus.
3. Common oil seeds : Arachis, Brassica, Sunflower, Castor, Cotton.
4. Common textile fibres-Cotton, Jute, Crotolaria.
5. Differences between soft and hard woods.
6. Museum specimen of tea-twig, commercial products (tearolled processed leaf, CTC product, powder; tobacco-twig, dried leaf, processed tobacco used for smoking, chewiing; rubber-twig, non-vulcanised and vulcanised rubber.

BIO-CHEMISTRY

Biochemistry (to be denonstrated if facilities not available):

1. **Demonstration of DNA model.**

2. Effect of temperature, substrate concentration on urease (commercial) activity.
3. Measurement of pH of beet, carrot, potato tuber, Amaranthus leaves and sap of water hyacinth
4. Isolation of Protein from bean pea seeds. Acid and Alkaline hydrolysis of protein.
5. Paper chromatographic separation of amino acids from acid/alkali hydrolysate.
6. Estimation of urease activity (commercial enzymes).
7. Estimation of amylase activity of starch.
8. Anaerobic respiration by yeast (alcohol production).
9. Isolation, separation of chloroplasts, Hill reaction.
10. Lipase activity of germinating groundnut seeds.

BIOTECHNOLOGY

Biotechnology (demonstration by model/chart/photographs; etc.)

1. Callus induction, organogenesis and plant regeneration, (rice mature embryo/tobacco/**Petunja**).
2. Anther Culture.
3. Protoplast isolation, fusion.

Books Recommended

Paper-I : Physiology and Applied Botany

1.	Plant Physiology	Devlin
2.	Plant Physiology	Salisburg & Ross
3.	Plant Physiology	Bidwell
4.	Plant Physiology	Ting
5.	Plant Physiology	H.S. Srivastava
6.	Recent advances in Plant Biochemistry	S.L. Mehta etal ICAR Publishing
7.	Nitrogen nutrition in Higher Plants	H.S. Srivastava & R.P. Singh (Associate Publication Co. New Delhi-5
8.	Tropical Economic Botany	S.L. Kochar
9.	Economic Botany	Robert Hill

Paper-II Biochemistry and Biotechnology

1.	Biochemistry	Lehinger
2.	Biochemistry	Stryer
3.	Biochemistry	K. Trehan

4. Biochemistry — H.S. Srivastava
5. Plant tissue Culture ; Theory & Practical — Bhojwani & Razdan
6. Biochemistry — K.Trehan
7. Essentials of Biochemistry — P.K. Gupta

B.Sc. II (Zoology)

Scheme of Examination

Note:There will be two theory papers of 55 marks each and one practical of 40 marks. The duration of each theory and practical papers will be of 3 hours.

Theory : Paper-I

Section-A (Protochordata and Cyclostomata)

Section-B (Comparative account of Vertebrates)

Theory : Paper-II

Section-A (Classification of Chordates)

Section-B (Mammalian Physiology)

Practical : Paper-III

Theory Paper-I (Zoology) — Max. Marks : 55, Time : 3 hrs.

Section-A (Protochordata and Cyclostomata)

a) Protochordata : systematic position, distribution, ecology morphology, anatomy and affinities of the following types :-

Urochordata : Herdmania (excluding embryology)

Cephalochordata : Branchiostoma (excluding embryology)

Cyclostomata :External Morphology of Petromyzon : An Account of ammocoete larva and affinities of Cyclostomata.

Section-B (comparative account of vertebrates) Study of comparative anatomy of the following systems with emphasis on evolutionary trends from super-class pisces to class Mam malia :

Integumentary system : Comparative account of integument and its derivatives.

Skeletal system : Comparative account of jaw suspension, visceral arches and vertebral column.

Digestive system :Comparative account of ailmentary canal and associated glands and dentition in mammals.

Circulatory system : Evolution of heart, aortic arches and venous system.

Respiratory system comparative account of respiratory tract, respiratory organs. Different kinds of respiratory mechanisms, cutaneous, gill & pulmonary.

Nervous system : Comparative anatomy and evolution of brain and cranial nerves.

Sympathetic and parasympathetic nervous system in mammals.
Sense organs : Eye and Ear.

Urinogenital system : Origin and evolution of Kidney, evolution of gonads and urinogenital ducts.

Instructions :

Nine questions are to be set in all. The candidates is required to attempt five questions, including the compulsory question.

1. Question 1 is compulsory and should cover the entire syllabus. It will have 10 parts, each of $1^{1/2}$ marks. Answer should not exceed 20 words.
2. Remaining eight questions are to set from both the section A & B, four from each section. The candidate is required to attempt four questions, 2 from each sections.

Paper-II

Max. Marks : 55
Time : 3 hrs.

Section-A (Classification of chordates)

Classification of the following upto orders giving important characters and examples :

Urochordata : Cephalochordata, Cyclostomata; Chondrichthyes; Osteichthyes; Amphibia; Reptilia; Aves; Mammalia. Affinities of Prototheria & Metatheria.

Section-B (Mammalian Physiology)

Nutrition : Nutritional components, carbohydrates, fats, lipids and their requirement : Vitamins and Minerals.

Types of nutrition & feeding. Digestion of dietary constituents viz. lipids, Proteins, carbohydrates & nucleic acids.Symbiotic digestion. Absorption of Nutrients and assimilation: control of enzyme secretion. Circulation : Origin, conduction and regulation of heart beat, cardiac cycle, electrocardiogram, cardiac output, fluid pressure and flow pressure in closed and open circulatory system.

Composition and functions of blood & lymph, coagulation of blood, coagulation factors, anticoagulants, haemopoiesis;

Respiration . Exchange of respiratory gases, transport of gases, lung air volumes, oxygen dissociation curve of haemoglobin, Bohr effect, Hamburger's phenomenon (chloride shift) control/regulation of respiration.

Excretion : Patterns of excretory products viz; Ammonotelic, Ureotelie, uricotelism; Ornithine cycle (Krebs-Henseleit cycle) for urea formation in liver, urine formation, counter current mechanism of urine concentration, osmoregulation, micturition.

Muscles : Types of muscles, ultra-structure of skeletal muscle, Bio-chemical and physical events during muscle contraction.

Mechanics of muscle contraction : Isotonic, isometric contraction, single muscle twitch, tetanus, muscle fatigue, muscle, tone, oxygen debt, coris cycle, single unit smooth muscles & multi unit smooth muscle; Red (slow) and white (fast) skeletal muscle fibres-their physical and functional properties.

Neural Intergration : Nature, origin and propagation of nerve impulse alongwith medullated & non-medullated nerve fibre; conduction of nerve impulse across synapse.

Chemical Integration or Endocrinology : structure and mechanism of hormone effect, physiology of chyroid, parethyriod, adrenal hypothalamus, pituitary, pancreas and gonads.

Reproduction : Spermatogenes; capacitation of spermatozoan, ovulation, formation of corpusluteum, oestrous, anoestrous cycle, menstrual cycle in Human fertilization implantation, gestation parturation.

Instructions : Nine question are to be set in all. The candidate is required to attempt five questions in all, including the compulsory question.

1. *Question 1 is compulsory and should cover the entire syllabus. It will have 10 parts, each of 1 1/2 marks. Answer should not exceed 20 words.*
2. *Remaining eight questions are to be set from both the Section A & B, two from section A and six from section B. The candidate is required to attempt one question from section A and three from section B.*

Paper-III Practical Max. Marks : 40

Time : 3 Hrs.

Protochordates to chordates

1. Classification upto orders. Habit : Habits, external characters and economic importance (if any) of the following animals:-

Protochordata	Molqula, Botryllus, Pyrosoma, Dolliolum Oikopleura and Amphioxus.
Cyclostomata	Myxine, Petromyzon & Ammocoetus Larva.
Chondrichthyes	Zygaena, Pristis, Narcine (electric ray), Trygon, Rhinobatus, Raja and Chimaera.

Osteichthyse	Acipenser, Lepid-osteus, Muraena, Mystus Catla, Hippocampus, Syngnathus Exocoetus, Anbas, Diodon, Ostracpion, Tetradon Echeneis, Lophius, solea and Polypterus. Any of the lung fishes.
Amphibia	Necturus, Proteus, Amphiuma, Salamandra, Amblystoma Axolotle larva.
Reptilia	Hemidactylus, Calotes, Draco, Varanus, Phybacsoma, Chamaelcon, Typhlops, Python, Eryx, Plyas, Bungarus, Naja, Hydrus, Viper Crocodilus, Gavialis, Chelone (turtle) and Testudo (tortoise).
Aves	Casuarius, Ardea, Anas, Milvus, Pavo, Eudynamis Tyto and Alcedo/Malcyon.
Mammalia	Ornithorhynchus, Echidna, Didelphis Macropus, Loris. Macaca, Hystrix, Funambulus, Felix, Panthera, canis, Herpestes, Capra, pteropus.

2. Examine and dissect the following animals :-

Hardmania	General anatomy.
Scoliodon	Digestive and reproductive systems, heart, afferent and efferent branchial arteries, cranial nerves and internal ear.
Hemidactylus and Columba	Digestive, arterial, venous and urinogenital systems.
White rat	Digestive, arterial, venous and urinogenital systems.

3. Study of the skeleton of Rana (frog), Scoliodon, Labeo, Varanus, Gallus and Oryctolagus.
4. Study of the following prepared slides:

   Tomaria Lorva, T.S. Amphioxus through different regions, Oikopleura, Histology of rat/rabbit (compound tissues).
5. Make permanent stained preparations of the following :

   Salpa : spicules and a portion of pharynx of Hardmonia, Amphioxus, placoid scales and ampullae of Lorenzini of Scoliodon.

Mammalian Physiology

Effects of isotonic, hypotonic and hypertonic solutions on erythrocyte.

Study of haemolysis, haemolytic effects of acid and alkali coagulation of blood-clotting time.

Preparation of haemin and haeochromogen crystals.

Detection of abnormal constituents of urine; specific tests for albumin and sugar.

Study of reflex action and reflex time in the frog.

Simple muscle twitch with mechanical, thermal and chemical stimulation of gastrocnemius muscle; muscle sciatic nerve preparation in frog.

Study of the action of salivary amylase, pepsin and trypsin in using tissue extracts.

Effect of PH and of temperature on the enzymatic action of salivary amylase.

GEOLOGY

	Max. Marks	Time
Paper-I Optical Mineralogy and Petrology	45	3 Hrs.
Paper-II Palaeontology	45	3 Hrs.
Paper-III Practical	60	3½ Hrs.

Syllabus and courses of Readings

Note: Nine questions may be set and the candidates be required to answer five questions in all.

Paper-I (Theory) Optical Mineralogy and petrology.

Max. Marks: 45

Time : 3 Hrs.

Principles of optics and use of polarising, microscope, optical properties of common rock forming minerals.

Study of igneous, sedimentary & matamorphic rocks, their structures and textures, minerals and chemical composition, classification and origin.

Paper-II (Theory) Paleontology

Max. Marks : 45
Time : 3 Hrs.

Fossils, their economic and stratigraphic significance standard stratigraphic scale, modes of preservation. A study of the representative forms belonging to the following.

Forminifera, Radiolaria Actinoxoa, Graptolithina Echinoidea, Crinoidea Trilobites Gastropoda Lamellibranchiata Cephalopoda and Brachipoda.

Study of the more important vertebrate and plantfossils of India.

Paper-III (Practical) M.M. :60
Time : 3½ hrs.

Note : Emphasis may be laid on field work which is compulsory for all candidates :

Study of common igneous, sedimentary and metamorphic rocks in hands specimen and their identification.

Study of the optical properties of common rocks forming minerals under microscope and thier identification Study of common rocks of all the three in thin sections.

Study of the common types of the fossils mentioned under theory papers and their identification.

Text :

Tyrell, G.W.	:	Principles of Petrology.
Smith, H.G.	:	Minerals under Microscope
Harkar, A.	:	Petrology for Student.
Hatch and Wells	:	Petrology of Student.
Kerr, Paul F.	:	Petrology
Woods, H.	:	Optical Minerology.
Moore, Lalicker and Fisher	:	Palaentology. Invertebrate Fossils.

COMPUTER SCIENCE

Outlines of Test

		Max. Marks	Time
Paper-I	Computer Oriented Numerical and Statistical Methods	45	3 Hours
Paper-II	Business Data Processing-I	45	3 Hours
Paper-III	Practical and Viva-Voce	60	6 Hours

B.Sc. IInd Year (Computer Science)
B.A. IInd Year Computer Applications
Outlines of Test

		Max. Marks	Time
Paper-I	Computer Oriented Numerical and Statistical Methods	45	3 Hours.

Paper-II	Business Data Processing-I	45	3 Hours
Paper-III	Practical & Viva-voce	60	6 Hours
			(Two sittings)

Syllabus and Courses of Reading

Paper-I	Computer Oriented Numerical and Statistical Methods.	Max. Marks 45	Time : 3 Hours.

Note : i) Twelve questions will be set in the paper with two from each UNIT. The candidates shall be required to attempt in all six questions selecting one question from each UNIT. All questions shall carry equal marks.

ii) Emphasis will be on concepts, applications and algorithms, Derivations are not to be covered.

Objectives of the Course :

1. To solve linear and non-linear algebric equations, perform operations of calculus, fit curves and solve differential equations, using a computer.
2. To appreciate problems due to rounding errors and of convergence.
3. To introduce Statistical Methods & elementry forecasting techniques.

Contents : (Electronic calculators are allowed)

UNIT-1

Computer Arithmetic :Floating point representation of numbers, arithmetic operations with normalised floating point numbers and their consequences.

Error in number representation-inherent error, truncation error, round-off error.

UNIT-2

Interactive Methods : Bisection, False position, Newton-Raphson Methods, Interaction Method, discussion of convergence, Bairstow's Method.

UNIT-3

Solution of simultaneous linear equations and ordinary differential equations: Gauss-Elimination methods-pivoting, Ill-conditioned equations, refinement of solution. Gauss-Seidal Iterative Method, Euler Method. Taylor-Series Method Runge Kutta Methods, Predictor Corrector Method.

UNIT-4

(i) **Interpolation and Approximation :** Polynomial interpolation : Newton, Lagrange :Approximation of functions by Taylor Series and Chebyshev Polynomial.

(ii) Numerical Differentiation and Integration: Differentiation Formulae based on Polynomicial fit, pitfalls in differentiation. Trapezoidial & Simpson Rules, Gaussian Quadrature.

UNIT-5

Statistical Methods : Frequency distributions, Bionomial, Poisson, Normal, Mathematical expectation, moments generation & cumulative functions, method of Least Squares and curve fitting, correlation and regression.

UNIT-6

Tests of significance : Z-test, T-test, Chi-Square test. One way ANOVE, Baye's theorem in decision making, forcasting techniques.

Suggested Books :

1. Rajaraman, V : Computer Oriented Numerical Methods (PHI.)
2. Sastry, S.S.: Introductory Methods of Numerical Analysis (PHI,New Delhi).
3. Jain M.K. & Iyenger, S.R.K.: Numerical Methods for Scientific and Engineering Computation.
4. Dorn, W.S.& McCracken D.: Numerical Methods with FORTRAN-IV Case Studies (John Wiley) (Wiley Eastern Ltd.)
5. Gupta S.P. : Statistical Methods (Sultan Chand & Sons.New Delhi).
6. Scalgo, F : Elementary Computer Assisted Statistics (Von Nostland Reinhold Co. Ltd., 1978)
7. Rajaraman, V : Computer Programming in FORTRAN 77 (PHI) New Delhi).

Paper-II : **Business Data Processing-I** Max. Marks : 45
Time : 3 Hours

Note:Twelve questions will be set in the paper with two questions from each Unit. Candidates shall be required to attempt in all six questions selecting one question from each Unit. All questions shall carry equal marks.

Objectives of the Course :

1. To write programs in COBOL language, in good style, debug and document them.
2. To enable students to analyse, design and implement some business systems.

Course Contents:

UNIT-I

Business files-Master Files-Transactions files : Files Processing sorting, searching, matching, summarizing, File organisation techniques-Sequential, Random

Introduction to COBOL : History of COBOL , File concepts, record concept, coding format for COBOL Programs; Structure of a COBOL Program; Character Set, COBOL Words, Data Names & Indentifiers, Literals, Figurative Constants, language Description, Notation, Implementation Differences.

Identification Division , Environment Division and its all sections, Data division and its all sections (details about Report section).

UNIT-II

Verbs : MOVE, ADD, SUBTRACT, MULTIPLY, DIVIDE, COMPUTE, GO TO, STOP, OPEN, CLOSE, READ, WRITE, ACCEPT, DISPLAY, IF, Categories of COBOL Statements.

COBOL Program writing, runing & Testing : Program style.

USAGE, SYNCHRONIZED, JUSTIFIED, REDEFINES, RENAMES, SIGN clauses: Elementary and group moves: MOVE corresponding :ADD & SUBTRACT corresponding : General Rules about CORRESPONDING option, rounded and ON-SIZE ERROR option.

Conditional & Sequence control verbs: Relational, Sign, class, condition-name and negated simple conditions: compound condition; IF statement : Nested IF Sentence : GO TO with DEPENDING Phrase : ALTER, PERFORM, EXIT Statements.

UNIT-III

Table Handling : OCCURS Clause and subscripting; Assigning values to Table elements; Multi-Dimensional tables, PERFORM verbs and Table Handling; Indexed Tables and Indexing; Set and Search Verbs; OCCURS DEPENDING Clause; Sorting a Table; Index Data Item: Use of Indexes and Index data Item.

Sequential Files : File characteristics; File Control Entries for Sequential Files; File description-fixed length records, statements for sequential Files-OPEN, CLOSE, READ, WRITE and REWRITE Statements Line-printer files.

Sorting & Merging of Files : Simple Sort & Merge Verb; File Updation Variations of Updation; File Matching & File Merging.

UNIT-4

Introduction to Business Organisation: Production, stock control, costing, purchase control, sales order processing, wage accounting. Information system, need and role of information system in management

UNIT-5

System Analysis and Design: System concepts, Role of System Analyst, Project Selection, System Life-Cycle, Feasibility Analysis, Fact Gathering, Fact Recording.

UNIT-6

Logical design & Physical Design (Forms Design, I/O Design, File Design, Code Design, Procedure Design), System Implementation, Installation & Evaluation, Audit Considerations, Computer Workload Scheduling, System Documentation & its Importance.

SUGGESTED BOOKS :

1. Clifton, H.D. : Business Data Systems (Prentice Hall).
2. Parkinson, David : Business Computer Systems. (Mitchell Publishing).
3. Lee, B. : Introductory System Analysis and Design Vol. I & II, (Galgotia Booksource).
4. A Wad, Elias M: System Analysis & Design.
5. Roy, M.K. : Dastidar, D.G. : COBOL Programming (Tata McGraw Hill).
6. Thomas, Wirth :COBOL for beginners (PHI).

Paper-III (Practical and Viva-voce): Max. Marks : 60

Time : 6 hrs.
(Two sittings of three hrs. each)

Practical Examination will be conducted in two sitting of three hours each.

First Sitting : Programs in FORTRAN OR PASCAL relating to Numerical Analysis & Statistical Methods taught in Theory Paper-I.

Second Sitting :

Programs in COBOL Languages.

Distribution of Marks :

Program in FORTRAN OR PASCAL	: 20 Marks
Program in COBOL	: 20 Marks
Viva-Voce	: 15 Marks
Practical-record	: 5 Marks

Note: Each student must write at least 10 programs in FORTRAN or PASCAL (relating to Numerical & Statistical Methods) and 10 programs in COBOL durng the Academic Session.

Laboratory

The laboratory should emphasis on life Organisation and life processing techniques.

APPLIED ART
(Commercial Art Designing & Painting)
Outlines of Test

	Max. Marks	Time
Paper-I (Theory)	25	3 Hours
Paper-II (Practical) Illustration	20	6 Hours
Paper-III (Practical) Layout	20	6 Hours
Paper-IV (Practical) Poster	20	6 Hours
Sessional Work	15	

Syllabus and Courses of Reading M.M. 25

Paper-I Theory Time : 3 Hrs.

Note :Eight questions are to be set and cadidates are required to attempt five questions in all.

What is Art ? Commercial Art, Principle of Art, Element of Art, Detailed Theory of Design Quality of a Commercial Artist. Theory of Lettering Layout Perspective Illustration. Poster, Photography, Material used and its techniques, Various Medium in Art.

Paper-II (Practical) Illustration Max. Marks : 20
Time : 6 Hours.

Colour of Black and White Illustration with Pen or Brush on the following theme:

(i) College Campus (ii) Canteen (iii) Class-Room (iv) Story

Size : 10"x 15"

Paper-III (**Practical**) **Layout** Max. Marks : 20
Time : 6 Hours

Layouts with very short slogan in Colour or Black and White Tone.

i) One layout in cutting and pasting on any theme.

ii) Industrial Product on any three themes.

Size not more than 10"x15"

Paper-IV (**Practical**) **Poster** Max. Marks : 20
Time : 6 Hours.

Simple Poster of 20"x30" with very short slogan in Monochrome or Colour on the following theme i.e. Educational, Industrial Products or any current Topic.

Optional subjects (Any one of the following):

i) Photography: Introduction of Camera's and their Mechanism.

ii) Batik-Creative Batik on small cloth.

iii) Screen Printing-Simple Process.

Note :No Examination of Optional Subject only submission of work.

Sessional Work	15 Marks
1. Sketches	70
2. Illustration	5
3. Layout	3
4. Poster	3

5. Optional Subject-Any One (submission of two work).

Note : All sessional Work to be assigned by the concerned teacher and maintained by the students duly signed by the concerned teacher and also private candidates are required Sessional Work duly attested by the teacher concerned.

In all 10 questions shall be set in this paper out of which the candidates shall be required to attempt any five questions. All questions shall carry equal marks.

The questions are to be set so as to test the broad survey of the topics and not minute-details.

ANTHROPOLOGY

Outlines of Test

		Max. Marks	Time
Paper-I	**(Theory) Palaeoanthropology**	50	3 Hrs.
Paper-II	**(Theory) Social Anthropology**	50	3 Hrs.
Paper-III	**(Practical)**		

N.B. : 20% Marks are reserved for laboratory records and Viva-Voce in Paper-III.

Details of Course Content

Paper-I **(Theory) Palaeoanthropology** Max. Marks : 50
Time : 3 Hrs.

1. Palaeoathropology Definition, Aims and Scope, Objectives and its relationship with other Scentific disciplines.
2. General problems of Palaeoanthropological Study.
3. Fossils their preservation. Fossilisation and their Use.
4. Dating Methods.
5. Life through Ages.
6. Siwalik Group-Palaeoanthropological significance of Siwalik Group.

7. Taxonomic Status, Description and Geographical distribution of Ramapithecus, Australopithecus. Home Arectus (Pitheoanthropus, Homo habilis, and Hiedelberg), Homo Neanderthalensis, and Fossil Homo Sapiens.

Books Recommended :

1. Dass, B.M.	:	Outlines of Physical Anthropology
2. Jaunisch, Buetner	:	Origines of Man.
3. Haviland	:	Human Evolution
4. Stirton	:	Time, Life and Man.
5. Poirier, F.E.	:	In search of Ourselves
6. Wadia, D.N.	:	Geology of India.
7. Pit Seam, David	:	The Evolution of Man.

Paper-II (Theory) Social Anthoropology M.M. : 50
Time : 3 Hrs.

1. **Introduction to the Study of Man, Culture and Society;** Definition, aims and Scope of Social Anthropology-Differences from Ethnology, Ethnography, and Cultural Anthropology. Relationship with other disciplines concerned, with other disciplines concerned with the Study of Man notably Sociology, History Economics and Psychology.
2. **Definition and attributes of Culture:** athos and eidos; Explicit and Implicit elements; Culture determinism; Culture vis-a-vis the individual; Culture and Civilisation. Theories of culture growth; Evolutionism; diffusionism; Kulturkreise Theory; Culture areas and Marginal areas; British Diffusionists; Acculturation. Theories of Cultural Integration : Functionalism; pattern of culture; themes, Style of life.
3. **Basic concept** : Group community, tribe caste and class, Caste system in India.
4. **Family :** definition and function of family, distinctive features of family; Types of family; unclear, extended, and joint family stability and change in the Indian Family.
5. **Marriage** : Reasons underlying marriages; forms and types of marriage prescriptive and preferential (exogamy, endogamy, cross-cousin marriage, levirate, sororate, hypergamy and polygamy); ways of aquiring a mate in Tribal India; Marriage among Hindu and Muslim societies; problems of incast.

6. **Kinship** : Types of Kinship; Consanguleous and affmil.Degree of Kinship; Range of Kinship System : Broad and Narrow; descent; cognates, agnets and uterine Kin; Kinship usages : avoidance, familiarity Teknoymy, avunculate amitate, couvade; Kinship terms : classificatory, and descriptive.
7. **Religion and Magic** : Definition of religion, Mana, Taboo, Totamism, Witcheraft and Sorcery.
8. **Economic organisation** : Definition of Economic activity; economic and property relations in primitive societies; owners, ownership production, distribution and exchange in primitive societies with reference to Indian Tribes.
9. Political organisation of simpler societies and primitive law; Political system; definition and types.
10. Applied value of Social Anthropology.

Books Recommended

1. Majumdar, D.N. and Madan, T.N.-Introduction to Social Anthropology.
2. Mair, L-Introduction to Social Anthropology.
3. Herskovits, M.J.-Cultural Anthropology.
4. Beaty, John,-Other Cultures.
5. Beals and Hoijar-Introduction to Anthropology.
6. Herskovits, M.J.-Man and his Works.
7. Evans Pritcherd, F.E.-Social Anthropology.
8. Kroeber, A.L.(ed.)-Anthropology Today.
9. Thapar, Romesh (ed.)-Tribe, Caste and Religion in India.

Paper-III Practical Max. Marks : 50
Time : 3 Hrs.

Selected Measurements of Somatometry, Craniometry and Osteometry besides Somatoscopy in detail.

A. Somatometric Measurements

1. Wieght linear Measurements
2. Height Vertex
3. Sitting Height Vertex
4. Total Arm Length (Ht. acromion minus Ht. Dactylin)
5. Height iliospam
6. Biacromial diameter
7. Chest breath
8. Chest depth

9. Bienstal diamer
10. Head length
11. Head breadth

Circumferences

12. Horizontal Circumference of head
13. Chest Circumference

Skinfolds

14. Biceps skinfold
15. Triceps skinfold

Bone Breadth

16. Wrist breadth
17. Humerus bicondyar diameter
18. Femur Bicondyiar Diameter

B. Craniometry

1. Maximum Cranial length
2. Maximum Cranial breadth
3. Minimum frontial diameter
4. Bi-mastoid diameter
5. Bizygomatic breadth
6. Outer bi-orbital breadth
7. Maxillo-Alveolar breadth
8. Maxillo-Alveolar length
9. Bigonial breadth of mandible
10. Bicondyiar breadth of mandible

C. Osteometry

Following measurements to be recorded on Femur. Tibia and Humerus.

1. Maximum/Physiological length.
2. Breadth of proximal and disial ends.
3. Transverse diameter of shaft.
4. Sagittal diameter of shaft.
5. least-circumference of shaft.

D. Sumatoscopy

1. Skin colour of cheek/forehead and inner side of the upper arm.
2. Hair : furm, texture, colour and whorls.

3. Eye : colour, iris, sclere, eyeslits, eyefold, eyebrows.
4. Supra orbital ridges.
5. Nose : Nasion depression, Nasal bridge, Nasal septum, Nasal tip.
6. Forehead : slope, height, width.
7. Lips : thickness and eversion.
8. Pragnathism : Alveolar and facial.
9. Chin
10. Body : Musculature

Paper-III **Practical** Max. Marks : 60
Time : 3+3 Hours
List of Experiment (on two days)

Note : (Minimum 6 experiments from Section A. 5 from Section B and one from Section-C should be performed by each student).

Section-A

1. To study the methods for stabilization of quescent operating point of a transistor.
2. Study of transistor bias stabilization circuits.
3. Effect of negative feedback on transistor amplifier voltage gain input impedance and out-put impedance.
4. To study the design of Eartely Oscillator and measure its frequency.
5. To study the design of Colpites Oscillator and measure its frequency for two values of L.
   (inductance with and without ferrite core)
6. RC Oscillator design base shift oscillator
7. Wien-bridge audio oscillator-study of the condition for sustained oscillations.
8. Operational amplifier as :

i) Unity gain buffer stage.
ii) Non-inverting amplifier.
iii) Inverting amplifier.

9. Applications of operational amplifiers as :
   i) Summing amplifier
   ii) Differential amplifier.
10. Measurement of offset voltage and bias currents of operational amplifier.

Section-B

11. To design a transistor as able multivibrator and measure its frequency.
12. To study the operation of a transistorised monostable multivibrator circuit and measure its delay time.
13. To design a transistor bistable multivibrator circuit and study its operation.
14. To study the various triggering methods of bistable multivibrator circuits.
15. Measurement of common mode rejection ratio of op-amps.
16. Intergrating and differentiating circuits using op-amps.
17. To design a DTL NAND gate using discrete components and verify its truth table.
18. To design a TTL NAND gate using discrete components and verify its truth table.
19. Use a desital trainer to verify the given boolean indentities.

Section-C

20. Design and assemble any one of the following and evaluate its performance experimentally.
    a) Electronic multimeter using IC
    b) Solid State variac using thyristors.
    c) Transformerless output amplifier stage.
    d) Function generator using IC
    e) Stabilised power Supply, single output, using IC regulators.
    f) Design of a under over voltage cut-off-circuit.
    g) Battery eliminator using zener diode.
    h) Transistor tester.

The evaluation of report on Practical training for 4 weeks in summer vacation at the end of 2nd year of B.Sc. in the subject of Electronics be done by teacher-in-charge of the class of the respective colleges immediately after the completion of the training. The evaluation be given in grades, viz Excellent, Good Average and Poor.

1. Components, test equiments and other accessories for the projects in each class will be provided by the college concerned.
2. Since this course is of practical nature, the number of students in a practical group should not exceed 10.

References

1. Experiments in Electronics by W.H. Evans (Prentice Hall, India).

2. Electronics for Scientist and Engineers by Viswanathan, Mehta and Rajaraman (Prentice Hall, India).
3. Operational amplifiers by S.V. Subrahmanyam (Mac Millan Co., India).
4. Electronics Devices and Circuits by Motterhead.
5. Electronics Devices and Circuits Discrete and Iptegrated by Y.N. Bapat.

FRUIT & VEGETABLE PRESERVATION, APPLIED NURITION, BAKERY, TAILORING AND HOSIERY APPLIED NUTRITION AND DIETETICS

(4 periods per week)

Paper-I **(Theory)**

Max. Marks
B.Sc. B.A.
45 30
Time : 3 Hours

Syllabus and Courses of Reading

(a) Definition of nutrition, Nutrients, the functions, sources and deficiency diseases. Digestion and absorption of Nutrients, Malnutrition, its causes and prevention, food fads and Falladies.

(b) Recommended Dietetary Allowances for differnet age and sex group under different conditions of working and physiological stress. Balanced diet, low cost nutritious recipes from locally available food-stuffs.

(c) Planning and composing of Nutritionally adequate diets for family, sportsmen, pregnant, and lactating mothers, infants, children, adolescent and old persons. Therapeutic diets for hypertension, obesity and gastritis.

BAKERY

(4 periods per week)

Paper-II

Max. Marks
B.A. B.Sc.
45 30
Time : 3 Hrs.

Syllabus and courses of Reading

(a) Types and function of Wheat, flour.

(b) Function of sugar, shortenine, eggs, milk, salt and coco in cake and cookies making. Methods of cake making. Heat an important factor in Bakery.

(c) Methods and principles of making Biscuits, doughnuts, cones and pastries. Methods and princples of making salties, cheese straws, cheese fingers, etc.

(d) Methods and principles of making loaves and buns Nutritive value of bread and its enrichment.

Paper-II Practical (4 Periods per week, spread over 2 days)

Max. Marks
B.A. B.Sc.
60 40
Time : 3 Hours.

(a) Approximate analysis of food samples.

(b) Planning and couducting a food consumption survey and their analysis and interpretation.

(c) Planning and preparation of family meals and some therapeutic diets.

(d) Study of bakers oven, its plan of construction, Proportionate diagrams of bakers oven.

(e) Moulds and tools used in a Bakey. Proportionate diagram and their uses. Identification of bakery products.

RURAL INDUSTRIALISATION

Max. Marks : 100
Time : 3 Hrs.

Note : 1. Special lectures by specialists in the field concerned.

2. Five questions out of 10 each of 20 Marks.

Elementary ideas: Survery report Feasibility report and Project report.

Problems : Location; Industrial Estates; Focal Points; Industrial development colonies.

Factors determining Location : Problems relating to Raw materials. Skilled labour, Management, Finance, Marketing, Quality Control.

After having elementary idea about survey, feasibility and project reports, the students would start working on their individual projects to be submitted by the end of December of the succeeding year i.e. part-III.

LOCAL SELF GOVERNMENT

Max. Marks : 100
Time : 3 Hours.

Panchayat Raj in India

(The students are expected to be familiar with the organisation and working of Panchayat Raj in Haryana. It is also expected that eductional institutions will make arrangements for the students to witness the actual working of Panchayat Raj in their respective areas).

1. Meaning and importance of Panchayat Raj.
2. Evolution of Panchayat Raj.
3. The structure of Panchayat Raj : Zila Parishad, Panchayat Samiti. Gram Panchayat and Gram Sabha.

4. The organisation of deliberative and executive wings and problems of their relationship.
5. The powers and functions of Panchayat Raj Bodies.
6. Personnel Management : the problems of their recruitment, training and promotion.
7. Financial : sources of income, financial administration and the problem of their augmentation.
8. Sate control over Panchayat Raj institutions.
9. Problems of Panchayat Raj.
10. Future of Panchayat Raj in India.

Paper MARKETING Max. Marks : 100
Time : 3 Hours.

Salesmanship and Agricultural Marketing

Note : At least ten questions shall be set in Question-Paper. The paper shall be divided into five units containing two questions from each unit. The candidates shall be required to attempt five questions in all selecting at least one question from each unit.

Unit-I Salesmanship

Meaning; Significance;Nature of Salesmanship Science, or profession : kinds of salesmanship; criticism of salesmanship and advertising.

Unit-II Fundamentals of Successful of Salesmanship

Qualities of successful salesman, knowledge of products; knowledge of customers, 'sizing up' the customer; classification of customers and different ways to deal with different customers.

Unit-III Selling Process

Concept of selling Process; steps in selling process-prospecting, pre approach, approach, presentation and demonstration, overcoming objections and closing sales.

Unit-IV Marketing of Agricultural Product in India

Different kind of mandies and their organisation. Agencies involved in marketing of agricultural produce, Defects of the uses of system; steps taken by Indian Govt. to improve the system of agricultural marketing.

Unit-V State and Agricultural marketing in India

Goverment's control and regulation of agricultural marketing in India; Regulated market co-operative marketing societies; Warehousing Agencies; State trading in foodgrains; price control and rationing, public distribution system.

LABOUR WELFARE

Max. Marks : 100
Time : 3 Hours

1. Concept of Labour Welfare :

   Definition of labour welfare; approaches to labour welfare; scope of labour welfare; princples of labour welfare.

2. Labour Welfare Policy

   Objectives of labour welfare policy; Review of various labour welfare policies; labour welfare policy after the planning era; growth of welfare legislation; factors stimulating growth of welfare legislation.

3. Labour Welfare and Trade Unions:

   Role of trade unions in labour welfare; welfare orientation of unions; activities in the field of health, housing, legal and co-operative etc.

4. Social Security

   The concept of social security; workmen's compensation, industrial health insurance, old age relief, gratuity, unemployment.

5. Welfare of Special Group

   Women work force, Child labour, physically handicapped agricultural labour and Scheduled Caste and Tribes and other unorganised labour.

OFFICE MANAGEMENT

Paper-Secretarial Practice

Max. Marks :100
Time : 3 Hours.

1. **Introduction** : Meaning and type secretaries, Qualifications, position, rights, duties and responsibilites of Secretary.
2. Role of Secretary in Government Office, Organisation of Haryana Govt. Secretariat.
3. Role and Function of personnel assistants in business houses.
4. Secretarial practice relating to the formation of a company, procedure of issue of shares, allotment of shares, issue of share certificates, share, warrants, dividend warrants.
5. Procedure of convening meetings with reference to notice, quorum agenda, motions and resolutions, sense of the meeting, adjournment of the meetings, and the minutes.
6. Drafting directors report and other numerical returns.

ARCHAEOLOGY, MUSEUM AND TOURISM

One Paper-Museum

The paper shall be divided into two parts: Theory and Practical.

Part-I (Theory Paper) Max. Marks : 75
Time : 3 Hours

Note : 1. *In all ten questions shall be set in this paper with four questions from section-A and three questions each from Section-B and C. The candidates shall be required to attempt in all five questions with at least one question each from all Sections. All questions shall carry equal marks.*

2. *The questions set in the paper shall be of an elementary nature, not requiring an advanced or specialised knowledge of the topics prescribed.*

Syllabus and Courses of Reading

a) Museum-Its meaning and scope, types of Museum, Collection and Recording of Museum objects.

b) Display of objects-An idea of Museum building and lighting and staff. Elementary knowledge of cleaning and preservation of Museum objects.

c) A brief history of museum in India. Museum and Education.

Books Recommended

1. Nigam, M.L. : Fundamentals of Museology Navahind Prakashan, Hyderabad, (1966).
2. Baxi, S.J. Dwivedi, V.P. : Modern Museum (Abhinav Publications New Delhi, 1973).
3. Shachim Roy, Agrawal, O.P., Roychoudhury, D. & Nilima Roy (Translation : Ramesh Verma) : Sangrahalaya Anusilana (M.K. Publication, Delhi 1965).

Paper-II Practical Work (in the Museum) 25 Marks

INSURANCE

Law and Practical of Insurance Max. Marks : 100
Time : 3 Hours

Note :At least ten questions shall be set in the Question-Paper. The paper shall be divided into five Units containing two questions from each Unit. The candidates shall be reuired to attempt five questions in all, selecting at least one question from each Unit.

Unit-I Salient Aspects of Law of Contract; Contract of Agency and Indemnity.

Unit-II Insurance Contracts; Agency of Insurance, Laws of Insurance (Based on the Insurance Act 1938,) underwriting and claims.

Unit-III Laws relating to General, Fire and Marine Insurance.

Unit-IV Preparation of Revenue Accounts and Balance Sheet of General Insurance Companies.

Unit-V Accounts of Life Insurance Corporation in India.

COMMERCE

Paper-I Basic of Accounting

Max. Marks : 100
Time : 3 Hours.

1. Basic Concepts and Conventions of Accounting, Concept of Capital and Revenue, Systems of Accounting.
2. Types of Accounting.
3. Double Entry System of Accounting. Books of Original Entry. Ledger, Subsidiary, Books and Trial Balance.
4. Banking Transactions and Bank Reconcilliation Statement.
5. Account current and average due date.
6. Errors and their rectifications.
7. Depreciation Methods and Accounting.
8. Preparation of final Accounts with simple adjustments.
9. Receipt and Payment Accounts, Income and Expenditure Accounts.

B.A. (Computer Applications)-Vocational Course
SCHEME OF EXAMINATION

The existing Scheme of Examination applicable to B.A.(Part-I, II & III) will continue to be operative. A new subject Computer Applications will be added to the existing list of elective subjects. The students desiring to offer Computer Applications as a subject will be required to take one more elective subject from the existing list of elective subjects. the details about the papers in Computer Applications in Parts-I, II & III B.A. Examinations are as under :-

Examination	Title of Paper		Max. Marks	Time
B.A.(Part-I)	CA.-I	Computer Fundamentals & Introduction to IBM PC	35	3 hrs.
	CA.-II	Operating Systems and Business Data Processing	35	3 hrs.
Practical Examination		Ist Sitting	7.5	4 hrs.
		IInd Sitting	7.5	4 hrs
REPORT ON:	On-The-Job Training of 4 weeks duration during autumn & winter breaks.		15	
B.A. (Part-II)	CA-III	Data Base-Management Systems	35	3 hrs.
	CA-IV	Structured Programming and Computer graphics.	35	3 hrs.
Practical Examination		Ist Sitting	7.5	4 hrs
		IInd Sitting	7.5	4 hrs.
REPORT ON :		On-The-Job Training of 4 weeks duration during autumn & winter breaks.	15	
B.A.(Part-III)	CA-V	Computer Aided Drafting & Advanced topics in Computer	35	3 hrs.
Practical Examination			15	4 hrs
	CA-VI	Project Report	50	

(Last date for submission of Project Report will be 31st March of the Academic Year concerned).

The duration of this vocational course shall be three Academic Years and the candidates shall be issued the Degree of B.A. (Pass) (Vocational) with Computer Applications. The degree will be considered at par with B.A. (pass) Degree for the purpose of admission to Master Degree Courses.

Details about Practical Examination

The Practical Examination will be given jointly by two examiners, one Internal and one External to be appointed by the University.

A common typed/printed question paper will be provided to each student of the Class (or group in case it is not possible to conduct practical examination for all the students of a class together due to non-availability of adequate number of Computers). The questions paper will contain questions, Test-Data, if required, format in which results are to be produced by the students and the documents the examiners are expected to submit.

An answer-book will also be provided to each student.

The students will be permitted to do their theortical work, if any, in the examination hall before they move to Computer Lab for working on the Computers.

Each student will be provided a computer to work on it independently. The students will submit their results in the form detailed in the question paper. The two examiners will jointly evaluate it. They may, if they so desire, discuss the results propuced by a student with him while evaluating the paper.

The evaluation will be completed on the day of examination and will be sent to the University in the award list prescribed by the University.

The University will plan for the practical examination to be conducted in each college offering this course, after collecting details from the college well in advance. The details will be communicated to practical examiners well in advance to enable them to plan for the examination. The external examiner may have to go to the Centre/College of examination to get the paper prepared/typed in consulation with internal examiner, a day before the date of examination.

B.A./B.Com (Computer Applications) - Part-II

Vocational Course

Paper CA-III **Data Base Management Systems** Max. Marks : B.Com :70 B. A. : 35 Time : 3 Hours

Note:- Examiner should set five questions from each section making a total of ten questions covering the entire syllabus. Candidates are required to attempt any five questions selecting at least two questions from each section.

Section-A

Categorization of DBMS Systems, Network, Hierarchical and relational Databases. Application of DBMS systems.

Relational data base Management systems, why to use them and where. Data Description Language. Data Manipulation Language and Data Control Language.

Introduction to DBASE, DBASE COMMANDS, Development of an application under DBASE using forms, screens and PRG files.

Security considerations in Database Management Systems. Performance improvement in databases.

Section-B

Relational databases-advanced concepts. Introductions to ORACLE on a multiuser environment.

Structured query language, Form design on a advanced RDBMS. Report generator. Query by example and Report by form. Accessing RDBMS using programming languages.

System Management, User Management, Security considerations.

Paper:CA-IV Max.marks : 70 (B.Com)/35 (B.A.)

Structured Programming & Computer Graphics. Time : 3 hrs

Note:-Examiner should set five questions from each section making a total of ten questions covering the entire syllabus. Candidates are required to attempt any five questions selecting atleast two questions from each section.

Section:A

Introduction :Need of structured programming. Methods of documentation. Methods of Analysing a program requirements. Data flow diagram. Entity relationship Charts. Flow Charts.

Various categories of programming languages (3GL, 4GL, etc). Introductions to C and COBOL, Program development in C using structured programming concepts.

Section:-B

Why graphics? Various types of graphics program. Drafting packages. DTP packages. Microsoft windows. Various documentation cum pacakages e.g. Wordperfect, Microsoft Word etc.

Introduction to a Pagemaker : Preparation of documents using DTP packages, Formating, Printing, Vartious fonts and character sets. Various

types of printers used in DTP Introduction to Commercial DTP systems available in market. Indian language fonts. Creation of Indian Language fonts.

Practical Examination	Max. Marks	Time
(Ist sitting) - Design of a database for a Business Application. Design of Data Entry forms and report layouts for this database. Creation of programs to access and manipulate database.	15(B.Com.) 7.5(B.A.).	4 hrs
Development of a Business Application in RDBMS (IInd sitting) - Development of a Business Application using C.	15 (B.Com.) 7.5.(B.A.).	4 hrs
Managing a Microsoft Window Session. Creating groups and program items under windows. Tuning windows for a Computer System. Preparation of a document and publishing it using a DTP system. Pagemaker. Creation of fonts.		
On-The-Job Training Report* based on Business Systems using C, COBOL, Programming languages, Fox Pro/d Base/ Ventura/Pagemaker/ORACLE/INGRESE	30 (B.Com.) 15 (B.A.).	Four weeks duration

**Note:The candiate will be required to prospecute Job training in an Industrial Environment or Software development house or any other suitable place approved by the Principal of the College concerned on the recommendations of the teacher concerned in Computer Science and Applications of the coneerned college. On the Job Training Report of second year must be submitted to the Controller of Examinations through the Principal of the college concerned atleast one month before the commencement of second year annual examinations.*

On the job.training should be organised during Autumn and winter breaks when the students are free from regualr classes and can concentrate on this training.