


UPSC SYLLABUS

WITH SAMPLE PAPERS
& FREQUENTLY ASKED QUESTIONS

FOR

**CIVIL SERVICES
EXAMINATION**

(PRELIMINARY & MAIN)

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UPSC SYLLABUS

with Question Papers
& Frequently Asked Questions

FOR

CIVIL SERVICES EXAMINATION (PRELIMINARY & MAIN)

FOR

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A ROAD-MAP TO CIVIL SERVICES WITH NEW PATTERN

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Every one wants to win, but a few have the will to give all that it takes to win. We all seek success in our life, but have not realized what success is made of. Well, in simple language success is achieved when **preparation meets performance**. We spend more time in planning ordinary day to day things, than planning our lives. The road-map to success can be briefly put like this: PLAN, PREPARE, PRACTICE, PERFORM and WIN. In short, success takes more than just slogging.

Now, I propose to take you on a conducted tour of how to prepare for “the career”, i.e. a career in Civil Services or simply I.A.S.

The Nature of the Examination

The Civil Services Examination offers widest range of jobs in our country and is conducted by the Union Public Service Commission (UPSC). Some of the top services offered by this examination are: IAS (Indian Administrative Service), IPS (Indian Police Service), IFS (Indian Foreign Service), IRS (Indian Revenue Service), Indian Customs and Central Excise Service etc. There are, in all, about twenty-four services offered through this single examination. Considering the importance and the nature of the jobs, UPSC takes utmost care in selecting the right people. A three-level examination is conducted to achieve this purpose.

The Structure of the Examination

The candidates are put through three kinds of testings to ensure that the persons selected have: (i) a wide range of general awareness; (ii) analytical ability and content retention capacity; and (iii) a cheerful mental disposition even under stressful conditions and some other officers like qualities. Each one of these requirements is tested respectively through:

- (A) Preliminary Examination** (objective-type questions),
- (B) Main Examination** (descriptive-type questions), and
- (C) Interview Test**

Structure of Preliminary Examination

As per the new pattern, at the Preliminary Examination stage, there will be two objective-type question papers common for all the candidates. Both these papers will have equal weightage. The emphasis will be on testing the aptitude of the candidate

for the demanding life in the civil service, and on the ethical and moral dimensions of decision-making.

The new scheme will have the advantages of (a) testing a candidate's decision-making skills and aptitude for the civil services; and (b) providing a level playing field for all the aspirants, since all the candidates will have to attempt two common objective-type papers.

The new pattern has come into effect from Civil Services Exam, 2011. The change is effective only for the Preliminary Test, i.e., the first stage of the Civil Services Exam from 2011 onwards. The second and third stages — Civil Services Main Exam and Interview, respectively — will remain the same.

The **Preliminary Examination** is conducted in the month of May/June every year and it consists of two Objective type (multiple choice questions) compulsory papers and carries a maximum of 400 marks in the following manner:

1. Paper I – 200 marks and,
2. Paper II – 200 marks.

Syllabus for Preliminary Examination as per the New Pattern

Paper I - It comprises seven areas:

1. Current events of national and international importance
2. History of India and Indian National Movement
3. Indian and World Geography - Physical, Social, Economic Geography of India and the World.
4. Indian Polity and Governance – Constitution, Political System, Panchayati Raj, Public Policy, Rights Issues, etc.
5. Economic and Social Development – Sustainable Development, Poverty, Inclusion, Demographics, Social Sector Initiatives, etc.
6. General issues on Environmental ecology, Bio-diversity and Climate Change - that do not require subject specialization
7. General Science.

Paper II - It comprises seven areas:

1. Comprehension
2. Interpersonal skills including communication skills;
3. Logical reasoning and analytical ability
4. Decision making and problem solving

5. General mental ability
6. Basic numeracy (numbers and their relations, orders of magnitude etc.) (Class X level), Data interpretation (charts, graphs, tables, data sufficiency etc. -Class X level)
7. English Language Comprehension skills (Class X level).

Questions relating to English Language Comprehension skills of Class X level (last item in the Syllabus of Paper-II) will be tested through passages from English language only without providing Hindi translation thereof in the question paper.

A Hindi equivalent / translation will be available for the initial six tested areas, while the seventh area. English Language Comprehension skills, will be available exclusively in English language, indicating a need of understanding of English language in prospective IAS officers as English is the Lingua Franca of our country.

Strategy for Preparation for Preliminary Exam

Now we will discuss how to prepare for both the papers of Preliminary Examination.

On the analysis of the sample questions, given by UPSC, based on the revised pattern of Civil Services Preliminary Examination effective from 2011, we find that **Paper I** of Preliminary Exam is the same which was known earlier as **General Studies** paper. To prepare for Paper I, the candidate should see the last ten years' question papers of General Studies Preliminary Exam. These questions will give them a fair idea as to how the question is framed from the respective themes of the syllabus and also know the difficulty level.

1. **Current Events of National and International Importance** – Here, questions generally revolve around such happenings that have taken place during the previous 12 months.
2. **History of India and Indian National Movement** – Under this topic, questions include social, economic and political aspects of ancient, medieval and modern Indian history. Special emphasis should be given to 19th century resurgence and the attainment of the Indian Independence.
3. **Indian and World Geography – Physical, Social, Economic Geography of India and the World** - Geography questions usually focus on Indian geography, with regard to physical, social and economic aspects.
4. **Indian Polity and Governance – Constitution, Political System, Panchayati Raj, Public Policy, Rights Issues etc.** – In these topics, an analysis of the previous years' questions suggests that majority of the questions cover the themes

related to the Indian Constitution and the existing political system.

5. **Economic and Social Development – Sustainable Development, Poverty, Inclusion, Demographics, Social Sector Initiatives, etc.** – Recent developments in the field of economic priorities are also a favourite area for questioning. The candidate should be more focused on various policy programmes initiated by the government to eradicate poverty.
6. **General Issues on Environmental ecology, Bio-diversity and Climate Change** – This is a new topic added in the new pattern of the syllabus, so the candidates should thoroughly understand the basic concepts of Ecology, Biodiversity and Climate Change. They should also keep in mind the recent debates on environment and climate change.
7. **General Science** - In this segment, questions include the basics and scientific awareness of related areas. It comprises themes such as physics, astrophysics, chemistry, botany, zoology, agriculture, medicine & life sciences etc. Though, each one of these is a fully developed discipline, but the questions asked here are the ones that can be expected from a well-educated person without any special knowledge of these disciplines.

The syllabus of **Paper II of Preliminary Exam** reflects that it is like an **APTITUDE TEST** for **Civil Services**. To understand the impact of introduction of the Civil Services Aptitude Test (CSAT) on a student's approach, preparation and attitude, we need to understand the context of its evolution.

The Background of CSAT

The concept of CSAT was advocated, first of all, by Dr Y.K. Alagh in his Civil Services Review Committee Report, 2001. He recommended major changes in the structure of the examination system. He favoured the idea of testing the candidates in a common subject rather than on optional subjects.

To decide the exact content and syllabus of CSAT, the honourable UPSC Chairman, Prof. D.P. Agrawal, constituted a high-power committee under Prof. S.K. Khanna, former Vice-Chairman, University Grants Commission. The committee submitted its report at the end of April, 2010, after which the UPSC formally announced the contents of the syllabi of the two objective-type papers of the CSAT stage.

The Myths

The candidates for CSAT (Civil Services Aptitude Test) are confronted by a plethora of

information, conjectures and assumptions disseminated by people lacking the perception needed for handling the CSAT and by organizations with vested interests. Candidates need to sift through the chaff and understand what direction to take. I have tried to dispel some myths that my students ask me about.

Myth 1 – CSAT will be a diluted version of the IIM-CAT, XAT or MAT

The **CSAT** stands for the **Civil Services Aptitude Test**, an exam customised to test a candidate's aptitude for the Civil Services and not a **Management Aptitude Test**, which tests for aptitude to do an MBA successfully. Management Aptitude Tests such as the IIM-CAT and XAT have a dual focus – to test whether a student has the aptitude / potential to become a manager in the corporate world and to test whether a student will be able to handle the academic rigours of a demanding course, a Masters in Business Administration or a Post Graduate Diploma in Business Management. CSAT, on the other hand is not an entrance exam for admission into an MBA program offered by a Business School, rather CSAT is a recruitment exam for a career in the Civil Services, a discipline which requires a different set of abilities and attitude, so the CSAT is an entirely different exam.

Myth 2 – The Maths of CSAT will be difficult and will give an undue advantage to candidates with a Maths background

CSAT, by virtue of being an Aptitude Test for Civil Services, will test students for their ability to play with numbers and not higher level Maths. The sample questions released by UPSC are indicative of the difficulty level of this component. They do not need knowledge of formulae or any difficult Math skills. A difficult Maths question in which more students tend to make mistakes will not be difficult because of higher level Maths but will be difficult because of a twist or a trap in question due to fancy language. A candidate who has passed 10th standard knows more Maths than is needed by the CSAT. I agree that with passage of years the mathematical skills would have got rusty but would definitely not need learning from scratch. Understanding and practicing various types of questions that can come in the exam is required initially, while later the candidates can focus on finding out what type of questions they most frequently make mistakes in and correcting themselves is required for the final honing of quantitative skills.

Myth 3 – The English and Reasoning questions are easy and do not need hard work

The English questions are not easy rather they are **seemingly easy**. If you compare

English with say an area like Maths, then the differences are stark. Candidates from our Indian schooling systems have to do a lot of Maths in their syllabi. Parents, teachers and students work hard on Maths, but except for the initial focus on English during primary schooling, at later stages from standards 5 to 12, students are just handed a mandatory English Reader (book), which has a few stories followed by some questions. Students can recall that during the high school and later stages they could study English for a few days before exam and could secure the desired score in English subject. So if you analyze, English is an area where our foundation is weak and candidates will have to put in an extra effort to match the standards of testing. **To know more about CSAT preparation, visit us at <http://www.rauias.com/csat>**

The Structure of the Main Examination

The **Main Examination** comprises total nine papers of two types:

- [A] 2 papers of non-ranking type
- [B] 7 papers of ranking type

Two papers of non-ranking type include one paper of an Indian language to be selected by the candidate out of languages included in the Eighth Scheduled to the Constitution and the second paper is of English, which is a compulsory language. Both these papers are of a very simple nature and, in a way, mentally prepare the candidate for writing the subsequent examination.

Among ranking or scoring papers, there are three groups of papers, which are: two optional subjects – 4 papers in all (comprising a total of 1200 marks), Essay- one paper (200 marks) and General Studies – two papers (total 600 marks).

For the optional papers in the Main Examination, UPSC has a list of about twenty-six subjects out of which two subjects have to be selected by the candidate. However, a few combinations belonging to disciplines having substantial overlaps in content are not allowed, viz.

- (a) Political Science & International Relations **and** Public Administration;
- (b) Commerce & Accountancy **and** Management;
- (c) Anthropology **and** Sociology;
- (d) Mathematics **and** Statistics;
- (e) Agriculture **and** Animal Husbandry & Veterinary Science.

- (f) Management **and** Public Administration;
- (g) Of the Engineering subjects, viz., Civil Engineering, Electrical Engineering and Mechanical Engineering—not more than one subject.
- (h) Animal Husbandry & Veterinary Science **and** Medical Science.

General Studies for Main Examination

It comprises two papers of four and five segments, respectively.

Paper – I – The four segments of Paper-I are:

1. History of Modern India and Indian Culture,
2. Geography of India,
3. Constitution of India & Indian Polity, and
4. Current National Issues and Topics of Social Relevance.

Paper – II – The five segments of Paper-II are:

1. India and the World,
2. India's Economic Interaction with the World,
3. Developments in the Field of Science & Technology, IT and Space,
4. International Affairs & Institutions, and
5. Statistical Analysis, Graphs and Diagrams

The Main Examination, apart from optional subjects and General Studies papers, also includes an **ESSAY PAPER**. It carries 200 marks. The candidates are advised to prepare for this paper keeping some major themes in mind. Besides their preparation for the contents, aspirants are also advised to polish their basic skills for essay-writing. The basic idea behind the Essay Writing paper is to test the candidate's grasp of his material, its relevance to the subject chosen, and to his ability to think constructively and the present his ideas concisely, logically and effectively.

The Strategy for Preparation for Main Exam

The strategy for General Studies preparation is a bit different from that of the optional subjects, as the word "General" is very difficult to define. But if one proceeds with right approach and strategy, it becomes fairly organised. Then the next question is "what is the right approach and strategy"? Well, for that, one needs to keep in mind the basic fact that if the goal is to reach the highest level of achievement, then one must have not only ample patience for details, but should be able to keep the big picture regarding any theme in one's mind at the time of study. Thus the preparation strategy is to follow a mix of both micro and macro level approaches.

The first step in this direction is the understanding of the syllabus. One must look at the syllabus closely and in detail. After that, one should analyze the past years' question papers that indicate the important areas, as well as, the real scope of the syllabus. Then comes the next step of apportioning of time depending on the importance and length of each area.

The next step would cover the selection of right books and an efficient method to study them. The basic guideline at the start of the preparations for both Preliminary and Main Examination is to read N.C.E.R.T. books on related subjects. There is no substitute for them. One should refrain in the beginning from reading guidebooks, as they load you with information, but with very little concept.

Interview Test

Interview Test is the final lap of the Civil Services selection process. Though it carries only 300 marks, one can not afford to take it lightly, because a candidate's selection or ranking is likely to be affected by the marks that he/she gets in it. This test is not a cross-examination of the candidate, but something which appears between the twilight of a question-and-answer session and a purposive conversation.

Well, let me tell you that the most important part of the interview is "you". Everything else that goes on in an interview is peripheral or secondary. Talking about oneself is not easy for any one in such a situation. Yet, that is what precisely you are required to do in an interview. Your achievements, interests and vision are what you must be ready to talk about in a clear-headed manner. An interview is a celebration of "you" from start to finish. The interviewers usually have two major enquiries in their mind: (a) the personality issues and (b) the knowledge base of the candidate.

Now, in case of Civil Services Examination the knowledge aspect is taken care of by an elaborate written examination which is already over by the time you go for the interview. What remains to be evaluated is the personality aspects of the candidate, and it is for this reason the interview has been, at times, also called the personality test.

The Personality Test of a person has been variously defined to include a vast number of qualities of head and heart. The personality of any person is the sum total of what one has experienced, seen, heard, read or felt from the very moment one starts being aware of one-self in the society.

In short, what UPSC is looking for in a candidate is a person of substance who has the intelligence and courage to take on any job and give his/her best to it without fear or favour. Briefly, they are looking for a person who will hold his/her ground and stand by his/her colleagues in difficult situations with complete sincerity and commitment. Finally, remember that **winning is an event, but being a winner is a spirit**. To win, you will have to understand the spirit of deserving something before getting it. The mantra for success in an examination like Civil Services is to cultivate the real 'joy of learning' as a pre-condition for any learning to have an impact on your mind.

GENERAL STUDIES (BOOKS/PERIODICALS/OTHER SUGGESTIONS)

BOOKS

1. **NCERT** : The basic concepts of the different segments of General Studies are derived from the NCERT books, as mentioned below:
 - i) General Science : 9th and 10th Standards
 - ii) History : 11th and 12th Standards
 - iii) Geography : 11th and 12th Standards
 - iv) Economics : 11th Standard (Preferably latest edition)

MAGAZINES

1. *Pratiyogita Darpan*: (available in both English and Hindi)
2. *Special issues of Pratiyogita Darpan*: It is coming out with 4 special issues, viz., History, Geography, Indian Polity and Indian Economy (latest issue of Indian Economy is preferred).
3. *Frontline*
4. *India Year book*: (latest issue) by Publication Division, Government of India
5. *Economic Survey*: (latest issue) by Ministry of Finance, Government of India

NEWSPAPERS

1. The Hindu
2. The Times of India

RADIO NEWS

1. *BBC World News*
 - i) 6.20 a.m. to 7.00 a. m. (Hindi)
 - ii) 7.30 p.m. to 8.30 p. m. (Hindi)
2. *All India Radio National News*:
9.00 p.m. to 9.30 p.m. (English)

MISCELLANEOUS

1. The candidates are also advised to make it a regular habit of writing at least one page on current and contemporary events, issues and affairs every day, of what they observe from newspapers/news, magazine, etc.
2. The events of National and International which effect human lives at large are important from General Studies point of view.

CIVIL SERVICES EXAMINATION

Section-I

PLAN OF EXAMINATION

1. The competitive examination comprises two successive stages :
 - (i) Civil Services (Preliminary) Examinations (Objective Type) for the selection of candidates for Main Examination; and
 - (ii) Civil Services (Main) Examination (Written and Interview) for the selection of candidates for the various services and posts.
2. The Preliminary Examination will consist of two papers of Objective type (multiple choice questions) and carry a maximum of 400 marks in the subjects set out in sub-section (A) of Section-II. This examination is meant to serve as a screening test only; the marks obtained in the Preliminary Examination by the candidates who are declared qualified for admission to the Main Examination will not be counted for determining their final order of merit. The number of candidates to be admitted to the Main Examination will be about twelve to thirteen times the total approximate number of vacancies to be filled in the year in the various Services and Posts. Only those candidates who are declared by the Commission to have qualified in the Preliminary Examination in the year will be eligible for admission to the Main Examination of that year provided they are otherwise eligible for admission to the Main Examination.
3. The Main Examination will consist of a written examination and an Interview Test. The written examination will consist of 9 papers of conventional essay type in the subjects set out in sub-section (B) of Section-II. Also see Note (ii) under para I of Section-II (B).
4. Candidates who obtain such minimum qualifying marks in the written part of the Main Examination as may be fixed by the Commission at their discretion, shall be summoned by them for an interview/for a Personality Test vide sub-section 'C' of Section-II. However, the papers on Indian Languages and English will be of qualifying nature. Also see Note (ii) under para 1 of Section-II (B). The marks obtained in these papers will not be counted for ranking. The number of candidates to be summoned for interview will be about twice the number of vacancies to be filled. The interview will carry 300 marks (with no minimum qualifying marks).
 - Marks thus obtained by the candidates in the Main Examination (written part as well as interview) would determine their final ranking. Candidates will be allotted to the various Services keeping in view their ranks in the examination and the preferences expressed by them for the various Services and Posts.

Section-II

Scheme and subjects for the Preliminary and Main Examinations.

A. Preliminary Examination

- The Examination shall comprise two compulsory papers of 200 marks each.

NOTE

- Both the question papers will be of the objective type (multiple choice questions).
- The question papers will be set both in Hindi and English. However, questions relating to English Language Comprehension skills of Class X level will be tested through passages from English Language only without providing Hindi translation thereof in the question paper.
- Details of the syllabi are indicated in Part A of Section III.
- Each paper will be of two hours duration.
Blind candidates will however, be allowed an extra time of twenty minutes at each paper.

B. Main Examination		
<ul style="list-style-type: none">The written examination will consist of the following papers :		
Paper I	One of the Indian languages to be selected by the candidate from the Languages included in the Eighth Schedule to the Constitution.	300 marks
Paper II	English	300 marks
Paper III	Essay	200 marks
Papers IV and V	General Studies	300 marks for each paper
Papers VI, VII, VIII and IX	Any two subjects to be selected from the list of the optional subjects set out in para 2 below. Each subject will have two papers.	300 marks for each paper
<i>Interview Test will carry 300 marks.</i>		

NOTE

- (i) *The papers on Indian Languages and English will be of Matriculation or equivalent standard and will be of qualifying nature; the marks obtained in these papers will not be counted for ranking.*
- (ii) *Evaluation of the papers, namely, 'Essay', 'General Studies' and Optional Subjects of all candidates would be done simultaneously along with evaluation of their qualifying papers on 'Indian languages' and English' but the papers on 'Essay', 'General Studies' and 'Optional Subjects' of only such candidates will be taken cognizance of as attain such minimum standard as may be fixed by the Commission at their discretion for the qualifying papers on 'Indian language' and 'English' and, therefore, the marks in 'Essay' 'General studies and Optional subjects' will not be disclosed to those candidates who fail to obtain such minimum qualifying standard in 'Indian language and 'English'.*
- (iii) *The paper-I on Indian Languages will not, however, be compulsory for candidates hailing from the North-Eastern States of Arunachal Pradesh, Manipur, Meghalaya, Mizoram and Nagaland and also for candidates hailing from the State of Sikkim.*
- (iv) *For the Language papers, the script to be used by the candidates will be as under :*

Language Script

Assamese	Assamese
Bengali	Bengali
Bodo	Devanagari
Dogri	Devanagari
Gujarati	Gujarati
Hindi	Devanagari
Kannada	Kannada
Kashmiri	Persian
Konkani	Devanagari
Maithili	Devanagari
Malayalam	Malayalam
Manipuri	Bengali
Marathi	Devanagari
Nepali	Devanagari
Oriya	Oriya
Punjabi	Gurumukhi
Sanskrit	Devanagari
Santali	Devanagari or Olchiki

Sindhi	Devanagari or Arabic
Tamil	Tamil
Telugu	Telugu
Urdu	Persian

NOTE : For Santali language, question paper will be printed in Devanagari script; but candidates will be free to answer either in Devanagari script or in Olchiki.

2. List of optional subjects for Main Examination

- Agriculture
- Anthropology
- Chemistry
- Commerce and Accountancy
- Electrical Engineering
- Geology
- Law
- Mathematics
- Medical Science
- Physics
- Political Science and International Relations
- Psychology
- Sociology
- Zoology
- Animal Husbandry & Veterinary Science
- Botany
- Civil Engineering
- Economics
- Geography
- History
- Management
- Mechanical Engineering
- Philosophy
- Literature of **one** of the following languages:
- Arabic, Assamese, Bodo, Bengali, Chinese, Dogri, English, French, German, Gujarati, Hindi, Kannada, Kashmiri, Konkani, Maithili, Malayalam, Manipuri, Marathi, Nepali, Oriya, Pali, Persian, Punjabi, Russian, Sanskrit, Santali, Sindhi, Tamil, Telugu, Urdu.

NOTE

- (i) *Candidates will not be allowed to offer the following combinations of subjects:–*
- (a) *Political Science & International Relations **and** Public Administration;*
 - (b) *Commerce & Accountancy **and** Management;*
 - (c) *Anthropology **and** Sociology;*
 - (d) *Mathematics **and** Statistics;*
 - (e) *Agriculture **and** Animal Husbandry & Veterinary Science.*
 - (f) *Management **and** Public Administration;*
 - (g) *Of the Engineering subjects, viz., Civil Engineering, Electrical Engineering*

and Mechanical Engineering—not more than one subject.

*(h) Animal Husbandry & Veterinary Science **and** Medical Science.*

(ii) *The question papers for the examination will be of conventional (essay) type.*

(iii) *Each paper will be of three hours duration.*

Blind candidates will, however, be allowed an extra time of thirty minutes at each paper.

(iv) *Candidates will have the option to answer all the question papers, except the language papers viz. Papers I and II above in any one of the languages included in the Eighth Schedule to the Constitution or in English.*

(v) *Candidates exercising the option to answer papers III to IX in any one of the languages included in the Eighth Schedule to the Constitution may, if they so desire, give English version within brackets of only the description of the technical terms, if any, in addition to the version in the language opted by them.*

Candidates should, however, note that if they misuse the above rule, a deduction will be made on this account from the total marks otherwise accruing to them and in extreme cases, their script(s) will not be valued for being in an unauthorised medium.

(vi) *The question papers other than language papers will be set both in Hindi and English.*

(vii) *The details of the syllabi are set out in Part B of Section-III.*

“General Instructions (Preliminary as well as Main Examination)” :

(i) Candidates must write the papers in their own hand. In no circumstances, will they be allowed the help of a scribe to write the answers for them. However, blind candidates will be allowed to write the examination with the help of a scribe.

(ii) An extra time of twenty minutes per hour shall be permitted for the candidates with locomotor disability and cerebral palsy where dominant (writing) extremity is affected to the extent of slowing the performance of function (minimum of 40% impairment) **in the Civil Services (Main) Examination only**. However, no scribe shall be permitted to such candidates.

NOTE:

1. The eligibility conditions of a scribe, his/her conduct inside the examination hall and the manner in which and extent to which he/she can help the blind candidate in writing the Civil Services Examination shall be governed by the instructions issued by the UPSC in this regard.

Violation of all or any of the said instructions shall entail the cancellation of the candidature of the blind candidate in addition to any other action that the UPSC may take against the scribe.

2. For purpose of these rules the candidate shall be deemed to be a blind candidate if the percentage of visual impairment is 40% or more. The criteria for determining the percentage of visual impairment shall be as follows :

	All with Corrections		Percentage
	Better eye	Worse eye	
Category 0	6/9-6/18	6/24 to 6/36	20%
Category I	6/18-6/36	6/60 to nil	40%
Category II	6/60-4/60 or field of vision 10-20 ^o	3/60 to nil	75%
Category III	3/60-1/60 or field of vision 10 ^o	F. C. at 1 ft to nil	100%
Category IV	FC. at 1 ft to nil field of vision 100 ^o	F. C. at 1 ft to nil field of vision 100 ^o	100%
One eyed person	6/6	F. C. at 1 ft to nil	30%

NOTE 3 :

- For availing of the concession admissible to a blind candidate, the candidate concerned shall produce a certificate in the prescribed proforma from a Medical Board constituted by the Central/State Governments alongwith his application for the Main Examination.

NOTE 4 :

- The concession admissible to blind candidates shall not be admissible to those suffering from Myopia.
- The Commission have discretion to fix qualifying marks in any or all the subjects of the examination.
- If a candidate's handwriting is not easily legible, a deduction will be made on this account from the total marks otherwise accruing to him.
- Marks will not be allotted for mere superficial knowledge.
- Credit will be given for orderly, effective and exact expression combined with due economy of words in all subjects of the examination.
- In the question papers, wherever required, SI units will be used.
- Candidates should use only international form of Indian numerals (i.e. 1,2,3,4,5,6 etc.) while answering question papers.

(viii) Candidates will be allowed the use of Scientific (Non-Programmable type) Calculators at the conventional (Essay) type examination of UPSC. Programmable type calculators will however not be allowed and the use of such calculators shall tantamount to resorting to unfair means by the candidates. Loaning or interchanging of calculators in the Examination Hall is not permitted.

It is also important to note that candidates are not permitted to use calculators for answering objective type papers (Test Booklets).

They should not therefore, bring the same inside the Examination Hall.

C. Interview test

1. The candidate will be interviewed by a Board who will have before them a record of his/her career. He/she will be asked questions on matters of general interest. The object of the interview is to assess the personal suitability of the candidate for a career in public service by a Board of competent and unbiased observers. The test is intended to judge the mental calibre of a candidate. In broad terms this is really an assessment of not only his intellectual qualities but also social traits and his interest in current affairs. Some of the qualities to be judged are mental alertness, critical powers of assimilation, clear and logical exposition, balance of judgement, variety and depth of interest, ability for social cohesion and leadership, intellectual and moral integrity.
2. The technique of the interview is not that of a strict cross-examination but of a natural, though directed and purposive conversation which is intended to reveal the mental qualities of the candidate.
3. The interview test is not intended to be a test either of the specialised or general knowledge of the candidates which has been already tested through their written papers. Candidates are expected to have taken an intelligent interest not only in their special subjects of academic study but also in the events which are happening around them both within and outside their own state or country as well as in modern currents of thought and in new discoveries which should rouse the curiosity of well educated youth.

SERVICES AND POSTS TO BE FILLED THROUGH CIVIL SERVICES EXAMINATION

- i) Indian Administrative Service.
 - ii) Indian Foreign Service.
 - iii) Indian Police Service.
 - iv) Indian P & T Accounts & Finance Service, Group 'A'.
 - v) Indian Audit and Accounts Service, Group 'A'.
 - vi) Indian Revenue Service (Customs and Central Excise), Group 'A'.
 - vii) Indian Defence Accounts Service, Group 'A'.
 - viii) Indian Revenue Service (I.T.), Group 'A'.
 - ix) Indian Ordnance Factories Service, Group 'A' (Assistant Works Manager, Administration).
 - x) Indian Postal Service, Group 'A'.
 - xi) Indian Civil Accounts Service, Group 'A'.
 - xii) Indian Railway Traffic Service, Group 'A'.
 - xiii) Indian Railway Accounts Service, Group 'A'.
 - xiv) Indian Railway Personnel Service, Group 'A'.
 - xv) Post of Assistant Security Commissioner in Railway Protection Force, Group 'A'
 - xvi) Indian Defence Estates Service, Group 'A'.
 - xvii) Indian Information Service (Junior Grade), Group 'A'.
 - xviii) Indian Trade Service, Group 'A' (Gr. III).
 - xix) Indian Corporate Law Service, Group "A".
 - xx) Armed Forces Headquarters Civil Service, Group 'B' (Section Officer's Grade).
 - xxi) Delhi, Andaman & Nicobar Islands, Lakshadweep, Daman & Diu and Dadra & Nagar Haveli Civil Service, Group 'B'.
 - xxii) Delhi, Andaman & Nicobar Islands, Lakshadweep, Daman & Diu and Dadra & Nagar Haveli Police Service, Group 'B'.
 - xxiii) Pondicherry Civil Service, Group 'B'.
 - xxiv) Pondicherry Police Service, Group 'B'.
- Reservation will be made for candidates belonging to Scheduled Castes, Scheduled Tribes, Other Backward Classes and Physically Disabled Categories in respect of vacancies as may be fixed by the Government.

POST RESERVED FOR PHYSICAL DISABLED CANDIDATES

The eligibility for availing reservation against the vacancies reserved for the physically disabled persons shall be the same as prescribed in "The Persons with Disability (Equal Opportunities, Protection of Rights and Full Participation)

Act, 1995.” Provided further that the physically disabled candidates shall also be required to meet special eligibility criteria in terms of physical requirements/ functional classification (abilities/disabilities) consistent with requirements of the identified Service/Post as may be prescribed by its Cadre Controlling Authority.

- The physical requirement and functional classification can for example be one or more of the following :

Code	Physical Requirements
MF	1. Work performed by Manipulation by Fingers
PP	2. Work Performed by Pulling & Pushing
L	3. Work Performed by Lifting
KC	4. Work Performed by Kneeling and Crouching
BN	5. Work Performed by Bending
S	6. Work Performed by Sitting (on bench or chair)
ST	7. Work Performed by Standing
W	8. Work Performed by Walking
SE	9. Work Performed by Seeing
H	10. Work Performed by Hearing/Speaking
RW	11. Work Performed by Reading and Writing
C	12. Communication

Code	FUNCTIONAL CLASSIFICATION
BL	1. Both legs affected but not arms
BA	2. Both arms affected a. Impaired Reach b. Weakness of Grip. c. ataxic
BLA	3. Both legs and both arms affected.
OL	4. One leg affected (R or L) a. impaired reach b. weakness of grip c. ataxic
OA	5. One arm affected (R or L) a. impaired reach b. weakness of grip c. ataxic
OAL	6. One arm and one leg affected
MW	7. Muscular weakness.
B	8. Blind
LV	9. Low vision
H	10. Hearing

Note : The above list is subject to revision.

- Services identified suitable for Physically Disabled Categories alongwith respective functional classification and physical requirements are given below:

S No.	Name of the Service	Category(ies) for which Identified	Functional classification	*Physical requirements
1.	Indian Administrative Service	i) Locomotor Disability ii) Visual impairment iii) Hearing impairment	BA, OL, OA, BH, MW PB PD	S, ST, W, SE, H, RWT
2.	Indian Foreign Service	i) Locomotor Disability ii) Visual impairment iii) Hearing impairment	OA, OL, OAL LV HH	S, ST, W, RW, C, MF, SE
3.	Indian Revenue Service (Customs & Central Excise, Gr. 'A')	i) Locomotor disability ii) Hearing impairment	OL, OA HH	S, ST, W, BN, L SE, MF, RW, H, C
4.	Indian P&T Account & Finance Service	i) Locomotor disability ii) Visual impairment iii) Hearing impairment	OA, OL, OAL, BL LV HH	S, W, SE, RW, C
5.	Indian Audit & Accounts Service, Gr. 'A'	i) Locomotor disability ii) Visual impairment iii) Hearing impairment	OA, OL, OAL LV HH	S, ST, W, BN, SE, RW, H, C
6.	Indian Defence Accounts Service, Gr. 'A'	i) Locomotor disability ii) Visual	OA, OL, OAL, BL LV	S, ST, W, BN, SE, RW, C

		impairment		
		iii) Hearing	HH	
		impairment		
7.	Indian Revenue Service (I. T.), Gr. 'A'	i) Locomotor disability	OA, OL, OAL, BL	S, ST, W, SE, RW, C
		ii) Hearing impairment	HH	
8.	Indian Ordnance Factories Service Gr. 'A'	i) Locomotor disability	OA, OL, OAL	S, ST, W, BN, RW SE, H, C
		ii) Visual impairment	LV	
		iii) Hearing impairment		
9.	Indian Postal Service, Gr. 'A'	i) Locomotor disability	OA, OL, OAL BL	S, ST, W, BN, RW, SE, H, C
		ii) Visual impairment	B, LV	
		Hearing impairment	HH	
10.	Indian Civil Accounts Service, Gr. 'A'	i) Locomotor disability	OA, OL, OAL, BL	S, ST, W, SE, RW, H, C
		ii) Visual impairment	LV	
		iii) Hearing impairment	HH	
11.	Indian Railway Accounts Service, Gr. 'A'	i) Locomotor disability	OA, OL, OAL, BL	S, ST, W, SE, RW, H, C
		ii) Visual impairment	LV	
		iii) Hearing impairment	HH	
12.	Indian Railway Personnel Service, Gr. 'A'	i) Locomotor disability	OA, OL	S, ST, W, BN, SE, RW, H, C
		ii) Visual impairment	B, LV	
		iii) Hearing impairment	HH	
13.	Indian Defence Estates Service Gr. 'A'	i) Locomotor disability	OA, OL	S, ST, W, BN, MF, PP, KC,
		ii) Blindness or	LV	SE, RW, H, C

		Low Vision		
		iii) Hearing impairment	HH	
14.	Indian Information Service, Gr. 'A'	i) Locomotor disability	OA, OL, OAL, BL	
		ii) Visual impairment	B, LV	S, ST, W, SE RW, H, C
		iii) Hearing impairment	HH	
15.	Indian Trade Service Gr. 'A' (Gr. III)	i) Locomotor disability	OA, OL, OAL, BL	S, ST, W, BN, MF, SE, RW, H, C
		ii) Visual impairment	LV	
		iii) Hearing impairment	HH	
16.	Indian Corporate Law Service, Group 'A'	i) Locomotor disability	OA, OL, BL	ST, RW, SE S, BN, H
		ii) Visual impairment	LV	
		iii) Hearing impairment	HH	
17.	Armed Forces Headquarters Civil Service, Gr. 'B' (Section Officers Grade)	i) Locomotor disability	OA, OL	S, ST, W, BN MF, SE, RW, H, C
		ii) Visual impairment	LV	
		iii) Hearing impairment	HH	
18.	Delhi, Andaman Nicobar Islands, Lakshadweep, Daman & Diu and Dadra & Nagar Haveli Civil Service, Gr. 'B'	i) Locomotor disability	OA, OL, OAL, BL	S, ST, W, SE, RW, MF, H, C
		ii) Hearing impairment	HH	
19.	Delhi, Andaman & Nicobar Islands, Lakshadweep, Daman & Diu and	i) Locomotor disability	OL	S, ST, W, BN, PP, KC, MF, SE, RW, H, C
		ii) Hearing impairment	HH	

	Dadra & Nagar Haveli Police Service, Gr. 'B'			
20.	Pondicherry Civil Service, (Group B)	i) Locomotor disability ii) Visual impairment iii) Hearing impairment	OA, OL, OAL, BL, LV LV HH	S, ST, W, SE, RW, H, C

CENTRES FOR PRELIMINARY EXAMINATION

The examination will be held at the following Centres:

Agartala	Chandigarh	Imphal	Lucknow	Ranchi
Ahmedabad	Chennai	Itanagar	Maduri	Sambalpur
Aizawl	Cuttack	Jaipur	Mumbai	Shillong
Aligarh	Dehradun	Jammu	Nagpur	Shimla
Allahabad	Delhi	Jodhpur	Panaji (Goa)	Srinagar
Aurangabad	Dharwad	Jorhat	Patna	Thiruvananthapuram
Bangalore	Dispur	Kochi	Puducherry	Tirupati
Bareilly	Gangtok	Kohima	Port Blair	Udaipur
Bhopal	Hyderabad	Kolkata	Raipur	Vishakhapatnam

CENTRES FOR MAIN EXAMINATION

The examination will be held at the following Centres:

Ahmedabad	Allahabad	Bangalore	Bhopal	Mumbai
Kolkata	Cuttack	Delhi	Dispur (Guwahati)	
Hyderabad	Jaipur	Chennai	Patna	Shillong
Shimla	Thiruvananthapuram		Lucknow	Jammu
Chandigarh				

ELIGIBILITY CONDITIONS

(i) **Nationality**

- (1) For the Indian Administrative Service and the Indian Police Service, a candidate must be a citizen of India.
- (2) For other services, a candidate must be either :—
 - (a) a citizen of India, or
 - (b) a subject of Nepal, or
 - (c) a subject of Bhutan, or
 - (d) a Tibetan refugee who came over to India before 1st January, 1962 with the intention of permanently settling in India, or
 - (e) a person of Indian origin who has migrated from Pakistan, Burma, Sri Lanka, East African countries of Kenya, Uganda, the United Republic of Tanzania, Zambia, Malawi, Zaire, Ethiopia and Vietnam with the intention of permanently settling in India.
- Provided that a candidate belonging to categories (b), (c), (d) and (e) shall be a person in whose favour a certificate of eligibility has been issued by the Government of India.
- Provided further that candidates belonging to categories (b), (c) and (d) above will not be eligible for appointment to the Indian Foreign Service.
- A candidate in whose case a certificate of eligibility is necessary, may be admitted to the examination but the offer of appointment may be given only after the necessary eligibility certificate has been issued to him/her by the Government of India.

(ii) **Age Limits :**

- (a) A candidate must have attained the age of 21 years and must not have attained the age of 30 years on 1st August, of the year in which he/she is appearing for the Preliminary Examination (*i.e. a candidate appearing for the preliminary examination of the year 2011 should be between 21-30 years of age as on 01st August, 2011*) i.e. he/she must have been born not earlier than 2nd August, 1981 and not later than 1st August, 1990.
- (b) The upper age limit prescribed above will be relaxable :
 - (i) upto a maximum of five years if a candidate belongs to a Scheduled Caste or a Scheduled Tribe.
 - (ii) upto a maximum of three years in the case of candidates belonging to Other Backward Classes who are eligible to avail of reservation applicable to such candidates.

- (iii) upto a maximum of five years if a candidate had ordinarily been domiciled in the State of Jammu & Kashmir during the period from the 1st January, 1980 to the 31st day of December, 1989.
- (iv) upto a maximum of three years in the case of Defence Services personnel disabled in operations during hostilities with any foreign country or in a disturbed area and released as a consequence thereof.
- (v) upto a maximum of five years in the case of ex-servicemen including Commissioned Officers and ECOs/SSCOs who have rendered at least five years Military Service as on 1st August, 2011 and have been released (i) on completion of assignment (including those whose assignment is due to be completed within one year from 1st August, 2011) otherwise than by way of dismissal or discharge on account of misconduct or inefficiency, or (ii) on account of physical disability attributable to Military Service, or (iii) on invalidment.
- (vi) Upto a maximum of five years in the case of ECOs/SSCOs who have completed an initial period of assignment of five years Military Service as on 1st August, 2011 and whose assignment has been extended beyond five years and in whose case the Ministry of Defence issues a certificate that they can apply for civil employment and that they will be released on three months notice on selection from the date of receipt of offer of appointment.
- (vii) upto a maximum of 10 years in the case of blind, deaf-mute and orthopaedically handicapped persons.

NOTE I:

- Candidates belonging to the Scheduled Castes and the Scheduled Tribes and the Other Backward Classes who are also covered under any other clauses of para 3(ii) (b) above, viz. those coming under the category of Ex-servicemen, persons domiciled in the State of J & K, blind, deaf-mute and orthopaedically handicapped etc. will be eligible for grant of cumulative age-relaxation under both the categories.

NOTE II:

- The term ex-servicemen will apply to the persons who are defined as ex-servicemen in the Ex-servicemen (Re-employment in Civil Services and Posts) Rules, 1979, as amended from time to time.

NOTE III :

- The age concession under para 3(ii) (b) (v) and (vi) will not be admissible to Ex-Servicemen and Commissioned Officers including ECOs/SSCOs who are released on own request.

NOTE IV:

- Notwithstanding the provision of age-relaxation under para 3 (ii) (b) (vii) above, a physically disabled candidate will be considered to be eligible for appointment only if he/she (after such physical examination as the Government or appointing authority, as the case may be, may prescribe) is found to satisfy the requirements of physical and medical standards for the concerned Services/posts to be allocated to the physically disabled candidates by the Government.

SAME AS PROVIDED ABOVE THE AGE LIMITS PRESCRIBED CAN IN NO CASE BE RELAXED.

- The date of birth accepted by the Commission is that entered in the Matriculation or Secondary School Leaving Certificate or in a certificate recognised by an Indian University as equivalent to Matriculation or in an extract from a Register of Matriculates maintained by a University, which extract must be certified by the proper authority of the University or in the Higher Secondary or an equivalent examination certificate.
- These certificates are required to be submitted only at the time of applying for the Civil Services (Main) Examination. No other document relating to age like horoscopes, affidavits, birth extracts from Municipal Corporation, service records and the like will be accepted.
- The expression Matriculation/Secondary Examination Certificate in this part of the instruction includes the alternative certificates mentioned above.

NOTE 1:

- Candidates should note that only the Date of Birth as recorded in the Matriculation/Secondary Examination Certificate or an equivalent certificate as on the date of submission of applications will be accepted by the Commission and no subsequent request for its change will be considered or granted.

NOTE 2 :

- Candidates should also note that once a Date of Birth has been claimed by them and entered in the records of the Commission for the purpose of admission to an examination, no change will be allowed subsequently (or at any other examination of the Commission) on any grounds whatsoever.

NOTE 3 :

- The candidates should exercise due care while entering their date of birth in column 3 of the Application Form for the Preliminary Examination. If on verification at any subsequent stage, any variation is found in their date of birth from the one entered in their matriculation or equivalent Examination certificate, disciplinary action will be taken against them by the Commission under the Rules.

MINIMUM EDUCATIONAL QUALIFICATIONS

- The candidate must hold a degree of any of Universities incorporated by an Act of the Central or State Legislature in India or other educational institutions established by an Act of Parliament or declared to be deemed as a University Under Section-3 of the University Grants Commission Act, 1956, or possess an equivalent qualification.

NOTE I :

- Candidates who have appeared at an examination the passing of which would render them educationally qualified for the Commission's examination but have not been informed of the results as also the candidates who intend to appear at such a qualifying examination will also be eligible for admission to the Preliminary Examination.
- All candidates who are declared qualified by the Commission for taking the Civil Services (Main) Examination will be required to produce proof of passing the requisite examination with their application for the Main Examination failing which such candidates will not be admitted to the Main Examination. The applications for the Main Examination will be called sometime in the month of July/August, 2011.

NOTE II :

- In exceptional cases the Union Public Service Commission may treat a candidate who has not any of the foregoing qualifications as a qualified candidate provided that he/ she has passed examination conducted by the other Institutions, the standard of which in the opinion of the Commission justifies his/her admission to the examination.

NOTE III :

- Candidates possessing professional and technical qualifications which are recognised by Government as equivalent to professional and technical degree would also be eligible for admission to the examination.

NOTE IV :

- Candidates who have passed the final professional M.B.B.S. or any other Medical Examination but have not completed their internship by the time of submission of their applications for the Civil Services (Main) Examination, will be provisionally admitted to the Examination provided they submit along with their application a copy of certificate from the concerned authority of the University/Institution that they had passed the requisite final professional medical examination. In such cases, the candidates will be required to produce at the time of their interview original Degree or a certificate from the concerned competent authority of the University/Institution that they had completed all requirements (including completion of internship) for the award of the Degree.

NUMBER OF ATTEMPTS

- Every candidate appearing at the examination who is otherwise eligible, shall be permitted four attempts at the examination. Provided that this restriction on the number of attempts will not apply in the case of Scheduled Castes and Scheduled Tribes candidates who are otherwise eligible.
- Provided further that the number of attempts permissible to candidates belonging to Other Backward Classes, who are otherwise eligible shall be seven. The relaxation will be available to the candidates who are eligible to avail of reservation applicable to such candidates.
- Provided further that a physically handicapped will get as many attempts as are available to other non-physically handicapped candidates of his or her community, subject to the condition that a physically handicapped candidate belonging to the General Category shall be eligible for seven attempts. The relaxation will be available to the physically handicapped candidates who are eligible to avail of reservation applicable to such candidates.

NOTE :

- (i) An attempt at a Preliminary Examination shall be deemed to be an attempt at the Examination.
- (ii) If a candidate actually appears in any one paper in the Preliminary Examination, he/she shall be deemed to have made an attempt at the Examination.
- (iii) Notwithstanding the disqualification/cancellation of candidature, the fact of appearance of the candidate at the examination will count as an attempt.

RESTRICTIONS ON APPLYING FOR THE EXAMINATION

- A candidate who is appointed to the Indian Administrative Service or the Indian Foreign Service on the results of an earlier examination and continues to be a member of that service will not be eligible to compete at this examination.
- In case such a candidate is appointed to the IAS/IFS after the Preliminary Examination of Civil Services Examination, 2011 is over and he/she continues to be a member of that service, he/she shall not be eligible to appear in the Civil Services (Main) Examination, 2011 notwithstanding his/her having qualified in the Preliminary Examination, 2011.
- Also provided that if such a candidate is appointed to IAS/IFS after the commencement of the Civil Services (Main) Examination, 2011 but before the result thereof and continues to be a member of that service, he/she shall not be considered for appointment to any service/post on the basis of the result of this examination viz. Civil Services Examination, 2011.

REGULATIONS RELATING TO THE PHYSICAL EXAMINATIONS OF CANDIDATES

- Candidates must be physically fit according to physical standards for admission to Civil Services Examination. The regulations are published for the convenience of candidates and enable them to ascertain the probability of their possessing the required physical standard. The regulations are also intended to provide guidelines to the medical examiners.

NOTE-1 “The medical Board while conducted medical examination of the candidates who have applied against the posts reserved for physically handicapped category will keep the relevant provisions of the persons with Disabilities (equal opportunity. Protection of right and full participation) Act,1995 wherein the extent of permissible physical disability has been defined.”

NOTE-2 “Further, Government also constitute Special Medical Board(s)/Appellate Medical Board to issue the Disability Certificate in the prescribed form to physically disabled candidates and also to conduct the regular medical examination of physically disabled candidates in terms of these regulations.

Blind candidates shall be eligible only for selection/appointment in posts which are identified as suitable for them in the Brochure on Reservations and Concessions for physically handicapped in Central Government services.

2. (a) The Government of India reserve to themselves absolute discretion to reject or accept any candidate after considering the report of the Medical Board.
2. (b) The medical examination shall be conducted in two parts, i.e. Part I which shall consist of the entire medical examination which the medical board may prescribe for a candidate, except the Radiographic Examination of the chest (X-ray test) and Part II which shall consist of Radiographic Examination (X-ray test of the chest). The part II shall be conducted only in respect of the candidates who have been declared finally successful on the basis of the examination.

The classification of various Services under the two categories, namely “Technical” and “Non-Technical” will be as under:-

A. TECHNICAL

- (1) Indian Railway Traffic Service.
- (2) Indian Police service and other Central Police Services Group ‘A’ and ‘B’.
- (3) Group ‘A’ Posts in the Railway Protection Force.

B. NON-TECHNICAL

IAS, IFS, IA, and AS, Indian Customs and Central Excise service, Indian Civil Accounts Service, Indian Railway Accounts service, Indian Railway personnel service, Indian Defence Accounts services, Indian Revenue Service, Indian Ordnance Factories Services. Group A,

Indian Postal Service, Indian Defence Estates Service Group A, Indian P&T Accounts and Finance Service, Group A and other Central Civil Services Group A and B.

1. To be passed as fit for appointment, a candidate must be in good mental and bodily health and free from any physical defect likely to interfere with the efficient performance of the duties on his appointment.
2. (a) In the matter of co-relation of age limit, height and chest girth of candidates of India (including Anglo-Indian race), it is left to the Medical Board to use whatever correlation figure are considered most suitable as a guide in the examination of the candidates. If there be any disproportion with regard to height, weight and chest girth, the candidates should be hospitalized for investigation and X-ray of the chest taken before the candidate is declared fit or not fit by the Board. However, the X-ray of the chest will be done in respect of only such candidates who are directed to appear before the medical board for Part II of the medical examination.
(b) However, for certain services minimum standard for height and chest girth without which candidates cannot be accepted, are as follows:-

(1)	Height (2)	Chest girth fully expanded (3)	Expansion (4)
(1) Indian Railways	152 cm*	84 cm	5 cm (for men)
Traffic service (s)	150 cm*	79 cm	5 cm (for women)
(2) Indian Policy	165 cm	84 cm	5 cm (for men)
Service Group 'A'			
Post in Railway			
Protection Force			
and other Central	150 cm**	79 cm	5 cm (for women)
Police Services			
Group 'A' & Group 'B'			

*The minimum height prescribed is relaxable in the case of candidates belonging to scheduled Tribes and to races such as Gorkhas, Garhwalis, Assamese, Kumaonis, and Nagaland Tribal etc. whose average height is distinctly lower.

**The following relaxed minimum height standard in case of candidates belonging to the Scheduled Tribes and to the races such as Gorkhas, Assamese, Kumaonis, and Nagaland are applicable to Indian Police Service.

Men	160cms.
Women	145cms.

3. The candidate's height will be measured as follows:-

He will be remove his shoes and be placed against the standard with his feet together and the weight thrown on the heels and not on the toe or other sides of the feet. He will stand erect without rigidity and with heels calves' buttocks and shoulder touching the standard; the chin will be depressed to bring the vertex of the head level under the horizontal bar and the height will be recorded in centimeters and parts of a centimeter to halves.

4. The candidate's chest will be measured as follows:

He will be made to stand with his feet together and to raise arms over his head. The tape will be so adjusted round the chest that its upper edge touches the inferior angles of the shoulder blades behind and ties in the same horizontal plane when the tape is taken round the chest. The arms will then be lowered to hang loosely by the side and care will be taken that the shoulders are not thrown upwards or backwards so as to displace the tape. The candidate will then be directed to take a deep inspiration several times and the maximum expansion of the chest will be carefully noted and the minimum and maximum will then be recorded in centimeters 84-89, 86-93.5 etc. In recording the measurements fractions of less than half a centimeter should not be noted.

N.B.- The height and chest of the candidates should be measured twice before coming to a final decision.

5. The candidate will also be weighed and his weight recorded in kilograms; fractions of half a kilogram should not be noted.

6. (a) The candidate's eye-sight will be tested in accordance with the following rules. The result of each test will be recorded.

(i) General- The candidate's eyes will be submitted to a general examination directed to the detection of any disease or abnormality. The candidate will be rejected if he suffers from any morbid conditions of eye, eyelids or contiguous structure of such a sort as to render or are likely at future date to render him unfit for service.

(ii) Visual Acuity- The examination for determining the acuteness of visions includes two tests-one for distant the other for near vision. Each eye will be examined separately.

(b) There shall be no limit for maximum naked eye vision but the naked eye vision of the candidates shall however be recorded by the Medical Board or other medical authority in every case, as it will furnish the basic information in regard to the condition of the eye.

(c) The following standards are prescribed for distant and near vision with or without glasses for different types of services.

Class of Service

	IPS and other Police Services, Group 'A' & 'B' and IRTS/RPF (Technical Services)		IAS, IFS and Other Central Civil Services, Group 'A' & 'B' (Non-technical Services)	
	Better eye (corrected vision)	Worse eye	Better eye (corrected vision)	Worse eye
1. Distant vision	6/6 or 6/9	6/12 or 6/9	6/6 or 6/9	6/18 to Nil or 6/12
2. Near vision	J1**	J2**	J1** J2	J3 to Nil** J2
3. Types of corrections permitted	Spectacles		Spectacles 10L* Radial Keratotomy*/ Lasik Laser Surgery	
4. Limits of refractive permitted	+4.00 D (including cylinder)-Non-Myopia	Pathological	None but without	
5. Colour vision requirements	High Grade		Low grade	
6. Binocular vision needed	Yes		No	

* To be referred to a Special Board of Ophthalmologists.

** Near vision for Railways Service viz., IRTS, IRAS, IRPS and RPF is J1 in better eye and J11 in worse eye

(d) (i) in respect of the Technical service mentioned above any other service concerned with the safety of public the total amount of Myopia (including the cylinder) shall not exceed minus 4.00 D. Total amount of hypermetropia (including the cylinder) shall not exceed plus 4.00 D:

Provided that in case a candidate in respect of the services classified as “Technical” (other than the Services under the Ministry of Railways) is found unfit on grounds of high myopia the matter shall be referred to a special board of three ophthalmologists to declare whether this myopia is pathological or not. In case it is not pathological, the candidate shall be declared fit, provided he fulfils the visual requirements otherwise.

(ii) In every case of myopia, fundus examination should be carried out and the results recorded. In the event of pathological condition being present which is likely to be progressive and affect the efficiency of the candidate, he/she should be declared unfit.

(e) Field of vision: The field of vision shall be tested in respect of all services by the confrontation method. When such test gives unsatisfactory or doubtful result the field of vision should be determined on the perimeter.

(f) Night Blindness: Broadly there are two types of night blindness (1) as a result of Vitamin A deficiency and (2) as a result of Organic disease of Retina-common cause being Retinitis Pigmentosa. In (1) the fundus is normal, generally seen in younger age group and ill nourished persons and improves by large doses of Vitamin A. In (2) the fundus is often involved and mere fundus examination will reveal the condition in majority of cases. The patient in this category is an adult and may not suffer from malnutrition persons seeking employment for higher posts in the Government will fall in this category. For both (1) and (2) dark adaptation test will reveal the condition. For (2) specially when fundus is not involved electro-Retinography is required to be done. Both these tests (dark adaptation and retinography) are time-consuming and require as a routine test in a medical check up. Because of these specialized set up, and equipment and thus are not possible as a technical considerations, it is for the Ministry/Department to indicate if these tests for night blindness are required to be done. This will depend upon the job requirement and nature of duties to be performed by the prospective Government employees.

For Railway Services (IRTS, IRAS, IRPS and RPF) - Night blindness need not be tested as a routine but only in special cases. No standard test for the testing of night blindness or dark adaption is prescribed. The Medical Board should be given the discretion to improvise such rough test e.g., recording of visual acuity with reduced illumination or by making or by making the candidate recognize various objects in a darkened room after he has been there for 20 to 30 minutes. “Candidates” own statements should not always be relied upon but they should be given due consideration.

(g) Colour Vision: The testing of color vision shall be essential in respect of the Technical Services mentioned above. As regards the non-Technical Services/posts the Ministry/ Department concerned will have to inform the medical board that the candidate is for a service requiring colour vision examination or not.

Colour perception should be graded into higher and lower depending upon the size of aperture in the lantern as described in the table below:-

Grade	Higher Grade colour Perception	Lower Grade Colour Perception
1	2	3
1. Distance between the lamp and the candidate	16 ft	16 ft
2. Size of aperture	1.3 mm.	13 mm.
3. Time of exposure	5 seconds	5 seconds

For the IPS and other Police Services, Group 'A' and 'B' Indian Railway Traffic Service Group A posts in the Railway Protection force and for other Services concerned with the safety of the public higher grade of colour vision is essential but for others lower, grade of colour vision should be considered sufficient.

Satisfactory colour vision constitutes, recognition with ease and without hesitation of signal red, green and yellow colours. The use of Ishihara's plates, shown in good light and a suitable Edrige Green's lantern shall be considered quite dependable for testing colour vision. While either of the two tests may ordinarily be considered sufficient in respect of services concerned with road, rail and air traffic, it is essential to carry out the lantern test. In doubtful cases where a candidate fails to qualify when tested by only one of the two tests, both the tests should be employed. However both the Ishihara's plates and Edrige Green's lantern shall be used for testing colour vision of candidates for appointment to the Indian Railway Traffic Service and Group 'A' posts in the Railway protection Force.

(h) Ocular condition other than visual acuity-

(i) Any organic disease or a progressive refractive error, which is likely to result in lowering visual acuity, should be considered a disqualification.

(ii) squint: For technical services where the presence of binocular vision is essential squint, even if the vision acuity in each eye is of prescribed standard should be considered a disqualification. For other services the presence of squint should not be considered as a disqualification if the visual acuity is of the prescribed standards. For Railways technical services binocular vision is essential.

(iii) if a person has one eye or if he has one eye which has normal vision and the other eye is amblyopic or has subnormal vision the usual effect is

that the person is lacking stereoscopic vision for perception of depth. Such vision is not necessary for many civil posts. The medical board may recommend as fit such persons provided the normal eye has-

- (i) 6/6 distant vision j/l near vision with or without glasses provided the error in any meridian is not more than 4 dioptres for distant vision.
- (ii) Has full field of vision.
- (iii) Normal colour vision wherever required:

Provided the Board is satisfied that the candidate can perform all the functions for the particular job in question.

The above relaxed standard of visual acuity will NOT apply to candidates for post/services classified as "TECHNICAL" The Ministry/Department concerned will have to inform the medical board that the candidate is for a "TECHNICAL" post or not.

- (iv) Contact Lenses: During the medical examination of Candidate, the use of contact lenses is not to be allowed. It is necessary that when conducting eye test the illumination of the typed letters for distant vision should have an illumination of 15 foot-candles.

GUIDELINES FOR SPECIAL OPHTHALMIC BOARD

Special ophthalmic Board for eye examination shall consist of 3 ophthalmologists:

- (a) Cases where the Medical Board has recorded visual function within normal prescribed limits but suspects a disease of progressive and organic nature, which is likely to cause damage to the visual function should refer the candidate to a special ophthalmic Board for opinion as part of the first Medical Board.
- (b) All cases of any type of surgery on eyes. IOL, refractive corneal surgery, doubtful cases of colour defect should be referred to special ophthalmic Board.
- (c) In such cases where a candidate is found to be having high myopia or high hypermetropia the Central Standing Medical Board/State Medical Board should immediately refer the candidates for a special Board of three ophthalmologists constituted by the Medical Superintendent of the hospital/A.M.O. with the head of the Department of ophthalmology of the hospital or the senior most ophthalmologist as the Chairman of the special Board . The ophthalmologist/Medical Officer who has conducted the preliminary ophthalmic examination cannot be a part of the special Board.

The examination by the special board should preferably be done on the same day. Whenever it is not possible to convene the special board of three Ophthalmologists on the day of medical examination by the central standing Medical Board/State Medical

board, the board may be convened at an earliest possible date.

The special Ophthalmic Board may carry out detailed investigation before arriving at their decision.

The Medicals Board's report may not be deemed as complete unless it includes the report of the Special board for all such cases which are referred to it.

FEE

- (a) Candidates applying Online (exempting Female/SC/ST/PH Candidates who are exempted from payment of fee) are required to pay a reduced fee of Rs. 50/- (Rupees Fifty only) either by remitting the money in any Branch of SBI by Cash, or by using net banking facility of SBI or by using Visa/Master Credit/Debit Card.
 - (b) Candidates applying Offline (through Common Application Form) are required to pay a fee of Rs. 100/- (Rupees One Hundred only) through a single Central Recruitment Stamp. Central Recruitment Fee Stamp (NOT Postage Stamp) of the requisite denomination may be obtained from the Post Office and affixed on the application form in the space provided therein. The stamp must be got cancelled from the issuing Post Office with the date stamp of the Post Office in such a manner that the impression of the cancellation mark partially overflows on the application form itself but within the space provided on the Application form itself. The impression of the cancellation mark should be clear and distinct to facilitate the identification of date and the Post Office of issue.
- Candidates residing abroad should deposit the prescribed fee in the office of India's High Commissioner, Ambassador or representative abroad as the case may be for credit to account head "051-Public Service Commission-Examination Fees" and attach the receipt with the application.
 - *All female candidates and candidates belonging to Scheduled Caste/Scheduled Tribe/ Physically Handicapped categories are exempted from payment of fee. No fee exemption is, however, available to OBC candidates and they are required to pay the prescribed fee in full.*
 - Physically disabled persons are exempted from the payment of fee provided they are otherwise eligible for appointment to the Services/Posts to be filled on the results of this examination on the basis of the standards of medical fitness for these Services/
 - Posts (including any concessions specifically extended to the physically disabled).
 - A physically disabled candidate claiming fee concession will be required by the Commission to submit along with their Detailed Application Form, a certified copy of the certificate from a Government Hospital/Medical Board in support of his/her claim for being physically disabled.

NOTE :

- Notwithstanding the aforesaid provision for fee exemption, a physically disabled candidate will be considered to be eligible for appointment only if he/she (after such physical examination as the Government or the Appointing Authority, as the case may be, may prescribe) is found to satisfy the requirements of physical and medical standards for the concerned Services/Posts to be allocated to physically disabled candidates by the Government.
- 'Postage Stamps' will in no case be accepted in lieu of 'Central Recruitment Fee Stamp'.
- Candidates should note that the fee sent through **Indian Postal Orders, Bank Draft, Money Order, Crossed Cheque, Currency notes or Treasury Challan etc.** will not be accepted by the Commission and such applications will be treated as without fee and will be summarily rejected.

NOTE I :

- *APPLICATIONS NOT ACCOMPANIED BY THE PRESCRIBED FEE (UNLESS REMISSION OF FEE IS CLAIMED) SHALL BE SUMMARILY REJECTED.*

NOTE II :

- Fee once paid shall not be refunded under any circumstances nor can the fee be held in reserve for any other examination or selection.

NOTE III :

- If any candidate who took the Civil Services Examination held in 2010 wishes to apply for admission to this examination, he/she must submit his/her application so as to reach the Commission's Office by the prescribed date without waiting for the results or an offer of appointment.

NOTE IV :

- Candidates admitted to the Main Examination will be required to pay a further fee of Rs. 200/- (Rupees Two hundreds only).

HOW TO APPLY

- (a) Candidates may apply online using the website **<http://www.upsconline.nic.in>** Detailed instructions for filling up online applications are available on the abovementioned website.
 - (b) Candidates may also apply offline in the Common Application form devised by the commission for its examinations which can be processed on computerized machines.
- This application form along with an Information Brochure containing general instructions for filling up the form, an acknowledgement card and an envelope for sending the application will be **obtainable from the designated Head Post Offices/Post Offices** throughout the country of Notice against cash **payment of**

Rs. 30/- (Rupees Thirty only). Form should be purchased from the designated Head Post Offices/Post Offices only and not from any other agency. This **Form can be used only once and for only one examination**. Candidates who wish to apply offline must use the form supplied with the Information Brochure only and they should in no case use photocopy/reproduction/unauthorisedly printed copy of the Form. Since this form is electronically scanned, due care should be taken to fill up the application form, correctly. While filling up the application form. The candidates should also fill up in the relevant places of the **Acknowledgement Card**, their Application Form Number and the name of the examination. The applicants are required to affix the postage stamp of Rs. Six on the Acknowledgement Card and send the same along with application form to UPSC.

- If an applicant fails to affix the postage stamp of requisite amount his acknowledgement card will not be dispatched and Commission will not be responsible for non-receipt of acknowledgement cards by the applicant.
- The duly filled in application form and the acknowledgement card should then be **mailed in the special envelope** supplied with the Information Brochure. The candidate should also write the name of examination viz. **Civil Services (Preliminary) Examination (of that particular year in which the candidate apply)** on the envelope before dispatching it to *Controller of Examinations, Union Public Service Commission, Dholpur House, Shahjahan Road, New Delhi-110069*.
- (c) All candidates, whether already in Government Service, Government owned industrial undertakings or other similar organisations or in private employment should submit their applications direct to the Commission. If any candidate forwards his/her application through his/her employer and it reaches the Union Public Service Commission late, the application, even if submitted to the employer before the closing date, will not be considered.
- Persons already in Government Service, whether in a permanent or temporary capacity or as workcharged employees other than casual or daily rated employees or those serving under the Public Enterprises are however, required to submit an undertaking that they have informed in writing their Head of Office/Department that they have applied for the Examination.
- Candidates should note that in case a communication is received from their employer by the Commission withholding permission to the candidates applying for/appearing at the examination, their application will be liable to be rejected/candidature will be liable to be cancelled.

NOTE 1 :

- **While filling in his/her Application Form, the candidate should carefully decide about his/her choice of centre for the Examination. More than**

one application from a candidate giving different centres will not be accepted in any case. Even if a candidate sends more than one completed application the Commission will accept only one application at their discretion and the Commission's decision in the matter shall be final.

- If any candidate appears at a centre other than the one indicated by the Commission in his/her Admission Certificate, the papers of such a candidate will not be valued and his/her candidature will be liable to cancellation.

NOTE 2 :

- Since these Application Forms are to be processed in a computerised system, due care should be taken by the candidates to fill up their Application Form correctly.
- Necessary instructions for filling up the Form may be seen at Appendix II (B). No relevant columns of the application should be left blank. Incomplete or defective applications shall be summarily rejected. No representation or correspondence regarding such rejection shall be entertained under any circumstances.
- Candidates are not required to submit alongwith their applications any certificate in support of their claims regarding Age, Educational Qualifications, Scheduled Castes/Scheduled Tribes/Other Backward Classes and Physically disabled etc. which will be verified at the time of the Main examination only. The candidates applying for the examination should ensure that they fulfil all the eligibility conditions for admission to the Examination.
- Their admission at all the stages of examination for which they are admitted by the Commission viz. Preliminary Examination, Main (Written) Examination and Interview Test will be purely provisional, subject to their satisfying the prescribed eligibility conditions. If on verification at any time before or after the Preliminary Examination, Main (written) Examination and Interview Test, it is found that they do not fulfil any of the eligibility conditions, their candidature for the examination will be cancelled by the Commission.
- If any of their claims is found to be incorrect, they may render themselves liable to disciplinary action by the Commission in terms of Rule 14 of the Rules for the Civil Services Examination, 2011 reproduced below :
A candidate who is or has been declared by the Commission to be guilty of :
 - (i) Obtaining support for his/her candidature by the following means, namely :
 - (a) offering illegal gratification to, or

- (b) applying pressure on, or
 - (c) blackmailing, or threatening to blackmail any person connected with the conduct of the examination, or
 - (ii) impersonating, or
 - (iii) procuring impersonation by any person, or
 - (iv) submitting fabricated documents or documents which have been tampered with, or
 - (v) making statements which are incorrect or false or suppressing material information, or
 - (vi) resorting to the following means in connection with his/her candidature for the examination, namely
 - (a) obtaining copy of question paper through improper means, (b) finding out the particulars of the persons connected with secret work relating to the examination.
 - (c) influencing the examiners, or (vii) using unfair means during the examination, or
 - (viii) writing obscene matter or drawing obscene sketches in the scripts, or
 - (ix) misbehaving in the examination hall including tearing of the scripts, provoking fellow examinees to boycott examination, creating a disorderly scene and the like, or
 - (x) harassing or doing bodily harm to the staff employed by the Commission for the conduct of their examinations, or
 - (xi) being in possession of or using mobile phone, pager or any electronic equipment or device or any other equipment capable of being used as a communication device during the examination; or
 - (xii) violating any of the instructions issued to candidates along with their Admission Certificates permitting them to take the examination, or
 - (xiii) attempting to commit or as the case may be abetting the Commission of all or any of the acts specified in the foregoing clauses; may in addition to rendering himself/herself liable to criminal prosecution, be liable.
 - (a) to be disqualified by the Commission from the examination for which he/she is a candidate and/or
 - (b) to be debarred either permanently or for a specified period
 - (i) by the Commission from any examination or selection held by them;
 - (ii) by the Central Government from any employment under them; and
 - (c) if he/she is already in service under Government to disciplinary action under the appropriate Rules.
- Provided that no penalty under this Rules shall be imposed except after:
- (i) giving the candidate an opportunity of making such representation, in writing

- as he/she may wish to make in that behalf; and
- (ii) taking the representation, if any, submitted by the candidate within the period allowed to him/her into consideration.

ACKNOWLEDGEMENT OF APPLICATIONS

- Immediately on receipt of an application from a candidate, the Acknowledgement Card submitted by him/her along with the Application Form will be despatched to him/her by the Commission's Office duly stamped in token of receipt of his/her Application.
- If a candidate does not receive the Acknowledgement Card within 30 days, he/she should at once contact the Commission by quoting his/her Application Form No. and name & year of examination. Candidates delivering the Application Form in person at the Commission's Counter will be issued Acknowledgement Card at the Counter itself. The mere fact that a candidate's application has been acknowledged by the Commission does not mean that his/her candidature for the examination has been accepted by the Commission. Candidates will be informed at the earliest possible about their admission to the examination or rejection of their application.

CORRESPONDENCE WITH THE COMMISSION

- The Commission will not enter into any correspondence with the candidates about their candidature except in the following cases:
 - (i) Every candidate for this examination will be informed at the earliest possible date of the result of his/her application. Admission Certificates, indicating the Roll Nos. will be issued to the candidates who are admitted to the examination. The Admission Certificate will bear the photograph of the candidate. If a candidate does not receive his Admission Certificate or any other communication regarding his/her candidature for the examination **three weeks** before the commencement of the examination, he/she should at once contact the Commission. On receipt of such a communication, Admission Certificate or a duplicate copy thereto will be issued to the admitted candidate. Information in this regard can also be obtained from the Facilitation Counter located in the Commission's Office either in person or over phone Nos. 011-23381125/011-23385271/011-23098543. **In case no communication is received in the Commission's Office from the candidate regarding non-receipt of his/her Admission Certificate at least 3 weeks before the examination, he/she himself/herself will be solely responsible for non-receipt of his/her Admission Certificate.**

It may be noted that the Admission Certificate will be issued at the address as photocopied from the Application Form filled in by the candidate. The candidate should, therefore, ensure that address given by him/her in the Application Form is correct and complete with pin code.

- **No candidate will ordinarily be allowed to take the examination unless he/she holds a certificate of admission for the examination. On the receipt of Admission Certificate, check it carefully and bring discrepancies/ errors, if any, to the notice of UPSC immediately.**
- The candidates should note that their admission to the examination will be purely provisional based on the information given by them in the Application Form. This will be subject to verification of all the eligibility conditions by the UPSC.
- **The mere fact that a certificate of admission to the Examination has been issued to a candidate, will not imply that his/her candidature has been finally cleared by the Commission or that entries made by the candidate in his/her application for the Preliminary examination have been accepted by the Commission as true and correct. Candidates may note that the Commission takes up the verification of eligibility conditions of a candidate, with reference to original documents, only after the candidate has qualified for Civil Services (Main) Examination. Unless candidature is formally confirmed by the Commission, it continues to be provisional.**
- The decision of the Commission as to the eligibility or otherwise of a candidate for admission to the Examination shall be final. Candidates should note that the name in the Admission Certificate in some cases, may be abbreviated due to technical reasons.
- (ii) In the event of a candidate receiving more than one Admission Certificate from the Commission, he/she should use only one of these Admission Certificates for appearing in the examination and return the other(s) to the Commission's Office.
- (iii) A candidate must see that communications sent to him/her at the address stated in his/her application are redirected, if necessary.
- Change in address should be communicated to the Commission at the earliest opportunity. Although the Commission make every effort to take account of such changes, they cannot accept any responsibility in the matter.
- (iv) Candidates are informed that as the Preliminary Examination is only a screening test, no marks sheets will be supplied to successful or unsuccessful to be Confirmed candidates and no correspondence will be entertained by the Commission, in this regard.
- (v) If a candidate receives an Admission Certificate in respect of some other candidate on account of handling error, the same should be immediately returned to the Commission with a request to issue the correct Admission Certificate. Candidates may note that they will not be allowed to take the examination on the strength of an Admission Certificate issued in respect of another candidate.
- **IMPORTANT : ALL COMMUNICATIONS TO THE COMMISSION SHOULD INVARIABLY CONTAIN THE FOLLOWING PARTICULARS.**

1. NAME AND YEAR OF THE EXAMINATION.
 2. APPLICATION FORM NUMBER
 3. ROLL NUMBER (IF RECEIVED)
 4. NAME OF CANDIDATE (IN FULL AND IN BLOCK LETTERS)
 5. COMPLETE POSTAL ADDRESS AS GIVEN IN THE APPLICATION.
- **N.B. I. COMMUNICATION NOT CONTAINING THE ABOVE PARTICULARS MAY NOT BE ATTENDED TO.**
 - **N.B. II. CANDIDATES SHOULD ALSO NOTE DOWN THEIR APPLICATION FORM NUMBER FOR FUTURE REFERENCE.**
 - **THEY MAY BE REQUIRED TO INDICATE THE SAME IN CONNECTION WITH THEIR CANDIDATURE FOR THE CIVIL SERVICES (MAIN) EXAMINATION.**

Section-III
SYLLABUS FOR THE EXAMINATION
PART-A
PRELIMINARY EXAMINATION

- The Examination shall comprise two compulsory papers of 200 marks each.
- Paper I - (200 marks) Duration : Two hours***
- Current events of national and international importance.
 - History of India and Indian National Movement.
 - Indian and World Geography - Physical, Social, Economic Geography of India and the World.
 - Indian Polity and Governance - Constitution, Political System, Panchayati Raj, Public Policy, Rights Issues, etc.
 - Economic and Social Development - Sustainable Development, Poverty, Inclusion, Demographics, Social Sector initiatives, etc.
 - General issues on Environmental Ecology, Bio-diversity and Climate Change - that do not require subject specialisation
 - General Science.

Paper II- (200 marks) Duration: Two hours

- Comprehension
- Interpersonal skills including
- Communication Skills;
- Logical reasoning and analytical ability
- Decision-making and problem solving
- General mental ability
- Basic numeracy (numbers and their relations, orders of magnitude, etc.) (Class X level), Data interpretation (charts, graphs, tables, data sufficiency etc. - Class X level) English Language Comprehension skills (Class X level).

Note 1

- Questions relating to English Language Comprehension skills of Class X level (last item in the Syllabus of Paper-II) will be tested through passages from English language only without providing Hindi translation thereof in the question paper.

Note 2

- The questions will be of multiple choice, objective type.

Note 3: Penalty for Wrong Answers

- There will be penalty (negative marking) for wrong answers marked by a candidate in the objective type question papers except some of the questions where the negative marking will be in built in the form of different marks being awarded to most appropriate and not so appropriate answer for such questions.
- There are four alternatives for the answers to every question. For each question for which a wrong answer has been given by the candidate, one third (0.33) of the marks assigned to that question will be deducted as penalty.

- If a candidate gives more than one answer, it will be treated as a wrong answer even if one of the given answers happens to be correct and there will be same penalty as above for that question.
- If a question is left blank i.e. no answer is given by the candidate, there will be no penalty for that question.

PART-B

MAIN EXAMINATION

- The main Examination is intended to assess the overall intellectual traits and depth of understanding of candidates rather than merely the range of their information and memory.
- The scope of the syllabus for the optional subject papers for the examination is broadly of the honours degree level i.e. a level higher than the bachelors degree and lower than the masters degree. In the case of Engineering and law, the level corresponds to the bachelor's degree.

COMPULSORY SUBJECTS

ENGLISH AND INDIAN LANGUAGES

- The aim of the paper is to test the candidate's ability to read and understand serious discursive prose, and to express his ideas clearly and correctly in English/ Indian language concerned.
- The pattern of questions would be broadly as follows :
 - (i) Comprehension of given passages.
 - (ii) Precis Writing
 - (iii) Usage and Vocabulary
 - (iv) Short Essay

INDIAN LANGUAGES

- (i) Comprehension of given passages.
- (ii) Precis Writing
- (iii) Usage and Vocabulary.
- (iv) Short Essay
- (v) Translation from English to the Indian language and vice-versa.

Note 1:

- The Papers on Indian Languages and English will be of Matriculation or equivalent standard and will be of qualifying nature only. The marks obtained in these papers will not be counted for ranking.

Note 2

- The candidates will have to answer the English and Indian Languages papers in English and the respective Indian language (except where translation is involved).

ESSAY

- Candidates will be required to write an essay on a specific topic. The choice of subjects will be given. They will be expected to keep closely to the subject of the essay to arrange their ideas in orderly fashion, and to write concisely. Credit will be given for effective and exact expression.

GENERAL STUDIES

General Guidelines:

- The nature and standard of questions in the **General Studies** papers will be such that a well-educated person will be able to answer them without any specialized study. The questions will be such as to test a candidate's general awareness of a variety of subjects, which will have relevance for a career in Civil Services. The questions are likely to test the candidate's basic understanding of all relevant issues, and ability to analyze, and take a view on conflicting socio-economic goals, objectives and demands. The candidates must give relevant, meaningful and succinct answers.

PAPER - I

1. History of Modern India and Indian Culture :

- The History of Modern India will cover history of the Country from about the middle of nineteenth century and would also include questions on important personalities who shaped the freedom movement and social reforms. The part relating to Indian culture will cover all aspects of Indian culture from the ancient to modern times as well as principal features of literature, arts and architecture.

2. Geography of India :

- In this part, questions will be on the physical, economic and social geography of India.

3. Constitution of India and Indian Polity:

- This part will include questions on the Constitution of India as well as all constitutional, legal, administrative and other issues emerging from the politico-administrative system prevalent in the country.

4. Current National Issues and Topics of Social Relevance :

- This part is intended to test the candidate's awareness of current national issues and topics of social relevance in present-day India, such as the following:
 - (i) The Indian economy and issues relating to planning, mobilization of resources, growth, development and employment.
 - (ii) Issues arising from the social and economic exclusion of large sections from the benefits of development.
 - (iii) Other issues relating to the development and management of human resource.
 - (iv) Health issues including the management of Public Health, Health education

and ethical concerns regarding health-care, medical research and pharmaceuticals.

- (v) Law enforcement, internal security and related issues such as the preservation of communal harmony.
- (vi) Issues relating to good governance and accountability to the citizens including the maintenance of human rights, and of probity in public life.
- (vii) Environmental issues, ecological preservation, conservation of natural resources and national heritage.

PAPER - II

1. India and the World :

- This part will include questions to test candidate's awareness of India's relationship with the world in various spheres such as the following:
- Foreign Affairs with special emphasis on India's relations with neighbouring countries and in the region.
- Security and defence related matters.
- Nuclear policy, issues, and conflicts.
- The Indian Diaspora and its contribution to India and the world.

2. India's Economic Interaction with the World :

- In this part, questions will be on economic and trade issues such as foreign trade, foreign investment; economic and diplomacy issues relating to oil, gas and energy flows; the role and functions of I.M.F., World Bank, W.T.O., WIPO etc. which influence India's economic interaction with other countries and international institutions.

3. Developments in the Field of Science & Technology, IT and space :

- In this part, questions will test the candidate's awareness of the developments in the field of science and technology, information technology, space and basic ideas about computers, robotics, nanotechnology, biotechnology and related issues regarding intellectual property rights.

4. International Affairs and Institutions :

- This part will include questions on important events in world affairs and on international institutions.

5. Statistical analysis, graphs and diagrams

- This part will test the candidate's ability to draw conclusions from information presented in statistical, graphical or diagrammatical form and to interpret them.

**OPTIONAL SUBJECTS SYLLABUS
FOR MAIN EXAMINATION**

**AGRICULTURE
PAPER - I**

- Ecology and its relevance to man, natural resources, their sustainable management and conservation. Physical and social environment as factors of crop distribution and production. Agro ecology; cropping pattern as indicators of environments. Environmental pollution and associated hazards to crops, animals and humans. Climate change – International conventions and global initiatives. Green house effect and global warming. Advance tools for ecosystem analysis – Remote sensing (RS) and Geographic Information Systems (GIS).
- Cropping patterns in different agro-climatic zones of the country. Impact of high-yielding and short-duration varieties on shifts in cropping patterns. Concepts of various cropping and farming systems. Organic and Precision farming. Package of practices for production of important cereals, pulses, oil seeds, fibres, sugar, commercial and fodder crops.
- Important features and scope of various types of forestry plantations such as social forestry, agro-forestry, and natural forests. Propagation of forest plants. Forest products. Agro forestry and value addition. Conservation of forest flora and fauna.
- Weeds, their characteristics, dissemination and association with various crops; their multiplications; cultural, biological, and chemical control of weeds.
- Soil- physical, chemical and biological properties. Processes and factors of soil formation. Soils of India. Mineral and organic constituents of soils and their role in maintaining soil productivity. Essential plant nutrients and other beneficial elements in soils and plants. Principles of soil fertility, soil testing and fertilizer recommendations, integrated nutrient management. Biofertilizers. Losses of nitrogen in soil, nitrogen-use efficiency in submerged rice soils, nitrogen fixation in soils. Efficient phosphorus and potassium use. Problem soils and their reclamation. Soil factors affecting greenhouse gas emission.
- Soil conservation, integrated watershed management. Soil erosion and its management. Dry land agriculture and its problems. Technology for stabilizing agriculture production in rain fed areas.
- Water-use efficiency in relation to crop production, criteria for scheduling irrigations, ways and means of reducing run-off losses of irrigation water. Rainwater harvesting. Drip and sprinkler irrigation. Drainage of waterlogged soils, quality of

irrigation water, effect of industrial effluents on soil and water pollution. Irrigation projects in India.

- Farm management, scope, importance and characteristics, farm planning. Optimum resource use and budgeting. Economics of different types of farming systems. Marketing management – strategies for development, market intelligence. Price fluctuations and their cost; role of co-operatives in agricultural economy; types and systems of farming and factors affecting them. Agricultural price policy. Crop Insurance.
- Agricultural extension, its importance and role, methods of evaluation of extension programmes, socio-economic survey and status of big, small and marginal farmers and landless agricultural labourers. Training programmes for extension workers. Role of Krishi Vigyan Kendra's (KVK) in dissemination of Agricultural technologies. Non Government Organization (NGO) and self- help group approach for rural development.

PAPER – II

- Cell structure, function and cell cycle. Synthesis, structure and function of genetic material. Laws of heredity. Chromosome structure, chromosomal aberrations, linkage and cross-over, and their significance in recombination breeding. Polyploidy, euploids and aneuploids. Mutations - and their role in crop improvement. Heritability, sterility and incompatibility, classification and their application in crop improvement. Cytoplasmic inheritance, sex-linked, sex-influenced and sex-limited characters.
- History of plant breeding. Modes of reproduction, selfing and crossing techniques. Origin, evolution and domestication of crop plants, center of origin, law of homologous series, crop genetic resources- conservation and utilization. Application of principles of plant breeding, improvement of crop plants. Molecular markers and their application in plant improvement. Pure-line selection, pedigree, mass and recurrent selections, combining ability, its significance in plant breeding. Heterosis and its exploitation. Somatic hybridization. Breeding for disease and pest resistance. Role of interspecific and intergeneric hybridization. Role of genetic engineering and biotechnology in crop improvement. Genetically modified crop plants.
- Seed production and processing technologies. Seed certification, seed testing and storage. DNA finger printing and seed registration. Role of public and private sectors in seed production and marketing. Intellectual Property Rights (IPR) issues, WTO issues and its impact on Agriculture.
- Principles of Plant Physiology with reference to plant nutrition, absorption, translocation and metabolism of nutrients. Soil - water- plant relationship.
- Enzymes and plant pigments; photosynthesis- modern concepts and factors

affecting the process, aerobic and anaerobic respiration; C_3 , C_4 and CAM mechanisms. Carbohydrate, protein and fat metabolism. Growth and development; photoperiodism and vernalization. Plant growth substances and their role in crop production. Physiology of seed development and germination; dormancy. Stress physiology – draught, salt and water stress.

- Major fruits, plantation crops, vegetables, spices and flower crops. Package practices of major horticultural crops. Protected cultivation and high tech horticulture. Post harvest technology and value addition of fruits and vegetables. Landscaping and commercial floriculture. Medicinal and aromatic plants. Role of fruits and vegetables in human nutrition.
- Diagnosis of pests and diseases of field crops, vegetables, orchard and plantation crops and their economic importance. Classification of pests and diseases and their management. Integrated pest and disease management. Storage pests and their management. Biological control of pests and diseases. Epidemiology and forecasting of major crop pests and diseases. Plant quarantine measures. Pesticides, their formulation and modes of action.
- Food production and consumption trends in India. Food security and growing population – vision 2020. Reasons for grain surplus. National and international food policies. Production, procurement, distribution constraints. Availability of food grains, per capita expenditure on food. Trends in poverty, Public Distribution System and Below Poverty Line population, Targeted Public Distribution System (PDS), policy implementation in context to globalization. Processing constraints. Relation of food production to National Dietary Guidelines and food consumption pattern. Food based dietary approaches to eliminate hunger. Nutrient deficiency – Micro nutrient deficiency : Protein Energy Malnutrition or Protein Calorie Malnutrition (PEM or PCM), Micro nutrient deficiency and HRD in context of work capacity of women and children. Food grain productivity and food security.

ANIMAL HUSBANDRY AND VETERINARY SCIENCE PAPER-I

1. Animal Nutrition:

- 1.1 Partitioning of food energy within the animal. Direct and indirect calorimetry. Carbon – nitrogen balance and comparative slaughter methods. Systems for expressing energy value of foods in ruminants, pigs and poultry. Energy requirements for maintenance, growth, pregnancy, lactation, egg, wool, and meat production.
- 1.2 Latest advances in protein nutrition. Energy protein interrelationships. Evaluation of protein quality. Use of NPN compounds in ruminant diets. Protein requirements for maintenance, growth, pregnancy, lactation, egg, wool and meat production.
- 1.3 Major and trace minerals - Their sources, physiological functions and deficiency symptoms. Toxic minerals. Mineral interactions. Role of fat-soluble and water – soluble vitamins in the body, their sources and deficiency symptoms.
- 1.4 Feed additives – methane inhibitors, probiotics, enzymes, antibiotics, hormones, oligosaccharides, antioxidants, emulsifiers, mould inhibitors, buffers etc. Use and abuse of growth promoters like hormones and antibiotics – latest concepts.
- 1.5 Conservation of fodders. Storage of feeds and feed ingredients. Recent advances in feed technology and feed processing. Anti – nutritional and toxic factors present in livestock feeds. Feed analysis and quality control. Digestibility trials – direct, indirect and indicator methods. Predicting feed intake in grazing animals.
- 1.6 Advances in ruminant nutrition. Nutrient requirements. Balanced rations. Feeding of calves, pregnant, work animals and breeding bulls. Strategies for feeding milch animals during different stages of lactation cycle. Effect of feeding on milk composition. Feeding of goats for meat and milk production. Feeding of sheep for meat and wool production.
- 1.7 Swine Nutrition. Nutrient requirements. Creep, starter, grower and finisher rations. Feeding of pigs for lean meat production. Low cost rations for swine.
- 1.8 Poultry nutrition. Special features of poultry nutrition. Nutrient requirements for meat and egg production. Formulation of rations for different classes of layers and broilers.

2. Animal Physiology:

- 2.1 Physiology of blood and its circulation, respiration; excretion. Endocrine glands

- in health and disease.
- 2.2 Blood constituents.-Properties and functions-blood cell formation-Haemoglobin synthesis and chemistry-plasma proteins production, classification and properties, coagulation of blood;Haemorrhagic disorders-anticoagulants-blood groups-Blood volume-Plasma expanders-Buffer systems in blood. Biochemical tests and their significance in disease diagnosis.
- 2.3 Circulation. - Physiology of heart, cardiac cycle, heart sounds, heart beat, electrocardiograms. Work and efficiency of heart-effect of ions on heart function-metabolism of cardiac muscle, nervous and chemical regulation of heart, effect of temperature and stress on heart, blood pressure and hypertension, osmotic regulation, arterial pulse, vasomotor regulation of circulation, shock. Coronary and pulmonary circulation, Blood-Brain barrier-Cerebrospinal fluid- circulation in birds.
- 2.4 Respiration. - Mechanism of respiration, Transport and exchange of gases – neural control of respiration-chemo-receptors-hypoxia-respiration in birds.
- 2.5 Excretion-Structure and function of kidney-formation of urine-methods of studying renal function-renal regulation of acid-base balance: physiological constituents of urine-renal failure-passive venous congestion-Urinary secretion in chicken-Sweat glands and their function. Bio-chemical test for urinary dysfunction.
- 2.6 Endocrine glands. -Functional disorders their symptoms and diagnosis. Synthesis of hormones, mechanism and control of secretion- hormonal receptors-classification and function.
- 2.7 Growth and Animal Production- Prenatal and postnatal growth, maturation, growth curves, measures of growth, factors affecting growth, conformation, body composition, meat quality.
- 2.8 Physiology of Milk Production, Reproduction and Digestion- Current status of hormonal control of mammary development, milk secretion and milk ejection, Male and Female reproductive organs, their components and functions. Digestive organs and their functions.
- 2.9 Environmental Physiology- Physiological relations and their regulation; mechanisms of adaptation, environmental factors and regulatory mechanisms involved in animal behaviour, climatology – various parameters and their importance. Animal ecology. Physiology of behaviour. Effect of stress on health and production.
- 3. Animal Reproduction:**
Semen quality- Preservation and Artificial Insemination- Components of semen, composition of spermatozoa, chemical and physical properties of ejaculated semen, factors affecting semen *in vivo* and *in vitro*. Factors affecting

semen production and quality, preservation, composition of diluents, sperm concentration, transport of diluted semen. Deep freezing techniques in cows, sheep, goats, swine and poultry. Detection of oestrus and time of insemination for better conception. Anoestrus and repeat breeding.

4. Livestock Production and Management:

4.1 Commercial Dairy Farming- Comparison of dairy farming in India with advanced countries. Dairying under mixed farming and as specialized farming, economic dairy farming. Starting of a dairy farm, Capital and land requirement, organization of the dairy farm. Opportunities in dairy farming, factors determining the efficiency of dairy animal. Herd recording, budgeting, cost of milk production, pricing policy; Personnel Management. Developing Practical and Economic rations for dairy cattle; supply of greens throughout the year, feed and fodder requirements of Dairy Farm. Feeding regimes for young stock and bulls, heifers and breeding animals; new trends in feeding young and adult stock; Feeding records.

4.2 Commercial meat, egg and wool production- Development of practical and economic rations for sheep, goats, pigs, rabbits and poultry. Supply of greens, fodder, feeding regimes for young and mature stock. New trends in enhancing production and management. Capital and land requirements and socio-economic concept.

4.3 Feeding and management of animals under drought, flood and other natural calamities.

5. Genetics and Animal Breeding:

History of animal genetics. Mitosis and Meiosis: Mendelian inheritance; deviations to Mendelian genetics; Expression of genes; Linkage and crossing over; Sex determination, sex influenced and sex limited characters; Blood groups and polymorphism; Chromosome aberrations; Cytoplasmic inheritance. Gene and its structure; DNA as a genetic material; Genetic code and protein synthesis; Recombinant DNA technology. Mutations, types of mutations, methods for detecting mutations and mutation rate. Trans-genesis.

5.1 Population Genetics applied to Animal Breeding- Quantitative Vs. qualitative traits; Hardy Weinberg Law; Population Vs. individual; Gene and genotypic frequency; Forces changing gene frequency; Random drift and small populations; Theory of path coefficient; Inbreeding, methods of estimating inbreeding coefficient, systems of inbreeding, Effective population size; Breeding value, estimation of breeding value, dominance and epistatic deviation; Partitioning of variation; Genotype X environment correlation and genotype X environment interaction; role of multiple measurements; Resemblance between relatives.

5.2 Breeding Systems- Breeds of livestock and Poultry. Heritability, repeatability and genetic and phenotypic correlations, their methods of estimation and precision of estimates; Aids to selection and their relative merits; Individual, pedigree, family and within family selection; Progeny testing; Methods of selection; Construction of selection indices and their uses; Comparative evaluation of genetic gains through various selection methods; Indirect selection and correlated response; Inbreeding, out breeding, upgrading, cross-breeding and synthesis of breeds; Crossing of inbred lines for commercial production; Selection for general and specific combining ability; Breeding for threshold characters. Sire index.

6. Extension:

Basic philosophy, objectives, concept and principles of extension. Different Methods adopted to educate farmers under rural conditions. Generation of technology, its transfer and feedback. Problems and constraints in transfer of technology. Animal husbandry programmes for rural development.

PAPER – II

1. Anatomy, Pharmacology and Hygiene:

1.1 Histology and Histological Techniques: Paraffin embedding technique of tissue processing and H.E. staining - Freezing microtomy- Microscopy-Bright field microscope and electron microscope. Cytology-structure of cell, organelles and inclusions; cell division-cell types- Tissues and their classification-embryonic and adult tissues-Comparative histology of organs-Vascular. Nervous, digestive, respiratory, musculo- skeletal and urogenital systems-Endocrine glands -Integuments-sense organs.

1.2 Embryology – Embryology of vertebrates with special reference to aves and domestic mammals gametogenesis-fertilization-germ layers- foetal membranes and placentation-types of placenta in domestic mammals-Teratology-twins and twinning- organogenesis -germ layer derivatives-endodermal, mesodermal and ectodermal derivatives.

1.3 Bovine Anatomy- Regional Anatomy: Paranasal sinuses of OX- surface anatomy of salivary glands. Regional anatomy of infraorbital, maxillary, mandibuloalveolar, mental and cornual nerve block. Regional anatomy of paravertebral nerves, pudendal nerve, median ulnar and radial nerves-tibial, fibular and digital nerves-Cranial nerves-structures involved in epidural anaesthesia-superficial lymph nodes-surface anatomy of visceral organs of thoracic, abdominal and pelvic cavities-comparative features of locomotor apparatus and their application in the biomechanics of mammalian body.

1.4 Anatomy of Fowl- Musculo-skeletal system-functional anatomy in relation to

- respiration and flying, digestion and egg production.
- 1.5 Pharmacology and therapeutic drugs - Cellular level of pharmacodynamics and pharmacokinetics. Drugs acting on fluids and electrolyte balance. Drugs acting on Autonomic nervous system. Modern concepts of anaesthesia and dissociative anaesthetics. Autacoids. Antimicrobials and principles of chemotherapy in microbial infections. Use of hormones in therapeutics-chemotherapy of parasitic infections. Drug and economic concerns in the Edible tissues of animals- chemotherapy of Neoplastic diseases. Toxicity due to insecticides, plants, metals, non-metals, zootoxins and mycotoxins.
- 1.6 Veterinary Hygiene with reference to water, air and habitation - Assessment of pollution of water, air and soil- Importance of climate in animal health-effect of environment on animal function and performance-relationship between industrialization and animal agriculture- animal housing requirements for specific categories of domestic animals viz. pregnant cows and sows, milking cows, broiler birds- stress, strain and productivity in relation to animal habitation.
- 2. Animal Diseases:**
- 2.1 Etiology, epidemiology pathogenesis, symptoms, postmortem lesions, diagnosis, and control of infectious diseases of cattle, sheep and goat, horses, pigs and poultry.
- 2.2 Etiology, epidemiology, symptoms, diagnosis, treatment of production diseases of cattle, horse, pig and poultry.
- 2.3 Deficiency diseases of domestic animals and birds.
- 2.4 Diagnosis and treatment of non-specific conditions like impaction, Bloat, Diarrhoea, Indigestion, dehydration, stroke, poisoning.
- 2.5 Diagnosis and treatment of neurological disorders.
- 2.6 Principles and methods of immunization of animals against specific diseases-herd immunity- disease free zones- 'zero' disease concept- chemoprophylaxis.
- 2.7 Anaesthesia- local, regional and general-preanesthetic medication. Symptoms and surgical interference in fractures and dislocation. Hernia, choking abomasal displacement- Caesarian operations. Rumenotomy-Castrations.
- 2.8 Disease investigation techniques.- Materials for laboratory investigation-Establishment of Animal Health Centers- Disease free zone-
- 3. Veterinary Public Health:**
- 3.1 Zoonoses. - Classification, definition, role of animals and birds in prevalence and transmission of zoonotic diseases- occupational zoonotic diseases.
- 3.2 Epidemiology- Principle, definition of epidemiological terms, application of epidemiological measures in the study of diseases and disease control. Epidemiological features of air, water and food borne infections. OIE

- regulations, WTO, sanitary and phytosanitary measures.
- 3.3 Veterinary Jurisprudence- Rules and Regulations for improvement of animal quality and prevention of animal diseases - State and central rules for prevention of animal and animal product borne diseases- S P C A- Veterolegal cases- Certificates -Materials and Methods of collection of samples for veterolegal investigation.
- 4. Milk and Milk Products Technology:**
- 4.1 Market Milk: Quality, testing and grading of raw milk. Processing, packaging, storing, distribution, marketing, defects and their control. Preparation of the following milks: Pasteurized, standardized, toned, double toned, sterilized, homogenized, reconstituted, recombined and flavoured milks. Preparation of cultured milks, cultures and their management, yoghurt, Dahi, Lassi and Srikhand. Preparation of flavoured and sterilized milks. Legal standards. Sanitation requirement for clean and safe milk and for the milk plant equipment.
- 4.2 Milk Products Technology.- Selection of raw materials, processing, storing , distributing and marketing milk products such as Cream, Butter, Ghee, Khoa, Channa, Cheese, condensed, evaporated, dried milk and baby food, Ice cream and Kulfi; by-products, whey products, butter milk, lactose and casein. Testing, grading, judging milk products- BIS and Agmark specifications, legal standards, quality control and nutritive properties. Packaging, processing and operational control. Costing of dairy products.
- 5. Meat Hygiene and Technology:**
- 5.1 Meat Hygiene.
- 5.1.1 Ante mortem care and management of food animals, stunning, slaughter and dressing operations; abattoir requirements and designs; Meat inspection procedures and judgment of carcass meat cuts- grading of carcass meat cuts- duties and functions of Veterinarians in wholesome meat production.
- 5.1.2 Hygienic methods of handling production of meat- Spoilage of meat and control measures- Post - slaughter physicochemical changes in meat and factors that influence them- Quality improvement methods – Adulteration of meat and detection - Regulatory provisions in Meat trade and Industry.
- 5.2 Meat Technology.
- 5.2.1 Physical and chemical characteristics of meat- Meat emulsions- Methods of preservation of meat- Curing, canning, irradiation, packaging of meat and meat products, processing and formulations.
- 5.3 By- products- Slaughter house by- products and their utilization- Edible and inedible by products- Social and economic implications of proper utilization of slaughter house by-products- Organ products for food and pharmaceuticals.

- 5.4 Poultry Products Technology- Chemical composition and nutritive value of poultry meat, pre - slaughter care and management. Slaughtering techniques, inspection, preservation of poultry meat and products. Legal and BIS standards.
- Structure, composition and nutritive value of eggs. Microbial spoilage. Preservation and maintenance. Marketing of poultry meat, eggs and products. Value added meat products.
- 5.5 Rabbit/Fur Animal farming - Rabbit meat production. Disposal and utilization of fur and wool and recycling of waste by products. Grading of wool.

ANTHROPOLOGY

PAPER - I

- 1.1 Meaning, scope and development of Anthropology.
- 1.2 Relationships with other disciplines: Social Sciences, Behavioural Sciences, Life Sciences, Medical Sciences, Earth Sciences and Humanities.
- 1.3 Main branches of Anthropology, their scope and relevance:
 - (a) Social- cultural Anthropology.
 - (b) Biological Anthropology.
 - (c) Archaeological Anthropology.
 - (d) Linguistic Anthropology.
- 1.4 Human Evolution and emergence of Man:
 - (a) Biological and Cultural factors in human evolution.
 - (b) Theories of Organic Evolution (Pre- Darwinian, Darwinian and Post-Darwinian).
 - (c) Synthetic theory of evolution; Brief outline of terms and concepts of evolutionary biology (Doll's rule, Cope's rule, Gause's rule, parallelism, convergence, adaptive radiation, and mosaic evolution).
- 1.5 Characteristics of Primates; Evolutionary Trend and Primate Taxonomy; Primate Adaptations; (Arboreal and Terrestrial) Primate Taxonomy; Primate Behaviour; Tertiary and Quaternary fossil primates; Living Major Primates; Comparative Anatomy of Man and Apes; Skeletal changes due to erect posture and its implications.
- 1.6 Phylogenetic status, characteristics and geographical distribution of the following:
 - (a) Plio-pleistocene hominids in South and East Africa - Australopithecines.
 - (b) Homo erectus: Africa (Paranthropus), Europe (Homo erectus heidelbergensis), Asia (Homo erectus javanicus, Homo erectus pekinensis).
 - (c) Neanderthal Man- La-Chapelle-aux-saints (Classical type), Mt. Carmel (Progressive type).
 - (d) Rhodesian man.
 - (e) Homo sapiens — Cromagnon, Grimaldi and Chancelade.
- 1.7 The biological basis of life: The Cell, DNA structure and replication, Protein Synthesis, Gene, Mutation, Chromosomes, and Cell Division.
- 1.8 (a) Principles of Prehistoric Archaeology. Chronology: Relative and Absolute Dating methods.

- (b) Cultural Evolution- Broad Outlines of Prehistoric cultures:
 - (i) Paleolithic, (ii) Mesolithic, (iii) Neolithic, (iv) Chalcolithic, (v) Copper-Bronze Age, (vi) Iron Age
- 2.1 *The Nature of Culture*: The concept and characteristics of culture and civilization; Ethnocentrism vis-à-vis cultural Relativism.
- 2.2 *The Nature of Society*: Concept of Society; Society and Culture; Social Institutions; Social groups; and Social stratification.
- 2.3 *Marriage*: Definition and universality; Laws of marriage (endogamy, exogamy, hypergamy, hypogamy, incest taboo); Types of marriage (monogamy, polygamy, polyandry, group marriage). Functions of marriage; Marriage regulations (preferential, prescriptive and proscriptive); Marriage payments (bride wealth and dowry).
- 2.4 *Family*: Definition and universality; Family, household and domestic groups; functions of family; Types of family (from the perspectives of structure, blood relation, marriage, residence and succession); Impact of urbanization, industrialization and feminist movements on family.
- 2.5 *Kinship*: Consanguinity and Affinity; Principles and types of descent (Unilineal, Double, Bilateral, Ambilineal); Forms of descent groups (lineage, clan, phratry, moiety and kindred); Kinship terminology (descriptive and classificatory); Descent, Filiation and Complimentary Filiation; Descent and Alliance.
- 3. **Economic organization**: Meaning, scope and relevance of economic anthropology; Formalist and Substantivist debate; Principles governing production, distribution and exchange (reciprocity, redistribution and market), in communities, subsisting on hunting and gathering, fishing, swiddening, pastoralism, horticulture, and agriculture; globalization and indigenous economic systems.
- 4. **Political organization and Social Control**: Band, tribe, chiefdom, kingdom and state; concepts of power, authority and legitimacy; social control, law and justice in simple societies.
- 5. **Religion**: Anthropological approaches to the study of religion (evolutionary, psychological and functional); monotheism and polytheism; sacred and profane; myths and rituals; forms of religion in tribal and peasant societies (animism, animatism, fetishism, naturism and totemism); religion, magic and science distinguished; magico- religious functionaries (priest, shaman, medicine man, sorcerer and witch).
- 6. **Anthropological theories**:
 - (a) Classical evolutionism (Tylor, Morgan and Frazer)
 - (b) Historical particularism (Boas); Diffusionism (British, German and

- American)
 - (c) Functionalism (Malinowski); Structural- functionalism (Radcliffe-Brown)
 - (d) Structuralism (L'evi - Strauss and E. Leach)
 - (e) Culture and personality (Benedict, Mead, Linton, Kardiner and Cora - du Bois).
 - (f) Neo - evolutionism (Childe, White, Steward, Sahlins and Service)
 - (g) Cultural materialism (Harris)
 - (h) Symbolic and interpretive theories (Turner, Schneider and Geertz)
 - (i) Cognitive theories (Tyler, Conklin)
 - (j) Post- modernism in anthropology
7. **Culture, language and communication:** Nature, origin and characteristics of language; verbal and non-verbal communication; social context of language use.
8. **Research methods in anthropology:**
- (a) Fieldwork tradition in anthropology
 - (b) Distinction between technique, method and methodology
 - (c) Tools of data collection: observation, interview, schedules, questionnaire, Case study, genealogy, life-history, oral history, secondary sources of information, participatory methods.
 - (d) Analysis, interpretation and presentation of data.
- 9.1 *Human Genetics* – Methods and Application: Methods for study of genetic principles in man-family study (pedigree analysis, twin study, foster child, co-twin method, cytogenetic method, chromosomal and karyo-type analysis), biochemical methods, immunological methods, D.N.A. technology and recombinant technologies.
- 9.2 Mendelian genetics in man-family study, single factor, multifactor, lethal, sub-lethal and polygenic inheritance in man.
- 9.3 Concept of genetic polymorphism and selection, Mendelian population, Hardy-Weinberg law; causes and changes which bring down frequency – mutation, isolation, migration, selection, inbreeding and genetic drift. Consanguineous and non-consanguineous mating, genetic load, genetic effect of consanguineous and cousin marriages.
- 9.4 Chromosomes and chromosomal aberrations in man, methodology.
- (a) Numerical and structural aberrations (disorders).
 - (b) Sex chromosomal aberrations – Klinefelter (XXY), Turner (XO), Super female (XXX), intersex and other syndromic disorders.
 - (c) Autosomal aberrations – Down syndrome, Patau, Edward and Cri-du-

chat syndromes.

- (d) Genetic imprints in human disease, genetic screening, genetic counseling, human DNA profiling, gene mapping and genome study.
- 9.5 Race and racism, biological basis of morphological variation of non-metric and metric characters. Racial criteria, racial traits in relation to heredity and environment; biological basis of racial classification, racial differentiation and race crossing in man.
- 9.6 Age, sex and population variation as genetic marker- ABO, Rh blood groups, HLA Hp, transferrin, Gm, blood enzymes. Physiological characteristics-Hb level, body fat, pulse rate, respiratory functions and sensory perceptions in different cultural and socio-economic groups.
- 9.7 Concepts and methods of Ecological Anthropology. Bio-cultural Adaptations – Genetic and Non- genetic factors. Man's physiological responses to environmental stresses: hot desert, cold, high altitude climate.
- 9.8 Epidemiological Anthropology: Health and disease. Infectious and non-infectious diseases. Nutritional deficiency related diseases.
10. Concept of human growth and development: stages of growth - pre-natal, natal, infant, childhood, adolescence, maturity, senescence.
- Factors affecting growth and development genetic, environmental, biochemical, nutritional, cultural and socio-economic.
- Ageing and senescence. Theories and observations - biological and chronological longevity. Human physique and somatotypes. Methodologies for growth studies.
- 11.1 Relevance of menarche, menopause and other bioevents to fertility. Fertility patterns and differentials.
- 11.2 Demographic theories- biological, social and cultural.
- 11.3 Biological and socio-ecological factors influencing fecundity, fertility, natality and mortality.
12. Applications of Anthropology: Anthropology of sports, Nutritional anthropology, Anthropology in designing of defence and other equipments, Forensic Anthropology, Methods and principles of personal identification and reconstruction, Applied human genetics – Paternity diagnosis, genetic counseling and eugenics, DNA technology in diseases and medicine, serogenetics and cytogenetics in reproductive biology.

PAPER – II

- 1.1 Evolution of the Indian Culture and Civilization — Prehistoric (Palaeolithic, Mesolithic, Neolithic and Neolithic - Chalcolithic). Protohistoric (Indus Civilization): Pre- Harappan, Harappan and post- Harappan cultures.

- Contributions of tribal cultures to Indian civilization.
- 1.2 Palaeo – anthropological evidences from India with special reference to Siwaliks and Narmada basin (Ramapithecus, Sivapithecus and Narmada Man).
 - 1.3 Ethno-archaeology in India: The concept of ethno-archaeology; Survivals and Parallels among the hunting, foraging, fishing, pastoral and peasant communities including arts and crafts producing communities.
 2. Demographic profile of India — Ethnic and linguistic elements in the Indian population and their distribution. Indian population - factors influencing its structure and growth.
 - 3.1 The structure and nature of traditional Indian social system — Varnashram, Purushartha, Karma, Rina and Rebirth.
 - 3.2 Caste system in India- structure and characteristics, Varna and caste, Theories of origin of caste system, Dominant caste, Caste mobility, Future of caste system, Jajmani system, Tribe- caste continuum.
 - 3.3 Sacred Complex and Nature- Man- Spirit Complex.
 - 3.4 Impact of Buddhism, Jainism, Islam and Christianity on Indian society.
 4. Emergence and growth of anthropology in India-Contributions of the 18th, 19th and early 20th Century scholar-administrators. Contributions of Indian anthropologists to tribal and caste studies.
 - 5.1 Indian Village: Significance of village study in India; Indian village as a social system; Traditional and changing patterns of settlement and inter-caste relations; Agrarian relations in Indian villages; Impact of globalization on Indian villages.
 - 5.2 Linguistic and religious minorities and their social, political and economic status.
 - 5.3 Indigenous and exogenous processes of socio-cultural change in Indian society: Sanskritization, Westernization, Modernization; Inter-play of little and great traditions; Panchayati raj and social change; Media and social change.
 - 6.1 Tribal situation in India – Bio-genetic variability, linguistic and socio-economic characteristics of tribal populations and their distribution.
 - 6.2 Problems of the tribal Communities — land alienation, poverty, indebtedness, low literacy, poor educational facilities, unemployment, underemployment, health and nutrition.
 - 6.3 Developmental projects and their impact on tribal displacement and problems of rehabilitation. Development of forest policy and tribals. Impact of urbanization and industrialization on tribal populations.

- 7.1 Problems of exploitation and deprivation of Scheduled Castes, Scheduled Tribes and Other Backward Classes. Constitutional safeguards for Scheduled Tribes and Scheduled Castes.
- 7.2 Social change and contemporary tribal societies: Impact of modern democratic institutions, development programmes and welfare measures on tribals and weaker sections.
- 7.3 The concept of ethnicity; Ethnic conflicts and political developments; Unrest among tribal communities; Regionalism and demand for autonomy; Pseudo-tribalism; Social change among the tribes during colonial and post-Independent India.
- 8.1 Impact of Hinduism, Buddhism, Christianity, Islam and other religions on tribal societies.
- 8.2 Tribe and nation state — a comparative study of tribal communities in India and other countries.
- 9.1 History of administration of tribal areas, tribal policies, plans, programmes of tribal development and their implementation. The concept of PTGs (Primitive Tribal Groups), their distribution, special programmes for their development. Role of N.G.O.s in tribal development.
- 9.2 Role of anthropology in tribal and rural development.
- 9.3 Contributions of anthropology to the understanding of regionalism, communalism, and ethnic and political movements.

BOTANY PAPER – I

1. **Microbiology and Plant Pathology:**

Structure and reproduction/multiplication of viruses, viroids, bacteria, fungi and mycoplasma; Applications of microbiology in agriculture, industry, medicine and in control of soil and water pollution; Prion and Prion hypothesis. Important crop diseases caused by viruses, bacteria, mycoplasma, fungi and nematodes; Modes of infection and dissemination; Molecular basis of infection and disease resistance/defence; Physiology of parasitism and control measures; Fungal toxins; Modelling and disease forecasting; Plant quarantine.

2. **Cryptogams:**

Algae, fungi, lichens, bryophytes, pteridophytes - structure and reproduction from evolutionary viewpoint; Distribution of Cryptogams in India and their ecological and economic importance.

3. **Phanerogams:**

Gymnosperms: Concept of Progymnosperms; Classification and distribution of gymnosperms; Salient features of Cycadales, Ginkgoales, Coniferales and Gnetales, their structure and reproduction; General account of Cycadofilicales, Bennettitales and Cordaitales; Geological time scale; Type of fossils and their study techniques.

Angiosperms: Systematics, anatomy, embryology, palynology and phylogeny.

Taxonomic hierarchy; International Code of Botanical Nomenclature; Numerical taxonomy and chemotaxonomy; Evidence from anatomy, embryology and palynology.

Origin and evolution of angiosperms; Comparative account of various systems of classification of angiosperms; Study of angiospermic families – Mangnoliaceae, Ranunculaceae, Brassicaceae, Rosaceae, Fabaceae, Euphorbiaceae, Malvaceae, Dipterocarpaceae, Apiaceae, Asclepiadaceae, Verbenaceae, Solanaceae, Rubiaceae, Cucurbitaceae, Asteraceae, Poaceae, Arecaceae, Liliaceae, Musaceae and Orchidaceae.

Stomata and their types; Glandular and non-glandular trichomes; Unusual secondary growth; Anatomy of C_3 and C_4 plants; Xylem and phloem differentiation; Wood anatomy.

Development of male and female gametophytes, pollination, fertilization; Endosperm - its development and function; Patterns of embryo development; Polyembryony and apomixes; Applications of palynology; Experimental embryology including pollen storage and test-tube fertilization.

4. **Plant Resource Development:**

Domestication and introduction of plants; Origin of cultivated plants; Vavilov's centres of origin; Plants as sources for food, fodder, fibre, spices, beverages,

edible oils, drugs, narcotics, insecticides, timber, gums, resins and dyes, latex, cellulose, starch and its products; Perfumery; Importance of Ethnobotany in Indian context; Energy plantations; Botanical Gardens and Herbaria.

5. Morphogenesis:

Totipotency, polarity, symmetry and differentiation; Cell, tissue, organ and protoplast culture; Somatic hybrids and Cybrids; Micropropagation; Somaclonal variation and its applications; Pollen haploids, embryo rescue methods and their applications.

PAPER – II

1. Cell Biology:

Techniques of cell biology; Prokaryotic and eukaryotic cells - structural and ultrastructural details; Structure and function of extracellular matrix (cell wall), membranes-cell adhesion, membrane transport and vesicular transport; Structure and function of cell organelles (chloroplasts, mitochondria, ER, dictyosomes, ribosomes, endosomes, lysosomes, peroxisomes); Cytoskeleton and microtubules; Nucleus, nucleolus, nuclear pore complex; Chromatin and nucleosome; Cell signalling and cell receptors; Signal transduction; Mitosis and meiosis; Molecular basis of cell cycle; Numerical and structural variations in chromosomes and their significance; Chromatin organization and packaging of genome; Polytene chromosomes; B-chromosomes – structure, behaviour and significance.

2. Genetics, Molecular Biology and Evolution:

Development of genetics; Gene versus allele concepts (Pseudoalleles); Quantitative genetics and multiple factors; Incomplete dominance, polygenic inheritance, multiple alleles; Linkage and crossing over; Methods of gene mapping, including molecular maps (idea of mapping function); Sex chromosomes and sex-linked inheritance, sex determination and molecular basis of sex differentiation; Mutations (biochemical and molecular basis); Cytoplasmic inheritance and cytoplasmic genes (including genetics of male sterility).

Structure and synthesis of nucleic acids and proteins; Genetic code and regulation of gene expression; Gene silencing; Multigene families; Organic evolution – evidences, mechanism and theories.

Role of RNA in origin and evolution.

3. Plant Breeding, Biotechnology and Biostatistics:

Methods of plant breeding – introduction, selection and hybridization (pedigree, backcross, mass selection, bulk method); Mutation, polyploidy, male sterility and heterosis breeding; Use of apomixes in plant breeding; DNA sequencing; Genetic engineering – methods of transfer of genes; Transgenic crops and biosafety aspects; Development and use of molecular markers in plant

breeding; Tools and techniques - probe, southern blotting, DNA fingerprinting, PCR and FISH.

Standard deviation and coefficient of variation (CV); Tests of significance (Z-test, t-test and chi-square test); Probability and distributions (normal, binomial and Poisson); Correlation and regression.

4. Physiology and Biochemistry:

Water relations, mineral nutrition and ion transport, mineral deficiencies; Photosynthesis – photochemical reactions; photophosphorylation and carbon fixation pathways; C₃, C₄ and CAM pathways; Mechanism of phloem transport; Respiration (anerobic and aerobic, including fermentation) – electron transport chain and oxidative phosphorylation; Photorespiration; Chemiosmotic theory and ATP synthesis; Lipid metabolism; Nitrogen fixation and nitrogen metabolism; Enzymes, coenzymes; Energy transfer and energy conservation; Importance of secondary metabolites; Pigments as photoreceptors (plastidial pigments and phytochrome); Plant movements; Photoperiodism and flowering, vernalization, senescence; Growth substances – their chemical nature, role and applications in agri-horticulture; Growth indices, growth movements; Stress physiology (heat, water, salinity, metal); Fruit and seed physiology; Dormancy, storage and germination of seed; Fruit ripening – its molecular basis and manipulation.

5. Ecology and Plant Geography:

Concept of ecosystem; Ecological factors; Concepts and dynamics of community; Plant succession; Concept of biosphere; Ecosystems; Conservation; Pollution and its control (including phytoremediation); Plant indicators; Environment (Protection) Act.

Forest types of India - Ecological and economic importance of forests, afforestation, deforestation and social forestry; Endangered plants, endemism, IUCN categories, Red Data Books; Biodiversity and its conservation; Protected Area Network; Convention on Biological Diversity; Farmers' Rights and Intellectual Property Rights; Concept of Sustainable Development; Biogeochemical cycles; Global warming and climatic change; Invasive species; Environmental Impact Assessment; Phytogeographical regions of India.

CHEMISTRY PAPER - I

- 1. Atomic Structure:** Heisenberg's uncertainty principle, Schrodinger wave equation (time independent); Interpretation of wave function, particle in one-dimensional box, quantum numbers, hydrogen atom wave functions; Shapes of s, p and d orbitals.
- 2. Chemical Bonding:** Ionic bond, characteristics of ionic compounds, lattice energy, Born-Haber cycle; covalent bond and its general characteristics, polarities of bonds in molecules and their dipole moments; Valence bond theory, concept of resonance and resonance energy; Molecular orbital theory (LCAO method); bonding in H_2^+ , H_2 , He_2^+ to Ne_2 , NO, CO, HF, and CN^- ; Comparison of valence bond and molecular orbital theories, bond order, bond strength and bond length.
- 3. Solid State:** Crystal systems; Designation of crystal faces, lattice structures and unit cell; Bragg's law; X-ray diffraction by crystals; Close packing, radius ratio rules, calculation of some limiting radius ratio values; Structures of NaCl, ZnS, CsCl and CaF_2 ; Stoichiometric and nonstoichiometric defects, impurity defects, semi-conductors.
- 4. The Gaseous State and Transport Phenomenon:** Equation of state for real gases, intermolecular interactions and critical phenomena and liquefaction of gases, Maxwell's distribution of speeds, intermolecular collisions, collisions on the wall and effusion; Thermal conductivity and viscosity of ideal gases.
- 5. Liquid State:** Kelvin equation; Surface tension and surface energy, wetting and contact angle, interfacial tension and capillary action.
- 6. Thermodynamics:** Work, heat and internal energy; first law of thermodynamics. Second law of thermodynamics; entropy as a state function, entropy changes in various processes, entropy–reversibility and irreversibility, Free energy functions; Thermodynamic equation of state; Maxwell relations; Temperature, volume and pressure dependence of U, H, A, G, C_p and C_v , α and β ; J-T effect and inversion temperature; criteria for equilibrium, relation between equilibrium constant and thermodynamic quantities; Nernst heat theorem, introductory idea of third law of thermodynamics.
- 7. Phase Equilibria and Solutions:** Clausius-Clapeyron equation; phase diagram for a pure substance; phase equilibria in binary systems, partially miscible liquids–upper and lower critical solution temperatures; partial molar quantities, their significance and determination; excess thermodynamic functions and their determination.
- 8. Electrochemistry:** Debye-Huckel theory of strong electrolytes and Debye-Huckel limiting Law for various equilibrium and transport properties. Galvanic cells, concentration cells; electrochemical series, measurement of e.m.f. of cells and its applications fuel cells and batteries. Processes at electrodes; double layer at the interface; rate of charge transfer,

- current density; overpotential; electroanalytical techniques: Polarography, amperometry, ion selective electrodes and their uses.
9. **Chemical Kinetics:** Differential and integral rate equations for zeroth, first, second and fractional order reactions; Rate equations involving reverse, parallel, consecutive and chain reactions; branching chain and explosions; effect of temperature and pressure on rate constant; Study of fast reactions by stop-flow and relaxation methods; Collisions and transition state theories.
 10. **Photochemistry:** Absorption of light; decay of excited state by different routes; photochemical reactions between hydrogen and halogens and their quantum yields.
 11. **Surface Phenomena and Catalysis:** Adsorption from gases and solutions on solid adsorbents, Langmuir and B.E.T. adsorption isotherms; determination of surface area, characteristics and mechanism of reaction on heterogeneous catalysts.
 12. **Bio-inorganic Chemistry:** Metal ions in biological systems and their role in ion transport across the membranes (molecular mechanism), oxygen-uptake proteins, cytochromes and ferredoxins.
 13. **Coordination Compounds:**
 - (i) Bonding theories of metal complexes; Valence bond theory, crystal field theory and its modifications; applications of theories in the explanation of magnetism and electronic spectra of metal complexes.
 - (ii) Isomerism in coordination compounds; IUPAC nomenclature of coordination compounds; stereochemistry of complexes with 4 and 6 coordination numbers; chelate effect and polynuclear complexes; trans effect and its theories; kinetics of substitution reactions in square-planar complexes; thermodynamic and kinetic stability of complexes.
 - (iii) EAN rule, Synthesis structure and reactivity of metal carbonyls; carboxylate anions, carbonyl hydrides and metal nitrosyl compounds.
 - (iv) Complexes with aromatic systems, synthesis, structure and bonding in metal olefin complexes, alkyne complexes and cyclopentadienyl complexes; coordinative unsaturation, oxidative addition reactions, insertion reactions, fluxional molecules and their characterization; Compounds with metal-metal bonds and metal atom clusters.
 14. **Main Group Chemistry:** Boranes, borazines, phosphazenes and cyclic phosphazene, silicates and silicones, Interhalogen compounds; Sulphur – nitrogen compounds, noble gas compounds.
 15. **General Chemistry of 'f' Block Elements:** Lanthanides and actinides; separation, oxidation states, magnetic and spectral properties; lanthanide contraction.

PAPER - II

- 1. Delocalised Covalent Bonding:** Aromaticity, anti-aromaticity; annulenes, azulenes, tropolones, fulvenes, sydnones.
- (i) Reaction Mechanisms:** General methods (both kinetic and non-kinetic) of study of mechanism of organic reactions: isotopic method, cross-over experiment, intermediate trapping, stereochemistry; energy of activation; thermodynamic control and kinetic control of reactions.
 - (ii) Reactive Intermediates:** Generation, geometry, stability and reactions of carbonium ions and carbanions, free radicals, carbenes, benzyne and nitrenes.
 - (iii) Substitution Reactions:** S_N1 , S_N2 and S_Ni mechanisms; neighbouring group participation; electrophilic and nucleophilic reactions of aromatic compounds including heterocyclic compounds—pyrrole, furan, thiophene and indole.
 - (iv) Elimination Reactions:** E1, E2 and E1cb mechanisms; orientation in E2 reactions—Saytzeff and Hoffmann; pyrolytic **syn** elimination – Chugaev and Cope eliminations.
 - (v) Addition Reactions:** Electrophilic addition to C=C and C=C; nucleophilic addition to C=O, C=N, conjugated olefins and carbonyls.
 - (vi) Reactions and Rearrangements:** (a) Pinacol-pinacolone, Hoffmann, Beckmann, Baeyer–Villiger, Favorskii, Fries, Claisen, Cope, Stevens and Wagner-Meerwein rearrangements.
(b) Aldol condensation, Claisen condensation, Dieckmann, Perkin, Knoevenagel, Witting, Clemmensen, Wolff-Kishner, Cannizzaro and von Richter reactions; Stobbe, benzoin and acyloin condensations; Fischer indole synthesis, Skraup synthesis, Bischler-Napieralski, Sandmeyer, Reimer-Tiemann and Reformatsky reactions.
- 3. Pericyclic Reactions:** Classification and examples; Woodward-Hoffmann rules – electrocyclic reactions, cycloaddition reactions [2+2 and 4+2] and sigmatropic shifts [1, 3; 3, 3 and 1, 5] FMO approach.
- (i) Preparation and Properties of Polymers:** Organic polymers—polyethylene, polystyrene, polyvinyl chloride, teflon, nylon, terylene, synthetic and natural rubber.
 - (ii) Biopolymers:** Structure of proteins, DNA and RNA.
- 5. Synthetic Uses of Reagents:**
 OsO_4 , HIO_4 , CrO_3 , $Pb(OAc)_4$, SeO_2 , NBS, B_2H_6 , Na-Liquid NH_3 , $LiAlH_4$, $NaBH_4$, n-BuLi and MCPBA.
- 6. Photochemistry:** Photochemical reactions of simple organic compounds, excited and ground states, singlet and triplet states, Norrish-Type I and Type II reactions.
- 7. Spectroscopy:** Principle and applications in structure elucidation:

- (i) **Rotational:** Diatomic molecules; isotopic substitution and rotational constants.
- (ii) **Vibrational:** Diatomic molecules, linear triatomic molecules, specific frequencies of functional groups in polyatomic molecules.
- (iii) **Electronic:** Singlet and triplet states; $n \rightarrow \pi^*$ and $\pi\pi^* \rightarrow$ transitions; application to conjugated double bonds and conjugated carbonyls—Woodward-Fieser rules; Charge transfer spectra.
- (iv) **Nuclear Magnetic Resonance ($^1\text{H NMR}$):** Basic principle; chemical shift and spin-spin interaction and coupling constants.
- (v) **Mass Spectrometry:** Parent peak, base peak, metastable peak, McLafferty rearrangement.

**CIVIL ENGINEERING
PAPER – I**

1. Engineering Mechanics, Strength of Materials and Structural Analysis:

1.1 Engineering Mechanics:

Units and Dimensions, SI Units, Vectors, Concept of Force, Concept of particle and rigid body. Concurrent, Non Concurrent and parallel forces in a plane, moment of force, free body diagram, conditions of equilibrium, Principle of virtual work, equivalent force system.

First and Second Moment of area, Mass moment of Inertia.

Static Friction.

Kinematics and Kinetics:

Kinematics in Cartesian Co-ordinates, motion under uniform and nonuniform acceleration, motion under gravity. Kinetics of particle: Momentum and Energy principles, collision of elastic bodies, rotation of rigid bodies.

1.2 Strength of Materials:

Simple Stress and Strain, Elastic constants, axially loaded compression members, Shear force and bending moment, theory of simple bending, Shear Stress distribution across cross sections, Beams of uniform strength.

Deflection of beams: Macaulay's method, Mohr's Moment area method, Conjugate beam method, unit load method. Torsion of Shafts, Elastic stability of columns, Euler's Rankine's and Secant formulae.

1.3 Structural Analysis:

Castigliano's theorems I and II, unit load method of consistent deformation applied to beams and pin jointed trusses. Slope-deflection, moment distribution,

Rolling loads and Influences lines: Influences lines for Shear Force and Bending moment at a section of beam. Criteria for maximum shear force and bending Moment in beams traversed by a system of moving loads. Influences lines for simply supported plane pin jointed trusses.

Arches: Three hinged, two hinged and fixed arches, rib shortening and temperature effects.

Matrix methods of analysis: Force method and displacement method of analysis of indeterminate beams and rigid frames.

Plastic Analysis of beams and frames: Theory of plastic bending, plastic analysis, statical method, Mechanism method.

Unsymmetrical bending: Moment of inertia, product of inertia, position of Neutral Axis and Principle axes, calculation of bending stresses.

2. Design of Structures: Steel, Concrete and Masonry Structures:

2.1 Structural Steel Design:

Structural Steel: Factors of safety and load factors. Riveted, bolted and welded joints and connections. Design of tension and compression member, beams

of built up section, riveted and welded plate girders, gantry girders, stanchions with battens and lacings.

2.2 Design of Concrete and Masonry Structures:

Concept of mix design. Reinforced Concrete: Working Stress and Limit State method of design—Recommendations of I.S. codes Design of one way and two way slabs, stair-case slabs, simple and continuous beams of rectangular, T and L sections. Compression members under direct load with or without eccentricity,

Cantilever and Counter fort type retaining walls.

Water tanks: Design requirements for Rectangular and circular tanks resting on ground.

Prestressed concrete: Methods and systems of prestressing, anchorages, Analysis and design of sections for flexure based on working stress, loss of prestress.

Design of brick masonry as per I.S. Codes

3. Fluid Mechanics, Open Channel Flow and Hydraulic Machines:

3.1 Fluid Mechanics:

Fluid properties and their role in fluid motion, fluid statics including forces acting on plane and curved surfaces.

Kinematics and Dynamics of Fluid flow: Velocity and accelerations, stream lines, equation of continuity, irrotational and rotational flow, velocity potential and stream functions.

Continuity, momentum and energy equation, Navier-Stokes equation, Euler's equation of motion, application to fluid flow problems, pipe flow, sluice gates, weirs.

3.2 Dimensional Analysis and Similitude:

Buckingham's Pi-theorem, dimensionless parameters.

3.3 Laminar Flow:

Laminar flow between parallel, stationary and moving plates, flow through tube.

3.4 Boundary layer:

Laminar and turbulent boundary layer on a flat plate, laminar sub layer, smooth and rough boundaries, drag and lift.

Turbulent flow through pipes: Characteristics of turbulent flow, velocity distribution and variation of pipe friction factor, hydraulic grade line and total energy line.

3.5 Open channel flow:

Uniform and non-uniform flows, momentum and energy correction factors, specific energy and specific force, critical depth, rapidly varied flow, hydraulic jump, gradually varied flow, classification of surface profiles, control section, step method of integration of varied flow equation.

3.6 Hydraulic Machines and Hydropower:

Hydraulic turbines, types classification, Choice of turbines, performance parameters, controls, characteristics, specific speed.

Principles of hydropower development.

4. Geotechnical Engineering:

Soil Type and structure – gradation and particle size distribution – consistency limits.

Water in soil – capillary and structural – effective stress and pore water pressure – permeability concept – field and laboratory determination of permeability – Seepage pressure – quick sand conditions – Shear strength determination – Mohr Coulomb concept.

Compaction of soil – Laboratory and field tests.

Compressibility and consolidation concept – consolidation theory – consolidation settlement analysis.

Earth pressure theory and analysis for retaining walls, Application for sheet piles and Braced excavation.

Bearing capacity of soil – approaches for analysis – Field tests – settlement analysis – stability of slope of earth walk.

Subsurface exploration of soils – methods

Foundation – Type and selection criteria for foundation of structures –

Design criteria for foundation – Analysis of distribution of stress for footings and pile – pile group action-pile load test.

Ground improvement techniques.

PAPER - II

1. Construction Technology, Equipment, Planning and Management:

1.1 Construction Technology:

Engineering Materials:

Physical properties of construction materials with respect to their use in construction - Stones, Bricks and Tiles; Lime, Cement, different types of Mortars and Concrete.

Specific use of ferro cement, fibre reinforced C.C, High strength concrete.

Timber, properties and defects - common preservation treatments.

Use and selection of materials for specific use like Low Cost Housing, Mass Housing, High Rise Buildings.

1.2 Construction:

Masonry principles using Brick, stone, Blocks – construction detailing and strength characteristics.

Types of plastering, pointing, flooring, roofing and construction features.

common repairs in buildings.

Principles of functional planning of building for residents and specific use -

Building code provisions.

Basic principles of detailed and approximate estimating - specification writing and rate analysis – principles of valuation of real property.

Machinery for earthwork, concreting and their specific uses – Factors affecting selection of equipments – operating cost of Equipments.

1.3 Construction Planning and Management:

Construction activity – schedules- organization for construction industry – Quality assurance principles.

Use of Basic principles of network – analysis in form of CPM and PERT – their use in construction monitoring, Cost optimization and resource allocation.

Basic principles of Economic analysis and methods.

Project profitability – Basic principles of Boot approach to financial planning – simple toll fixation criterions.

2. Surveying and Transportation Engineering

2.1 Surveying:

Common methods and instruments for distance and angle measurement for CE work – their use in plane table, traverse survey, leveling work, triangulation, contouring and topographical map.

Basic principles of photogrammetry and remote sensing.

2.2 Railway Engineering:

Permanent way – components, types and their functions – Functions and Design constituents of turn and crossings – Necessity of geometric design of track – Design of station and yards.

2.3 Highway Engineering:

Principles of Highway alignments – classification and geometrical design elements and standards for Roads.

Pavement structure for flexible and rigid pavements - Design principles and methodology of pavements.

Typical construction methods and standards of materials for stabilized soil, WBM, Bituminous works and CC roads.

Surface and sub-surface drainage arrangements for roads - culvert structures.

Pavement distresses and strengthening by overlays.

Traffic surveys and their applications in traffic planning - Typical design features for channelized, intersection, rotary etc – signal designs – standard Traffic signs and markings.

3. Hydrology, Water Resources and Engineering:

3.1 Hydrology:

Hydrological cycle, precipitation, evaporation, transpiration, infiltration, overland flow, hydrograph, flood frequency analysis, flood routing through a

reservoir, channel flow routing-Muskingam method.

3.2 Ground water flow:

Specific yield, storage coefficient, coefficient of permeability, confined and unconfined equifers, aquifers, aquitards, radial flow into a well under confined and unconfined conditions.

3.3 Water Resources Engineering:

Ground and surface water resource, single and multipurpose projects, storage capacity of reservoirs, reservoir losses, reservoir sedimentation.

3.4 Irrigation Engineering:

- (i) Water requirements of crops: consumptive use, duty and delta, irrigation methods and their efficiencies.
- (ii) Canals: Distribution systems for canal irrigation, canal capacity, canal losses, alignment of main and distributory canals, most efficient section, lined canals, their design, regime theory, critical shear stress, bed load.
- (iii) Water logging: causes and control, salinity.
- (iv) Canal structures: Design of, head regulators, canal falls, aqueducts, metering flumes and canal outlets.
- (v) Diversion headwork: Principles and design of weirs of permeable and impermeable foundation, Khosla's theory, energy dissipation.
- (vi) Storage works: Types of dams, design, principles of rigid gravity, stability analysis.
- (vii) Spillways: Spillway types, energy dissipation.
- (viii) River training: Objectives of river training, methods of river training.

4. Environmental Engineering:

4.1 Water Supply:

Predicting demand for water, impurities, of water and their significance, physical, chemical and bacteriological analysis, waterborne diseases, standards for potable water.

4.2 Intake of water:

Water treatment: principles of coagulation, flocculation and sedimentation; slow-, rapid-, pressure-, filters; chlorination, softening, removal of taste, odour and salinity.

4.3 Sewerage systems:

Domestic and industrial wastes, storm sewage—separate and combined systems, flow through sewers, design of sewers.

4.4 Sewage characterization:

BOD, COD, solids, dissolved oxygen, nitrogen and TOC. Standards of disposal in normal watercourse and on land.

4.5 Sewage treatment:

Working principles, units, chambers, sedimentation tanks, trickling filters, oxidation ponds, activated sludge process, septic tank, disposal of sludge, recycling of wastewater.

4.6 Solid waste:

Collection and disposal in rural and urban contexts, management of long-term ill effects.

5. Environmental pollution:

Sustainable development. Radioactive wastes and disposal. Environmental impact assessment for thermal power plants, mines, river valley projects. Air pollution. Pollution control acts.

COMMERCE & ACCOUNTANCY

PAPER - I

Accounting and Finance

Accounting, Taxation & Auditing

- 1. Financial Accounting:** Accounting as a Financial Information System; Impact of Behavioural Sciences. Accounting Standards e.g., Accounting for Depreciation, Inventories, Research and Development Costs, Long-term Construction Contracts, Revenue Recognition, Fixed Assets, Contingencies, Foreign Exchange Transactions, Investments and Government Grants, Cash Flow Statement, Earnings Per Share.
Accounting for Share Capital Transactions including Bonus Shares, Right Shares, Employees Stock Option and Buy- Back of Securities.
Preparation and Presentation of Company Final Accounts.
Amalgamation, Absorption and Reconstruction of Companies.
- 2. Cost Accounting:** Nature and Functions of Cost Accounting. Installation of Cost Accounting System. Cost Concepts related to Income Measurement, Profit Planning, Cost Control and Decision Making.
Methods of Costing: Job Costing, Process Costing, Activity Based Costing.
Volume – cost – Profit Relationship as a tool of Profit Planning.
Incremental Analysis/ Differential Costing as a Tool of Pricing Decisions, Product Decisions, Make or Buy Decisions, Shut-Down Decisions etc.
Techniques of Cost Control and Cost Reduction: Budgeting as a Tool of Planning and Control. Standard Costing and Variance Analysis.
Responsibility Accounting and Divisional Performance Measurement.
- 3. Taxation:** Income Tax: Definitions; Basis of Charge; Incomes which do not form Part of Total Income. Simple problems of Computation of Income (of Individuals only) under Various Heads, i.e., Salaries, Income from House Property, Profits and Gains from Business or Profession, Capital Gains, Income from other sources, Income of other Persons included in Assessee's Total Income.
Set - Off and Carry Forward of Loss.
Deductions from Gross Total Income.
Salient Features/Provisions Related to VAT and Services Tax.
- 4. Auditing:** Company Audit: Audit related to Divisible Profits, Dividends, Special investigations, Tax audit.
Audit of Banking, Insurance, Non-Profit Organizations and Charitable Societies / Trusts / Organizations.

Financial Management, Financial Institutions and Markets

- 1. Financial Management:**
Finance Function: Nature, Scope and Objectives of Financial Management: Risk and Return Relationship.
Tools of Financial Analysis: Ratio Analysis, Funds-Flow and Cash-Flow Statement.
Capital Budgeting Decisions: Process, Procedures and Appraisal Methods. Risk

and Uncertainty Analysis and Methods.

Cost of capital: Concept, Computation of Specific Costs and Weighted Average Cost of Capital. CAPM as a Tool of Determining Cost of Equity Capital.

Financing Decisions: Theories of Capital Structure - Net Income (NI) Approach, Net Operating Income (NOI) Approach, MM Approach and Traditional Approach. Designing of Capital structure: Types of Leverages (Operating, Financial and Combined), EBIT- EPS Analysis, and other Factors.

Dividend Decisions and Valuation of Firm: Walter's Model, MM Thesis, Gordon's Model Lintner's Model. Factors Affecting Dividend Policy.

Working Capital Management: Planning of Working Capital. Determinants of Working Capital. Components of Working Capital - Cash, Inventory and Receivables.

Corporate Restructuring with focus on Mergers and Acquisitions (Financial aspects only)

2. **Financial Markets and Institutions:** Indian Financial System: An Overview
Money Markets: Participants, Structure and Instruments. Commercial Banks. Reforms in Banking sector. Monetary and Credit Policy of RBI. RBI as a Regulator. Capital Market: Primary and Secondary Market. Financial Market Instruments and Innovative Debt Instruments; SEBI as a Regulator.
Financial Services: Mutual Funds, Venture Capital, Credit Rating Agencies, Insurance and IRDA.

PAPER – II

Organisation Theory and Behaviour, Human Resource Management and Industrial Relations

Organisation Theory and Behaviour

1. **Organisation Theory:**

Nature and Concept of Organisation; External Environment of Organizations
- Technological, Social, Political, Economical and Legal; Organizational Goals
- Primary and Secondary goals, Single and Multiple Goals; Management by Objectives.

Evolution of Organisation Theory: Classical, Neo-classical and Systems Approach.

Modern Concepts of Organisation Theory: Organisational Design, Organisational Structure and Organisational Culture.

Organisational Design—Basic Challenges; Differentiation and Integration Process; Centralization and Decentralization Process; Standardization / Formalization and Mutual Adjustment. Coordinating Formal and Informal Organizations. Mechanistic and Organic Structures.

Designing Organizational structures—Authority and Control; Line and Staff Functions, Specialization and Coordination. Types of Organization Structure—Functional. Matrix Structure, Project Structure. Nature and Basis of Power, Sources of Power, Power Structure and Politics. Impact of Information Technology on Organizational Design and Structure.

Managing Organizational Culture.

2. Organisation Behaviour:

Meaning and Concept; Individual in organizations: Personality, Theories, and Determinants; Perception - Meaning and Process.

Motivation: Concepts, Theories and Applications. Leadership-Theories and Styles. Quality of Work Life (QWL): Meaning and its impact on Performance, Ways of its Enhancement. Quality Circles (QC) – Meaning and their Importance. Management of Conflicts in Organizations. Transactional Analysis, Organizational Effectiveness, Management of Change.

Human Resources Management and Industrial Relations

1. Human Resources Management (HRM):

Meaning, Nature and Scope of HRM, Human Resource Planning, Job Analysis, Job Description, Job Specification, Recruitment Process, Selection Process, Orientation and Placement, Training and Development Process, Performance Appraisal and 360° Feed Back, Salary and Wage Administration, Job Evaluation, Employee Welfare, Promotions, Transfers and Separations.

2. Industrial Relations (IR):

Meaning, Nature, Importance and Scope of IR, Formation of Trade Unions, Trade Union Legislation, Trade Union Movement in India. Recognition of Trade Unions, Problems of Trade Unions in India. Impact of Liberalization on Trade Union Movement.

Nature of Industrial Disputes : Strikes and Lockouts , Causes of Disputes, Prevention and Settlement of Disputes.

Worker's Participation in Management: Philosophy, Rationale, Present Day Status and Future Prospects.

Adjudication and Collective Bargaining.

Industrial Relations in Public Enterprises, Absenteeism and Labor Turnover in Indian Industries and their Causes and Remedies.

ILO and its Functions.

ECONOMICS PAPER – I

1. Advanced Micro Economics:

- (a) Marshallian and Walrasian Approaches to Price determination.
- (b) Alternative Distribution Theories: Ricardo, Kaldor, Kalecki
- (c) Markets Structure: Monopolistic Competition, Duopoly, Oligopoly.
- (d) Modern Welfare Criteria: Pareto Hicks & Scitovsky, Arrow's Impossibility Theorem, A.K. Sen's Social Welfare Function.

2. Advanced Macro Economics:

Approaches to Employment Income and Interest Rate determination: Classical, Keynes (IS-LM) curve, Neo classical synthesis and New classical, Theories of Interest Rate determination and Interest Rate Structure.

3. Money - Banking and Finance:

- (a) Demand for and Supply of Money: Money Multiplier Quantity Theory of Money (Fisher, Pique and Friedman) and Keynes's Theory on Demand for Money, Goals and Instruments of Monetary Management in Closed and Open Economies. Relation between the Central Bank and the Treasury. Proposal for ceiling on growth rate of money.
- (b) Public Finance and its Role in Market Economy: In stabilization of supply, allocation of resources and in distribution and development. Sources of Govt. revenue, forms of Taxes and Subsidies, their incidence and effects. Limits to taxation, loans, crowding-out effects and limits to borrowings. Public Expenditure and its effects.

4. International Economics:

- (a) Old and New Theories of International Trade
 - (i) Comparative Advantage
 - (ii) Terms of Trade and Offer Curve.
 - (iii) Product Cycle and Strategic Trade Theories.
 - (iv) Trade as an engine of growth" and theories of under development in an open economy.
- (b) Forms of Protection: Tariff and quota.
- (c) Balance of Payments Adjustments: Alternative Approaches.
 - (i) Price versus income, income adjustments under fixed exchange rates,
 - (ii) Theories of Policy Mix
 - (iii) Exchange rate adjustments under capital mobility
 - (iv) Floating Rates and their Implications for Developing Countries: Currency Boards.
 - (v) Trade Policy and Developing Countries.
 - (vi) BOP, adjustments and Policy Coordination in open economy

- macro-model.
- (vii) Speculative attacks
- (viii) Trade Blocks and Monetary Unions.
- (ix) WTO: TRIMS, TRIPS, Domestic Measures, Different Rounds of WTO talks.

5. **Growth and Development:**

- (a) (i) Theories of growth: Harrod's model,
- (ii) Lewis model of development with surplus labour
- (iii) Balanced and Unbalanced growth,
- (iv) Human Capital and Economic Growth.
- (v) Research and Development and Economic Growth
- (b) Process of Economic Development of Less developed countries: Myrdal and Kuznets on economic development and structural change: Role of Agriculture in Economic Development of less developed countries.
- (c) Economic development and International Trade and Investment, Role of Multinationals.
- (d) Planning and Economic Development: changing role of Markets and Planning, Private- Public Partnership
- (e) Welfare indicators and measures of growth – Human Development Indices. The basic needs approach.
- (f) Development and Environmental Sustainability – Renewable and Non Renewable Resources, Environmental Degradation, Intergenerational equity development.

PAPER – II

1. **Indian Economy in Pre-Independence Era:**

Land System and its changes, Commercialization of agriculture, Drain theory, Laissez faire theory and critique. Manufacture and Transport: Jute, Cotton, Railways, Money and Credit.

2. **Indian Economy after Independence:**

- A The Pre Liberalization Era:
 - (i) Contribution of Vakil, Gadgil and V.K.R.V. Rao.
 - (ii) Agriculture: Land Reforms and land tenure system, Green Revolution and capital formation in agriculture,
 - (iii) Industry Trends in composition and growth, Role of public and private sector, Small scale and cottage industries.
 - (iv) National and Per capita income: patterns, trends, aggregate and Sectoral composition and changes their in.
 - (v) Broad factors determining National Income and distribution, Measures of poverty, Trends in poverty and inequality.

- B The Post Liberalization Era:
- (i) New Economic Reform and Agriculture: Agriculture and WTO, Food processing, Subsidies, Agricultural prices and public distribution system, Impact of public expenditure on agricultural growth.
 - (ii) New Economic Policy and Industry: Strategy of industrialization, Privatization, Disinvestments, Role of foreign direct investment and multinationals.
 - (iii) New Economic Policy and Trade: Intellectual property rights: Implications of TRIPS, TRIMS, GATS and new EXIM policy.
 - (iv) New Exchange Rate Regime: Partial and full convertibility, Capital account convertibility.
 - (v) New Economic Policy and Public Finance: Fiscal Responsibility Act, Twelfth Finance Commission and Fiscal Federalism and Fiscal Consolidation.
 - (vi) New Economic Policy and Monetary system. Role of RBI under the new regime.
 - (vii) Planning: From central Planning to indicative planning, Relation between planning and markets for growth and decentralized planning: 73rd and 74th Constitutional amendments.
 - (viii) New Economic Policy and Employment: Employment and poverty, Rural wages, Employment Generation, Poverty alleviation schemes, New Rural, Employment Guarantee Scheme.

ELECTRICAL ENGINEERING PAPER - I

1. **Circuit Theory:** Circuit components; network graphs; KCL, KVL; circuit analysis methods: nodal analysis, mesh analysis; basic network theorems and applications; transient analysis: RL, RC and RLC circuits; sinusoidal steady state analysis; resonant circuits; coupled circuits; balanced 3-phase circuits; Two-port networks.
2. **Signals & Systems:** Representation of continuous-time and discrete-time signals & systems; LTI systems; convolution; impulse response; time-domain analysis of LTI systems based on convolution and differential/difference equations. Fourier transform, Laplace transform, Z-transform, Transfer function. Sampling and recovery of signals DFT, FFT Processing of analog signals through discrete-time systems.
3. **E.M. Theory:** Maxwell's equations, wave propagation in bounded media. Boundary conditions, reflection and refraction of plane waves. Transmission line: travelling and standing waves, impedance matching, Smith chart.
4. **Analog Electronics:** Characteristics and equivalent circuits (large and small-signal) of Diode, BJT, JFET and MOSFET. Diode circuits: clipping, clamping, rectifier. Biasing and bias stability. FET amplifiers. Current mirror; Amplifiers: single and multi-stage, differential, operational, feedback and power. Analysis of amplifiers; frequency-response of amplifiers. OPAMP circuits. Filters; sinusoidal oscillators: criterion for oscillation; single-transistor and OPAMP configurations. Function generators and wave-shaping circuits. Linear and switching power supplies.
5. **Digital Electronics:** Boolean algebra; minimization of Boolean functions; logic gates; digital IC families (DTL, TTL, ECL, MOS, CMOS). Combinational circuits: arithmetic circuits, code converters, multiplexers and decoders. Sequential circuits: latches and flip-flops, counters and shift-registers. Comparators, timers, multivibrators. Sample and hold circuits, ADCs and DACs. Semiconductor memories. Logic implementation using programmable devices (ROM, PLA, FPGA).
6. **Energy Conversion:** Principles of electromechanical energy conversion: Torque and emf in rotating machines. DC machines: characteristics and performance analysis; starting and speed control of motors; Transformers: principles of operation and analysis; regulation, efficiency; 3-phase transformers. 3-phase induction machines and synchronous machines: characteristics and performance analysis; speed control.

7. **Power Electronics and Electric Drives:** Semiconductor power devices: diode, transistor, thyristor, triac, GTO and MOSFET—static characteristics and principles of operation; triggering circuits; phase control rectifiers; bridge converters: fully-controlled and half-controlled; principles of thyristor choppers and inverters; DC-DC converters; Switch mode inverter; basic concepts of speed control of DC and AC motor drives applications of variable-speed drives.
8. **Analog Communication:** Random variables: continuous, discrete; probability, probability functions. Statistical averages; probability models; Random signals and noise: white noise, noise equivalent bandwidth; signal transmission with noise; signal to noise ratio. Linear CW modulation: Amplitude modulation: DSB, DSB-SC and SSB. Modulators and Demodulators; Phase and Frequency modulation: PM & FM signals; narrowband FM; generation & detection of FM and PM, Deemphasis, Preemphasis. CW modulation system: Superhetrodyne receivers, AM receivers, communication receivers, FM receivers, phase locked loop, SSB receiver Signal to noise ratio calculation for AM and FM receivers.

PAPER - II

1. **Control Systems:** Elements of control systems; block-diagram representation; open-loop & closed-loop systems; principles and applications of feed-back. Control system components. LTI systems: time-domain and transform-domain analysis. Stability: Routh Hurwitz criterion, root-loci, Bode-plots and polar plots, Nyquist's criterion; Design of lead-lag compensators. Proportional, PI, PID controllers. State-variable representation and analysis of control systems.
2. **Microprocessors and Microcomputers:** PC organisation; CPU, instruction set, register set, timing diagram, programming, interrupts, memory interfacing, I/O interfacing, programmable peripheral devices.
3. **Measurement and Instrumentation:** Error analysis; measurement of current, voltage, power, energy, power-factor, resistance, inductance, capacitance and frequency; bridge measurement. Signal conditioning circuit; Electronic measuring instruments: multimeter, CRO, digital voltmeter, frequency counter, Q-meter, spectrum-analyzer, distortion-meter. Transducers: thermocouple, thermistor, LVDT, strain-gauge, piezo-electric crystal.
4. **Power Systems: Analysis and Control:** Steady-state performance of overhead transmission lines and cables; principles of active and reactive power transfer and distribution; per-unit quantities; bus admittance and impedance matrices; load flow; voltage control and power factor correction; economic operation; symmetrical components, analysis of symmetrical and

unsymmetrical faults. Concept of system stability: swing curves and equal area criterion. Static VAR system. Basic concepts of HVDC transmission.

5. Power System Protection:

Principles of overcurrent, differential and distance protection. Concept of solid state relays. Circuit breakers. Computer aided protection: Introduction; line bus, generator, transformer protection; numeric relays and application of DSP to protection.

6. Digital Communication:

Pulse code modulation (PCM), differential pulse code modulation (DPCM), delta modulation (DM), Digital modulation and demodulation schemes: amplitude, phase and frequency keying schemes (ASK, PSK, FSK). Error control coding: error detection and correction, linear block codes, convolution codes. Information measure and source coding. Data networks, 7-layer architecture.

GEOGRAPHY

PAPER - I

PRINCIPLES OF GEOGRAPHY

Physical Geography

1. **Geomorphology:** Factors controlling landform development; endogenetic and exogenetic forces; Origin and evolution of the earth's crust; Fundamentals of geomagnetism; Physical conditions of the earth's interior; Geosynclines; Continental drift; Isostasy; Plate tectonics; Recent views on mountain building; Vulcanicity; Earthquakes and Tsunamis; Concepts of geomorphic cycles and Landscape development ; Denudation chronology; Channel morphology; Erosion surfaces; Slope development ; Applied Geomorphology : Geohydrology, economic geology and environment.
2. **Climatology:** Temperature and pressure belts of the world; Heat budget of the earth; Atmospheric circulation; atmospheric stability and instability. Planetary and local winds; Monsoons and jet streams; Air masses and fronto genesis, Temperate and tropical cyclones; Types and distribution of precipitation; Weather and Climate; Koppen's, Thornthwaite's and Trewartha's classification of world climates; Hydrological cycle; Global climatic change and role and response of man in climatic changes, Applied climatology and Urban climate.
3. **Oceanography:** Bottom topography of the Atlantic, Indian and Pacific Oceans; Temperature and salinity of the oceans; Heat and salt budgets, Ocean deposits; Waves, currents and tides; Marine resources: biotic, mineral and energy resources; Coral reefs, coral bleaching; sea-level changes; law of the sea and marine pollution.
4. **Biogeography:** Genesis of soils; Classification and distribution of soils; Soil profile; Soil erosion, Degradation and conservation; Factors influencing world distribution of plants and animals; Problems of deforestation and conservation measures; Social forestry; agro-forestry; Wild life; Major gene pool centres.
5. **Environmental Geography:** Principle of ecology; Human ecological adaptations; Influence of man on ecology and environment; Global and regional ecological changes and imbalances; Ecosystem their management and conservation; Environmental degradation, management and conservation; Biodiversity and sustainable development; Environmental policy; Environmental hazards and remedial measures; Environmental education and legislation.

Human Geography:

1. **Perspectives in Human Geography:** Areal differentiation; regional synthesis; Dichotomy and dualism; Environmentalism; Quantitative revolution

and locational analysis; radical, behavioural, human and welfare approaches; Languages, religions and secularisation; Cultural regions of the world; Human development index.

2. **Economic Geography:** World economic development: measurement and problems; World resources and their distribution; Energy crisis; the limits to growth; World agriculture: typology of agricultural regions; agricultural inputs and productivity; Food and nutrition problems; Food security; famine: causes, effects and remedies; World industries: locational patterns and problems; patterns of world trade.
3. **Population and Settlement Geography:** Growth and distribution of world population; demographic attributes; Causes and consequences of migration; concepts of over-under-and optimum population; Population theories, world population problems and policies, Social well-being and quality of life; Population as social capital.

Types and patterns of rural settlements; Environmental issues in rural settlements; Hierarchy of urban settlements; Urban morphology: Concepts of primate city and rank-size rule; Functional classification of towns; Sphere of urban influence; Rural - urban fringe; Satellite towns; Problems and remedies of urbanization; Sustainable development of cities.
4. **Regional Planning:** Concept of a region; Types of regions and methods of regionalisation; Growth centres and growth poles; Regional imbalances; regional development strategies; environmental issues in regional planning; Planning for sustainable development.
5. **Models, Theories and Laws in Human Geography:** Systems analysis in Human geography; Malthusian, Marxian and demographic transition models; Central Place theories of Christaller and Losch; Perroux and Boudeville; Von Thunen's model of agricultural location; Weber's model of industrial location; Ostov's model of stages of growth. Heartland and Rimland theories; Laws of international boundaries and frontiers.

PAPER – II GEOGRAPHY OF INDIA

1. **Physical Setting:** Space relationship of India with neighboring countries; Structure and relief; Drainage system and watersheds; Physiographic regions; Mechanism of Indian monsoons and rainfall patterns, Tropical cyclones and western disturbances; Floods and droughts; Climatic regions; Natural vegetation; Soil types and their distributions.
2. **Resources:** Land, surface and ground water, energy, minerals, biotic and marine resources; Forest and wild life resources and their conservation; Energy crisis.

3. **Agriculture:** Infrastructure: irrigation, seeds, fertilizers, power; Institutional factors: land holdings, land tenure and land reforms; Cropping pattern, agricultural productivity, agricultural intensity, crop combination, land capability; Agro and social-forestry; Green revolution and its socio- economic and ecological implications; Significance of dry farming; Livestock resources and white revolution; aqua - culture; sericulture, apiculture and poultry; agricultural regionalisation; agro-climatic zones; agro- ecological regions.
4. **Industry:** Evolution of industries; Locational factors of cotton, jute, textile, iron and steel, aluminium, fertilizer, paper, chemical and pharmaceutical, automobile, cottage and agro - based industries; Industrial houses and complexes including public sector undertakings; Industrial regionalisation; New industrial policies; Multinationals and liberalization; Special Economic Zones; Tourism including eco -tourism.
5. **Transport, Communication and Trade:** Road, railway, waterway, airway and pipeline networks and their complementary roles in regional development; Growing importance of ports on national and foreign trade; Trade balance; Trade Policy; Export processing zones; Developments in communication and information technology and their impacts on economy and society; Indian space programme.
6. **Cultural Setting:** Historical Perspective of Indian Society; Racial, linguistic and ethnic diversities; religious minorities; major tribes, tribal areas and their problems; cultural regions; Growth, distribution and density of population; Demographic attributes: sex-ratio, age structure, literacy rate, work-force, dependency ratio, longevity; migration (inter-regional, intra- regional and international) and associated problems; Population problems and policies; Health indicators.
7. **Settlements:** Types, patterns and morphology of rural settlements; Urban developments; Morphology of Indian cities; Functional classification of Indian cities; Conurbations and metropolitan regions; urban sprawl; Slums and associated problems; town planning; Problems of urbanization and remedies.
8. **Regional Development and Planning:** Experience of regional planning in India; Five Year Plans; Integrated rural development programmes; Panchayati Raj and decentralised planning; Command area development; Watershed management; Planning for backward area, desert, drought prone, hill, tribal area development; multi-level planning; Regional planning and development of island territories.
9. **Political Aspects:** Geographical basis of Indian federalism; State reorganisation; Emergence of new states; Regional consciousness and inter state issues; international boundary of India and related issues; Cross border terrorism; India's role in world affairs; Geopolitics of South Asia and Indian Ocean realm.

10. **Contemporary Issues:** Ecological issues: Environmental hazards: landslides, earthquakes, Tsunamis, floods and droughts, epidemics; Issues relating to environmental pollution; Changes in patterns of land use; Principles of environmental impact assessment and environmental management; Population explosion and food security; Environmental degradation; Deforestation, desertification and soil erosion; Problems of agrarian and industrial unrest; Regional disparities in economic development; Concept of sustainable growth and development; Environmental awareness; Linkage of rivers; Globalisation and Indian economy.

Note : Candidates will be required to answer one compulsory map question pertinent to subjects covered by this paper.

GEOLOGY PAPER - I

1. **General Geology:** The Solar System, Meteorites, Origin and interior of the earth and age of earth; Volcanoes- causes and products, Volcanic belts; Earthquakes-causes, effects, Seismic zones of India; Island arcs, trenches and mid-ocean ridges; Continental drifts; Seafloor spreading, Plate tectonics; Isostasy.
2. **Geomorphology and Remote Sensing:** Basic concepts of geomorphology; Weathering and soil formations; Landforms, slopes and drainage; Geomorphic cycles and their interpretation; Morphology and its relation to structures and lithology; Coastal geomorphology; Applications of geomorphology in mineral prospecting, civil engineering; Hydrology and environmental studies; Geomorphology of Indian subcontinent.
Aerial photographs and their interpretation-merits and limitations; The Electromagnetic spectrum; Orbiting satellites and sensor systems; Indian Remote Sensing Satellites; Satellites data products; Applications of remote sensing in geology; The Geographic Information Systems (GIS) and Global Positioning System (GPS) - its applications.
3. **Structural Geology:** Principles of geologic mapping and map reading, Projection diagrams, Stress and strain ellipsoid and stress-strain relationships of elastic, plastic and viscous materials; Strain markers in deformed rocks; Behaviour of minerals and rocks under deformation conditions; Folds and faults classification and mechanics; Structural analysis of folds, foliations, lineations, joints and faults, unconformities; Time-relationship between crystallization and deformation.
4. **Paleontology:** Species- definition and nomenclature; Megafossils and Microfossils; Modes of preservation of fossils; Different kinds of microfossils; Application of microfossils in correlation, petroleum exploration, paleoclimatic and paleoceanographic studies; Evolutionary trend in Hominidae, Equidae and Proboscidae; Siwalik fauna; Gondwana flora and fauna and its importance; Index fossils and their significance.
5. **Indian Stratigraphy:** Classification of stratigraphic sequences: lithostratigraphic, biostratigraphic, chronostratigraphic and magnetostratigraphic and their interrelationships; Distribution and classification of Precambrian rocks of India; Study of stratigraphic distribution and lithology of Phanerozoic rocks of India with reference to fauna, flora and economic importance; Major boundary problems- Cambrian/Precambrian, Permian/Triassic, Cretaceous/Tertiary and Pliocene/Pleistocene; Study of climatic conditions, paleogeography and igneous activity in the Indian subcontinent in the geological past; Tectonic framework of India; Evolution of the Himalayas.
6. **Hydrogeology and Engineering Geology:** Hydrologic cycle and genetic classification of water; Movement of subsurface water; Springs; Porosity, permeability, hydraulic conductivity, transmissivity and storage coefficient, classification of aquifers; Water-bearing characteristics of rocks; Groundwater

chemistry; Salt water intrusion; Types of wells; Drainage basin morphometry; Exploration for groundwater; Groundwater recharge; Problems and management of groundwater; Rainwater harvesting; Engineering properties of rocks; Geological investigations for dams, tunnels highways, railway and bridges; Rock as construction material; Landslides-causes, prevention and rehabilitation; Earthquake-resistant structures.

PAPER - II

- 1. Mineralogy:** Classification of crystals into systems and classes of symmetry; International system of crystallographic notation; Use of projection diagrams to represent crystal symmetry; Elements of X-ray crystallography.
Physical and chemical characters of rock forming silicate mineral groups; Structural classification of silicates; Common minerals of igneous and metamorphic rocks; Minerals of the carbonate, phosphate, sulphide and halide groups; Clay minerals.
Optical properties of common rock forming minerals; Pleochroism, extinction angle, double refraction, birefringence, twinning and dispersion in minerals.
- 2. Igneous and Metamorphic Petrology:** Generation and crystallization of magmas; Crystallization of albite-anorthite, diopside-anorthite and diopside-wollastonite-silica systems; Bowen's Reaction Principle; Magmatic differentiation and assimilation; Petrogenetic significance of the textures and structures of igneous rocks; Petrography and petrogenesis of granite, syenite, diorite, basic and ultrabasic groups, charnockite, anorthosite and alkaline rocks; Carbonatites; Deccan volcanic province.
Types and agents of metamorphism; Metamorphic grades and zones; Phase rule; Facies of regional and contact metamorphism; ACF and AKF diagrams; Textures and structures of metamorphic rocks; Metamorphism of arenaceous, argillaceous and basic rocks; Minerals assemblages Retrograde metamorphism; Metasomatism and granitisation, migmatites, Granulite terrains of India.
- 3. Sedimentary Petrology:** Sediments and Sedimentary rocks: Processes of formation; diagenesis and lithification; Clastic and non-clastic rocks-their classification, petrography and depositional environment; Sedimentary facies and provenance; Sedimentary structures and their significance; Heavy minerals and their significance; Sedimentary basins of India.
- 4. Economic Geology:** Ore, ore minerals and gangue, tenor of ore, classification of ore deposits; Process of formation of minerals deposits; Controls of ore localization; Ore textures and structures; Metallogenic epochs and provinces; Geology of the important Indian deposits of aluminium, chromium, copper, gold, iron, lead zinc, manganese, titanium, uranium and thorium and industrial minerals; Deposits of coal and petroleum in India; National Mineral Policy; Conservation and utilization of mineral resources; Marine mineral resources and Law of Sea.
- 5. Mining Geology:** Methods of prospecting-geological, geophysical, geochemical and geobotanical; Techniques of sampling; Estimation of reserves or ore; Methods

of exploration and mining metallic ores, industrial minerals, marine mineral resources and building stones; Mineral beneficiation and ore dressing.

6. **Geochemistry and Environmental Geology:** Cosmic abundance of elements; Composition of the planets and meteorites; Structure and composition of Earth and distribution of elements; Trace elements; Elements of crystal chemistry- types of chemical bonds, coordination number; Isomorphism and polymorphism; Elementary thermodynamics.

Natural hazards-floods, mass wasting, costal hazards, earthquakes and volcanic activity and mitigation; Environmental impact of urbanization, mining, industrial and radioactive waste disposal, use of fertilizers, dumping of mine waste and fly ash; Pollution of ground and surface water, marine pollution; Environment protection - legislative measures in India; Sea level changes: causes and impact.

HISTORY PAPER - I

- 1. Sources:**

Archaeological sources:
Exploration, excavation, epigraphy, numismatics, monuments

Literary sources:
Indigenous: Primary and secondary; poetry, scientific literature, literature, literature in regional languages, religious literature.
Foreign accounts: Greek, Chinese and Arab writers.
- 2. Pre-history and Proto-history:**

Geographical factors; hunting and gathering (paleolithic and mesolithic);
Beginning of agriculture (neolithic and chalcolithic).
- 3. Indus Valley Civilization:**

Origin, date, extent, characteristics, decline, survival and significance, art and architecture.
- 4. Megalithic Cultures:**

Distribution of pastoral and farming cultures outside the Indus, Development of community life, Settlements, Development of agriculture, Crafts, Pottery, and Iron industry.
- 5. Aryans and Vedic Period:**

Expansions of Aryans in India.
Vedic Period: Religious and philosophic literature; Transformation from Rig Vedic period to the later Vedic period; Political, social and economical life; Significance of the Vedic Age; Evolution of Monarchy and Varna system.
- 6. Period of Mahajanapadas:**

Formation of States (Mahajanapada) : Republics and monarchies; Rise of urban centres; Trade routes; Economic growth; Introduction of coinage; Spread of Jainism and Buddhism; Rise of Magadha and Nandas.
Iranian and Macedonian invasions and their impact.
- 7. Mauryan Empire:**

Foundation of the Mauryan Empire, Chandragupta, Kautilya and Arthashastra; Ashoka; Concept of Dharma; Edicts; Polity, Administration; Economy; Art, architecture and sculpture; External contacts; Religion; Spread of religion; Literature.
Disintegration of the empire; Sungas and Kanvas.
- 8. Post - Mauryan Period (Indo-Greeks, Sakas, Kushanas, Western Kshatrapas):**

Contact with outside world; growth of urban centres, economy, coinage, development of religions, Mahayana, social conditions, art, architecture, culture, literature and science.

- 9. Early State and Society in Eastern India, Deccan and South India:**
Kharavela, The Satavahanas, Tamil States of the Sangam Age; Administration, economy, land grants, coinage, trade guilds and urban centres; Buddhist centres; Sangam literature and culture; Art and architecture.
- 10. Guptas, Vakatakas and Vardhanas:**
Polity and administration, Economic conditions, Coinage of the Guptas, Land grants, Decline of urban centres, Indian feudalism, Caste system, Position of women, Education and educational institutions; Nalanda, Vikramshila and Vallabhi, Literature, scientific literature, art and architecture.
- 11. Regional States during Gupta Era:**
The Kadambas, Pallavas, Chalukyas of Badami; Polity and Administration, Trade guilds, Literature; growth of Vaishnava and Saiva religions. Tamil Bhakti movement, Shankaracharya; Vedanta; Institutions of temple and temple architecture; Palas, Senas, Rashtrakutas, Paramaras, Polity and administration; Cultural aspects. Arab conquest of Sind; Alberuni, The Chalukyas of Kalyana, Cholas, Hoysalas, Pandyas; Polity and Administration; local Government; Growth of art and architecture, religious sects, Institution of temple and Mathas, Agraharas, education and literature, economy and society.
- 12. Themes in Early Indian Cultural History:**
Languages and texts, major stages in the evolution of art and architecture, major philosophical thinkers and schools, ideas in Science and Mathematics.
- 13. Early Medieval India, 750-1200:**
- Polity: Major political developments in Northern India and the Peninsula, origin and the rise of Rajputs
 - The Cholas: administration, village economy and society
 - “Indian Feudalism”
 - Agrarian economy and urban settlements
 - Trade and commerce
 - Society: the status of the Brahman and the new social order
 - Condition of women
 - Indian science and technology
- 14. Cultural Traditions in India, 750-1200:**
- Philosophy: Shankaracharya and Vedanta, Ramanuja and Vishishtadvaita, Madhva and Brahma-Mimansa
 - Religion: Forms and features of religion, Tamil devotional cult, growth of Bhakti, Islam and its arrival in India, Sufism
 - Literature: Literature in Sanskrit, growth of Tamil literature, literature in the newly developing languages, Kalhan’s Rajtarangini, Alberuni’s India
 - Art and Architecture: Temple architecture, sculpture, painting

- 15. The Thirteenth Century:**
- Establishment of the Delhi Sultanate: The Ghurian invasions – factors behind Ghurian success
 - Economic, social and cultural consequences
 - Foundation of Delhi Sultanate and early Turkish Sultans
 - Consolidation: The rule of Iltutmish and Balban
- 16. The Fourteenth Century:**
- “The Khalji Revolution”
 - Alauddin Khalji: Conquests and territorial expansion, agrarian and economic measures
 - Muhammad Tughluq: Major projects, agrarian measures, bureaucracy of Muhammad Tughluq
 - Firuz Tughluq: Agrarian measures, achievements in civil engineering and public works, decline of the Sultanate, foreign contacts and Ibn Battuta’s account
- 17. Society, Culture and Economy in the Thirteenth and Fourteenth Centuries:**
- Society: composition of rural society, ruling classes, town dwellers, women, religious classes, caste and slavery under the Sultanate, Bhakti movement, Sufi movement
 - Culture: Persian literature, literature in the regional languages of North India, literature in the languages of South India, Sultanate architecture and new structural forms, painting, evolution of a composite culture
 - Economy: Agricultural production, rise of urban economy and non-agricultural production, trade and commerce
- 18. The Fifteenth and Early Sixteenth Century – Political Developments and Economy:**
- Rise of Provincial Dynasties: Bengal, Kashmir (Zainul Abedin), Gujarat, Malwa, Bahmanids
 - The Vijayanagra Empire
 - Lodis
 - Mughal Empire, First phase: Babur and Humayun
 - The Sur Empire: Sher Shah’s administration
 - Portuguese Colonial enterprise
 - Bhakti and Sufi Movements
- 19. The Fifteenth and early Sixteenth Century – Society and Culture:**
- Regional cultural specificities
 - Literary traditions
 - Provincial architecture
 - Society, culture, literature and the arts in Vijayanagara Empire.

- 20. Akbar:**
- Conquests and consolidation of the Empire
 - Establishment of Jagir and Mansab systems
 - Rajput policy
 - Evolution of religious and social outlook, theory of Sulh-i-kul and religious policy
 - Court patronage of art and technology
- 21. Mughal Empire in the Seventeenth Century:**
- Major administrative policies of Jahangir, Shahjahan and Aurangzeb
 - The Empire and the Zamindars
 - Religious policies of Jahangir, Shahjahan and Aurangzeb
 - Nature of the Mughal State
 - Late Seventeenth century crisis and the revolts
 - The Ahom Kingdom
 - Shivaji and the early Maratha Kingdom.
- 22. Economy and Society in the Sixteenth and Seventeenth Centuries:**
- Population, agricultural production, craft production
 - Towns, commerce with Europe through Dutch, English and French companies : a trade revolution
 - Indian mercantile classes, banking, insurance and credit systems
 - Condition of peasants, condition of women
 - Evolution of the Sikh community and the Khalsa Panth
- 23. Culture in the Mughal Empire:**
- Persian histories and other literature
 - Hindi and other religious literature
 - Mughal architecture
 - Mughal painting
 - Provincial architecture and painting
 - Classical music
 - Science and technology
- 24. The Eighteenth Century:**
- Factors for the decline of the Mughal Empire
 - The regional principalities: Nizam's Deccan, Bengal, Awadh
 - Maratha ascendancy under the Peshwas
 - The Maratha fiscal and financial system
 - Emergence of Afghan Power, Battle of Panipat:1761
 - State of politics, culture and economy on the eve of the British conquest

PAPER - II

1. **European Penetration into India:**
The Early European Settlements; The Portuguese and the Dutch; The English and the French East India Companies; Their struggle for supremacy; Carnatic Wars; Bengal -The conflict between the English and the Nawabs of Bengal; Siraj and the English; The Battle of Plassey; Significance of Plassey.
2. **British Expansion in India:**
Bengal – Mir Jafar and Mir Kasim; The Battle of Buxar; Mysore; The Marathas; The three Anglo-Maratha Wars; The Punjab.
3. **Early Structure of the British Raj:**
The early administrative structure; From diarchy to direct control; The Regulating Act (1773); The Pitt's India Act (1784); The Charter Act (1833); The voice of free trade and the changing character of British colonial rule; The English utilitarian and India.
4. **Economic Impact of British Colonial Rule:**
 - (a) Land revenue settlements in British India; The Permanent Settlement; Ryotwari Settlement; Mahalwari Settlement; Economic impact of the revenue arrangements; Commercialization of agriculture; Rise of landless agrarian labourers; Impoverishment of the rural society.
 - (b) Dislocation of traditional trade and commerce; De-industrialisation; Decline of traditional crafts; Drain of wealth; Economic transformation of India; Railroad and communication network including telegraph and postal services; Famine and poverty in the rural interior; European business enterprise and its limitations.
5. **Social and Cultural Developments:**
The state of indigenous education, its dislocation; Orientalist-Anglicist controversy, The introduction of western education in India; The rise of press, literature and public opinion; The rise of modern vernacular literature; Progress of science; Christian missionary activities in India.
6. **Social and Religious Reform movements in Bengal and Other Areas:**
Ram Mohan Roy, The Brahma Movement; Devendranath Tagore; Iswarchandra Vidyasagar; The Young Bengal Movement; Dayanada Saraswati; The social reform movements in India including Sati, widow remarriage, child marriage etc.; The contribution of Indian renaissance to the growth of modern India; Islamic revivalism – the Feraizi and Wahabi Movements.
7. **Indian Response to British Rule:**
Peasant movements and tribal uprisings in the 18th and 19th centuries including the Rangpur Dhing (1783), the Kol Rebellion (1832), the Mopla Rebellion in Malabar (1841-1920), the Santal Hul (1855), Indigo Rebellion (1859-60), Deccan Uprising (1875) and the Munda Ulgulan (1899-1900); The Great Revolt of

- 1857 - Origin, character, causes of failure, the consequences; The shift in the character of peasant uprisings in the post-1857 period; the peasant movements of the 1920s and 1930s.
8. Factors leading to the birth of Indian Nationalism; Politics of Association; The Foundation of the Indian National Congress; The Safety-valve thesis relating to the birth of the Congress; Programme and objectives of Early Congress; the social composition of early Congress leadership; the Moderates and Extremists; The Partition of Bengal (1905); The Swadeshi Movement in Bengal; the economic and political aspects of Swadeshi Movement; The beginning of revolutionary extremism in India.
 9. Rise of Gandhi; Character of Gandhian nationalism; Gandhi's popular appeal; Rowlatt Satyagraha; the Khilafat Movement; the Non-cooperation Movement; National politics from the end of the Non-cooperation movement to the beginning of the Civil Disobedience movement; the two phases of the Civil Disobedience Movement; Simon Commission; The Nehru Report; the Round Table Conferences; Nationalism and the Peasant Movements; Nationalism and Working class movements; Women and Indian youth and students in Indian politics (1885-1947); the election of 1937 and the formation of ministries; Cripps Mission; the Quit India Movement; the Wavell Plan; The Cabinet Mission.
 10. Constitutional Developments in the Colonial India between 1858 and 1935
 11. Other strands in the National Movement
The Revolutionaries: Bengal, the Punjab, Maharashtra, U.P, the Madras Presidency, Outside India.
The Left; The Left within the Congress: Jawaharlal Nehru, Subhas Chandra Bose, the Congress Socialist Party; the Communist Party of India, other left parties.
 12. Politics of Separatism; the Muslim League; the Hindu Mahasabha; Communalism and the politics of partition; Transfer of power; Independence.
 13. Consolidation as a Nation; Nehru's Foreign Policy; India and her neighbours (1947-1964); The linguistic reorganisation of States (1935-1947); Regionalism and regional inequality; Integration of Princely States; Princes in electoral politics; the Question of National Language.
 14. Caste and Ethnicity after 1947; Backward castes and tribes in post-colonial electoral politics; Dalit movements.
 15. Economic development and political change; Land reforms; the politics of planning and rural reconstruction; Ecology and environmental policy in post-colonial India; Progress of science.
 16. **Enlightenment and Modern ideas:**
 - (i) Major ideas of Enlightenment: Kant, Rousseau

- (ii) Spread of Enlightenment in the colonies
 - (iii) Rise of socialist ideas (up to Marx); spread of Marxian Socialism.
- 17. Origins of Modern Politics:**
- (i) European States System.
 - (ii) American Revolution and the Constitution.
 - (iii) French revolution and aftermath, 1789-1815.
 - (iv) American Civil War with reference to Abraham Lincoln and the abolition of slavery.
 - (v) British Democratic Politics, 1815-1850; Parliamentary Reformers, Free Traders, Chartists.
- 18. Industrialization:**
- (i) English Industrial Revolution: Causes and Impact on Society
 - (ii) Industrialization in other countries: USA, Germany, Russia, Japan
 - (iii) Industrialization and Globalization.
- 19. Nation-State System:**
- (i) Rise of Nationalism in 19th century
 - (ii) Nationalism: state-building in Germany and Italy
 - (iii) Disintegration of Empires in the face of the emergence of nationalities across the world.
- 20. Imperialism and Colonialism:**
- (i) South and South-East Asia
 - (ii) Latin America and South Africa
 - (iii) Australia
 - (iv) Imperialism and free trade: Rise of neo-imperialism.
- 21. Revolution and Counter-Revolution:**
- (i) 19th Century European revolutions
 - (ii) The Russian Revolution of 1917-1921
 - (iii) Fascist Counter-Revolution, Italy and Germany.
 - (iv) The Chinese Revolution of 1949
- 22. World Wars:**
- (i) 1st and 2nd World Wars as Total Wars: Societal implications
 - (ii) World War I: Causes and consequences
 - (iii) World War II: Causes and consequence
- 23. The World after World War II:**
- (i) Emergence of two power blocs
 - (ii) Emergence of Third World and non-alignment
 - (iii) UNO and the global disputes.
- 24. Liberation from Colonial Rule:**
- (i) Latin America-Bolivar
 - (ii) Arab World-Egypt

- (iii) Africa-Apartheid to Democracy
- (iv) South-East Asia-Vietnam
- 25. Decolonization and Underdevelopment:**
 - (i) Factors constraining development: Latin America, Africa
- 26. Unification of Europe:**
 - (i) Post War Foundations: NATO and European Community
 - (ii) Consolidation and Expansion of European Community
 - (iii) European Union.
- 27. Disintegration of Soviet Union and the Rise of the Unipolar World:**
 - (i) Factors leading to the collapse of Soviet communism and the Soviet Union, 1985-1991
 - (ii) Political Changes in Eastern Europe 1989-2001.
 - (iii) End of the cold war and US ascendancy in the World as the lone superpower.

LAW **PAPER - I**

Constitutional and Administrative Law

1. Constitution and Constitutionalism: The distinctive features of the Constitution.
2. Fundamental rights – Public interest litigation; Legal Aid; Legal services authority.
3. Relationship between fundamental rights, directive principles and fundamental duties.
4. Constitutional position of the President and relation with the Council of Ministers.
5. Governor and his powers.
6. Supreme Court and High Courts:
 - (a) Appointments and transfer.
 - (b) Powers, functions and jurisdiction.
7. Centre, States and local bodies:
 - (a) Distribution of legislative powers between the Union and the States.
 - (b) Local bodies.
 - (c) Administrative relationship among Union, State and Local Bodies.
 - (d) Eminent domain – State property – common property – community property.
8. Legislative powers, privileges and immunities.
9. Services under the Union and the States:
 - (a) Recruitment and conditions of services; Constitutional safeguards; Administrative tribunals.
 - (b) Union Public Service Commission and State Public Service Commissions – Power and functions
 - (c) Election Commission – Power and functions.
10. Emergency provisions.
11. Amendment of the Constitution.
12. Principles of natural justice – Emerging trends and judicial approach.
13. Delegated legislation and its constitutionality.
14. Separation of powers and constitutional governance.
15. Judicial review of administrative action.
16. Ombudsman: Lokayukta, Lokpal etc.

International Law

1. Nature and definition of international law.
2. Relationship between international law and municipal law.
3. State recognition and state succession.
4. Law of the sea: Inland waters, territorial sea, contiguous zone, continental

- shelf, exclusive economic zone, high seas.
5. Individuals: Nationality, statelessness; Human rights and procedures available for their enforcement.
 6. Territorial jurisdiction of States, extradition and asylum.
 7. Treaties: Formation, application, termination and reservation.
 8. United Nations: Its principal organs, powers, functions and reform.
 9. Peaceful settlement of disputes – different modes.
 10. Lawful recourse to force: aggression, self-defence, intervention.
 11. Fundamental principles of international humanitarian law – International conventions and contemporary developments.
 12. Legality of the use of nuclear weapons; ban on testing of nuclear weapons; Nuclear – non proliferation treaty, CTBT.
 13. International terrorism, state sponsored terrorism, hijacking, international criminal court.
 14. New international economic order and monetary law: WTO, TRIPS, GATT, IMF, World Bank.
 15. Protection and improvement of the human environment: International efforts.

PAPER - II

Law of Crimes

1. General principles of criminal liability: Mens rea and actus reus, mens rea in statutory offences.
2. Kinds of punishment and emerging trends as to abolition of capital punishment.
3. Preparation and criminal attempt.
4. General exceptions.
5. Joint and constructive liability.
6. Abetment.
7. Criminal conspiracy.
8. Offences against the State.
9. Offences against public tranquility.
10. Offences against human body.
11. Offences against property.
12. Offences against women.
13. Defamation.
14. Prevention of Corruption Act, 1988.
15. Protection of Civil Rights Act 1955 and subsequent legislative developments.
16. Plea bargaining.

Law of Torts

1. Nature and definition.
2. Liability based upon fault and strict liability; Absolute liability.

3. Vicarious liability including State liability.
4. General defences.
5. Joint tort feasons.
6. Remedies.
7. Negligence.
8. Defamation.
9. Nuisance.
10. Conspiracy.
11. False imprisonment.
12. Malicious prosecution.
13. Consumer Protection Act, 1986.

Law of Contracts and Mercantile Law

1. Nature and formation of contract/E-contract.
2. Factors vitiating free consent.
3. Void, voidable, illegal and unenforceable agreements.
4. Performance and discharge of contracts.
5. Quasi- Contracts.
6. Consequences of breach of contract.
7. Contract of indemnity, guarantee and insurance.
8. Contract of agency.
9. Sale of goods and hire purchase.
10. Formation and dissolution of partnership.
11. Negotiable Instruments Act, 1881.
12. Arbitration and Conciliation Act, 1996.
13. Standard form contracts.

Contemporary Legal Developments

1. Public Interest Litigation.
2. Intellectual property rights – Concept, types/prospects.
3. Information Technology Law including Cyber Laws – Concept, purpose/prospects.
4. Competition Law- Concept, purpose/ prospects.
5. Alternate Dispute Resolution – Concept, types/prospects.
6. Major statutes concerning environmental law.
7. Right to Information Act.
8. Trial by media.

MATHEMATICS PAPER - I

1. **Linear Algebra:**

Vector spaces over R and C, linear dependence and independence, subspaces, bases, dimension; Linear transformations, rank and nullity, matrix of a linear transformation.

Algebra of Matrices; Row and column reduction, Echelon form, congruence's and similarity; Rank of a matrix; Inverse of a matrix; Solution of system of linear equations; Eigenvalues and eigenvectors, characteristic polynomial, Cayley-Hamilton theorem, Symmetric, skew-symmetric, Hermitian, skew-Hermitian, orthogonal and unitary matrices and their eigenvalues.

2. **Calculus:**

Real numbers, functions of a real variable, limits, continuity, differentiability, mean-value theorem, Taylor's theorem with remainders, indeterminate forms, maxima and minima, asymptotes; Curve tracing; Functions of two or three variables: limits, continuity, partial derivatives, maxima and minima, Lagrange's method of multipliers, Jacobian.

Riemann's definition of definite integrals; Indefinite integrals; Infinite and improper integrals; Double and triple integrals (evaluation techniques only); Areas, surface and volumes.

3. **Analytic Geometry:**

Cartesian and polar coordinates in three dimensions, second degree equations in three variables, reduction to canonical forms, straight lines, shortest distance between two skew lines; Plane, sphere, cone, cylinder, paraboloid, ellipsoid, hyperboloid of one and two sheets and their properties.

4. **Ordinary Differential Equations:**

Formulation of differential equations; Equations of first order and first degree, integrating factor; Orthogonal trajectory; Equations of first order but not of first degree, Clairaut's equation, singular solution.

Second and higher order linear equations with constant coefficients, complementary function, particular integral and general solution.

Second order linear equations with variable coefficients, Euler-Cauchy equation; Determination of complete solution when one solution is known using method of variation of parameters.

Laplace and Inverse Laplace transforms and their properties; Laplace transforms of elementary functions. Application to initial value problems for 2nd order linear equations with constant coefficients.

5. **Dynamics & Statics:**

Rectilinear motion, simple harmonic motion, motion in a plane, projectiles; constrained motion; Work and energy, conservation of energy; Kepler's laws, orbits under central forces.

Equilibrium of a system of particles; Work and potential energy, friction; common catenary; Principle of virtual work; Stability of equilibrium, equilibrium of forces in three dimensions.

6. Vector Analysis:

Scalar and vector fields, differentiation of vector field of a scalar variable; Gradient, divergence and curl in cartesian and cylindrical coordinates; Higher order derivatives; Vector identities and vector equations.

Application to geometry: Curves in space, Curvature and torsion; Serret-Frenet's formulae.

Gauss and Stokes' theorems, Green's identities.

PAPER - II

1. Algebra:

Groups, subgroups, cyclic groups, cosets, Lagrange's Theorem, normal subgroups, quotient groups, homomorphism of groups, basic isomorphism theorems, permutation groups, Cayley's theorem.

Rings, subrings and ideals, homomorphisms of rings; Integral domains, principal ideal domains, Euclidean domains and unique factorization domains; Fields, quotient fields.

2. Real Analysis:

Real number system as an ordered field with least upper bound property; Sequences, limit of a sequence, Cauchy sequence, completeness of real line; Series and its convergence, absolute and conditional convergence of series of real and complex terms, rearrangement of series.

Continuity and uniform continuity of functions, properties of continuous functions on compact sets.

Riemann integral, improper integrals; Fundamental theorems of integral calculus. Uniform convergence, continuity, differentiability and integrability for sequences and series of functions; Partial derivatives of functions of several (two or three) variables, maxima and minima.

3. Complex Analysis:

Analytic functions, Cauchy-Riemann equations, Cauchy's theorem, Cauchy's integral formula, power series representation of an analytic function, Taylor's series; Singularities; Laurent's series; Cauchy's residue theorem; Contour integration.

4. Linear Programming:

Linear programming problems, basic solution, basic feasible solution and optimal solution; Graphical method and simplex method of solutions; Duality.

Transportation and assignment problems.

5. Partial differential equations:

Family of surfaces in three dimensions and formulation of partial differential

equations; Solution of quasilinear partial differential equations of the first order, Cauchy's method of characteristics; Linear partial differential equations of the second order with constant coefficients, canonical form; Equation of a vibrating string, heat equation, Laplace equation and their solutions.

6. Numerical Analysis and Computer programming:

Numerical methods: Solution of algebraic and transcendental equations of one variable by bisection, Regula-Falsi and Newton-Raphson methods; solution of system of linear equations by Gaussian elimination and Gauss-Jordan (direct), Gauss-Seidel(iterative) methods. Newton's (forward and backward) interpolation, Lagrange's interpolation.

Numerical integration: Trapezoidal rule, Simpson's rules, Gaussian quadrature formula.

Numerical solution of ordinary differential equations: Euler and Runge Kutta-methods.

Computer Programming: Binary system; Arithmetic and logical operations on numbers; Octal and Hexadecimal systems; Conversion to and from decimal systems; Algebra of binary numbers.

Elements of computer systems and concept of memory; Basic logic gates and truth tables, Boolean algebra, normal forms.

Representation of unsigned integers, signed integers and reals, double precision reals and long integers.

Algorithms and flow charts for solving numerical analysis problems.

7. Mechanics and Fluid Dynamics:

Generalized coordinates; D'Alembert's principle and Lagrange's equations; Hamilton equations; Moment of inertia; Motion of rigid bodies in two dimensions.

Equation of continuity; Euler's equation of motion for inviscid flow; Stream-lines, path of a particle; Potential flow; Two-dimensional and axisymmetric motion; Sources and sinks, vortex motion; Navier-Stokes equation for a viscous fluid.

MECHANICAL ENGINEERING PAPER - I

1. Mechanics:

1.1 Mechanics of rigid bodies:

Equations of equilibrium in space and its application; first and second moments of area; simple problems on friction; kinematics of particles for plane motion; elementary particle dynamics.

1.2 Mechanics of deformable bodies:

Generalized Hooke's law and its application; design problems on axial stress, shear stress and bearing stress; material properties for dynamic loading; bending shear and stresses in beams; determination of principle stresses and strains - analytical and graphical; compound and combined stresses; bi-axial stresses - thin walled pressure vessel; material behaviour and design factors for dynamic load; design of circular shafts for bending and torsional load only; deflection of beam for statically determinate problems; theories of failure.

2. Engineering Materials:

Basic concepts on structure of solids; common ferrous and non-ferrous materials and their applications; heat-treatment of steels; non-metals- plastics, ceramics, composite materials and nano-materials.

3. Theory of Machines:

Kinematic and dynamic analysis of plane mechanisms. Cams, Gears and epicyclic gear trains, flywheels, governors, balancing of rigid rotors, balancing of single and multicylinder engines, linear vibration analysis of mechanical systems (single degree of freedom), Critical speeds and whirling of shafts.

4. Manufacturing Science:

4.1 Manufacturing Process: Machine tool engineering – Merchant's force analysis; Taylor's tool life equation; conventional machining; NC and CNC machining process; jigs and fixtures.

Non-conventional machining – EDM, ECM, ultrasonic, water jet machining etc; application of lasers and plasmas; energy rate calculations.

Forming and welding processes- standard processes.

Metrology - concept of fits and tolerances; tools and gauges; comparators; inspection of length; position; profile and surface finish.

4.2. Manufacturing Management:

System design: factory location- simple OR models; plant layout - methods based; applications of engineering economic analysis and break- even analysis for product selection, process selection and capacity planning; predetermined time standards.

System planning; forecasting methods based on regression and decomposition, design and balancing of multi model and stochastic assembly lines; inventory management – probabilistic inventory models for order time and order quantity determination; JIT systems; strategic sourcing; managing inter plant logistics.

System operations and control: Scheduling algorithms for job shops; applications of statistical methods for product and process quality control - applications of control charts for mean, range, percent defective, number of defectives and defects per unit; quality cost systems; management of resources, organizations and risks in projects.

System improvement: Implementation of systems, such as total quality management, developing and managing flexible, lean and agile organizations.

PAPER - II

- 1. Thermodynamics, Gas Dynamics and Turbine:**
 - 1.1** Basic concept of First –law and second law of Thermodynamics; concept of entropy and reversibility; availability and unavailability and irreversibility.
 - 1.2** Classification and properties of fluids; incompressible and compressible fluids flows; effect of Mach number and compressibility; continuity momentum and energy equations; normal and oblique shocks; one dimensional isentropic flow; flow of fluids in duct with frictions that transfer.
 - 1.3** Flow through fans, blowers and compressors; axial and centrifugal flow configuration; design of fans and compressors; single problems compresses and turbine cascade; open and closed cycle gas turbines; work done in the gas turbine; reheat and regenerators.
- 2. Heat Transfer:**
 - 2.1** Conduction heat transfer- general conduction equation - Laplace, Poisson and Fourier equations; Fourier law of conduction; one dimensional steady state heat conduction applied to simple wall, solid and hollow cylinder & spheres.
 - 2.2** Convection heat transfer- Newton’s law of convection; free and forced convection; heat transfer during laminar and turbulent flow of an incompressible fluid over a flat plate; concepts of Nusselt number, hydrodynamic and thermal boundary layer their thickness; Prandtl number; analogy between heat and momentum transfer- Reynolds, Colburn, Prandtl analogies; heat transfer during laminar and turbulent flow through horizontal tubes; free convection from horizontal and vertical plates.
 - 2.3** Black body radiation - basic radiation laws such as Stefan-Boltzman, Planck distribution, Wein’s displacement etc.
 - 2.4** Basic heat exchanger analysis; classification of heat exchangers.
- 3. I.C. Engines:**
 - 3.1** Classification, thermodynamic cycles of operation; determination of brake power, indicated power, mechanical efficiency, heat balance sheet,

- interpretation of performance characteristics, petrol, gas and diesel engines.
- 3.2** Combustion in SI and CI engines, normal and abnormal combustion; effect of working parameters on knocking, reduction of knocking; Forms of combustion chamber for SI and CI engines; rating of fuels; additives; emission.
- 3.3** Different systems of IC engines- fuels; lubricating; cooling and transmission systems. Alternate fuels in IC engines.
- 4. Steam Engineering:**
- 4.1** Steam generation- modified Rankine cycle analysis; Modern steam boilers; steam at critical and supercritical pressures; draught equipment; natural and artificial draught; boiler fuels solid, liquid and gaseous fuels. Steam turbines - principle; types; compounding; impulse and reaction turbines; axial thrust.
- 4.2** Steam nozzles- flow of steam in convergent and divergent nozzle; pressure at throat for maximum discharge with different initial steam conditions such as wet, saturated and superheated, effect of variation of back pressure; supersaturated flow of steam in nozzles, Wilson line.
- 4.3** Rankine cycle with internal and external irreversibility; reheat factor; reheating and regeneration, methods of governing; back pressure and pass out turbines.
- 4.4** Steam power plants - combined cycle power generation; heat recovery steam generators (HRSG) fired and unfired, co-generation plants.
- 5. Refrigeration and air-conditioning:**
- 5.1** Vapour compression refrigeration cycle - cycle on p-H & T-s diagrams; eco-friendly refrigerants - R134a,123; Systems like evaporators, condensers, compressor, expansion devices. Simple vapour absorption systems.
- 5.2** Psychrometry - properties; processes; charts; sensible heating and cooling; humidification and dehumidification effective temperature; air-conditioning load calculation; simple duct design.

MEDICAL SCIENCE
PAPER - I

1. Human Anatomy:

Applied anatomy including blood and nerve supply of upper and lower limbs and joints of shoulder, hip and knee.

Gross anatomy, blood supply and lymphatic drainage of tongue, thyroid, mammary gland, stomach, liver, prostate, gonads and uterus

Applied anatomy of diaphragm, perineum and inguinal region.

Clinical anatomy of kidney, urinary bladder, uterine tubes, vas deferens.

Embryology: Placenta and placental barrier. Development of heart, gut, kidney, uterus, ovary, testis and their common congenital abnormalities.

Central and peripheral autonomic nervous system: Gross and clinical anatomy of ventricles of brain, circulation of cerebrospinal fluid; Neural pathways and lesions of cutaneous sensations, hearing and vision; Cranial nerves, distribution and clinical significance; Components of autonomic nervous system.

2. Human Physiology:

Conduction and transmission of impulse, mechanism of contraction, neuromuscular transmission, reflexes, control of equilibrium, posture and muscle tone, descending pathways, functions of cerebellum, basal ganglia, Physiology of sleep and consciousness.

Endocrine system: Mechanism of action of hormones, formation, secretion, transport, metabolism, function and regulation of secretion of pancreas and pituitary gland.

Physiology of reproductive system: menstrual cycle, lactation, pregnancy.

Blood: Development, regulation and fate of blood cells.

Cardio-vascular, cardiac output, blood pressure, regulation of cardiovascular functions;

3. Biochemistry:

Organ function tests-liver, kidney, thyroid

Protein synthesis.

Vitamins and minerals.

Restriction fragment length polymorphism (RFLP).

Polymerase chain reaction (PCR).

Radio - immunoassays (RIA).

4. Pathology:

Inflammation and repair, disturbances of growth and cancer, Pathogenesis and histopathology of rheumatic and ischemic heart disease and diabetes mellitus. Differentiation between benign, malignant, primary and metastatic malignancies, Pathogenesis and histopathology of bronchogenic carcinoma, carcinoma breast, oral cancer, cancer cervix, leukemia, Etiology, pathogenesis and histopathology of - cirrhosis liver, glomerulonephritis,

tuberculosis, acute osteomyelitis.

5. **Microbiology:**

Humoral and cell mediated immunity

Diseases caused by and laboratory diagnosis of-

- Meningococcus, Salmonella
- Shigella, Herpes, Dengue, Polio
- HIV/AIDS, Malaria, E. Histolytica, Giardia
- Candida, Cryptococcus, Aspergillus

6. **Pharmacology:**

Mechanism of action and side effects of the following drugs

- Antipyretics and analgesics, Antibiotics, Antimalaria; Antikala-azar, Antidiabetics
- Antihypertensive, Antidiuretics, General and cardiac vasodilators, Antiviral, Antiparasitic, Antifungal, Immunosuppressants
- Anticancer

7. **Forensic Medicine and Toxicology:**

Forensic examination of injuries and wounds; Examination of blood and seminal stains; poisoning, sedative overdose, hanging, drowning, burns, DNA and finger print study.

PAPER - II

1. **General Medicine:**

Etiology, clinical features, diagnosis and principles of management (including prevention) of: - Tetanus, Rabies, AIDS, Dengue, Kala-azar, Japanese Encephalitis.

Etiology, clinical features, diagnosis and principles of management of:

Ischaemic heart disease, pulmonary embolism.

Bronchial asthma.

Pleural effusion, tuberculosis, Malabsorption syndromes, acid peptic diseases, Viral hepatitis and cirrhosis of liver.

Glomerulonephritis and pyelonephritis, renal failure, nephrotic syndrome, renovascular hypertension, complications of diabetes mellitus, coagulation disorders, leukemia, Hypo and hyper thyroidism, meningitis and encephalitis. Imaging in medical problems, ultrasound, echocardiogram, CT scan, MRI. Anxiety and Depressive Psychosis and schizophrenia and ECT.

2. **Pediatrics:**

Immunization, Baby friendly hospital, congenital cyanotic heart disease, respiratory distress syndrome, broncho - pneumonias, kernicterus. IMNCI classification and management, PEM grading and management. ARI and Diarrhea of under five and their management.

3. **Dermatology:**

Psoriasis, Allergic dermatitis, scabies, eczema, vitiligo, Stevan Johnson's syndrome, Lichen Planus.

- 4. General Surgery:**
 Clinical features, causes, diagnosis and principles of management of cleft palate, harelip.
 Laryngeal tumor, oral and esophageal tumors.
 Peripheral arterial diseases, varicose veins, coarctation of aorta
 Tumors of Thyroid, Adrenal Glands
 Abscess, cancer, fibroadenoma and adenosis of breast.
 Bleeding peptic ulcer, tuberculosis of bowel, ulcerative colitis, cancer stomach.
 Renal mass, cancer Prostate..
 Haemothorax, stones of Gall bladder, Kidney, Ureter and Urinary Bladder.
 Management of surgical conditions of Rectum, Anus and Anal canal, Gall bladder and Bile ducts
 Splenomegaly, cholecystitis, portal hypertension, liver abscess, peritonitis, carcinoma head of pancreas.
 Fractures of spine, Colles' fracture and bone tumors.
 Endoscopy
 Laparoscopic Surgery.
- 5. Obstetrics and Gynaecology including Family Planning:**
 Diagnosis of pregnancy.
 Labour management, complications of 3rd stage, Antepartum and postpartum hemorrhage, resuscitation of the newborn, Management of abnormal lie and difficult labour, Management of small for date or premature newborn.
 Diagnosis and management of anemia. Preeclampsia and Toxaemias of pregnancy, Management of Post menopausal Syndrome.
 Intra-uterine devices, pills, tubectomy and vasectomy. Medical termination of pregnancy including legal aspects.
 Cancer cervix.
 Leucorrhoea, pelvic pain, infertility, dysfunctional uterine bleeding (DUB), amenorrhoea, Fibroid and prolapse of uterus.
- 6. Community Medicine (Preventive and Social Medicine):**
 Principles, methods, approach and measurements of Epidemiology
 Nutrition, nutritional diseases / disorders & Nutrition Programmes.
 Health information Collection, Analysis and Presentation.
 Objectives, components and critical analysis of National programmes for control/eradication of:
 Malaria, Kala-azar, Filariasis and Tuberculosis,
 HIV/AIDS, STDs and Dengue
 Critical appraisal of Health care delivery system.
 Health management and administration: Techniques, Tools, Programme Implementation and Evaluation.
 Objective, Component, Goals and Status of Reproductive and Child Health, National Rural Health Mission and Millennium Development Goals
 Management of hospital and industrial waste.

PHILOSOPHY PAPER - I

History and Problems of Philosophy:

1. Plato and Aristotle: Ideas; Substance; Form and Matter; Causation; Actuality and Potentiality.
2. Rationalism (Descartes, Spinoza, Leibniz): Cartesian Method and Certain Knowledge; Substance; God; Mind-Body Dualism; Determinism and Freedom.
3. Empiricism (Locke, Berkeley, Hume): Theory of Knowledge; Substance and Qualities; Self and God; Scepticism.
4. Kant: Possibility of Synthetic a priori Judgments; Space and Time; Categories; Ideas of Reason; Antinomies; Critique of Proofs for the Existence of God
5. Hegel: Dialectical Method; Absolute Idealism
6. Moore, Russell and Early Wittgenstein: Defence of Commonsense; Refutation of Idealism; Logical Atomism; Logical Constructions; Incomplete Symbols; Picture Theory of Meaning; Saying and Showing.
7. Logical Positivism: Verification Theory of Meaning; Rejection of Metaphysics; Linguistic Theory of Necessary Propositions.
8. Later Wittgenstein: Meaning and Use; Language-games; Critique of Private Language.
9. Phenomenology (Husserl): Method; Theory of Essences; Avoidance of Psychologism.
10. Existentialism (Kierkegaard, Sartre, Heidegger): Existence and Essence; Choice, Responsibility and Authentic Existence; Being-in-the –world and Temporality.
11. Quine and Strawson: Critique of Empiricism; Theory of Basic Particulars and Persons.
12. Câr vâka : Theory of Knowledge; Rejection of Transcendent Entities.
13. Jainism: Theory of Reality; Saptabhaòginaya; Bondage and Liberation.
14. Schools of Buddhism: Pratîtyasamutpâda; Ksanikavada, Nairâtmyavâda
15. Nyâya- Vaiúesika: Theory of Categories; Theory of Appearance; Theory of Pramâna; Self, Liberation; God; Proofs for the Existence of God; Theory of Causation; Atomistic Theory of Creation.
16. Sâmkhya: Prakrti; Purusa; Causation; Liberation
17. Yoga: Citta; Cittavrtti; Klesas; Samadhi; Kaivalya.
18. Mimâmsâ: Theory of Knowledge
19. Schools of Vedânta: Brahman; Íúvara; Âtman; Jiva; Jagat; Mâyâ; Avidyâ; Adhyâsa; Moksa; Aprthaksiddhi; Pancavidhabheda
20. Aurobindo: Evolution, Involution; Integral Yoga.

PAPER – II

Socio-Political Philosophy

1. Social and Political Ideals: Equality, Justice, Liberty.
2. Sovereignty: Austin, Bodin, Laski, Kautilya.
3. Individual and State: Rights; Duties and Accountability
4. Forms of Government: Monarchy; Theocracy and Democracy.
5. Political Ideologies: Anarchism; Marxism and Socialism
6. Humanism; Secularism; Multiculturalism.
7. Crime and Punishment: Corruption, Mass Violence, Genocide, Capital Punishment.
8. Development and Social Progress.
9. Gender Discrimination: Female Foeticide, Land and Property Rights; Empowerment.
10. Caste Discrimination: Gandhi and Ambedkar

Philosophy of Religion:

1. Notions of God: Attributes; Relation to Man and the World. (Indian and Western).
2. Proofs for the Existence of God and their Critique (Indian and Western).
3. Problem of Evil.
4. Soul: Immortality; Rebirth and Liberation.
5. Reason, Revelation and Faith.
6. Religious Experience: Nature and Object (Indian and Western).
7. Religion without God.
8. Religion and Morality.
9. Religious Pluralism and the Problem of Absolute Truth.
10. Nature of Religious Language: Analogical and Symbolic; Cognitivist and Non-cognitive.

**PHYSICS
PAPER - I**

1. (a) Mechanics of Particles:

Laws of motion; conservation of energy and momentum, applications to rotating frames, centripetal and Coriolis accelerations; Motion under a central force; Conservation of angular momentum, Kepler's laws; Fields and potentials; Gravitational field and potential due to spherical bodies, Gauss and Poisson equations, gravitational self-energy; Two-body problem; Reduced mass; Rutherford scattering; Centre of mass and laboratory reference frames.

(b) Mechanics of Rigid Bodies:

System of particles; Centre of mass, angular momentum, equations of motion; Conservation theorems for energy, momentum and angular momentum; Elastic and inelastic collisions; Rigid body; Degrees of freedom, Euler's theorem, angular velocity, angular momentum, moments of inertia, theorems of parallel and perpendicular axes, equation of motion for rotation; Molecular rotations (as rigid bodies); Di and tri-atomic molecules; Precessional motion; top, gyroscope.

(c) Mechanics of Continuous Media:

Elasticity, Hooke's law and elastic constants of isotropic solids and their inter-relation; Streamline (Laminar) flow, viscosity, Poiseuille's equation, Bernoulli's equation, Stokes' law and applications.

(d) Special Relativity:

Michelson-Morley experiment and its implications; Lorentz transformations-length contraction, time dilation, addition of relativistic velocities, aberration and Doppler effect, mass-energy relation, simple applications to a decay process; Four dimensional momentum vector; Covariance of equations of physics.

2. Waves and Optics:

(a) Waves:

Simple harmonic motion, damped oscillation, forced oscillation and resonance; Beats; Stationary waves in a string; Pulses and wave packets; Phase and group velocities; Reflection and Refraction from Huygens' principle.

(b) Geometrical Optics:

Laws of reflection and refraction from Fermat's principle; Matrix method in paraxial optics-thin lens formula, nodal planes, system of two thin lenses, chromatic and spherical aberrations.

(c) Interference:

Interference of light-Young's experiment, Newton's rings, interference by thin films, Michelson interferometer; Multiple beam interference and Fabry-Perot interferometer.

(d) Diffraction:

Fraunhofer diffraction-single slit, double slit, diffraction grating, resolving power; Diffraction by a circular aperture and the Airy pattern; Fresnel diffraction: half-period zones and zone plates, circular aperture.

(e) Polarization and Modern Optics:

Production and detection of linearly and circularly polarized light; Double refraction, quarter wave plate; Optical activity; Principles of fibre optics, attenuation; Pulse dispersion in step index and parabolic index fibres; Material dispersion, single mode fibres; Lasers-Einstein A and B coefficients; Ruby and He-Ne lasers; Characteristics of laser light-spatial and temporal coherence; Focusing of laser beams; Three-level scheme for laser operation; Holography and simple applications.

3. Electricity and Magnetism:

(a) Electrostatics and Magnetostatics:

Laplace and Poisson equations in electrostatics and their applications; Energy of a system of charges, multipole expansion of scalar potential; Method of images and its applications; Potential and field due to a dipole, force and torque on a dipole in an external field; Dielectrics, polarization; Solutions to boundary-value problems-conducting and dielectric spheres in a uniform electric field; Magnetic shell, uniformly magnetized sphere; Ferromagnetic materials, hysteresis, energy loss.

(b) Current Electricity:

Kirchhoff's laws and their applications; Biot-Savart law, Ampere's law, Faraday's law, Lenz' law; Self-and mutual-inductances; Mean and r m s values in AC circuits; DC and AC circuits with R, L and C components; Series and parallel resonances; Quality factor; Principle of transformer.

(c) Electromagnetic Waves and Blackbody Radiation:

Displacement current and Maxwell's equations; Wave equations in vacuum, Poynting theorem; Vector and scalar potentials; Electromagnetic field tensor, covariance of Maxwell's equations; Wave equations in isotropic dielectrics, reflection and refraction at the boundary of two dielectrics; Fresnel's relations; Total internal reflection; Normal and anomalous dispersion; Rayleigh scattering; Blackbody radiation and Planck's radiation law, Stefan-Boltzmann law, Wien's displacement law and Rayleigh-Jeans' law.

4. Thermal and Statistical Physics:

(a) Thermodynamics:

Laws of thermodynamics, reversible and irreversible processes, entropy; Isothermal, adiabatic, isobaric, isochoric processes and entropy changes; Otto and Diesel engines, Gibbs' phase rule and chemical potential; van der Waals equation of state of a real gas, critical constants; Maxwell-Boltzman distribution of molecular velocities, transport phenomena, equipartition and virial theorems; Dulong-Petit, Einstein, and Debye's theories of specific heat

of solids; Maxwell relations and applications; Clausius- Clapeyron equation; Adiabatic demagnetisation, Joule-Kelvin effect and liquefaction of gases.

(b) Statistical Physics:

Macro and micro states, statistical distributions, Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac distributions, applications to specific heat of gases and blackbody radiation; Concept of negative temperatures.

PAPER - II

1. Quantum Mechanics:

Wave-particle duality; Schroedinger equation and expectation values; Uncertainty principle; Solutions of the one-dimensional Schroedinger equation for a free particle (Gaussian wave-packet), particle in a box, particle in a finite well, linear harmonic oscillator; Reflection and transmission by a step potential and by a rectangular barrier; Particle in a three dimensional box, density of states, free electron theory of metals; Angular momentum; Hydrogen atom; Spin half particles, properties of Pauli spin matrices.

2. Atomic and Molecular Physics:

Stern-Gerlach experiment, electron spin, fine structure of hydrogen atom; L-S coupling, J-J coupling; Spectroscopic notation of atomic states; Zeeman effect; Frank-Condon principle and applications; Elementary theory of rotational, vibrational and electronic spectra of diatomic molecules; Raman effect and molecular structure; Laser Raman spectroscopy; Importance of neutral hydrogen atom, molecular hydrogen and molecular hydrogen ion in astronomy; Fluorescence and Phosphorescence; Elementary theory and applications of NMR and EPR; Elementary ideas about Lamb shift and its significance.

3. Nuclear and Particle Physics:

Basic nuclear properties-size, binding energy, angular momentum, parity, magnetic moment; Semi-empirical mass formula and applications, mass parabolas; Ground state of deuteron, magnetic moment and non-central forces; Meson theory of nuclear forces; Salient features of nuclear forces; Shell model of the nucleus - successes and limitations; Violation of parity in beta decay; Gamma decay and internal conversion; Elementary ideas about Mossbauer spectroscopy; Q-value of nuclear reactions; Nuclear fission and fusion, energy production in stars; Nuclear reactors.

Classification of elementary particles and their interactions; Conservation laws; Quark structure of hadrons; Field quanta of electroweak and strong interactions; Elementary ideas about unification of forces; Physics of neutrinos.

4. Solid State Physics, Devices and Electronics:

Crystalline and amorphous structure of matter; Different crystal systems, space groups; Methods of determination of crystal structure; X-ray diffraction, scanning and transmission electron microscopies; Band theory of solids -

conductors, insulators and semiconductors; Thermal properties of solids, specific heat, Debye theory; Magnetism: dia, para and ferromagnetism; Elements of superconductivity, Meissner effect, Josephson junctions and applications; Elementary ideas about high temperature superconductivity. Intrinsic and extrinsic semiconductors; p-n-p and n-p-n transistors; Amplifiers and oscillators; Op-amps; FET, JFET and MOSFET; Digital electronics- Boolean identities, De Morgan's laws, logic gates and truth tables; Simple logic circuits; Thermistors, solar cells; Fundamentals of microprocessors and digital computers.

POLITICAL SCIENCE AND INTERNATIONAL RELATIONS PAPER - I

Political Theory and Indian Politics:

1. Political Theory: meaning and approaches.
2. Theories of the State: Liberal, Neo-liberal, Marxist, Pluralist, Post-colonial and feminist.
3. Justice: Conceptions of justice with special reference to Rawl's theory of justice and its communitarian critiques.
4. Equality: Social, political and economic; relationship between equality and freedom; Affirmative action.
5. Rights: Meaning and theories; different kinds of rights; concept of Human Rights.
6. Democracy: Classical and contemporary theories; different models of democracy – representative, participatory and deliberative.
7. Concept of power, hegemony, ideology and legitimacy.
8. Political Ideologies: Liberalism, Socialism, Marxism, Fascism, Gandhism and Feminism.
9. Indian Political Thought : *Dharamshastra*, *Arthashastra* and Buddhist traditions; Sir Syed Ahmed Khan, Sri Aurobindo, M.K. Gandhi, B.R. Ambedkar, M.N. Roy .
10. Western Political Thought: Plato, Aristotle, Machiavelli, Hobbes, Locke, John S. Mill, Marx, Gramsci, Hannah Arendt.

Indian Government and Politics:

1. Indian Nationalism:
 - (a) Political Strategies of India's Freedom Struggle: Constitutionalism to mass Satyagraha, Non-cooperation, Civil Disobedience; Militant and revolutionary movements, Peasant and workers' movements.
 - (b) Perspectives on Indian National Movement: Liberal, Socialist and Marxist; Radical humanist and Dalit.
2. Making of the Indian Constitution: Legacies of the British rule; different social and political perspectives.
3. Salient Features of the Indian Constitution: The Preamble, Fundamental Rights and Duties, Directive Principles; Parliamentary System and Amendment Procedures; Judicial Review and Basic Structure doctrine.
4. (a) Principal Organs of the Union Government: Envisaged role and actual working of the Executive, Legislature and Supreme Court.
 - (b) Principal Organs of the State Government: Envisaged role and actual working of the Executive, Legislature and High Courts.
5. Grassroots Democracy: Panchayati Raj and Municipal Government; significance of 73rd and 74th Amendments; Grassroot movements.

6. Statutory Institutions/Commissions: Election Commission, Comptroller and Auditor General, Finance Commission, Union Public Service Commission, National Commission for Scheduled Castes, National Commission for Scheduled Tribes, National Commission for Women; National Human Rights Commission, National Commission for Minorities, National Backward Classes Commission.
7. Federalism: Constitutional provisions; changing nature of centre-state relations; integrationist tendencies and regional aspirations; inter-state disputes.
8. Planning and Economic Development : Nehruvian and Gandhian perspectives; role of planning and public sector; Green Revolution, land reforms and agrarian relations; liberalization and economic reforms.
9. Caste, Religion and Ethnicity in Indian Politics.
10. Party System: National and regional political parties, ideological and social bases of parties; patterns of coalition politics; Pressure groups, trends in electoral behaviour; changing socio- economic profile of Legislators.
11. Social Movements: Civil liberties and human rights movements; women's movements; environmentalist movements.

PAPER – II

Comparative Politics and International Relations

Comparative Political Analysis and International Politics:

1. Comparative Politics: Nature and major approaches; political economy and political sociology perspectives; limitations of the comparative method.
2. State in comparative perspective: Characteristics and changing nature of the State in capitalist and socialist economies, and, advanced industrial and developing societies.
3. Politics of Representation and Participation: Political parties, pressure groups and social movements in advanced industrial and developing societies.
4. Globalisation: Responses from developed and developing societies.
5. Approaches to the Study of International Relations: Idealist, Realist, Marxist, Functionalist and Systems theory.
6. Key concepts in International Relations: National interest, Security and power; Balance of power and deterrence; Transnational actors and collective security; World capitalist economy and globalisation.
7. Changing International Political Order:
 - (a) Rise of super powers; strategic and ideological Bipolarity, arms race and Cold War; nuclear threat;
 - (b) Nonaligned movement: Aims and achievements;
 - (c) Collapse of the Soviet Union; Unipolarity and American hegemony; relevance of non-alignment in the contemporary world.

8. Evolution of the International Economic System: From Brettonwoods to WTO; Socialist economies and the CMEA (Council for Mutual Economic Assistance); Third World demand for new international economic order; Globalisation of the world economy.
9. United Nations: Envisaged role and actual record; specialized UN agencies-aims and functioning; need for UN reforms.
10. Regionalisation of World Politics: EU, ASEAN, APEC, SAARC, NAFTA.
11. Contemporary Global Concerns: Democracy, human rights, environment, gender justice, terrorism, nuclear proliferation.

India and the World:

1. Indian Foreign Policy: Determinants of foreign policy; institutions of policy-making; continuity and change.
2. India's Contribution to the Non-Alignment Movement: Different phases; current role.
3. India and South Asia:
 - (a) Regional Co-operation: SAARC – past performance and future prospects.
 - (b) South Asia as a Free Trade Area.
 - (c) India's "Look East" policy.
 - (d) Impediments to regional co-operation: river water disputes; illegal cross-border migration; ethnic conflicts and insurgencies; border disputes.
4. India and the Global South: Relations with Africa and Latin America; leadership role in the demand for NIEO and WTO negotiations.
5. India and the Global Centres of Power: USA, EU, Japan, China and Russia.
6. India and the UN System: Role in UN Peace-keeping; demand for Permanent Seat in the Security Council.
7. India and the Nuclear Question: Changing perceptions and policy.
8. Recent developments in Indian Foreign policy: India's position on the recent crisis in Afghanistan, Iraq and West Asia, growing relations with US and Israel; vision of a new world order.

PSYCHOLOGY PAPER - I

Foundations of Psychology

1. **Introduction:** Definition of Psychology; Historical antecedents of Psychology and trends in the 21st century; Psychology and scientific methods; Psychology in relation to other social sciences and natural sciences; Application of Psychology to societal problems.
2. **Methods of Psychology:** Types of research: Descriptive, evaluative, diagnostic and prognostic; Methods of Research: Survey, observation, case-study and experiments; Characteristics of experimental design and non-experimental design, Quasi-experimental designs; Focussed group discussions, brain storming, grounded theory approach.
3. **Research Methods:** Major steps in Psychological research (problem statement, hypothesis formulation, research designs, sampling, tools of data collection, analysis and interpretation and report writing) Fundamental versus applied research; Methods of data collection (interview, observation, questionnaire); Research designs (ex-post facto and experimental); Application of statistical technique (t - test, two way ANOVA correlation, regression and factor analysis); Item response theory.
4. **Development of Human Behaviour:** Growth and development; Principles of development, Role of genetic and environmental factors in determining human behaviour; Influence of cultural factors in socialization; Life span development - Characteristics, development tasks, promoting psychological well-being across major stages of the life span.
5. **Sensation, Attention and Perception:** Sensation: concepts of threshold, absolute and difference thresholds, signal-detection and vigilance; Factors influencing attention including set and characteristics of stimulus; Definition and concept of perception, biological factors in perception; Perceptual organization-influence of past experiences, perceptual defence-factors influencing space and depth perception, size estimation and perceptual readiness; The plasticity of perception; Extrasensory perception; Culture and perception, Subliminal perception.
6. **Learning:** Concept and theories of learning (Behaviourists, Gestaltalist and Information processing models); The Processes of extinction, discrimination and generalization; Programmed learning, probability learning, self-instructional learning, concepts; Types and the schedules of reinforcement, escape, avoidance and punishment, modeling and social learning.
7. **Memory:** Encoding and remembering; Short term memory, Long term memory, Sensory memory, Iconic memory, Echoic memory: The Multistore model, levels of processing; Organization and Mnemonic techniques to improve memory; Theories of forgetting: decay, interference and retrieval failure: Metamemory; Amnesia: Anterograde and retrograde.

8. **Thinking and Problem Solving:** Piaget's theory of cognitive development; Concept formation processes; Information processing, Reasoning and problem solving, Facilitating and hindering factors in problem solving, Methods of problem solving: Creative thinking and fostering creativity; Factors influencing decision making and judgment; Recent trends.
9. **Motivation and Emotion:** Psychological and physiological basis of motivation and emotion; Measurement of motivation and emotion; Effects of motivation and emotion on behaviour; Extrinsic and intrinsic motivation; Factors influencing intrinsic motivation; Emotional competence and the related issues.
10. **Intelligence and Aptitude:** Concept of intelligence and aptitude, Nature and theories of intelligence - Spearman, Thurstone, Gullford Vernon, Sternberg and J.P; Das; Emotional Intelligence, Social intelligence, measurement of intelligence and aptitudes, concept of IQ, deviation IQ, constancy of IQ; Measurement of multiple intelligence; Fluid intelligence and crystallized intelligence.
11. **Personality:** Definition and concept of personality; Theories of personality (psychoanalytical, socio-cultural, interpersonal, developmental, humanistic, behaviouristic, trait and type approaches); Measurement of personality (projective tests, pencil-paper test); The Indian approach to personality; Training for personality development; Latest approaches like big 5 factor theory; The notion of self in different traditions.
12. **Attitudes, Values and Interests:** Definition of attitudes, values and interests; Components of attitudes; Formation and maintenance of attitudes; Measurement of attitudes, values and interests; Theories of attitude change; Strategies for fostering values; Formation of stereotypes and prejudices; Changing others behaviour; Theories of attribution; Recent trends.
13. **Language and Communication:** Human language - Properties, structure and linguistic hierarchy, Language acquisition-predisposition, critical period hypothesis; Theories of language development - Skinner and Chomsky; Process and types of communication - effective communication training.
14. **Issues and Perspectives in Modern Contemporary Psychology:** Computer application in the psychological laboratory and psychological testing; Artificial intelligence; Psychocybernetics; Study of consciousness-sleep-wake schedules; dreams, stimulus deprivation, meditation, hypnotic/drug induced states; Extrasensory perception; Intersensory perception Simulation studies.

PAPER - II

Psychology: Issues and Applications

1. **Psychological Measurement of Individual Differences:** The nature of individual differences; Characteristics and construction of standardized psychological tests; Types of psychological tests; Use, misuse and limitation of psychological tests; Ethical issues in the use of psychological tests.
2. **Psychological well being and Mental Disorders:** Concept of health-ill

- health; Positive health, well being; Causal factors in mental disorders (Anxiety disorders, mood disorders, schizophrenia and delusional disorders; personality disorders, substance abuse disorders); Factors influencing positive health, well being, life style and quality of life; Happiness disposition.
3. **Therapeutic Approaches:** Psychodynamic therapies; Behaviour therapies; Client centered therapy; Cognitive therapies; Indigenous therapies (Yoga, Meditation); Bio-feedback therapy; Prevention and rehabilitation of the mentally ill; Fostering mental health.
 4. **Work Psychology and Organisational Behaviour:** Personnel selection and training; Use of psychological tests in the industry; Training and human resource development; Theories of work motivation – Herzberg, Maslow, Adam Equity theory, Porter and Lawler, Vroom; Leadership and participatory management; Advertising and marketing; Stress and its management; Ergonomics; consumer psychology; Managerial effectiveness; Transformational leadership; Sensitivity training; Power and politics in organizations.
 5. **Application of Psychology to Educational Field:** Psychological principles underlying effective teaching-learning process; Learning styles; Gifted, retarded, learning disabled and their training; Training for improving memory and better academic achievement; Personality development and value education, Educational, vocational guidance and career counseling; Use of psychological tests in educational institutions; Effective strategies in guidance programmes.
 6. **Community Psychology:** Definition and concept of community psychology; Use of small groups in social action; Arousing community consciousness and action for handling social problems; Group decision making and leadership for social change; Effective strategies for social change.
 7. **Rehabilitation Psychology:** Primary, secondary and tertiary prevention programmes-role of psychologists; Organising of services for rehabilitation of physically, mentally and socially challenged persons including old persons, Rehabilitation of persons suffering from substance abuse, juvenile delinquency, criminal behaviour; Rehabilitation of victims of violence, Rehabilitation of HIV/AIDS victims, the role of social agencies.
 8. **Application of Psychology to disadvantaged groups:** The concepts of disadvantaged, deprivation; Social, physical, cultural and economic consequences of disadvantaged and deprived groups; Educating and motivating the disadvantaged towards development; Relative and prolonged deprivation.
 9. **Psychological problems of social integration:** The concept of social integration; The problem of caste, class, religion and language conflicts and prejudice; Nature and manifestation of prejudice between the in-group and out-group; Causal factors of social conflicts and prejudices; Psychological

- strategies for handling the conflicts and prejudices; Measures to achieve social integration.
10. **Application of Psychology in Information Technology and Mass Media:** The present scenario of information technology and the mass media boom and the role of psychologists; Selection and training of psychology professionals to work in the field of IT and mass media; Distance learning through IT and mass media; Entrepreneurship through e-commerce; Multilevel marketing; Impact of TV and fostering value through IT and mass media; Psychological consequences of recent developments in Information Technology.
11. **Psychology and Economic development:** Achievement motivation and economic development; Characteristics of entrepreneurial behaviour; Motivating and training people for entrepreneurship and economic development; Consumer rights and consumer awareness, Government policies for promotion of entrepreneurship among youth including women entrepreneurs.
12. **Application of psychology to environment and related fields:** Environmental psychology-effects of noise, pollution and crowding; Population psychology: psychological consequences of population explosion and high population density; Motivating for small family norm; Impact of rapid scientific and technological growth on degradation of environment.
13. **Application of psychology in other fields:**
- (a) **Military Psychology**
Devising psychological tests for defence personnel for use in selection, Training, counseling; training psychologists to work with defence personnel in promoting positive health; Human engineering in defence.
 - (b) **Sports Psychology**
Psychological interventions in improving performance of athletes and sports. Persons participating in Individual and Team Games.
 - (c) Media influences on pro and antisocial behaviour.
 - (d) Psychology of terrorism.
14. **Psychology of Gender:** Issues of discrimination, Management of diversity; Glass ceiling effect, Self fulfilling prophesy, Women and Indian society

PUBLIC ADMINISTRATION PAPER – I

Administrative Theory

1. **Introduction:** Meaning, scope and significance of Public Administration; Wilson's vision of Public Administration; Evolution of the discipline and its present status; New Public Administration; Public Choice approach; Challenges of liberalization, Privatisation, Globalisation; Good Governance: concept and application; New Public Management.
2. **Administrative Thought:** Scientific Management and Scientific Management movement; Classical Theory; Weber's bureaucratic model – its critique and post-Weberian Developments; Dynamic Administration (Mary Parker Follett); Human Relations School (Elton Mayo and others); Functions of the Executive (C.I. Barnard); Simon's decision-making theory; Participative Management (R. Likert, C.Argyris, D.McGregor).
3. **Administrative Behaviour:** Process and techniques of decision-making; Communication; Morale; Motivation Theories – content, process and contemporary; Theories of Leadership: Traditional and Modern.
4. **Organisations:** Theories – systems, contingency; Structure and forms: Ministries and Departments, Corporations, Companies, Boards and Commissions; Ad hoc and advisory bodies; Headquarters and Field relationships; Regulatory Authorities; Public - Private Partnerships.
5. **Accountability and control:** Concepts of accountability and control; Legislative, Executive and Judicial control over administration; Citizen and Administration; Role of media, interest groups, voluntary organizations; Civil society; Citizen's Charters; Right to Information; Social audit.
6. **Administrative Law:** Meaning, scope and significance; Dicey on Administrative law; Delegated legislation; Administrative Tribunals.
7. **Comparative Public Administration:** Historical and sociological factors affecting administrative systems; Administration and politics in different countries; Current status of Comparative Public Administration; Ecology and administration; Riggsian models and their critique.
8. **Development Dynamics:** Concept of development; Changing profile of development administration; 'Anti-development thesis'; Bureaucracy and development; Strong state versus the market debate; Impact of liberalisation on administration in developing countries; Women and development - the self-help group movement.
9. **Personnel Administration:** Importance of human resource development; Recruitment, training, career advancement, position classification, discipline, performance appraisal, promotion, pay and service conditions; employer-employee relations, grievance redressal mechanism; Code of conduct; Administrative ethics.

10. **Public Policy:** Models of policy-making and their critique; Processes of conceptualisation, planning, implementation, monitoring, evaluation and review and their limitations; State theories and public policy formulation.
11. **Techniques of Administrative Improvement:** Organisation and methods, Work study and work management; e-governance and information technology; Management aid tools like network analysis, MIS, PERT, CPM.
12. **Financial Administration:** Monetary and fiscal policies; Public borrowings and public debt Budgets - types and forms; Budgetary process; Financial accountability; Accounts and audit.

PAPER - II

Indian Administration

1. **Evolution of Indian Administration:** Kautilya's Arthashastra; Mughal administration; Legacy of British rule in politics and administration - Indianization of public services, revenue administration, district administration, local self-government.
2. **Philosophical and Constitutional framework of government:** Salient features and value premises; Constitutionalism; Political culture; Bureaucracy and democracy; Bureaucracy and development.
3. **Public Sector Undertakings:** Public sector in modern India; Forms of Public Sector Undertakings; Problems of autonomy, accountability and control; Impact of liberalization and privatization.
4. **Union Government and Administration:** Executive, Parliament, Judiciary - structure, functions, work processes; Recent trends; Intragovernmental relations; Cabinet Secretariat; Prime Minister's Office; Central Secretariat; Ministries and Departments; Boards; Commissions; Attached offices; Field organizations.
5. **Plans and Priorities:** Machinery of planning; Role, composition and functions of the Planning Commission and the National Development Council; 'Indicative' planning; Process of plan formulation at Union and State levels; Constitutional Amendments (1992) and decentralized planning for economic development and social justice.
6. **State Government and Administration:** Union-State administrative, legislative and financial relations; Role of the Finance Commission; Governor; Chief Minister; Council of Ministers; Chief Secretary; State Secretariat; Directorates.
7. **District Administration since Independence:** Changing role of the Collector; Union-state-local relations; Imperatives of development management and law and order administration; District administration and democratic decentralization.
8. **Civil Services:** Constitutional position; Structure, recruitment, training and

- capacity-building; Good governance initiatives; Code of conduct and discipline; Staff associations; Political rights; Grievance redressal mechanism; Civil service neutrality; Civil service activism.
9. **Financial Management:** Budget as a political instrument; Parliamentary control of public expenditure; Role of finance ministry in monetary and fiscal area; Accounting techniques; Audit; Role of Controller General of Accounts and Comptroller and Auditor General of India.
 10. **Administrative Reforms since Independence:** Major concerns; Important Committees and Commissions; Reforms in financial management and human resource development; Problems of implementation.
 11. **Rural Development:** Institutions and agencies since independence; Rural development programmes: foci and strategies; Decentralization and Panchayati Raj; 73rd Constitutional amendment.
 12. **Urban Local Government:** Municipal governance: main features, structures, finance and problem areas; 74th Constitutional Amendment; Global-local debate; New localism; Development dynamics, politics and administration with special reference to city management.
 13. **Law and Order Administration:** British legacy; National Police Commission; Investigative agencies; Role of central and state agencies including paramilitary forces in maintenance of law and order and countering insurgency and terrorism; Criminalisation of politics and administration; Police-public relations; Reforms in Police.
 14. **Significant issues in Indian Administration:** Values in public service; Regulatory Commissions; National Human Rights Commission; Problems of administration in coalition regimes; Citizen-administration interface; Corruption and administration; Disaster management.

SOCIOLOGY PAPER - I

FUNDAMENTALS OF SOCIOLOGY

1. **Sociology - The Discipline:**

- (a) Modernity and social changes in Europe and emergence of sociology.
- (b) Scope of the subject and comparison with other social sciences.
- (c) Sociology and common sense.

2. **Sociology as Science:**

- (a) Science, scientific method and critique.
- (b) Major theoretical strands of research methodology.
- (c) Positivism and its critique.
- (d) Fact value and objectivity.
- (e) Non- positivist methodologies.

3. **Research Methods and Analysis:**

- (a) Qualitative and quantitative methods.
- (b) Techniques of data collection.
- (c) Variables, sampling, hypothesis, reliability and validity.

4. **Sociological Thinkers:**

- (a) Karl Marx- Historical materialism, mode of production, alienation, class struggle.
- (b) Emile Durkheim- Division of labour, social fact, suicide, religion and society.
- (c) Max Weber- Social action, ideal types, authority, bureaucracy, protestant ethic and the spirit of capitalism.
- (d) Talcolt Parsons- Social system, pattern variables.
- (e) Robert K. Merton- Latent and manifest functions, conformity and deviance, reference groups
- (f) Mead - Self and identity.

5. **Stratification and Mobility:**

- (a) Concepts- equality, inequality, hierarchy, exclusion, poverty and deprivation
- (b) Theories of social stratification- Structural functionalist theory, Marxist theory, Weberian theory.
- (c) Dimensions – Social stratification of class, status groups, gender, ethnicity and race.
- (d) Social mobility- open and closed systems, types of mobility, sources and causes of mobility.

6. **Works and Economic Life:**

- (a) Social organization of work in different types of society- slave society, feudal society, industrial /capitalist society.
- (b) Formal and informal organization of work

(c) Labour and society.

7. Politics and Society:

(a) Sociological theories of power

(b) Power elite, bureaucracy, pressure groups, and political parties.

(c) Nation, state, citizenship, democracy, civil society, ideology.

(d) Protest, agitation, social movements, collective action, revolution.

8. Religion and Society:

(a) Sociological theories of religion.

(b) Types of religious practices: animism, monism, pluralism, sects, cults.

(c) Religion in modern society: religion and science, secularization, religious revivalism, fundamentalism.

9. Systems of Kinship:

(a) Family, household, marriage.

(b) Types and forms of family.

(c) Lineage and descent

(d) Patriarchy and sexual division of labour

(e) Contemporary trends.

10. Social Change in Modern Society:

(a) Sociological theories of social change.

(b) Development and dependency.

(c) Agents of social change.

(d) Education and social change.

(e) Science, technology and social change.

PAPER - II

INDIAN SOCIETY : STRUCTURE AND CHANGE

A. Introducing Indian Society:

(i) Perspectives on the study of Indian society:

(a) Indology (GS. Ghurye).

(b) Structural functionalism (M N Srinivas).

(c) Marxist sociology (A R Desai).

(ii) Impact of colonial rule on Indian society :

(a) Social background of Indian nationalism.

(b) Modernization of Indian tradition.

(c) Protests and movements during the colonial period.

(d) Social reforms

B. Social Structure:

(i) Rural and Agrarian Social Structure:

(a) The idea of Indian village and village studies-

- (b) Agrarian social structure - evolution of land tenure system, land reforms.
- (ii) Caste System:**
 - (a) Perspectives on the study of caste systems: GS Ghurye, M N Srinivas, Louis Dumont, Andre Beteille.
 - (b) Features of caste system.
 - (c) Untouchability - forms and perspectives
- (iii) Tribal communities in India:**
 - (a) Definitional problems.
 - (b) Geographical spread.
 - (c) Colonial policies and tribes.
 - (d) Issues of integration and autonomy.
- (iv) Social Classes in India:**
 - (a) Agrarian class structure.
 - (b) Industrial class structure.
 - (c) Middle classes in India.
- (v) Systems of Kinship in India:**
 - (a) Lineage and descent in India.
 - (b) Types of kinship systems.
 - (c) Family and marriage in India.
 - (d) Household dimensions of the family.
 - (e) Patriarchy, entitlements and sexual division of labour.
- (vi) Religion and Society:**
 - (a) Religious communities in India.
 - (b) Problems of religious minorities.
- C. Social Changes in India:**
 - (i) Visions of Social Change in India:**
 - (a) Idea of development planning and mixed economy.
 - (b) Constitution, law and social change.
 - (c) Education and social change.
 - (ii) Rural and Agrarian transformation in India:**
 - (a) Programmes of rural development, Community Development Programme, cooperatives, poverty alleviation schemes.
 - (b) Green revolution and social change.
 - (c) Changing modes of production in Indian agriculture .
 - (d) Problems of rural labour, bondage, migration.
 - (iii) Industrialization and Urbanisation in India:**

- (a) Evolution of modern industry in India.
- (b) Growth of urban settlements in India.
- (c) Working class: structure, growth, class mobilization.
- (d) Informal sector, child labour
- (e) Slums and deprivation in urban areas.
- (iv) Politics and Society:**
- (a) Nation, democracy and citizenship.
- (b) Political parties, pressure groups , social and political elite.
- (c) Regionalism and decentralization of power.
- (d) Secularization
- (v) Social Movements in Modern India:**
- (a) Peasants and farmers movements.
- (b) Women's movement.
- (c) Backward classes & Dalit movement.
- (d) Environmental movements.
- (e) Ethnicity and Identity movements.
- (vi) Population Dynamics:**
- (a) Population size, growth, composition and distribution.
- (b) Components of population growth: birth, death, migration.
- (c) Population policy and family planning.
- (d) Emerging issues: ageing, sex ratios, child and infant mortality, reproductive health.
- (vii) Challenges of Social Transformation:**
- (a) Crisis of development: displacement, environmental problems and sustainability.
- (b) Poverty, deprivation and inequalities.
- (c) Violence against women.
- (d) Caste conflicts.
- (e) Ethnic conflicts, communalism, religious revivalism.
- (f) Illiteracy and disparities in education.

STATISTICS

PAPER - I

1. Probability:

Sample space and events, probability measure and probability space, random variable as a measurable function, distribution function of a random variable, discrete and continuous-type random variable, probability mass function, probability density function, vector-valued random variable, marginal and conditional distributions, stochastic independence of events and of random variables, expectation and moments of a random variable, conditional expectation, convergence of a sequence of random variable in distribution, in probability, in p -th mean and almost everywhere, their criteria and inter-relations, Chebyshev's inequality and Khintchine's weak law of large numbers, strong law of large numbers and Kolmogoroff's theorems, probability generating function, moment generating function, characteristic function, inversion theorem, Linderberg and Levy forms of central limit theorem, standard discrete and continuous probability distributions.

2. Statistical Inference:

Consistency, unbiasedness, efficiency, sufficiency, completeness, ancillary statistics, factorization theorem, exponential family of distribution and its properties, uniformly minimum variance unbiased (UMVU) estimation, Rao-Blackwell and Lehmann-Scheffe theorems, Cramer-Rao inequality for single parameter. Estimation by methods of moments, maximum likelihood, least squares, minimum chi-square and modified minimum chi-square, properties of maximum likelihood and other estimators, asymptotic efficiency, prior and posterior distributions, loss function, risk function, and minimax estimator. Bayes estimators.

Non-randomised and randomised tests, critical function, MP tests, Neyman-Pearson lemma, UMP tests, monotone likelihood ratio, similar and unbiased tests, UMPU tests for single parameter likelihood ratio test and its asymptotic distribution. Confidence bounds and its relation with tests.

Kolmogoroff's test for goodness of fit and its consistency, sign test and its optimality. Wilcoxon signed-ranks test and its consistency, Kolmogorov-Smirnov two-sample test, run test, Wilcoxon-Mann-Whitney test and median test, their consistency and asymptotic normality.

Wald's SPRT and its properties, OC and ASN functions for tests regarding parameters for Bernoulli, Poisson, normal and exponential distributions. Wald's fundamental identity.

3. Linear Inference and Multivariate Analysis:

Linear statistical models', theory of least squares and analysis of variance, Gauss-Markoff theory, normal equations, least squares estimates and their precision, test of significance and interval estimates based on least squares theory in one-way, two-way and three-way classified data, regression analysis, linear regression, curvilinear regression and orthogonal polynomials, multiple regression, multiple and partial correlations, estimation of variance and covariance components, multivariate normal distribution, Mahalanobis-D² and Hotelling's T² statistics and their applications and

properties, discriminant analysis, canonical correlations, principal component analysis.

4. Sampling Theory and Design of Experiments:

An outline of fixed-population and super-population approaches, distinctive features of finite population sampling, probability sampling designs, simple random sampling with and without replacement, stratified random sampling, systematic sampling and its efficacy, cluster sampling, two-stage and multi-stage sampling, ratio and regression methods of estimation involving one or more auxiliary variables, two-phase sampling, probability proportional to size sampling with and without replacement, the Hansen-Hurwitz and the Horvitz-Thompson estimators, non-negative variance estimation with reference to the Horvitz-Thompson estimator, non-sampling errors.

Fixed effects model (two-way classification) random and mixed effects models (two-way classification with equal observation per cell), CRD, RBD, LSD and their analyses, incomplete block designs, concepts of orthogonality and balance, BIBD, missing plot technique, factorial experiments and 2^n and 3^2 , confounding in factorial experiments, split-plot and simple lattice designs, transformation of data Duncan's multiple range test.

PAPER - II

1. Industrial Statistics:

Process and product control, general theory of control charts, different types of control charts for variables and attributes, \bar{X} , R, s, p, np and c charts, cumulative sum chart. Single, double, multiple and sequential sampling plans for attributes, OC, ASN, AOQ and ATI curves, concepts of producer's and consumer's risks, AQL, LTPD and AOQL, Sampling plans for variables, Use of Dodge-Romig tables.

Concept of reliability, failure rate and reliability functions, reliability of series and parallel systems and other simple configurations, renewal density and renewal function, Failure models: exponential, Weibull, normal, lognormal.

Problems in life testing, censored and truncated experiments for exponential models.

2. Optimization Techniques:

Different types of models in Operations Research, their construction and general methods of solution, simulation and Monte-Carlo methods formulation of linear programming (LP) problem, simple LP model and its graphical solution, the simplex procedure, the two-phase method and the M-technique with artificial variables, the duality theory of LP and its economic interpretation, sensitivity analysis, transportation and assignment problems, rectangular games, two-person zero-sum games, methods of solution (graphical and algebraic).

Replacement of failing or deteriorating items, group and individual replacement policies, concept of scientific inventory management and analytical structure of inventory problems, simple models with deterministic and stochastic demand with and without lead time, storage models with particular reference to dam type.

Homogeneous discrete-time Markov chains, transition probability matrix, classification of states and ergodic theorems, homogeneous continuous-time Markov chains, Poisson

process, elements of queuing theory, M/M/1, M/M/K, G/M/1 and M/G/1 queues. Solution of statistical problems on computers using well-known statistical software packages like SPSS.

3. Quantitative Economics and Official Statistics:

Determination of trend, seasonal and cyclical components, Box-Jenkins method, tests for stationary series, ARIMA models and determination of orders of autoregressive and moving average components, forecasting.

Commonly used index numbers-Laspeyre's, Paasche's and Fisher's ideal index numbers, chain-base index number, uses and limitations of index numbers, index number of wholesale prices, consumer prices, agricultural production and industrial production, test for index numbers - proportionality, time-reversal, factor-reversal and circular .

General linear model, ordinary least square and generalized least squares methods of estimation, problem of multicollinearity, consequences and solutions of multicollinearity, autocorrelation and its consequences, heteroscedasticity of disturbances and its testing, test for independence of disturbances, concept of structure and model for simultaneous equations, problem of identification-rank and order conditions of identifiability, two-stage least square method of estimation.

Present official statistical system in India relating to population, agriculture, industrial production, trade and prices, methods of collection of official statistics, their reliability and limitations, principal publications containing such statistics, various official agencies responsible for data collection and their main functions.

4. Demography and Psychometry:

Demographic data from census, registration, NSS other surveys, their limitations and uses, definition, construction and uses of vital rates and ratios, measures of fertility, reproduction rates, morbidity rate, standardized death rate, complete and abridged life tables, construction of life tables from vital statistics and census returns, uses of life tables, logistic and other population growth curves, fitting a logistic curve, population projection, stable population, quasi-stable population, techniques in estimation of demographic parameters, standard classification by cause of death, health surveys and use of hospital statistics.

Methods of standardisation of scales and tests, Z-scores, standard scores, T-scores, percentile scores, intelligence quotient and its measurement and uses, validity and reliability of test scores and its determination, use of factor analysis and path analysis in psychometry.

ZOOLOGY PAPER – I

1. Non-chordata and Chordata:

- (a) Classification and relationship of various phyla up to subclasses: Acoelomate and Coelomate, Protostomes and Deuterostomes, Bilateria and Radiata; Status of Protista, Parazoa, Onychophora and Hemichordata; Symmetry.
- (b) Protozoa: Locomotion, nutrition, reproduction, sex; General features and life history of *Paramecium*, *Monocystis*, *Plasmodium* and *Leishmania*.
- (c) Porifera: Skeleton, canal system and reproduction.
- (d) Cnidaria: Polymorphism, defensive structures and their mechanism; coral reefs and their formation; metagenesis; general features and life history of *Obelia* and *Aurelia*.
- (e) Platyhelminthes: Parasitic adaptation; general features and life history of *Fasciola* and *Taenia* and their pathogenic symptoms.
- (f) Nematelminthes: General features, life history, parasitic adaptation of *Ascaris* and *Wuchereria*.
- (g) Annelida: Coelom and metamerism; modes of life in polychaetes; general features and life history of Nereis, earthworm and leach.
- (h) Arthropoda: Larval forms and parasitism in Crustacea; vision and respiration in arthropods (Prawn, cockroach and scorpion); modification of mouth parts in insects (cockroach, mosquito, housefly, honey bee and butterfly); metamorphosis in insect and its hormonal regulation, social behaviour of *Apis* and termites.
- (i) Mollusca: Feeding, respiration, locomotion, general features and life history of *Lamellidens*, *Pila* and *Sepia*, torsion and detorsion in gastropods.
- (j) Echinodermata: Feeding, respiration, locomotion, larval forms, general features and life history of *Asterias*.
- (k) Protochordata: Origin of chordates; general features and life history of *Branchiostoma* and *Herdmania*.
- (l) Pisces: Respiration, locomotion and migration.
- (m) Amphibia: Origin of tetrapods, parental care, paedomorphosis.
- (n) Reptilia; Origin of reptiles, skull types, status of *Sphenodon* and crocodiles.
- (o) Aves: Origin of birds, flight adaptation, migration.
- (p) Mammalia: Origin of mammals, dentition, general features of egg laying mammals, pouched-mammals, aquatic mammals and primates, endocrine glands (pituitary, thyroid, parathyroid, adrenal, pancreas, gonads) and their interrelationships.

- (q) Comparative functional anatomy of various systems of vertebrates (integument and its derivatives, endoskeleton, locomotory organs, digestive system, respiratory system, circulatory system including heart and aortic arches, urino-genital system, brain and sense organs (eye and ear)).

2. Ecology:

- (a) Biosphere: Concept of biosphere; biomes, Biogeochemical cycles, Human induced changes in atmosphere including green house effect, ecological succession, biomes and ecotones, community ecology.
- (b) Concept of ecosystem; structure and function of ecosystem, types of ecosystem, ecological succession, ecological adaptation.
- (c) Population; characteristics, population dynamics, population stabilization.
- (d) Biodiversity and diversity conservation of natural resources.
- (e) Wildlife of India.
- (f) Remote sensing for sustainable development.
- (g) Environmental biodegradation, pollution and its impact on biosphere and its prevention.

3. Ethology:

- (a) Behaviour: Sensory filtering, responsiveness, sign stimuli, learning and memory, instinct, habituation, conditioning, imprinting.
- (b) Role of hormones in drive; role of pheromones in alarm spreading; crypsis, predator detection, predator tactics, social hierarchies in primates, social organization in insects.
- (c) Orientation, navigation, homing, biological rhythms, biological clock, tidal, seasonal and circadian rhythms.
- (d) Methods of studying animal behaviour including sexual conflict, selfishness, kinship and altruism.

4. Economic Zoology:

- (a) Apiculture, sericulture, lac culture, carp culture, pearl culture, prawn culture, vermiculture.
- (b) Major infectious and communicable diseases (malaria, filaria, tuberculosis, cholera and AIDS) their vectors, pathogens and prevention.
- (c) Cattle and livestock diseases, their pathogen (helminthes) and vectors (ticks, mites, Tabanus, Stomoxys).
- (d) Pests of sugar cane (*Pyrrilla perpusiella*) oil seed (*Achaea janata*) and rice (*Sitophilus oryzae*).
- (e) Transgenic animals.
- (f) Medical biotechnology, human genetic disease and genetic

counselling, gene therapy.

(g) Forensic biotechnology.

5. Biostatistics:

Designing of experiments; null hypothesis; correlation, regression, distribution and measure of central tendency, chi square, student-test, F-test (one-way & two-way F-test).

6. Instrumentation Methods:

(a) Spectrophotometer, phase contrast and fluorescence microscopy, radioactive tracer, ultra centrifuge, gel electrophoresis, PCR, ELISA, FISH and chromosome painting.

(b) Electron microscopy (TEM, SEM).

PAPER - II

1. Cell Biology:

(a) Structure and function of cell and its organelles (nucleus, plasma membrane, mitochondria, Golgi bodies, endoplasmic reticulum, ribosomes, and lysosomes), cell division (mitosis and meiosis), mitotic spindle and mitotic apparatus, chromosome movements, chromosome type polytene and lambrush, organization of chromatin, heterochromatin, Cell cycle regulation.

(b) Nucleic acid topology, DNA motif, DNA replication, transcription, RNA processing, translation, protein foldings and transport.

2. Genetics:

(a) Modern concept of gene, split gene, genetic regulation, genetic code.

(b) Sex chromosomes and their evolution, sex determination in *Drosophila* and man.

(c) Mendel's laws of inheritance, recombination, linkage, multiple alleles, genetics of blood groups, pedigree analysis, hereditary diseases in man.

(d) Mutations and mutagenesis.

(e) Recombinant DNA technology; plasmid, cosmid, artificial chromosomes as vectors, transgenic, DNA cloning and whole animal cloning (principles and methods).

(f) Gene regulation and expression in prokaryotes and eukaryotes.

(g) Signal molecules, cell death, defects in signaling pathway and consequences.

(h) RFLP, RAPD and AFLP and application of RFLP in DNA finger printing, ribozyme technologies, human genome project, genomics and proteomics.

3. Evolution:

(a) Theories of origin of life.

- (b) Theories of evolution; Natural selection, role of mutations in evolution, evolutionary patterns, molecular drive, mimicry, variation, isolation and speciation.
 - (c) Evolution of horse, elephant and man using fossil data.
 - (d) Hardy-Weinberg Law.
 - (e) Continental drift and distribution of animals.
- 4. Systematics:** Zoological nomenclature, international code, cladistics, molecular taxonomy and biodiversity.
- 5. Biochemistry:**
- (a) Structure and role of carbohydrates, fats, fatty acids and cholesterol, proteins and amino-acids, nucleic acids. Bioenergetics.
 - (b) Glycolysis and Krebs cycle, oxidation and reduction, oxidative phosphorylation, energy conservation and release, ATP cycle, cyclic AMP – its structure and role.
 - (c) Hormone classification (steroid and peptide hormones), biosynthesis and functions.
 - (d) Enzymes: types and mechanisms of action.
 - (e) Vitamins and co-enzymes
 - (f) Immunoglobulin and immunity.
- 6. Physiology (with special reference to mammals):**
- (a) Composition and constituents of blood; blood groups and Rh factor in man, factors and mechanism of coagulation, iron metabolism, acid-base balance, thermo-regulation, anticoagulants.
 - (b) Haemoglobin: Composition, types and role in transport of oxygen and carbon dioxide.
 - (c) Digestion and absorption: Role of salivary glands, liver, pancreas and intestinal glands.
 - (d) Excretion: nephron and regulation of urine formation; osmo-regulation and excretory product
 - (e) Muscles: Types, mechanism of contraction of skeletal muscles, effects of exercise on muscles.
 - (f) Neuron: nerve impulse – its conduction and synaptic transmission, neurotransmitters.
 - (g) Vision, hearing and olfaction in man.
 - (h) Physiology of reproduction, puberty and menopause in human.
- 7. Developmental Biology:**
- (a) Gametogenesis; spermatogenesis, composition of semen, *in vitro* and *in vivo* capacitation of mammalian sperm, Oogenesis, totipotency; fertilization, morphogenesis and morphogen, blastogenesis, establishment of body axes formation, fate map, gastrulation in frog

and chick; genes in development in chick, homeotic genes, development of eye and heart, placenta in mammals.

- (b) Cell lineage, cell-to cell interaction, Genetic and induced teratogenesis, role of thyroxine in control of metamorphosis in amphibia, paedogenesis and neoteny, cell death, aging.
- (c) Developmental genes in man, *in vitro* fertilization and embryo transfer, cloning.
- (d) Stem cells: Sources, types and their use in human welfare.
- (e) Biogenetic law.

**ARABIC
PAPER-I
(Answers must be written in Arabic)**

Section-A

1. a) Origin and development of the language an outline.
- b) Significant features of the grammar of the language, Rhetorics, Prosody.
- c) Short Essay in Arabic.

Section-B

2. Literary History and Literary Criticism :
Socio-Cultural Background, Classical lit-erature, literary movements, modern trends, origin and development of modern prose : drama, novel, short story, essay.

PAPER-II

This paper will require first hand reading of the texts prescribed and will be designed to test the candidate's critical ability. An-swers must be written in Arabic.

Section-A

POETS :

1. Imraul Qais : Qifa Nabke Min Zikra Habibin Wa Manzili (complete) Al Muallaqatus Saba
2. Hassan : Lillahi Darru Isabatin Nadamtuhum (complete)
bin Thabit Diwan Hassan Bin Thabit
3. Jarir : Hayyu Umamata Wazkuru Ahdan Mada
To
Jalbas Sifahi Wa Damiatin Bikila. Nukhbatul Deptt. of Arabic, A.M.U. Adab : Aligarh
4. Farzdaq : Hazal Lazi Tariful Batha-o-Watatuhu (complete) Majmuatun
Minan Nazm-i-Wan Nasr, Jamia Salafia, Varanasi
5. Al Mutanabbi : Ya Ukhta Khair-e-Akhin Ya Binta Khair-e-Abin
To
Aqamahul Fikru Baina Ijz-e-Wattaabi Nukhbatul Adab,
Deptt. of Arabic, A.M.U. Alig.
6. Abul Ala Al-Maarri Ala Fi Sabil Majdi Ma Ana Faailu
To
Wa Ya Nafsu Jiddi Inna Dahraki Hazilu Majmuatul Minan
Nazm-i-Wan Nasr, Jamia Salafia, Varanasi
7. Shauqi : Wulidal Huda Falkainatu Diau
To
Makhtara Illa Dinakal Fuqarau
Salamun Neeli Ya Ghandi (complete)
Shauqiat
8. Hafiz Ibrahim Rajatu Linafsi Fattahamtu
Hasati (complete)

9. Ilya Abu Madi Nukhbatul Adab
Damatun Kharsao (complete)
Mukhtarat Minal Sher Al Arabi Al Hadith, M.M.Badwi

Section-B
(A) AUTHORS

Authors Books Lessons

1. Ibnul Muqaffa Kalilah Wa Dimnah
Al Asad Wal Thaur
2. Al-Jahiz Mukhtarat Min Adabil
Arab Bakhilun Hakim (complete)
Part II By : S.A. Hasan Ali Nadwi
3. Ibn Khaldun Muqaddamah
Araun Fit Talim (com-plete)
4. Mahmud Taimur Qalar Rawi A m
Mutawalli (complete)
5. Taufiqua Hakim Masrahiyat Sirrul Muntahira (complete)
6. Abbas Mahmud Aqqad Mukhtarat Min
Adabil Arab-II
Assiddiq (complete)

(B) STUDY OF INDIAN AUTHORS

1. Ghulam Ali Azad Bilgrami
2. Shah Walullah Dehlavi
3. Zulfiqar Ali Deobandi
4. Abdul Aziz Mema
5. Syed Abul Hasan Ali Hasani Nadwi

ASSAMESE
PAPER-I

(Answers must be written in Assamese)

Section-A

Language

- (a) History of the origin and development of the Assamese language-its position among the Indo-Aryan Languages-periods in its history.
- (b) Developments of Assamese prose.
- (c) Vowels and consonants of the Assa-mese languages-rules of phonetic changes with stress on Assamese coming down from Old Indo-Aryan.
- (d) Assamese vocabulary-and its sources.
- (e) Morphology of the language-conjuga-tion-enclitic definitives and pleonastic suffixes.
- (f) Dialectal divergences-the standard colloquial and the Kamrupi dialect in particulars.
- (g) Assamese scripts-its evolution through the ages till 19th century A.D.

Section-B

Literary Criticism and Literary History

- (a) Principles of Literary criticism upto New criticism.
- (b) Different literary genres.
- (c) Development of literary forms in Assamese.
- (d) Development of literary criticism in Assamese.
- (e) Periods of the literary history of Assam from the earliest beginnings, i.e. from the period of the charyageets with their socio-cultural background : the proto Assamese-Pre-Sankaradeva-Sankaradeva-post Sankaradeva-Modern period (from the coming of the Britishers)-Post-Independence period. Special emphasis is to be given on the Vaisnavite period, the gonaki and the post-Independence period.

PAPER-II

This paper will require first-hand reading of the texts prescribed and will be designed to test the candidates' critical ability. Answers must be written in Assamese

Section-A

- Rāmāyana (Ayodhya Kānda only)-by Madhava Kandali.
- Pārijāt-Harana-by Sankaradeva.
- Rāsakrīdā-by Sankaradeva (From Kirtana Ghosa).
- Bargeet-by Madhavadeva
- Rājasūya-by Madhavadeva.
- Kāthā-Bhāgavata (Books I and II)-by Baikunthanath Bhattacharyya.
- Gurucarit-Kathā (Sankaradeva's Part only)-ed. by Maheswar Neog.

Section-B

- Mor Jeevan Soñwaran-by Lakshminath Bezbaroa.
- Kripābar Barbaruār Kākatar Topola-by
- Lakshminath Bezbaroa.
- Pratimā-by Chandra Kumar Agarwalla.
- Gāoñburhā-by Padmanath Gohain Barua.
- Monamatī-by Rajanikanta Bordoloi.
- Purani Asamīyā Sāhitya-by Banikanta Kakati.
- Kārengar Ligorī-by Jyotiprasad Agarwalla
- Jeevanar Bātāt-by Bina Barwa (Birinchi Kumar Barua)
- Mrityunjoy-by Birendrakumar Bhattacharyya
- Samrāt-by Navakanta Barua.

BENGALI

PAPER-I

History of Language and Literature.

Answers must be written in Bengali.

Section-A

Topics from the History of Bangla language

1. The chronological track from Proto Indo-European to Bangla (Family tree with

branches and approximate dates).

2. Historical stages of Bangla (Old, Middle, New) and their linguistic features.
3. Dialects of Bangla and their distinguishing characteristics.
4. Elements of Bangla Vocabulary.
5. Forms of Bangla Literary Prose-Sadhu and Chalit.
6. Processes of language change relevant for Bangla.
Apinihiti (Anaptyxis), Abhishruti (um-laut), Murdhanyibhavan (cerebralization), Nasikyibhavan (Na-salization), Samibhavan (Assimilation), Sadrishya (Analogy), Svaragama (Vowel insertion)-Adi Svaragama, Madhya Svaragama or Svarabhakti, Antya Svaragama, Svarasangati (Vowel harmony), y-shruti and w-shruti.
7. Problems of standardization and re-form of alphabet and spelling, and those of transliteration and Romanization.
8. Phonology, Morphology and Syntax of Modern Bangla.
(Sounds of Modern Bangla, Conjuncts; word formations, compounds; basic sentence patterns.)

Section-B

Topics from the History of Bangla Literature.

1. Periodization of Bangla Literature : Old Bangla and Middle Bangla.
2. Points of difference between modern and pre-modern Bangla Literature.
3. Roots and reasons behind the emergence of modernity in Bangla Literature.
4. Evolution of various Middle Bangla forms : Mangal kavyas, Vaishnava lyrics, Adapted narratives (Ramayana, Mahabharata, Bhagavata) and religious biographies.
5. Secular forms in middle Bangla literature.
6. Narrative and lyric trends in the nineteenth century Bangla poetry.
7. Development of prose.
8. Bangla dramatic literature (nineteenth century, Tagore, Post-1944 Bangla drama).
9. Tagore and post-Tagoreans.
10. Fiction, major authors : (Bankimchandra, Tagore, Saratchandra, Bibhutibusan, Tarasankar, Manik).
11. Women and Bangla literature : creators and created.

PAPER-II

Prescribed texts for close study.

Answers must be written in Bengali.

Section-A

1. **Vaishnava Padavali** (Calcutta University) Poems of Vidyapati, Chandidas, Jnanadas, Govindadas and Balaramdas.
2. **Chandimangal** Kalketu episode by Mukunda (Sahitya Akademi).
3. **Chaitanya Charitamrita** Madya Lila, by Krishnadas Kaviraj (Sahitya Akademi).
4. **Meghnadbadh Kavya** by Madhusudan Dutta.

5. **Kapalkundala** by Bankimchandra Chattarjee.
6. **Samya** and **Bangadesher Krishak** by Bankimchandra Chatterjee.
7. **Sonar Tari** by Rabindranath Tagore.
8. **Chhinnapatravali** by Rabindranath Tagore.

Section-B

9. **Raktakarabi** by Rabindranath Tagore.
10. **Nabajatak** by Rabindranath Tagore.
11. **Grihadaha** by Saratchandra Chatterjee.
12. **Prabandha Samgraha** Vol. 1, by Pramatha Choudhuri.
13. **Aranyak** by Bibhutibhusan Banerjee
14. **Short stories** by Manik Bandyopadhyay : Atashi Mami, Pragaitihasik, Holud-Pora, Sarisrip, Haraner Natjamai, Chhoto-Bokulpurer Jatri, Kustharogir Bou, Jakey Ghush Ditey Hoy.
15. **Shrestha Kavita** by Jibanananda Das.
16. **Jagori** by Satinath Bhaduri.
17. **Ebam Indrajit** by Badal Sircar.

BODO

PAPER-I

History of Bodo Language and Literature (Answers must be written in Bodo)

Section-A

History of Bodo Language

1. Homeland, language family, its present status and its mutual contact with Assamese.
2. (a) Phonemes : Vowel and Consonant Phonemes
(b) Tones.
3. Morphology : Gender, Case & Case endings, Plural suffix, Definitives, Verbal suffix.
4. Vocabulary and its sources.
5. Syntax : Types of sentences, Word Order.
6. History of Scripts used in writing Bodo Language since inception.

Section-B

History of Bodo Literature

1. General introduction of Bodo folk literature.
2. Contribution of the Missionaries.
3. Periodization of Bodo Literature.
4. Critical analysis of different genre (Poetry, Novel, Short Story and Drama)
5. Translation Literature.

Paper-II

The Paper will require first-hand reading of the texts prescribed and will be de-signed

to test the critical ability of the candidates.

(Answers must be written in Bodo)

Section-A

- (a) Khonthai-Methai (Edited by Madaram Brahma & Rupnath Brahma).
- (b) Hathorkhi-Hala (Edited by Pramod Chandra Brahma)
- (c) Boroni Gudi Sibsa Arw Aroz : Madaram Brahma.
- (d) Raja Nilambar : Dwarendra Nath Basumatary.
- (e) Bibar (Prose section) (Edited by Satish Chandra Basumatary)

Section-B

- (a) Gibi Bithai (Aida Nwi) : Bihuram Boro
- (b) Radab : Samar Brahma Chaudhury
- (c) Okhrang Gongse Nangou : Brajendra Kumar Brahma
- (d) Baisagu Arw Harimu : Laksheswar Brahma.
- (e) Gwdan Boro : Manoranjan Lahary
- (f) Jujaini Or : Chittaranjan Muchahary
- (g) Mwihoor : Dharanidhar Wary
- (h) Hor Badi Khwmsi : Kamal Kumar Brahma
- (i) Jaolia Dewan : Mangal Singh Hozowary
- (j) Hagra Guduni Mwi : Nilkamal Brahma.

CHINESE

PAPER-I

This paper will require the candidates to have a good knowledge of standard Chi-nese language and its characteristics so as to test the candidate's organisational capabilities. All the questions except the question on translation from Chinese to English must be answered in Chinese. All the questions carry equal marks.

Section-A

- 1. Essay writing in about 500 Chinese characters on a topical subject.
- 2. Translation :
 - a) Chinese-English
 - b) English-Chinese
- 3. Syntactic and grammatical usage.

Section-B

- 1. Explanation of idioms and phrases in Chinese.
- 2. Development of Chinese language
- 3. Comprehension Precis writing.

PAPER-II

This paper will require the candidates to have a good grasp of Chinese studies and will be designed to test the candidate's critical ability. All the questions must be an-

swered in Chinese. All the questions carry equal marks.

Section-A

1. Short notes on topics related to major events in modern Chinese history (from 1919 till date).
2. Critical evaluation of major literary works in pre-liberation period (1919-1949) :
 - a) Lao She : Four Generations, Rickshaw-puller.
 - b) Ba Jin : Family.
 - c) Lu Xun : Medicine, Madman's Diary.
The True Story of Ah Q.
 - d) Mao Dun : Midnight
 - e) Ai Qing : Coal's Reply (Mei de Duihua),
Beggar (Qigai), I
Love This Land
(Wo Ai Zhe Tudi),
Old Man (Laoren).
 - f) Guo Moruo : The Goddesses.
3. Role of Philosophy and Religion in the Development of Chinese Society.

Section-B

1. Socio-Economic/Political/Educational/Sports/Science and Technological Development since 1979.
2. Critical appreciation of major literary works in post-liberation period (1949 till date) :
 - a) Gu Hua : The Town Called Hibiscus (Furongzhen)
 - b) Chen Rong : Till the Middle Age (Ren dao Zhongnian)
 - c) Liu Xinwu : The Class-in-Charge (Ban Zhuren)
 - d) Lu Yao : The Human Existence (Rensheng)
 - e) Ai Qing : Fish Fossil, The Mirror, The Gardener's Dream, The Hunter
Who Drew Birds
 - f) Shu Ting : Motherland, My Beloved Mother-land.

DOGRI

PAPER-I

History of Dogri Language and Literature (Answers must be written in Dogri)

Section-A

History of Dogri Language

1. Dogri language : Origin and development through different stages.
2. Linguistic boundaries of Dogri and its dialects.
3. Characteristic features of Dogri lan-guage.
4. Structure of Dogri Language :
 - (a) Sound Structure :
Segmental : Vowels and Consonants

Non-Segmental : Length, Stress, Na-salization, Tone and Juncture.

(b) Morphology of Dogri :

(i) Inflection Categories : Gender, Num-ber, Case, Person, Tense and Voice.

(ii) Word Formation : use of prefixes, infixes and suffixes.

(iii) Vocabulary : Tatsam, tadbhav, foreign and regional.

(c) Sentence Structure : Major Sentence - types and their constituents, agreement and concord in Dogri syntax.

5. Dogri Language and Scripts : Dogre/Dogra Akkhar, Devanagari and Persian.

Section-B

History of Dogri Literature :

1. A brief account of Pre-independence Dogri Literature : Poetry & Prose.
2. Development of modern Dogri Poetry and main trends in Dogri Poetry.
3. Development of Dogri short-story, main trends & prominent short-story writers.
4. Development of Dogri Novel, main trends & contribution of Dogri Novel-ists.
5. Development of Dogri Drama & contribution of prominent Playwrights.
6. Development of Dogri Prose : Essays, Memoirs & Travelogues.
7. An introduction to Dogri Folk literature - Folk songs, Folk tales & Ballads.

Paper-II

Textual Criticism of Dogri Literature

(Answers must be written in Dogri)

Section-A

Poetry

1. Azadi Pahle Di Dogri Kavita.

The following poets :

Devi Ditta, Lakkhu, Ganga Ram, Ramdhan, Hardutt, Pahari Gandhi Baba Kanshi Ram & Permanand Almast.

2. Modern Dogri Poetry Azadi Bad Di Dogri Kavita The following poets :

Kishan Smailpuri, Tara Smailpuri, Mohan Lal Sapolia, Yash Sharma, K.S. Madhukar, Padma Sachdev, Jitendra Udhamपुरi, Charan Singh and Prakash Premi.

3. Sheeraza Dogri Number 102, Ghazal Ank.

The following poets :

Ram Lal Sharma, Ved Pal Deep, N.D. Jamwal, Shiv Ram Deep, Ashwini Magotra and Virendra Kesar.

4. Sheeraza Dogri Number 147, Ghazal Ank

The following poets :

R.N. Shastri, Jitendra Udhamपुरi, Champa Sharma and Darshan Darshi.

5. Ramayan (Epic) by Shambhu Nath Sharma (upto Ayodhya Kand)

6. Veer Gulab (Khand Kavya) by Dinoo Bhai Pant.

Section-B

Prose

1. Ajakani Dogri Kahani

The following short story writers :

Madan Mohan Sharma, Narendra Khajuria and B.P. Sathe.

2. Ajakani Dogri Kahani Part-II

The following Short Story writers :

Ved Rahi, Narsingh Dev Jamwal, Om Goswami, Chhatrapal, Lalit Magotra, Chaman Arora and Ratan Kesar.

3. Khatha Kunj Bhag II

The following Story writers :

Om Vidyarthi, Champa Sharma and Krishan Sharma

4. Meel Patthar (collection of short stories) by Bandhu Sharma

5. Kaidi (Novel) by Desh Bandhu Dogra Nutan

6. Nanga Rukkh (Novel) by O.P. Sharma Sarathi.

7. Nayaan (Drama) by Mohan Singh.

8. Satrang (A collection of one act plays)

The following playwrights :

Vishwa Nath Khajuria, Ram Nath Shastri, Jitendra Sharma, Lalit Magotra and Madan Mohan Sharma.

9. Dogri Lalit Nibandh

The following authors :

Vishwa Nath Khajuria, Narayan Mishra, Balkrishan Shastri, Shiv Nath, Shyam Lal Sharma, Lakshmi Narayan, D.C. Prashant, Ved Ghai, Kunwar Viyogi.

ENGLISH MAIN EXAMINATION

The syllabus consists of two papers, designed to test a first-hand and critical reading of texts prescribed from the following periods in English Literature : Paper I : 1600-1900 and Paper II : 1900-1990.

There will be two compulsory questions in each paper : a) A short-notes question related to the topics for general study, and b) A critical analysis of UNSEEN passages both in prose and verse.

Paper-I

Answers must be written in English.

Texts for detailed study are listed below. Candidates will also be required to show adequate knowledge of the following topics and movements :

The Renaissance : Elizabethan and Jacobean Drama; Metaphysical Poetry; The Epic and the Mock-epic; Neo-classicism; Satire; The Romantic Movement; The Rise of the Novel; The Victorian Age.

Section-A

1. William Shakespeare : **King Lear** and **The Tempest**.
2. John Donne. The following poems :
 - Canonization;
 - Death be not proud;
 - The Good Morrow;
 - On his Mistress going to bed;
 - The Relic;
3. John Milton : **Paradise Lost**, I, II, IV, IX
4. Alexander Pope. **The Rape of the Lock**.
5. William Wordsworth. The following poems:
 - Ode on Intimations of Immortality.
 - Tintern Abbey.
 - Three years she grew.
 - She dwelt among untrodden ways.
 - Michael.
 - Resolution and Independence.
 - The World is too much with us.
 - Milton, thou shouldst be living at this hour.
 - Upon Westminster Bridge.
6. Alfred Tennyson : **In Memoriam**.
7. Henrik Ibsen : **A Doll's House**.

Section-B

1. Jonathan Swift. **Gulliver's Travels**.
2. Jane Austen. **Pride and Prejudice**.
3. Henry Fielding. **Tom Jones**.
4. Charles Dickens. **Hard Times**.
5. George Eliot. **The Mill on the Floss**.
6. Thomas Hardy. **Tess of the d'Urbervilles**.
7. Mark Twain. **The Adventures of Huckleberry Finn**.

Paper-II

Answers must be written in English.

Texts for detailed study are listed below. Candidates will also be required to show adequate knowledge of the following topics and movements :

Modernism; Poets of the Thirties; The stream-of-consciousness Novel; Absurd Drama; Colonialism and Post-Colonialism; Indian Writing in English; Marxist, Psychoanalytical and Feminist approaches to literature; Post-Modernism.

Section-A

1. William Butler Yeats. The following poems:
 - Easter 1916
 - The Second Coming
 - A Prayer for my daughter.
 - Sailing to Byzantium.
 - The Tower.
 - Among School Children.
 - Leda and the Swan.
 - Meru
 - Lapis Lazuli
 - The Second Coming
 - Byzantium.
2. T.S. Eliot. The following poems :
 - The Love Song of J.Alfred Prufrock
 - Journey of the Magi.
 - Burnt Norton.
3. W.H. Auden. The following poems :
 - Partition
 - Musee des Beaux Arts
 - in Memory of W.B. Yeats
 - Lay your sleeping head, my love
 - The Unknown Citizen
 - Consider
 - Mundus Et Infans
 - The Shield of Achilles
 - September 1, 1939
 - Petition.
4. John Osborne : **Look Back in Anger.**
5. Samuel Beckett. **Waiting for Godot.**
6. Philip Larkin. The following poems :
 - Next
 - Please
 - Deceptions
 - Afternoons
 - Days
 - Mr. Bleaney

7. A.K. Ramanujan. The following poems :
- Looking for a Causim on a Swing
 - A River
 - Of Mothers, among other Things
 - Love Poem for a Wife 1
 - Small-Scale Reflections on a Great House
 - Obituary

(All these poems are available in the anthology Ten Twentieth Century Indian Poets, edited by R. Parthasarthy, published by Oxford University Press, New Delhi).

Section-B

1. Joseph Conrad. **Lord Jim**
2. James Joyce. **Portrait of the Artist as a Young Man.**
3. D.H. Lawrence. **Sons and Lovers.**
4. E.M. Forster. **A Passage to India.**
5. Virginia Woolf. **Mrs Dalloway.**
6. Raja Rao. **Kanthapura.**
7. V.S. Naipal. **A House for Mr. Biswas.**

FRENCH PAPER-I

Answers must be written in French except in the case of question requiring translation from French to English.

Section-A

1. Main trends in French Literature
 - a) Classicism
 - b) Rommanticism
 - c) Realism
2. Art in France
 - a) Romanticism
 - b) Realism
 - c) Impressionism
3. The Vth Republic
 - (a) De Gaulle and the Vth Republique
 - (b) May 1968
 - (c) Pompidou
 - (d) Giscard d' Estaing
 - (e) Mitterrand
 - (f) Chirac

4. Translation : French to English (2 pas-sages of socio-politico-economic nature of 200 words each).

Section-B

1. Main trends in French Literature
 - a) Symbolism
 - b) Surrealism
 - c) Theatre of the Absurd
2. Art in French
 - a) Surrealism
 - b) Cubism
 - c) Abstract Painting
3. The Vth Republic
 - a) Parts politiques en France
 - b) Place et rôle du Président de la Ve Republique
 - c) Le gouvernement
 - d) Le Parlement
 - e) Le Senat
4. Translation : English to French 2 pas-sages of socio-politico-economic nature of 200 words each.

PAPER-II

Answers must be written in French

Section-A

This paper will require an in-depth reading of the following texts and the questions will be designed to test the candidate's critical ability.

1. **XVIIth Century**
 - a) Corneille : *Le Cid*
 - b) Racine : *Andromaque*
 - c) Moliere : *L'Avare*
2. **XVIIIth Century**

Beaumarchais: *Le Mariage de Figaro*
3. **XIXth Century**
 - a) Lamartine : *Le lac Le Vallon*
 - b) Victor Hugo : *La Conscience. Elle Avait Pris Ce Pli.....*
Demain, Dés L'Aube
 - c) Victor Hugo : *Hernani*
 - d) Musset : *Souvenir. La Nuit de Decembre*
 - e) Marimee : *Colomba*
 - f) Balzac : *Eugenie Grandet*
 - g) Flaubert : *Madame Bovary*
 - h) Baudelaire : *L'Invitation au Voyage, Recueillement L'Albatros.*

- i) Rimbaud : *Le Dormeur du Val*
- j) Verlaine : *Chanson d'Automne, Mon Reve Familier, Il Pleure Dans mon Coeur...*

Section-B

4. XXth Century

- a) Appolinaire : *Nuit Rhenane, Le Pont Mirabeau*
- b) Jacques Prevert : *Pour Faire Le Portrait d'Un Oiseau, Barbara.*
- c) Paul Eluard : *Liberte*
- d) Paul Valery : *Les Pas, La Fileuse*
- e) Andre Gide : *La Symphonie pastorale*
- f) Camus : *L'Etranger*
- g) Sartre : *Les Mains Sales*
- h) Lonesco : *Rhinoceros*

Francophonie :

- a) Gerard Besette : *Le Libraire*
- b) Ananda Devi : *Le Voile de Draupadi*
- c) Cheikh Hamidou : *L'Aventure Kane Ambigiüe*
- d) Abdellatif Laabi : *Poemes en prose*
 - 1. *L'Arbre a poemes (L'Etreinte du Monde)*
 - 2. *Les Reves viennent mourir sur la page (L'Etreinte du Monde)*

- 5. Essay of general nature on a contempo-rary theme.

GERMAN PAPER-I

Answers must be written in German

Section-A

1. Structure of Language :

Candidates are expected to have a thorough knowledge of German grammar with reference to specific aspects such as word order, syntactic structures and semantics.

2. Essay in German :

Candidates are expected to demonstrate command over techniques of written ex-pression in German by writing an essay on a contemporary topic of a general nature.

Section-B

- 1. Translation of a text of a general na-ture from English into German.
- 2. Socio-political and cultural history of Germany from the 18th century onwards with special reference to :
 - a. Impact of Enlightenment on German society and culture
 - b. The impact of Prussian culture on Ger-many.
 - c. Cultural debates in the Weimar Re-public.
 - d. The concept of culture under National Socialism in Germany.

- e. The development of two German literatures and cultures after 1945.
- f. Reunification of Germany and the problems of cultural pluralism.
- g. The role and relevance of German language and literature in the European Union.

PAPER-II

(Answers must be written in German)

Section-A

1. **Development of German literature from the 19th century to the present.**
Candidates should know the main trends, representative authors and their important works. The emphasis is not on collecting information on works and authors, but the candidate is expected to identify features of a literary epoch on the basis of representative texts.
2. **The Study of literary genres.**
Candidates must be aware of the characteristic features of the different genres like *Roman, Novelle, Drama, Ballade, Elegie, Marchen, Fabeln, Kurzgeschichte*.

Section-B

1. **Perceptions of Literary Interpretation.**
Candidates should be aware of various approaches to a critical understanding of literature.
2. **Study of Selected Texts.**
 - a. Goethe : Die Leiden des jungen Werther.
 - b. Schiller : Maria Stuart.
 - c. Eichendorff. Gedichte.
 - d. Gottfried Keller : Kleider machen Leute.
 - e. Thomas Mann : Die vertauschten Kopfe.
 - f. Franz Kafka : Vor Dem Gesetz.
 - g. Friedrich Durrenmatt : Die Physiker.
 - h. Max Frisch : Andorra.
 - i. Heinrich Boll : Die verlorene Ehre der Katharina Blum.
 - j. Ingeborg Bachmann : Alles (aus dem Erzählband : Das dreißigste Jahr)
 - k. Rose Ausländer : Gedichte.
 - l. Christa Wolf : Der geteilte Himmel.
 - m. Gunter Grass : Zunge zeigen.

GUJARATI

MAIN EXAMINATION

PAPER - I

Answers must be written in Gujarati

Section-A

Gujarati Language : Form and history

1. History of Gujarati Language with special reference to New Indo-Aryan i.e. last one thousand years.

2. Significant features of the Gujarati language: Phonology, morphology and syntax.
3. Major dialects: Surti, Pattani, charotari and Saurashtri.

History of Gujarati Literature

Medieval :

4. Jaina tradition
5. Bhakti tradition: Sagun and Nirgun (Jnanmargi)
6. Non-sectarian tradition (Laukik parampara)

Modern:

7. Sudharak yug
8. Pandit yug
9. Gandhi yug
10. Anu-Gandhi yug
11. Adhunik yug

Section-B

Literary Forms : (Salient features, history and development of the following literary forms):

(a) **Medieval**

1. Narratives: Rasa, Akhyan and Padyavarta
2. Lyrical: Pada

(b) **Folk**

3. Bhavai

(c) **Modern**

4. Fiction: Novel and short story
5. Drama
6. Literary Essay
7. Lyrical Poetry

(d) **Criticism**

8. History of theoretical Gujarati criticism
9. Recent research in folk tradition

PAPER-II

Answers must be written in Gujarati

The paper will require first hand reading of the texts prescribed and will be designed to test the critical ability of the candidate.

Section-A

1. **Medieval**

- (i) Vasantvilas phagu-Ajnatkrut
- (ii) Kadambari-Bhalan

- (iii) Sudamacharitra-Premanand
- (iv) Chandrachandravagini varta-Shamal
- (v) Akhegeeta-Akho

2. **Sudharakyug & Pandityug**

- (vi) Mari Hakikat-Narmadashankar Dave
- (vii) Farbasveerah- Dalpatram
- (viii) Saraswachandra-Part-I Govar-dhanram Tripathi
- (ix) Purvalap- 'Kant' (Manishankar Ratnaji Bhatt)
- (x) Raino Parvat-Ramanbhai Neel-kanth

Section-B

1. **Gandhiyug & Anu Gandhiyug**

- (i) Hind Swaraj-Mohandas Kar-machand Gandhi
- (ii) Patanni Prabhuta- Kanhaiyalal Munshi
- (iii) Kavyani Shakti- Ramnarayan Vish-wanath Pathak
- (iv) Saurashtrani Rasdhar Part 1- Zaver-chand Meghani
- (v) Manvini Bhavai-Pannalal Patel
- (vi) Dhvani-Rajendra Shah

2. **Adhunik yug**

- (vii) Saptapadi-Umashankar Joshi
- (viii) Janantike- Suresh Joshi
- (ix) Ashwatthama- Sitanshu Yash-aschandra

**HINDI
PAPER-I**

Answers must be written in Hindi.

Section-A

1. **History of Hindi Language and Nagari Lipi.**

- I. Grammatical and applied forms of Apbhransh, Awahatta & Arambhik Hindi.
- II. Development of Braj and Awadhi as literary language during medieval period.
- III. Early form of Khari-boli in Siddha-Nath Sahitya, Khusero, Sant Sahitaya, Rahim etc. and Dakhni Hindi.
- IV. Development of Khari-boli and Nagari Lipi during 19th Century.
- V. Standardisation of Hindi Bhasha & Nagari Lipi.
- VI. Development of Hindi as national Language during freedom movement.
- VII. The development of Hindi as a National Language of Union of India.
- VIII. Scientific & Technical development of Hindi Language.
- IX. Prominent dialects of Hindi and their inter relationship.

- X. Salient features of Nagari Lipi and the efforts for its reform & Standard form of Hindi.
- XI. Grammatical structure of Standard Hindi.

Section-B

2. History of Hindi Literature.

- I. The relevance and importance of Hindi literature and tradition of writing History of Hindi Literature.
- II. Literary trends of the following four periods of history of Hindi Literature.
 - A : Adikal-Sidh, Nath and Raso Sahitya.
Prominent poets-Chandvardai, Khusaro, Hemchandra, Vidyapati.
 - B : Bhaktikal-Sant Kavyadhara, Sufi Kavyadhara, Krishna Bhaktidhara and Ram Bhaktidhara.
Prominent Poets-Kabir, Jayasi, Sur & Tulsi.
 - C: Ritikal-Ritikavya, Ritibaddhakavya & Riti Mukta Kavya.
Prominent Poets-Keshav, Bihari, Padmakar and Ghananand.
 - D : Adhunik Kal
- a. Renaissance, the development of Prose, Bharatendu Mandal.
- b. Prominent Writers : Bharatendu, Bal Krishna Bhatt & Pratap Narain Mishra.
- c. Prominent trends of modern Hindi Poetry : Chhayavad, Pragativad, Proyogvad, Nai Kavita, Navgeet and Contemporary poetry and Janvadi Kavita.
Prominent Poets : Maithili Sharan Gupta, Prasad, Nirala, Mahadevi, Dinkar, Agyeya, Muktibodh, Nagarjun.

III. Katha Sahitya

- A. Upanyas & Realism
- B. The origin and development of Hindi Novels.
- C. Prominent Novelists : Premchand, Jainendra, Yashpal, Renu and Bhisim Sahani.
- D. The origin and development of Hindi short story.
- E. Prominent short Story Writers : Premchand, Prasad, Agyeya, Mohan Rakesh & Krishna Shobti.

IV. Drama & Theatre

- A. The origin & Development of Hindi Drama.
- B. Prominent Dramatists : Bharatendu, Prasad, Jagdish Chandra Mathur, Ram Kumar Verma, Mohan Rakesh.
- C. The development of Hindi Theatre.

V. Criticism

- A : The origin and development of Hindi criticism : Saiddhantik, Vyavharik,

Pragativadi, Manovishleshanvadi & Nai Alochana.

B : Prominent critics : Ramchandra Shukla, Hajari Prasad Dwivedi, Ram Vilas Sharma & Nagendra.

VI. The other forms of Hindi prose-Lalit Nibandh, Rekhachitra, Sansmaran, Yatra-vrittant.

PAPER-II

Answers must be written in Hindi.

This paper will require first hand reading of prescribed texts and will test the critical ability of the candidates.

Section-A

1. Kabir : Kabir Granthawali, Ed, Shyam Sundar Das (First hundred Sakhis.)
2. Surdas : Bhramar Gitsar, Ed. Ramchandra Shukla (First hundred Padas)
3. Tulsidas : Ramchrit Manas (Sundar Kand) Kavitawali (Uttar Kand).
4. Jayasi : Padmawat Ed. Shyam Sundar Das (Sinhali Dwip Khand & Nagmativiyog Khand)
5. Bihari : Bihari Ratnakar Ed. Jagannath Prasad Ratnakar (First 100 Dohas)
6. Maithili Sharan Gupta : Bharat Bharati
7. Prasad : Kamayani (Chinta and Sharddha Sarg)
8. Nirala : Rag-Virag, Ed. Ram Vilas Sharma (Ram Ki Shakti Puja & Kukurmutta).
9. Dinkar : Kurushetra
10. Agyeya : Angan Ke Par Dwar (Asadhya Vina)
11. Muktiboth : Brahma Rakshas
12. Nagarjun : Badal Ko Ghirte Dekha Hai, Akal Ke Bad, Harijan Gatha.

Section-B

1. Bharatendu : Bharat Durdasha
2. Mohan Rakesh : Ashad Ka Ek Din
3. Ramchandra Shukla : Chintamani (Part I)
(Kavita Kya Hai] Shraddha Aur Bhakti)
4. Dr. Satyendra : Nibandh Nilaya-Bal Krishna Bhatt, Premchand, Gulab Rai, Hajari Prasad Dwivedi, Ram Vilas Sharma, Agyeya, Kuber Nath Rai.
5. Premchand : Godan, Premchand ki Sarvashreshtha Kahaniyan, Ed. Amrit Rai, Manjusha - Premchand ki Sarvashreshtha Kahaniyan, Ed. Amrit Rai
6. Prasad : Skandgupta
7. Yashpal : Divya
8. Phaniswar Nath Renu : Maila Anchal
9. Mannu Bhandari : Mahabhoj
10. Rajendra Yadav : Ek Dunia Samanantar (All Stories)

**KANNADA
PAPER-I
(Answers must be written in Kannada)
Section-A**

A. History of Kannada Language

What is Language? General characteristics of Language. Dravidian Family of Languages and its specific features, Antiquity of Kannada Language, Different Phases of its Development.

Dialects of Kannada Language : Regional and Social Various aspects of development of Kannada Language : phonological and Semantic changes. Language borrowing.

B. History of Kannada Literature

Ancient Kannada literature : Influence and Trends. Poets for study : Specified poets from Pampa to Ratnakara Varni are to be studied in the light of contents, form and expression : Pampa, Janna, Nagachandra. Medieval Kannada literature : Influence and Trends.

Vachana literature : Basavanna, Akka Mahadevi.

Medieval Poets : Harihara, Ragha-vanka, Kumar-Vyasa.

Dasa literature : Purandra and Kanaka.

Sangataya : Ratnakaravarni

C. Modern Kannada literature :

Influence, trends and ideologies, Navodaya, Pragatishila, Navya, Dalita and Bandaya.

Section-B

A. Poetics and literary criticism :

- Definition and concepts of poetry : Word, Meaning, Alankara, Reeti, Rasa, Dhvani, Auchitya.
- Interpretations of Rasa Sutra.
- Modern Trends of literary criticism : Formalist, Historical, Marxist, Feminist, Post-colonial criticism.

B. Cultural History of Karnataka

- Contribution of Dynasties to the culture of Karnataka : Chalukyas of Badami and Kalyani, Rashtrakutas, Hoysalas, Vijayanagara rulers, in literary context.
- Major religions of Karnataka and their cultural contributions.
- Arts of Karnataka : Sculpture, Architecture, Painting, Music, Dance-in the literary context.
- Unification of Karnataka and its impact on Kannada literature.

PAPER-II

(Answers must be written in Kannada)

The paper will require first-hand reading of the Texts prescribed and will be de-signed to test the critical ability of the can-didates.

Section-A

A. OLD KANNADA LITERATURE

1. Vikramaarjuna Vijaya of Pampa (cantos 12 & 13), (Mysore University Pub.)
2. Vaddaraadhane (Sukumaraswamyia Kathe, Vidyutchorana Kathe)

B. MEDIEVAL KANNADA LITERATURE :

1. Vachana Kammata, Ed: K. Marulasiddappa K.R. Nagaraj (Ban-galore University Pub.)
2. Janapriya Kanakasamputa, Ed. D. Javare Gowda (Kannada and Culture Directorate, Bangalore)
3. Nambiyannana Ragale, Ed., T.N. Sreekantaiah (Ta.Vem. Smaraka Grantha Male, Mysore)
4. Kumaravyasa Bharata : Karna Parva (Mysore University)
5. Bharatesha Vaibhava Sangraha Ed. Ta. Su. Shama Rao (Mysore University)

Section-B

A. MODERN KANNADA LITERATURE

1. Poetry : Hosagannada Kavite, Ed : G.H. Nayak (Kannada Saahitya Parishattu, Bangalore)
2. Novel : Bettada Jeeva-Shivarama Karanta Madhavi-Arupama Niranjana Odalaala-Devanuru Mahadeva
3. Short Story : Kannada Sanna Kathegalu, Ed. G.H. Nayak (Sahitya Academy, New Delhi).
4. Drama : Shudra Tapaswi-Kuvempu. Tughlak-Girish Karnad.
5. Vichara Saahitya : Devaru-A.N. Moorty Rao (Pub : D.V.K. Moorty, Mysore.)

B. FOLK LITERATURE :

1. Janapada Swaropa-Dr. H.M. Nayak. (Ta. Vem. Smaraka Grantha Male, Mysore.)
2. Janapada Geetaanjali-Ed.D. Javare Gowda. (Pub : Sahitya Academy, New Delhi.)
3. Kannada Janapada Kathegalu-Ed. J.S. Paramashivaiah, (Mysore Univer-sity.)
4. Beedi Makkalu Beledo. Ed. Kalegowda Nagavara (Pub : Bangalore University.)
5. Savirada Oगतugalu-Ed : S.G. Imrapura.

KASHMIRI

PAPER-I

(Answers must be written in Kashmiri)

Section-A

1. Genealogical relationship of the Kashmiri language: various theories.
2. Areas of occurrence and dialects (geo-graphical/ social)
3. Phonology and grammar:
 - i. Vowel and consonant system;

- ii. Nouns and pronouns with various case inflections;
 - iii. Verbs: various types and tenses.
4. Syntactic structure:
- i. Simple , active and declarative statments;
 - ii. Coordination;
 - iii. Relativisation.

Section-B

1. Kashmiri literature in the 14th century (Socio-cultural and intellectual back-ground with special reference to Lal Dyad and Sheikhul Alam)
2. Nineteenth century Kashmiri literature (development of various genres: vatsun; ghazal; and mathnavi).
3. Kashmiri literature in the first half of the twentieth century (with special ref-erence to Mahjoor and Azad; various literary influences).
4. Modern Kashmiri literature (with spe-cial refernece to the development of the short story, drama, novel and nazm).

PAPER-II

(Answers must be written in Kashmiri)

Section-A

1. Intensive study of Kashmiri poetry upto the nineteenth century:
 - i) Lal Dyad
 - ii) Sheikhul Aalam
 - iii) Habba Khatoon
2. Kashmiri poetry: 19th Century
 - i) Mahmood Gami (Vatsans)
 - ii) Maqbool Shah (Gulrez)
 - iii) Rasool Mir (Ghazals)
 - iv) Abdul Ahad Nadim (N'at)
 - v) Krishanjoo Razdan (Shiv Lagun)
 - vi) Sufi Poets (Text in Sanglaab, published by the Deptt. of Kashmiri, University of Kashmir)
3. Twentieth Century Kashmiri poetry (text in *Azich Kashir Shairi*, published by the Deptt. of Kashmiri, University of Kashmir)
4. Literary criticism and research work: development and various trends.

Section-B

1. An analytical study of the short story in Kashmiri.
 - i) *Afsana Majmu'a*, published by the Deptt. of Kashmiri, University of Kash-mir.
 - ii) *Kashur Afsana Az*, published by the Sahitya Akademi
 - iii) *Hamasar Kashur Afsana*, published by the Sahitya Akademi

The following short story writers only:
Akhtar Mohi-ud-Din, Kamil, Hari Krishan

- Kaul, Hraday Kaul Bharti, Bansi Nirdosh,
Gulshan Majid.
2. Novel in Kashmiri:
 - i) *Mujrim* by G.N. Gowhar
 - ii) *Marun-Ivan Ilyichun*, (Kashmiri version of Tolstoy's The Death of Ivan Ilyich (Published by Kashmiri Deptt).
 3. Drama in Kashmiri
 - i) *Natuk Kariv Band*, by Hari Krishan Kaul
 - ii) *Qk Angy Natuk*, ed. Motilal Keemu. published by Sahitya Akademi.
 - iii) *Razi Oedipus*, tr. Naji Munawar, published by Sahitya Akademi.
 4. Kashmiri Folk Literature:
 - i) *Kashur Luki Theatre* by Mohammad Subhan Bhagat, published by Deptt. of Kashmiri, University of Kashmir.
 - ii) *Kashiry Luki Beeth* (all volumes) published by the J & K Cultural Academy.

KONKANI

PAPER-I

(Answers must be written in Konkani)

Section-A

History of the Konkani Language :

- (i) Origin and development of the language and influences on it.
- (ii) Major variants of Konkani and their linguistic features.
- (iii) Grammatical and lexicographic work in Konkani, including a study of cases, adverbs, indeclinables and voices.
- (iv) Old Standard Konkani, new Standard and standardisation problems.

Section-B:

History of Konkani literature:

Candidates would be expected to be well-acquainted with Konkani literature and its social and cultural background and consider the problems and issues arising out of them.

- (i) History of Konkani literature from its probable source to the present times, with emphasis on its major works, writers and movements.
- (ii) Social and cultural background of the making of Konkani literature from time to time.
- (iii) Indian and Western influences on Konkani literature from the earliest to modern times.
- (iv) Modern literary trends in the various genres and regions including a study of Konkani folklore.

PAPER-II

(Answers must be written in Konkani)

Textual Criticism of Konkani Literature

The paper will be designed to test the candidate's critical and analytical abilities. Candidates would be expected to be well-acquainted with Konkani Literature and required to have a first-hand reading of the following texts:

Section-A

Prose

1. a) Konkani Mansagangotri (excluding poetry) ed. by Prof. Olivinho Gomes
b) Old Konkani language and literature the Portuguese Role
2. a) Otmoo Denvcharak-a novel by A.V da Cruz.
b) Vadoll ani Varem-A novel by Anto-nio Pereira.
c) Devache Kurpen-a novel by V J P Saldanha.
3. a) Vajralikhani-Shenoy Goem-bab-An anthology-ed. by Shantaram Varde Valavalikar
b) Konkani Lalit Niband-Essays-ed. by Shyam Verenkar
c) Teen Dasakam-An Anthology-ed. by Chandrakant Keni.
4. a) Demand-Drama-by Pundalik Naik
b) Kadambini- A miscellany of modern Prose-ed. by Prof. OJF Gomes & Smt. P.S. Tadkodkar.
c) Ratha Tujeo Ghudieo-by Smt. Jayanti Naik.

Section-B

Poetry

1. a) Ev ani Mori: Poetry by Eduardo Bruno de Souza.
b) Abravanchem Yadnyadan-by Luis Mascarenhas.
2. a) Godde Ramayan-ed.by R.K. Rao
b) Ratnahar I &II-collection of poems-ed. R.V. Pandit.
3. a) Zayo Zuyo-poems-Manohar L. Sardessai.
b) Kanadi Mati Konkani Kavi-Anthology of Poems-ed. Pratap Naik.
4. a) Aadrushatache Kalle-Poems by Pandurang Bhangu.
b) Yaman-Poems by Madhav Borkar

MAITHILI

PAPER-I

History of Maithili Language and its Literature

(Answer to be written in Maithili)

PART-A

History of Maithili Language

1. Place of Maithili in Indo-European language family.
2. Origin and development of Maithili language. (Sanskrit, Prakrit, Avhatt, Maithili)

3. Periodic division of Maithili Language. (Beginning, Middle era, Modern era)
4. Maithili and its different dialects.
5. Relationship between Maithili and other Eastern languages (Bengali, Assamese, Oriya).
6. Origin and development of Tirhuta Script.
7. Pronouns and Verbs in Maithili Language.

PART-B

History of Maithili Literature

1. Background of Maithili Literature (Religious, economic, social, cultural).
2. Periodic division of Maithili literature.
3. Pre-Vidyapati Literature.
4. Vidyapati and his tradition.
5. Medieval Maithili Drama (Kirtaniya Natak, Ankai Nat, Maithili dramas written in Nepal).
6. Maithili Folk Literature (Folk Tales, Folk Drama, Folk Stories, Folk Songs).
7. Development of different literary forms in modern era.
 - (a) Prabandh-kavya
 - (b) Muktak-kavya
 - (c) Novel
 - (d) Short Story
 - (e) Drama
 - (f) Essay
 - (g) Criticism
 - (h) Memoirs
 - (i) Translation
8. Development of Maithili Magazines and Journals.

PAPER-II

(Answers must be written in Maithili)

The paper will require first-hand reading of the prescribed texts and will test the critical ability of the candidates.

PART-A

1. Vidyapati Geet-Shati-Publisher : Sahitya Akademi, New Delhi (Lyrics- 1 to 50)
2. Govind Das Bhajanavali-Publisher : Maithili Academy, Patna (Lyrics - 1 to 25).
3. Krishnajanm - Manbodh
4. Mithilabhasha Ramayana - Chanda Jha (only Sunder-Kand)
5. Rameshwar Charit Mithila Ramayan -Lal Das (only Bal-kand)
6. Keechak-Vadh-Tantra Nath Jha.
7. Datta-Vati-Surendra Jha 'Suman' (only 1st and 2nd Cantos).
8. Chitra-Yatri

9. Samakaleen Maithili Kavita - Publisher : Sahitaya Akademi, New Delhi.

PART-B

10. Varna Ratnakar - Jyotirishwar (only 2nd Kallol)
11. Khattar Kakak Tarang - Hari Mohan Jha.
12. Lorik-Vijaya-Manipadma
13. Prithvi Putra-Lalit
14. Bhaphait Chahak Jinagi-Sudhanshu 'Shekar' Choudhary.
15. Kirti Rajkamlak-Publisher : Maithili Academy, Patna (First Ten Stories only).
16. Katha-Sangrah-Publisher : Maithili Academy, Patna.

MALAYALAM

PAPER-I

(Answers must be written in Malayalam)

Section-A

Unit 1-Early phase of Malayalam Language:

- 1.1 Various theories: origin from proto Dravidian, Tamil, Sanskrit.
1.2 Relation between Tamil and Malayalam: Six nayas of A.R. Rajarajavarma.
1.3 Pattu school-definition, Ramachari-tam, later pattu works-Niranam works and Krishnagatha.

Unit 2-Linguistic features of :

- 2.1 Manipravalam-definition. Language of early manipravala works-Champu, Sandesakavya, Chandrotsava, minor works. Later Manipravala works-medieval Champu and Attakkatha.
2.2 Folklore-Southern and Northern bal-lads, Mappila songs.
2.3 Early Malayalam prose-Bhashakau-taliyam, Brahmandapuram, Attap-rakaram, Kramadipika and Nambiantamil.

Unit 3-Standardisation of Malayalam:

- 3.1 Peculiarities of the language of Pana, Kilippattu and Tullal.
3.2 Contributions of indigenous and European missionaries to Malayalam.
3.3 Characteristics of contemporary Malayalam : Malayalam as administrative language. Language of scientific and technical literature-media language.

Section-B

Literary History

Unit-4 Ancient and Medieval Literature:

- 4.1 Pattu-Ramacharitam, Niranam works and Krishnagatha.
4.2 Manipravalam-early and medieval manipravala works including attakkatha and champu.
4.3 Folk literature.
4.4 Kilippattu, Tullal and Mahakavya.

Unit 5- Modern Literature-Poerty:

- 5.1 Venmani poets and contemporaries.
- 5.2 The advent of Romanticism-Poerty of Kavitraya i.e., Asan, Ulloor and Vallathol
- 5.3 Poetry after Kavitraya.
- 5.4 Modernism in Malayalam poetry.

Unit 6- Modern Literature-Prose:

- 6.1 Drama
- 6.2 Novel
- 6.3 Short story
- 6.4 Biography, travelogue, essay and criti-cism.

PAPER-II

(Answers must be written in Malayalam)

This paper will require first hand reading of the texts prescribed and is designed to test the candidate's critical ability.

Section-A**Unit 1**

- 1.1 Ramacharitam-Patalam 1.
- 1.2 Kannassaramayanam-Balakandam first 25 stanzas.
- 1.3 Unnunilisesandesam-Purvabhagam 25 slokas including Prastavana
- 1.4 Mahabharatham Kilippattu-Bhishmaparvam.

Unit 2

- 2.1 Kumaran Asan-Chintavisthayaya Sita.
- 2.2 Vailoppilli-Kutiyozhikkal.
- 2.3 G. Sankara Kurup-Perunthachan.
- 2.4 N.V. Krishna Variar-Tivandiyile Pattu.

Unit 3

- 3.1 ONV -Bhumikkoru Charamagitam
- 3.2 Ayyappa Panicker-Kurukshestram.
- 3.3 Akkittam-Pandatha Messanthi
- 3.4 Attur Ravivarma-Megharupan.

Section-B**Unit 4**

- 4.1 O. Chanthu Menon-Indulekha
- 4.2 Thakazhy-Chemmin.
- 4.3 O V Vijayan-Khasakkinte Ithihasam.

Unit 5

- 5.1 MT Vasudevan Nair-Vanaprastham (Collection).
- 5.2 NS Madhavan-Higvitta (Collection).
- 5.3 C J. Thomas-1128-il Crime 27.

Unit 6

- 6.1 Kuttikrishna Marar-Bharataparyat-anam

- 6.2 M. K Sanu-Nakshatrangalute snehabhajanam
6.3 V.T. Bhattathirippad-Kannirum Kinavum.

MANIPURI

PAPER-I

(Answers must be written in Manipuri)

Section-A

Language :

- a) General characteristics of Manipuri Language and history of its development; its importance and status among the Tibeto-Burman Languages of North-East India; recent development in the study of Manipuri language; evolution and study of old Manipuri script.
- b) Significant features of Manipuri language :
- i) *Phonology*-Phoneme-vowels, consonants juncture, tone, consonant cluster and its occurrence, syllable-its structure, pattern and types.
- ii) *Morphology* : Word-class, root and its types; affix and its types; grammatical categories gender, number, person, case, tense and aspects, process of compounding (samās and sandhi).
- iii) *Syntax* : Word order : types of sentences, phrase and clause structures.

Section-B

- a) Literary History of Manipuri :
Early period (upto 17th century)-Social and cultural background; Themes, diction and style of the works.
Medieval period (18th and 19th century)-Social, religious and political background; Themes, diction and style of the works. Modern period-Growth of major literary forms; change of Themes, diction and style.
- b) Manipuri Folk Literature :
Legend, Folktale, Folksong, Ballad, Proverb and Riddle.
- c) Aspects of Manipuri Culture :
Pre-Hindu Manipuri Faith; Advent of Hinduism and the process of syncreticism. Performing arts-Lai Haraoba, Maha Ras; Indigenous games-Sagol Kangjei, Khong Kangjei, Kang.

PAPER II

(Answers must be written in Manipuri)

This paper will require first hand reading of the texts prescribed and will be designed to test the candidate's critical ability to assess them.

Section-A

Old and Medieval Manipuri Literature

(a) Old Manipuri Literature

1. O. Bhogeswar Singh (Ed.) : Numit Kappa
2. M. Gourachandra Singh (Ed.) : Thawanthaba Hiran
3. N. Khelchandra Singh (Ed.) : Naothingkhong Phambal Kaba

4. M. Chandra Singh (Ed.) : Panthoibi Khonggul

(b) Medieval Manipuri Literature :

1. M. Chandra Singh (Ed.) : Samsok Ngamba
2. R.K.Snahal Singh (Ed.) : Ramayana Adi Kanda
3. N. Khelchandra Singh (Ed.) : Dhananjoy Laibu Ningba
4. O. Bhogeswar Singh (Ed.) : Chandrakirti Jila Changba

Section-B

Modern Manipuri Literature :

(a) Poetry and Epic :

(I) Poetry :

- (a) Manipuri Sheireng (Pub) Manipuri Sahitya Parishad, 1988 (ed.)
- | | |
|-----------------------|--|
| Kh. Chaoba Singh : | Pi Thadoi, Lamgi Chekla Amada, Loktak |
| Dr. L. Kamal Singh : | Nirjanata, Nirab Rajani |
| A. Minaketan Singh : | Kamalda, Nonggumlakkhoda |
| L. Samarendra Singh : | Ingagi Nong, Mamang Leikai Thambal Satle |
| E. Nilakanta Singh : | Manipur, Lamangnaba |
| Shri Biren : | Tangkhul Hui |
| Th. Ibopishak : | Anouba Thunglaba Jiba |
- (b) Kanchi Sheireng. (Pub) Manipur University 1998 (ed.)
- | | |
|----------------------|-----------------------|
| Dr. L. Kamal Singh : | Biswa-Prem |
| Shri Biren : | Chaphadraba Laigi Yen |
| Th. Ibopishak : | Norok Patal Prithivi |

(II) Epic :

1. A. Dorendrajit Singh : Kansa Bodha
2. H. Anganghal Singh : Khamba-Thoibi Sheireng (San-Senba, Lei Langba, Shamu Khonggi Bichar)

(III) Drama :

1. S. Lalit Singh : Areppa Marup
2. G.C. Tongbra : Matric Pass
3. A. Samarendra : Judge Sahebki Imung

(b) Novel, Short-story and Prose :

(I) Novel :

1. Dr. L. Kamal Singh : Madhabi
2. H. Anganghal Singh : Jahera
3. H. Guno Singh : Laman
4. Pacha Meetei : Imphal Amasung, Magi Ishing, Nungsitki Phibam

(II) Short-story :

- (a) Kanchi Warimacha (Pub) Manipur University 1997 (ed.)
- | | |
|------------------------|---------------|
| R.K. Shitaljit Singh : | Kamala Kamala |
|------------------------|---------------|

- M.K. Binodini : Eigi Thahoudraba Heitup Lalu
 Kh. Prakash : Wanom Shareng
- (b) Parishadki Khangatlaba Warimacha (Pub) Manipuri Sahitya Parishad 1994 (ed.)
 S. Nilbir Shastri : Loukhatpa
 R.K. Elangba : Karinunggi
- (c) Anouba Manipuri Warimacha (Pub) The Cultural Forum Manipur 1992 (ed.)
 N. Kunjamohon Singh : Ijat Tanba
 E. Dinamani : Nongthak Khongnang
- (III) Prose :**
- (a) Warenggi Saklon [Due Part (Pub) The Cultural Forum Manipur 1992 (ed.)
 Kh. Chaoba Singh : Khamba-Thoibigi Wari Amasung Mahakavya
- (b) Kanchi Wareng (Pub) Manipur University 1998 (ed.)
 B. Manisana Shastri : Phajaba
 Ch. Manihar Singh : Lai-Haraoba
- (c) Apunba Wareng. (Pub) Manipur University, 1986 (ed.)
 Ch. Pishak Singh : Samaj Amasung, Sanskriti
 M.K. Binodini : Thoibidu Warouhouida
 Eric Newton : Kalagi Mahousa (translated by I.R. Babu)
- (d) Manipuri Wareng (Pub) The Cultural Forum Manipur 1999 (ed.)
 S. Krishnamohan Singh : Lan

**MARATHI
MAIN EXAMINATION
Paper-I**

Answers must be written in Marathi.

Section-A

Language and Folk-lore

- (a) Nature and Functions of Language (with reference to Marathi)
Language as a signifying system : Langue and Parole; Basic functions; Poetic language; Standard Language and dialect; Language variations according to social parameters.
Linguistic features of Marathi in thirteenth century and seventeenth century.
- (b) **Dialects of Marathi**
Ahirani; Varhadi; Dangi
- (c) **Marathi Grammar**
Parts of Speech; Case-system; Prayog-vichar (Voice)
- (d) **Nature and kinds of Folk-lore**
(with special reference to Marathi)
Lok-Geet, Lok Katha, Lok Natya

Section-B

History of Literature and Literary Criticism

- (a) **History of Marathi Literature**
1. From beginning to 1818 AD, with special reference to the following : The Mahanubhava writers, the Varkari poets, the Pandit poets, the Shahirs, Bakhar literature.
 2. From 1850 to 1990, with special reference to developments in the following major forms : Poetry, Fiction (Novel and Short Story), Drama; and major literary currents and movements, Romantic, Realist, Modernist, Dalit Gramin, Feminist.
- (b) **Literary Criticism**
1. Nature and function of Literature;
 2. Evaluation of Literature;
 3. Nature, Objectives and Methods of Criticism;
 4. Literature, Culture and Society.

PAPER-II

Answers must be written in Marathi.

Textual study of prescribed literary works

The paper will require first-hand reading of the texts prescribed and will be designed to test the candidate's critical ability.

Section-A

Prose

- (1) 'Smritishala'
- (2) Mahatma Jotiba Phule
"Shetkaryacha Asud; 'Sarvajanic Satyadharma'
- (3) S.V. Ketkar 'Brahmankanya;
- (4) P.K. Atre 'Sashtang Namaskar'
- (5) Sharchchandra Muktibodh 'Jana Hey Volatu Jethe'
- (6) Uddhav Shelke 'Shilan'
- (7) Baburao Bagul 'Jevha Mi Jaat Chorli Hoti'
- (8) Gouri Deshpande 'Ekek Paan Galavaya'
- (9) P.I. Sonkamble 'Athavaninche Pakshi'

Section-B

Poetry

- (1) 'Namadevanchi Abhangawani' Ed: Inamdar, Relekar, Mirajkar Modern Book Depot, Pune
- (2) 'Painjan' Ed : M.N. Adwant Sahitya Prasar Kendra, Nagpur
- (3) 'Damayanti-Swayamvar' By Raghunath Pandit
- (4) 'Balakvinchi Kavita' By Balkavi
- (5) 'Vishakha' By Kusumagraj
- (6) 'Mridgandh' By Vinda Karandikar
- (7) 'Jahirnama' By Narayan Surve
- (8) 'Sandhyakalchya Kavita' By Grace
- (9) 'Ya Sattet Jeev Ramat Nahi' By Namdev Dhasal

**NEPALI
PAPER-I
(Answers must be written in Nepali)**

Section-A

1. History of the origin and development of Nepali as one of the new Indo-Aryan Languages
2. Fundamentals of Nepali Grammar and phonology:
 - (i) Nominal forms and categories :-Gender, Number, Case, Adjectives, Pronouns, Avyayas
 - (ii) Verbal forms and categories-Tense, Aspects, Voice, Roots and Fixes
 - (iii) Nepali Swara and Vyanjana;
3. Major Dialects of Nepali
4. Standardisation and Modernisation of Nepali with special reference to language movements (viz. Halanta Bahiskar, Jharrovaad etc.)
5. Teaching of Nepali language in India-Its history and development with special reference to its socio-cultural aspects.

Section-B

1. History of Nepali literature with special reference to its development in India.
2. Fundamental concepts and theories of literature : Kavya/Sahitya, Kavya Prayojan, Literary genres, Shabda Shakti, Rasa, Alankara, Tragedy, Comedy, Aesthetics, Stylistics.
3. Major literary trends and movements-Swachchhandatavad, Yatharthavad, Astitwavad, Ayamik Movement, Contemporary Nepali writings, Postmodernism.
4. Nepali folklores (the following folk-form only)- Sawai, Jhyaurey, Selo, Sangini, Lahari.

PAPER-II

(Answers must be written in Nepali)

This paper will require first hand reading of the texts prescribed below and questions will be designed to test the candidate's critical acumen.

Section-A

1. Santa Jnandil Das-**Udaya Lahari**
2. Lekhnath Poudyal-**Tarun Tapasi** (Vishrams III, V, VI, XII, XV, XVIII only)
3. Agam Singh Giri-**Jaleko Pratibimba : Royeko Pratidhwani** (The following poems only-rasawako Chichy-ahat-sanga Byunjheko Ek Raat, Chhorolai, Jaleko Pratibimba : Royeko Prati-dhwani, Hamro Akashmani Pani Hunchha Ujyalo, Tihar).
4. Haribhakta Katuwal-**Yo Zindagi Khai Ke Zindagi** : (The following poems only - Jeevan : Ek Dristi, Yo Zindagi Khai Ke Zindagi, Akashka tara Ke Tara, Hamilai Nirdho Nasamjha, Khai Many-ata Yahan Atmahutiko Balidan Ko).
5. Balkrishna Sama-**Prahlad**

6. Manbahadur Mukhia-**Andhyaroma Banchneharu** (The following One-Act plays only-‘Andhyaroma Banchneharu’, ‘Suskerā’).

Section-B

1. Indra Sundas-**Sahara**
2. Lilbahadur Chhetri-**Brahmaputrako Chheuchhau**
3. Rupnarayan Sinha-**Katha Navaratna** (The following stories only-Biteka Kura, Jimmewari Kasko, Dhanamatiko Cinema-Swapna, Vidhwasta Jeevan).
4. Indrabahadur Rai-**Vipana Katipaya** (The following stories only-Raatbhari Huri Chalyo, Jayamaya Aphumatra Lekha-pani Aipugi, Bhagi, Ghosh Babu, Chhutyaiyo).
5. Sanu Lama-**Katha Sampad** (The following stories only-Swasni Manchhey, Khani Tarma Ekdin, Phurbale Gaun Chhadyo, Asinapo Manchhey).
6. Laxmi Prasad Devkota-**Laxmi Nibandha Sangraha** (The following essays only-Sri Ganeshaya Namah, Nepali Sahityako Itihasma Sarvashrestha Purus, Kalpana, Kala Ra Jeevan, Gadha Buddhiman Ki Guru).
7. Ramkrishna Sharma-**Das Gorkha** (The following essays only-Kavi, Samaj Ra Sahitya, Sahityama Sapekshata, Sahityik Ruchiko Praudhata, Nepali Sahityako Pragati).

ORIYA

PAPER-I

(Answers must be written in Oriya)

Section-A

History of Oriya Language

- (1) Origin and development of Oriya Language- Influence of Austric, Dravidian, Perso-Arabic and English on Oriya Language.
- (2) Phonetics and Phonemics : Vowels, Consonants Principles of changes in Oriya sounds.
- (3) Morphology : Morphemes (free, bound compound and complex), derivational and inflectional affixes, case inflection, conjugation of verb.
- (4) Syntax : Kinds of sentences and their transformation, structure of sentences.
- (5) Semantics-Different types of change in meaning Euphemism.
- (6) Common errors in spellings, grammatical uses and construction of sentences.
- (7) Regional variations in Oriya Language (Western, Southern and Northern Oriya) and Dialects (Bhatri and Desia)

Section-B

History of Oriya Literature

- (1) Historical backgrounds (social, cultural and political) of Oriya Literature of different periods.
- (2) Ancient epics, ornate kavyas and cpadavalis.
- (3) Typical structural forms of Oriya Literature (Koili, Chautisa, Poi, Chaupadi, Champu).

(4) Modern trends in poetry, drama short story, novel, essay and literary criticism.

PAPER-II

(Answers must be written in Oriya)

Critical Study of texts -The paper will require first hand reading of the text and test the critical ability of the candidate.

Section-A

Poetry :

(Ancient)

1. Sāralā Das-Shanti Parva from Māhābharāta.
2. Jaganāth Das-Bhāgābāte, XI Skandha-Jadu Avadhuta Sambāda.

(Medieval)

3. Dinākrushna Dās-Rasakallola-(Chhāndas-16 & 34)
4. Upendra Bhanja-Lāvanyabati (Chhāndas-1 & 2)

(Modern)

5. Rādhānāth Rāy-Chandrabhāgā
6. Māyādhār Mānasinha-Jeevan Chitā
7. Satchidānanda Routray-Kabitā-1962
8. Ramākānta Ratha-Saptama Ritu.

Section-B

Drama :

9. Manoranjan Dās-Kātha-Ghodā
10. Bijay Mishra-Tata Niranjana

Novel :

11. Fakir Mohan Senāpati-Chhamāna Āthaguntha
12. Gopināth Mohanty-Dānāpāni

Short Story :

13. Surendra Mohānty-Marālāra Mrityu
14. Manoj Dās-Laxmira Abhisara

Essay :

15. Chittaranjan Dās-Taranga O Tadit (First five essays).
16. Chandra Sekhar Rath-Mun Satya-dhārma Kahuchhi (First five essays)

PALI
MAIN EXAMINATION
Paper-I

(Pāli Language)

N.B. All answers must be written in Pali language in Devanāgarī or Roman Script.

Section-A

1. Origin and Homeland of Pāli and its characteristics.
2. Pāli Grammar-(I) Technical Terms of Pāli Grammar-Akkhara, Sara, Vyañjana, Niggahīta, Nāma, Sabbanāma, Ākhyāta, Upasagga, Nipāta, Abyaya, (II) Kāraka, (III) Samāsa; (IV) Sandhi; (V) Taddhita. (Apaccabodhaka-and Ādhikārabodhaka-Paccaya); (VI) Etymological derivation of the following words :-
Buddho, Bhikkhu, Sāmanero, Satthā, Dhammo, Latāyā, Purisānam, Tumhe, Amhebbhi, Munina, Rattīsu, Phalāya, Atthīsu, Raññam, Sangho.
3. Translation of **two** Pāli unseen passages into English.

Section-B

4. Essays consisting of 300 words on any **one** of the following :
(a) Bhagavā Buddho, (b) Tilakkhanam, (c) Ariyo atthaṅgiko maggo, (d) Cattāri ariyasaccāni, (e) Kammavādo (f) Patikkasamuppādo, (g) Nibbānam paramam sukham, (h) Tipitakam, (i) Dhammapadam, (j) Majjhimā-Patipadā.
5. Summary of Pāli passages.
6. Explanation of Pāli verses in Pāli.
7. The meaning of following indeclinables (**Abyaya** and **Nipāta**) and their use in candidates' own Pāli sentences :
(I) Atha, (II) Antarā, (III) Addhā, (IV) Kadā, (V) Kittāvatā, (VI) Ahorattam, (VII) Divā, (VIII) Yathā, (IX) Ce, (X) Seyyathīdam, (XI) Vinā, (XII) Kudācannam, (XIII) Saddhim, (XIV) Antarena, (XV) Kho, (XVI) Mā, (XVII) Evam, (XVIII) Ettha, (XIX) Kira, (XX) Pana.

Paper-II

(Pāli Literature)

There will be two compulsory questions which must be answered in Pali Language in Devanagari or Roman Script. The remaining questions must be attempted either in Pali or in the medium of examination opted by the candidate.

Section-A

- (i) Life and teachings of Buddha from the Pāli sources.
- (ii) History of Pali Literature-Canonical and Non-Canonical with reference to the following books and authors:
Mahāvagga, Cullavagga, Pātimokkha, Dīgha-Nikāya, Dhammapada, Jātaka,

Theragāthā, Therîgāthā, Dîpavamsa, Mahāvamsa, Dāthāvamsa, Sāsanavamsa, Milindapanha, Petakopadesa, Nettippa-karana, Buddhadatta, Buddhaghosa and Dhammapāla.

Section-B

1. Textual questions, critical comments and annotated translations would be asked from the following prescribed texts :-
 - (i) Dîghā-Nikāya (Only the Sāmaññaphala-Sutta)
 - (ii) Sutta-nipāta (Only the **Khaggavisana-Sutta** and **Dhaniya-Sutta**)
 - (iii) **Dhammapada** (Only the first five **Vaggā-s**)
 - (iv) **Milindapanha** (Only the **Lakkhana-panha**)
 - (v) **Mahavamsa** (Only the **Tatiya-Sangiti**)
 - (vi) **Abhidhammattha-sangaha** (First, Second and Sixth Chapters)
 - (vii) Pāli Prosody : **Vuttodaya**-Anutthubha, Indavajirā, Upendavajirā, Vasantatilakā, Mālinî, Sikharinî, Upajati, totaka, Dodhaka, Vamsattha.
 - (viii) Pāli Rhetoric : **Subodhālankārā** -Yamaka, Anuppāsa, Rûpaka, Upama, Atisayutti, Vyatireka, Nidassanā, Atthanta-ranyāsa, Dîpaka, Ditthanta.
2. Short Notes on Buddhist concepts dealt within the prescribed texts.
3. Explanation of Pāli Verses from the prescribed texts.

PERSIAN PAPER-I

There will be two questions which must be answered in Persian. The remaining questions must be answered either in Persian or in the medium of examination opted by the candidate.

Section-A

1. (a) Description of the origin and development of Persian language (to be answered in Persian).
- (b) Applied Grammar, Rhetorics, Prosody, Idioms and Phrases frequently used.
 - (i) Grammar : Ism and its kinds, Zamir-e-Muttasil and Munfasil, Murakkabi-Tausifi, Murakkab-i-lzafi, Ismi-Ishara, Musharun Elaih, Fel and its kinds, Tenses, Gardan, singular and plural, Jumleh and its kinds.
 - (ii) Rhetorics : Tajnees, Ishteqaq, Luzum-mala-yalzum, seyaqatul Aaadad, Qalb, Tarsee, Esteaara, Maratun Nazir, Laff-o-Nashr, Iham, Husn-i-Taalil, Tajahuli-Aarefaneh, Talmih, Tansiqus Sifat.
 - (iii) Prosody : Bahri-Muzara, Ramal, Mutaqarib, Tawil, Hazaj, Kamil.

Secton-B

1. Short essay in Persian-250 words (to be answered in Persian).
2. History of Persian Literature in Iran and India; Literary criticism and styles; trends in classical and modern literature; socio-cultural influences, development of modern literary genres including drama, novel, short story.

PAPER-II

There will be two compulsory questions—one each in textual portions of prose and poetry which are to be answered in Persian. The remaining questions are to be answered either in Persian or in the medium of examination opted by the candidate. This paper will require first hand reading of the texts prescribed and will be designed to test the candidate's critical ability.

Section-A

Prose

1. Nizami Aroozī Samarqandī : Chahar Maqala :
 - (i) Dabiri
 - (ii) Shaairi
2. Qabus.b, Washmgir : Qabus Nama :
 - (i) Dar Shinakhtan-e-Haqq-e-Pidar-wa-Madar
 - (ii) Dar Bishi Justan Az Sukhandani
 - (iii) Dar Talib Ilmi Wa Faqih Wa Fuqaha
3. Sadi Shirazi : Gulistan :
 - (i) Dar Tasir-e-Suhbat.
4. Moh. Awfi : Jawameul Hikayat :
 - (i) First Ten Hikayaat
5. Ziauddin Burney : Tarikh-i-Firozshahi:
 - (i) Wasaya-i-Sultan Balban Be Farzand-e-Buzurg
6. Abul Fazl Ain-e-Akbari:
 - (i) Ain-Khazina-i-Abadi
 - (ii) Ain-e-Shabistan-e-Iqbal
 - (iii) Ain-e-Manzil Dar Yurisha
 - (iv) Ain-e-Cheragh Afrozi
7. Sadiq-i-Hedayat:
 - (i) Dash Akul
 - (ii) Girdab
8. Mohd. Hijazi :
 - (i) Khudkushi
 - (ii) Pezeshk-e-Chashm

Section-B

Poetry

1. Firadausi : Shahnama :
 - (i) Rustam-o-Sohrab
2. Khayyam : Rubaaiyat (Radif Alif and Be)
3. Saadi Shirazi : Bustan: 'Dar Adl-u-Tadbir-u-Rai'
4. Amir Khusrau: Majmua-i-Diwan-e-Khusrau. (Radif Dal)
5. Maulana Rum: Mathnawi Maanawi (First Half of Daftar Duwwum)
6. Hafiz : (Radif Alif and Dal)

7. Urfi Shirazi : Qasaaid :
 - (i) Iqbal-e-Karam Migazad Arbabi-Himam Ra.
 - (ii) Har Sukhta Jane Ki Ba Kashmir Dar Ayad.
 - (iii) Sabah-e-Idd Ke Dar Takiyagah-e-Naz-u-Naeem.
8. Ghalib : Ghazaaliyat (Radif Alif)
9. Bahar Mashhadi :
 - (i) Jughd-e-Jung
 - (ii) Sukoot-e-Shab
 - (iii) Damawandiye
 - (iv) Dukhtar-e-Basra
10. Furugh-e-Farrukhzad:
 - (i) Dar Barabad-e-Khuda
 - (ii) Diw-e-Shab
11. Nimayushij :
 - (i) Qu
 - (ii) Khar-Kan

Note :- Textual portions of prose and po-etry are to be explained in Persian compulsorily.

PUNJABI PAPER-I

Answers must be written in Punjabi in Gurumukhi Script.

Section-A

- a) Origin of Punjabi language : different stages of development and recent development in Punjabi language : characteristics of Punjabi phonology and the study of its tones: classification of vowels and consonants.
- b) Punjabi morphology : the number-gender system (animate and inanimate), prefixes, affixes and different categories of Post positions: Punjabi word formation: **Tatsam. Tad Bhav**, forms: Sentence structure, the notion of subject and object in Punjabi: Noun and verb phrases.
- c) Language and dialect; the notions of dialect and idiolect; major dialects of Punjabi; Pothohari, Majhi, Doabi, Malwai, Puadhi; the validity of speech variation on the basis of social stratification, the distinctive features of various dialects with special reference to tones. Language and script; origin and development of Gurmukhi; suitability of Gurmukhi for Punjabi.
- d) Classical background; Nath Jogi Sahit
Medieval literature : Gurmat, Sufti, Kissa and Var Janamsakhis.

Section-B

- a) Modern trends Mystic, romantic, progressive and neomystic (Vir Singh, Puran Singh, Mohan Singh, Amrita Pritam, Bawa Balwant, Pritam Singh Safeer, J.S. Neki).

Experimentalist (Jasbir Singh Ahluwalia, Ravinder Ravi, Ajaib Kamal)

Aesthetes (Harbhajan Singh, Tara Singh)

Neo-progressive (Pash. Jagtar, Patar)

Origin and Development of Genres :

- b) Folk literature Folk songs, Folk tales. Riddles, Proverbs.
Epic (Vir Singh, Avtar Singh, Azad Mohan Singh)
Lyric (Gurus, Sufis and Modern Lyricists-Mohan Singh Amrita Pritam, Shiv Kumar, Harbhajan Singh)
- c) Drama (I.C. Nanda, Harcharan Singh, Balwant Gargi, S.S.Sekhon, Charan Das Sidhu)
Novel (Vir Singh, Nanak Singh, Jaswant Singh Kanwal, K.S. Duggal, Sukhbir, Gurdial Singh, Dalip Kaur Tiwana, Swaran Chandan)
Short Story (Sujan Singh, K.S. Virk. Prem Parkash, Waryam Sandhu).
- d) Socio-cultural Sanskrit, Persian Literary influences : and Western.
Essay (Puran Singh, Teja Singh, Gurbaksh Singh)
- Literary Criticism (S.S. Sekhon, Attar Singh, Kishan Singh, Harbhajan Singh, Najam Hussain Sayyad).

PAPER-II

Answers must be written in Punjabi in Gurumukhi Script.

This paper will require first-hand reading of the texts prescribed and will be designed to test the candidate's critical ability.

Section-A

- a) Sheikh Farid The complete Bani as included in the Adi Granth.
b) Guru Nanak Japu Ji Baramah, Asa di Var
c) Bulleh Shah Kafian
d) Waris Shah Heer

Section-B

- a) Shah Mohammad Jangnama (Jang Singhan te Firangian)
Dhani Ram Chatrik (Poet) Chandan Vari
Sufi Khana
Nawan Jahan
- b) Nanak Singh (Novelist) Chitta Lahu
Pavittar Papi
Ek Mian Do Talwaran
- c) Gurbaksh Singh (Essayist) Zindagi di Ras
Nawan Shivala
Merian Abhul Yadaan.

- Balraj Sahni (Travelogue) Mera Roosi Safarnama
Mera Pakistani Safarnama
- d) Balwant Gargi (Dramatist) Loha Kutt
Dhuni-di-Agg
Sultan Razia
Sant Singh Sekhon (Critic) Sahityarth
Parsidh Punjabi Kavi
Punjabi Kav Shiromani

**RUSSIAN
PAPER-I**

**Answers must be written in Russian except in the case of question regarding translation from Russian to English.
(Language and Culture)**

Section-A

- i. Modern Russian Language : Phonetics, Morphology, Syntax, Lexicology, Lexicography and Semantics, linguistics
- ii. Translation from Russian into English and vice-versa.

Section-B

- i. Socio-political and economical development of the Russian Federation : Patriotic war of 1812, October Revolution, Perestroika and Glasnost, disintegration of USSR. Regional & Cultural variations of the Russian Federation.
- ii. Essay on general topics.

PAPER-II

**(Answers must be written in Russian)
(Literature)**

Section-A

Literary History and Literary Criticism, Literary movements, Sentimentalism, Romanticism, Naturalism, Realism, Critical Realism, Socialism, Acmeism, Symbolism, Futurism; Origin and development of literary genres : Folk literature, Lyrics and poems-

A.S. Pushkin, M.U. Lermontov, Alexander Blok, Esenin, V. Mayakovsky, Anna Akhmatova. Epic-L.N. Tolstoy, M. Sholokhov, Short story, novelet, novels-Pushkin, Lermontov, N.V. Gogol, S. Shchedrin, I. Goncharov, I. Turgenev, F.M. Dostoevsky, L.N. Tolstoy, A.P. Chekhov, M. Gorky, M. Sholokhov, I. Bunin, E. Zamyatin, Boris Pasternak, A. Solzhenitsyn, M. Bulgakov, Chingiz Aitmatov, V. Rasputin, V. Shukshin, Criticism-Belinsky, Dobrolyubov, Chernyshevsky, Pisarev, Drama-Chekhov, Gogol. Influence of socio-political movements on literature.

Section-B

This part will require first hand reading of the texts prescribed and will be designed to test the candidates' critical ability.

1. A.S. Pushkin Evgeny Onegin
2. M.U. Lermontov Hero of our times
3. N.V. Gogol Revizor
4. I.S. Turgenev Fathers and sons
5. F.M. Dostoevsky Crime and Punishment
6. L.N. Tolstoy
 - i. War and Peace
 - ii. Resurrection
7. A.P. Chekhov
 - i. Toska
 - ii. Smert Chinovnika
 - iii. Chameleon
8. A.M. Gorky Mother
9. A. Blok The twelve
10. B.B.
 - i. Cloud in plants Mayakovsky
 - ii. Good
11. M. Sholokhov Fate of a man
12. B. Pasternak Doctor Zhivago
13. Solzhenitsyn One day in the life of Ivan Danisovich
14. V. Rasputin Zhivi i Pomni
15. Chingiz Aitmatov Bely Porokhod
16. V. Shukshin Chudik

SANSKRIT PAPER-I

There will be three questions as indicated in the question paper which must be answered

in Sanskrit. The remaining questions must be answered either in Sanskrit or in the medium of examination opted by the candidate.

Section-A

1. Significant features of the grammar, with particular stress on Sanjna, Sandhi, Karaka, Samasa, Kartari and Karmani vacyas (voice usages) (to be answered in Sanskrit).
2. (a) Main characteristics of Vedic Sanskrit language.
(b) Prominent features of classical Sanskrit language.
(c) Contribution of Sanskrit to linguistic studies.
3. General Knowledge of:-
 - (a) Literary history of Sanskrit,

- (b) Principal trends of literary criticism
- (c) Ramayana,
- (d) Mahabharata
- (e) The origin and development of literary genres of:
Mahakavya, Rupaka (drama), Katha, Akhyayika, Campu,
Khandakavya, Mukta Kavya.

Section-B

- 4. Essentials of Indian Culture with stress on
 - a) Purusarthas
 - b) Samskaras
 - c) Varnasramavyavastha
 - d) Arts and fine arts
 - e) Technical sciences
- 5. Trends of Indian Philosophy
 - a) Mimamsa
 - b) Vedanta
 - c) Nyaya d) Vaishesika
 - e) Sankhya
 - f) Yoga
 - g) Bauddha
 - h) Jaina
 - i) Carvaka
- 6. Short Essay in Sanskrit
- 7. Unseen passage with the questions, to be answered in Sanskrit.

PAPER-II

Question from Group 4 is to be answered in Sanskrit only. Question from Groups 1, 2 and 3 are to be answered either in Sanskrit or in the medium opted by the candidate.

Section-A

General study of the following groups:

Group 1

- a) Raghuvamsam-Kalidasa
- b) Kumarasambhavam-Kalidasa
- c) Kiratarjuniyam-Bharavi
- d) Sisupalavadham-Magha
- e) Naisadhiyacaritam-Sriharsa
- f) Kadambari-Banabhatta
- g) Dasakumaracaritam -Dandin
- h) Sivarajyodayam-S.B. Varnekar

Group 2

- a) Isavasyopanisad

- b) Bhagavadgita
- c) Sundarakanda of Valmiki's Ramayana
- d) Arthasastra of Kautilya

Group 3

- a) Svapnavasavadattam- Bhasa
- b) Abhijnanasakuntalam- Kalidasa
- c) Mrcchakatikam-Sudraka
- d) Mudraraksasam-Visakhadatta
- e) Uttararamacaritam- Bhavabhuti
- f) Ratnavali-Sriharshavardhana
- g) Venisamharam- Bhattanarayana

Group 4

Short notes in Sanskrit on the following:

- a) Meghadutam-Kalidasa
- b) Nitisatakam-Bhartrhari
- c) Panchtantra
- d) Rajatarangini-Kalhana
- e) Harsacaritam-Banabhatta
- f) Amarukasatakam-Amaruka
- g) Gitagovindam-Jayadeva

Section-B

Questions from Groups 1 & 2 are to be answered in Sanskrit only. (Questions from Groups 3 & 4 are to be answered in Sanskrit or in the medium opted by the candidate).

This Section will require first hand reading of the following selected texts :

Group 1

- (a) Raghuvansam-Canto I, Verses 1 to 10
- (b) Kumarasambhavam-Canto I, Verses 1 to 10
- (c) Kiratarjuniyam-Canto I, Verses 1 to 10

Group 2

- (a) Isavasyopanisad-verses-1, 2, 4, 6, 7, 15 and 18
- (b) Bhagavatgita II chapter verses 13 to 25
- (c) Sundarakandam of Valmiki Canto 15, Verses 15 to 30 (Geeta Press Edition)

Group 3

- (a) Meghadutam-verses 1 to 10
- (b) Nitisatakam-Verses 1 to 10 (Edited by D.D. Kosambi Bharatiya Vidya Bhavan Publication)
- (c) Kadambari-Sukanaso-padesa (only)

Group 4

- (a) Svapnavasavadattam Act VI

- (b) Abhijnansakuntalam Act IV verses 15 to 30 (M.R. Kale Edition)
- (c) Uttararamacharitam Act 1 verses 31 to 47 (M.R. Kale Edition).

**SANTALI
PAPER-I**

(Answers must be written in Santali)

Section-A

Part-I History of Santali Language

- I. Main Austric Language family, population and distribution.
- II. Grammatical structure of Santali Lan-guage.
- III. Important character of Santali Language : Phonology, Morphology, Syntax, Seman-tics, Translation, Lexicography.
- IV. Impact of other languages on Santali.
- V. Standardization of Santali Language.

Part-II History of Santali Literature.

- I. Literary trends of the following four periods of History of Santali Literature.
 - (a) Ancient literature before 1854.
 - (b) Missionary period : Literature between 1855 to 1889 AD.
 - (c) Medieval period : Literature between 1890 to 1946 AD.
 - (d) Modern period : Literature from 1947 AD to till date.
- II. Writing tradition in History of Santali Lit-erature.

Section-B

Literary forms - Main characteristics, history and development of following literary forms.

Part-I : Folk Literature in Santali-folk song, folk tale, phrase, idioms, puzzles and Kudum.

Part-II : Modern literature in Santali

- (a) Development of poetry and prominent poets.
- (b) Development of prose and prominent writers.
 - (i) Novels and prominent Novelists.
 - (ii) Stories and prominent story writers.
 - (iii) Drama and prominent Dramatist.
 - (iv) Criticism and prominent critics.
 - (v) Essay, sketches, memoirs, travelogues and prominent writers.

Santali writers :

Shyam Sunder Hembram, Pandit Raghunath Murmu, Barha Beshra, Sadhu Ramchand Murmu, Narayan Soren 'Toresutam', Sarada Prasad Kisku, Raghunath Tudu, Kalipada Soren, Sakla Soren, Digambar Hansda, Aditya Mitra 'Santali', Babulal Murmu 'Adivasi', Jadumani Beshra, Arjun Hembram, Krishna Chandra Tudu, Rupchand Hansda, Kalendra Nath Mandi, Mahadev Hansda, Gour Chandra Murmu, Thakur Prasad Murmu, Hara Prasad Murmu, Uday Nath Majhi, Parimal Hembram, Dharendra Nath

Baske, Shyam Charan Hembram, Damayanti Beshra, T.K. Rapaj, Boyha Biswanath Tudu.

Part-III : Cultural Heritage of Santali tradition, customs, festival and rituals (birth, marriage and death).

PAPER-II

(Answers must be written in Santali)

Section-A

This paper will require in-depth reading of the following texts and the questions will be designed to test the candidates' critical ability.

Ancient Literature :

Prose

- (a) Kherwal Bonso Dhorom Puthi-Majhi Ramdas Tudu "Rasika".
- (b) Mare Hapramko Reyak Katha-L.O. Scrafsrud.
- (c) Jomsim Binti Lita-Mangal Chandra Turkulumang Soren.
- (d) Marang Buru Binti-Kanailal Tudu.

Poetry

- (a) Karam Sereng-Nunku Soren.
- (b) Devi Dasain Sereng-Manindra Hansda.
- (c) Horh Sereng-W.G. Archer.
- (d) Baha Sereng-Balaram Tudu
- (e) Dong Sereng-Padmashri Bhagwat Murmu 'Thakur'
- (f) Hor Sereng-Raghunath Murmu.
- (g) Soros Sereng-Babulal Murmu "Adivasi"
- (h) More Sin More Nida-Rup Chand Hansda
- (i) Judasi Madwa Latar-Tez Narayan Murmu.

Section-B

Modern Literature

Part-I : Poetry

- (a) Onorhen Baha Dhalwak-Paul Jujhar Soren.
- (b) Asar Binti-Narayan Soren "Tore Sutam"
- (c) Chand Mala-Gora Chand Tudu.
- (d) Onto Baha Mala-Aditya Mitra "Santali"
- (e) Tiryo Tetang-Hari Har Hansda
- (f) Sisirjon Rar-Thakur Prasad Murmu.

Part-II : Novels

- (a) Harmawak Ato-R. Karstiars (Transla-tor- R.R. Kisku Rapaz).
- (b) Manu Mati-Chandra Mohan Hansda
- (c) Ato Orak-Doman Hansda
- (d) Ojoy Gada Dhiphre-Nathaniel Murmu

Part-III : Stories

- (a) Jiyon Gada-Rup Chand Hansda and Jadumani Beshra.

(b) Mayajal-Doman Sahu, 'Samir' and Padmashri Bhagwat Murmu 'Thakur'

Part-IV : Drama

(a) Kherwar Bir-Pandit Raghunath Murmu

(b) Juri Khatir-Dr. K.C. Tudu

(c) Birsa Bir-Ravi Lal Tudu

Part-V : Biography

Santal Ko Ren Mayam Gohako-Dr. Biswanath Hansda.

SINDHI

PAPER-I

(Answers must be written in Sindhi)

(Arabic or Devanagari script)

Section-A

1. (a) Origin and evolution of Sindhi language-views of different scholars.
(b) Significant linguistic features of Sindhi language, including those pertaining to its phonology, morphology and syntax.
(c) Major dialects of the Sindhi language.
(d) Sindhi vocabulary-stages of its growth, including those in the pre-partition and post-partition periods.
(e) Historical study of various Writing Systems (Scripts) of Sindhi.
(f) Changes in the structure of Sindhi language in India, after partition, due to influence of other languages and social conditions.

Section-B

2. Sindhi literature through the ages in context of socio-cultural conditions in the respective periods :
 - a. Early medieval literature upto 1350 A.D. including folk literature.
 - b. Late medieval period from 1350 A.D. to 1850 A.D.
 - c. Renaissance period from 1850 A.D. to 1947 A.D.
 - d. Modern period from 1947 and onwards.
(Literary genres in Modern Sindhi literature and experiments in poetry, drama, novel, short story, essay, literary criticism, biography, autobiography, memoirs, and travelogues.)

PAPER-II

(Answers must be written in Sindhi)

(Arabic or Devanagari script).

This paper will require the first-hand reading of the texts prescribed and will be designed to test the candidates' critical ability.

Section-A

References to context and critical appreciation of the texts included in this section.

(1) **Poetry**

- a. "Shah Jo Choond Shair" : ed. H.I. Sadarangani, Published by Sahitya Akademi (First 100 pages)
- b. "Sachal Jo Choond Kalam" : ed. Kalyan B. Advani Published by Sahitya Akademi (Kafis only)
- c. "Sami-a-ja Choond Sloka" : ed. B.H. Nagrani Published by Sahitya Akademi (First 100 pages)
- d. "Shair-e-Bewas" : by Kishinchand Bewas ("Saamoondi Sipoon" portion only)
- e. "Roshan Chhanvro" : Narayan Shyam
- f. "Virhange Khanpoije Sindhi Shair jee Choond" : ed. H.I. Sadarangani Published by Sahitya Akademi

(2) **Drama**

- g. "Behtareen Sindhi Natak" (One-act Plays) : Edited by M. Kamal Published by Gujarat Sindhi Academy.
- h. "Kako Kaloomal" (Full-length Play) : by Madan Jumani

Section-B

References to context and critical appreciation of the texts included in this section.

- a. 'Pakheera Valar Khan Vichhrya' (Novel) : by Gobind Malhi
- b. 'Sat Deenhan' (Novel) : by Krishan Khatwani
- c. 'Choond Sindhi Kahanyoon' (Short Stories) Vol. III. : Edited by Prem Prakash, Published by Sahitya Akademi.
- d. 'Bandhan' (Short Stories) : Sundari Uttamchandani
- e. 'Behtareen Sindhi Mazmoon' (Essays) : Edited by Hiro Thakur, published by Gujarat Sindhi Akademi.
- f. 'Sindhi Tanqeed' (Criticism) : Edited by Harish Vaswani : Published by Sahitya Akademi.
- g. 'Mumhinjee Hayati-a ja Sona Ropa varqa' (Autobiography) : by Popati Hiranandani
- h. "Dr. Choithram Gidwani" (Biography) : by Vishnu Sharma

**TAMIL
MAIN EXAMINATION
PAPER-I**

Answers must be written in Tamil.

Section: A

Part: 1 History of Tamil Language

Major Indian Language Families-The place of Tamil among Indian languages in general and Dravidian in particular-Enumeration and Distribution of Dravidian languages.

The language of Sangam literature-The language of medieval Tamil: Pallava period only-Historical study of Nouns, Verbs, adjectives, adverbs Tense markers and case markers in Tamil.

Borrowing of words from other languages into Tamil-Regional and social dialects-

difference between literary and spoken Tamil.

Part: 2 **History of Tamil Literature**

Tolkappiyam-Sangam Literature-The division of Akam and puram-The secular characteristics of Sangam Literature-The development of Ethical literature-Silappadikaram and Manimekalai.

Part: 3 Devotional literature (Alvars and Nayanmars) The bridal mysticism in Alwar hymns-Minor literary forms (Tutu, Ula, Parani, Kuravanji)

Social factors for the development of Modern Tamil literature: Novel, Short story and New Poetry-The impact of various political ideologies on modern writings.

Section:B

Part:1 **Recent trends in Tamil Studies**

Approaches to criticism: Social , psychological, historical and moralistic-the use of criticism-the various techniques in literature: Ullurai, Iraicchi, Thonmam (Myth) Otturuvagam (allegory), Angadam (Satire), Meyppadu, Padimam(image), Kuriyeedu (Symbol), Irunmai (ambiguity)-The concept of comparative literature-the principle of comparative literature.

Part: 2 Folk literature in Tamil:Ballads, Songs, proverbs and riddles-Sociological study of Tamil folklore. Uses of translation-Translation of Tamil works into other languages-Development of journalism in Tamil.

Part: 3 **Cultural Heritage of the Tamils**

Concept of Love and War-Concept of Aram-the ethical codes adopted by the ancient Tamils in their warfare-customs, beliefs, rituals, modes of worship in the five Thinais. The cultural changes as revealed in post sangam literature-cultural fusion in the medieval period (Jainism & Buddhism). The development of arts and architecture through the ages (Pallavas, later cholas, and Nayaks). The impact of various political, social, religious and cultural movements on Tamil Society. The role of mass media in the cultural change of contemporary Tamil society.

PAPER-II

Answers must be written in Tamil.

The paper will require first hand reading of the Text prescribed and will be designed to test the critical ability of the candidate.

Section:- A

Part: 1 **Ancient Literature**

- (1) Kuruntokai (1-25 poems)
- (2) Purananurui (182-200 poems)
- (3) Tirukkural Porutpal : Arasiyalum Amaichiyalum (from Iraitatchi to Avaianjamai)

Part : 2 **Epic Literature**

- (1) Silappadikaram: Madhurai Kandam only.

(2) Kambaramayanam: Kumbakarunan Vadhai Padalam

Part 3: Devotional Literature

(1) Tiruvasagam: Neetthal Vinnappam

(2) Tiruppavai: (Full Text)

Section-: B

Modern Literature

Part:1 Poetry

(1) Bharathiar: Kannan Pattu

(2) Bharathidasan: Kudumba Vilakku

(3) Naa. Kamarasan: Karuppu Malarkal

Prose

(1) Mu. Varadharajanar. Aramum Arasiyalum

(2) C N Annadurai: Ye! Thazhntha Tamilagame.

Part : 2 Novel, Short story and Drama

(1) Akilon: Chittirappavai

(2) Jayakanthan: Guruppeedam

(3) Cho: Yarukkum Vetkamillai

Part: 3 Folk Literature

(1) Muthuppattan Kathai Edited by Na. Vanamamalai, (Publication: Madurai Kamaraj University)

(2) Malaiyaruvi, Edited by Ki. Va Jagannathan (Publication: Saraswathi, Mahal, Thanjavur)

**TELUGU
MAIN EXAMINATION
PAPER-I**

Answers must be written in Telugu.

Section-A

Language

1. Place of Telugu among Dravidian languages and its antiquity-Etymological history of Telugu, Tenugu and Andhra.
2. Major linguistic changes in phonological, morphological, grammatical and syntactical levels, from Proto-Dravidian to old Telugu and from old Telugu to Modern Telugu.
3. Evolution of spoken Telugu when compared to classical Telugu-Formal and functional view of Telugu language.
4. Influence of other languages and its impact on Telugu.

5. Modernization of Telugu language.
 - (a) Linguistic and literary movements and their role in modernization of Telugu.
 - (b) Role of media in modernization of Telugu (Newspapers, Radio, TV etc.)
 - (c) Problems of terminology and mechanisms in coining new terms in Telugu in various discourses including scientific and technical.
6. Dialects of Telugu-Regional and social variations and problems of standardization.
7. Syntax-Major divisions of Telugu sentences-simple, complex and compound sentences-Noun and verb predications-Processes of nominization and relativization-Direct and indirect reporting-conversion processes.
8. Translation-Problems of translation, cultural, social and idiomatic-Methods of translation-Approaches to translation-Literary and other kinds of translation-various uses of translation.

Section-B

Literature

1. Literature in Pre-Nannaya Period-Marga and Desi poetry.
2. Nannaya Period-Historical and literary background of Andhra Mahabharata.
3. Saiva poets and their contribution-Dwipada, Sataka, Ragada, Udaharana.
4. Tikkana and his place in Telugu literature.
5. Errana and his literary works-Nachana Somana and his new approach to poetry.
6. Srinatha and Potana-Their works and contribution.
7. Bhakti poets in Telugu literature-Tallapaka Annamayya, Ramadasu, Tyagayya.
8. Evolution of prabandhas-Kavya and prabandha.
9. Southern school of Telugu literature-Raghunatha Nayaka, Chemakura Vankatakavi and women poets-Literary forms like yakshagana, prose and padakavita.
10. Modern Telugu Literature and literary forms-Novel, Short Story, Drama, Playlet and poetic forms.
11. Literary Movements : Reformation, Nationalism, Neo-classicism, Romanticism and Progressive, Revolutionary movements.
12. Digambarakavulu, Feminist and Dalit Literature.
13. Main divisions of folk literature-Performing folk arts.

PAPER-II

Answers must be written in Telugu.

This paper will require first hand reading of the prescribed texts and will be designed to test the candidate's critical ability, which will be in relation to the following approaches.

- i) Aesthetic approach-Rasa, Dhvani, Vakroti and Auchitya-Formal and Structural-Imagery and Symbolism.

- ii) Sociological, Historical, Ideological, Psychological approaches.

Section-A

1. Nannaya-Dushyanta Charitra (Adiparva 4th Canto verses 5-109)
2. Tikkana-Sri Krishna Rayabaramu (Udyoga parva -3rd Canto verses 1-144)
3. Srinatha-Guna Nidhi Katha (Kasi-khandam, 4th Canto, verses 76-133)
4. Pingali Surana-Sugatri Salinulakatha (Kalapurnodayamu 4 Canto verses, 60-142)
5. Molla-Ramayanamu (Balakanda including avatarika)
6. Kasula Purushothama Kavi-Andhra Nayaka Satakamu

Section-B

7. Gurajada Appa Rao-Animutyalu (Short stories)
8. Viswanatha Satyanarayana-Andhra prasasti
9. Devulapalli Krishna Sastry-Krishnapaksham (excluding Urvasi and Pravasam)
10. Sri Sri-Maha prastanam.
11. Jashuva-Gabbilam (Part I)
12. C. Narayana Reddy-Karpuravasanta rayalu.
13. Kanuparti Varalakshamma-Sarada lekhalu (Part I)
14. Atreya-N.G.O.
15. Racha konda Visswanatha Sastry-Alpajaeevi.

URDU

PAPER-I

(Answers must be written in Urdu)

Section-A

Development of Urdu Language

- a) Development of Indo-Aryan
 - (i) Old Indo-Aryan
 - (ii) Middle Indo Aryan
 - (iii) New Indo Aryan
- b) Western Hindi and its dialects Brij Bhasha Khadi Boli, Haryanavi Kannauji, Bundeli-Theories about the origin of Urdu Language
- c) Dakhani Urdu-Origin and development, its significant linguistic features.
- d) Social and Cultural roots of Urdu language- and its distinctive features. Script, Phonology, Morphology, Vocabulary.

Section-B

- a) Genres and their development :
 - (i) Po-etry : Ghazal, Masnavi, Qasida, Marsia, Rubai, Jadid Nazm,
 - (ii) Prose : Novel, Short Story, Dastan, Drama, Inshaiya, Khutoot, Biography.
- b) Significant features of :

- (i) Deccani, Delhi and Lucknow schools
(ii) Sir Syed move-ment, Romantic movement, Progressive movement, Modernism.
- c) Literary Criticism and its development with reference to Hali, Shibli, Kaleemuddin Ahmad, Ehtisham Hussain, Ale-Ahmad Suroor.
- d) Essay writing (covering literary and imaginative topics)

PAPER-II

(Answers must be written in Urdu)

This paper will require first hand reading of the texts prescribed and will be designed to test the candidate's critical ability.

Section-A

- | | |
|-------------------|-----------------------------|
| 1. Mir Amman | Bagho-Babar |
| 2. Ghalib | Intikhab-e-Khutoot-e-Ghalib |
| 3. Mohd. Husain | Nairang-e-Khayal Azad |
| 4. Prem Chand | Godan |
| 5. Rajendra Singh | Apne Dukh Mujhe Bedi Dedo |
| 6. Abul Kalam | Azad Ghubar-e-Khatir |

Section-B

- | | |
|----------------|---|
| 1. Mir | Intikhab-e-Kalam-e-Mir (Ed. Abdul Haq.) |
| 2. Mir Hasan | Sahrul Bayan |
| 3. Ghalib | Diwan-e-Ghalib |
| 4. Iqbal | Bal-e-Jibrail |
| 5. Firaq | Gul-e-Naghma |
| 6. Faiz | Dast-e-Saba |
| 7. Akhtruliman | Bint-e-Lamhat |

FREQUENTLY ASKED QUESTIONS FOR CIVIL SERVICES EXAMINATION

Q. What is the restriction on number of attempts in Civil Services Examinations?

Ans. Number of attempts
Civil Service Examination - General-4, OBC-7, SC/ST- No restriction

Q. Is there any relaxation in number of attempts for physically handicapped?

Ans. Yes, Provided further that a physically handicapped will get as many attempts as are available to other non-physically handicapped candidates of his or her community, subject to the condition that a physically handicapped candidate belonging to the General Category shall be eligible for **seven** attempts. The relaxation will be available to the physically handicapped candidates who are eligible to avail of reservation applicable to such candidates.

Q. Can a candidate who has completed his education from an open school/ University apply for Commissions Examination?

Ans. Yes, provided it is a recognized University and he possess the educational qualifications prescribed for the exam and is otherwise eligible

Q. Whether a candidate belonging to a community included in the OBC list of states but not in the Central list of OBCs is eligible for age relaxation, reservation etc. for Commission's Examinations?

Ans. No. Only candidates belonging to communities which are included in the Central list of OBCs are eligible for such concessions.

Q. Can a candidate choose an optional subject, which he has not studied at graduate/PG level?

Ans. Yes.

Q. If a candidate has applied for the CS (P) Examination but has not appeared at any paper in the CS (P) Examination will it be counted as an attempt?

Ans. No. An attempt is counted only if a candidate has appeared in at least one paper in CS (P) Examination.

Q. Is a candidate who has done his graduation without passing class X and class XII eligible for Civil Service Examination?

Ans. Yes.

Q. Can a candidate write different papers of Civil Service (Main) Examination in different languages?

Ans. No, Candidates have the option to write their answers either in English or in any one of the Eighth schedule languages.

Q. **Can a candidate write the Civil Service (Main) Examination in English and take the interview in Hindi or any other Indian language?**

Ans. If a candidate opts an Eighth schedule language for the CS (Main) Examination he will have the option to take the interview in same language or in English.

Q. **After the written examination, on what criterion is the answer books sent for evaluation? Is it on Roll no. basis or based on centre of examination? That is, will a particular examiner/set of examiners get to evaluate answer books only of a particular center or a particular group of Roll nos.?**

Ans. Mixing of the answer books received from different venues is done before sending them for evaluation. Computer-based randomized fictitious code no. is given to each answer-book before evaluation.

Q. **Are answer books segregated/sorted based on community of the candidate?**

Ans. This is not done at any stage of the evaluation process.

Q. **Is it likely that my evaluated performance suffers because my answer books were evaluated by a strict examiner, while another candidate benefits as his answer books were evaluated by a liberal examiner?**

Ans. The Paper Setter, who is an eminent person in his field, normally acts as the Head Examiner, and wherever the number of candidates in a particular subject is very large, the Commission appoints Additional Examiners for valuation of answer books.

To achieve uniformity in valuation, where more than one Examiner is involved, the Commission arranges a meeting of the Head Examiner with the Additional Examiners after the Examination is over. At this stage, they discuss thoroughly the question paper, the appropriate answers and decide the standard of evaluation.

To further bring about uniformity of assessment inter se the Examiners, the following procedure is undertaken:

The Head Examiner conducts a sample survey of answer books of each Additional Examiner to verify whether the uniform standards of evaluation evolved in the meeting of Examiners have actually been followed. Depending on the standard adopted by the Additional Examiner, the Head Examiner may confirm the awards without any change if the Examiner has correctly followed the standard decided upon, or may carry out upward / downward moderation as

considered necessary to ensure maximum possible degree of uniformity in the evaluation process.

Therefore, the aspect of inter examiner variation in standards of evaluation in a Paper affecting candidates' performance is taken care of adequately.

Q. Can I know the question-wise marks awarded to me for a paper?

Ans. In a competitive examination, what is relevant is not the absolute performance of a candidate, but his/her relative performance that in fact determines whether the candidate qualifies and, if so, his/her position in the merit list. Accordingly, as already explained above, the evaluation process does not end after initial evaluation by an Examiner. Moderation, wherever applied, is on the total award initially given (the so-called raw marks) and not on question-wise basis. Therefore, once the evaluation process is complete, neither raw marks nor question-wise marks subsist. What subsists is the candidates total score in a paper awarded at the end of the evaluation process and this award is normally made available to the candidate in due course on the Commissions website through a query-based application software.

Q. Are there any open Examinations where subject-wise/paper wise marks of each candidate are not made accessible/available to him/her?

Ans. Yes; in the Civil Services (Preliminary) Examination.

This is because the Civil Services (Preliminary) Examination is simply and purely a shortlisting/elimination exercise to select candidates for the Main Examination and as such the scores obtained in this Examination are not communicated to candidates.

Q. Can I know the marks of other candidates who took the Examination from the Commission?

Ans. It is important to remember though a Constitutional Body, the Commissions role is advisory. The Examinations it conducts are for recommending candidates to Government based on clear requisitions received from Government. Therefore, as regards those who have finally qualified in an Examination, the detailed results, application/biodata forms of all such are sent to the concerned Ministry/Department for all further processing. Therefore, once these results are sent to the concerned Ministry/Department, the concerned Ministry/Department becomes the natural and proper custodian of these results and it would only perhaps be proper for queries pertaining to the results of qualified candidates to be addressed to the concerned Ministry/Department.

As regards candidates who do not qualify finally, the right of information of a

citizen has to be balanced against the right of privacy of an unsuccessful candidate who has not qualified for appointment to public service. The feedback received by the Commission shows that there are candidates who do not want their marks to be in the public domain. While a case can be made out for having the marks of those who qualified finally for public appointment in the public domain, no such public interest argument can be invoked for candidates who have not qualified and there is no reason why such candidates' scores should willy-nilly be forced into the public domain.

Q. If the overall marks of two or more candidates are equal, how is relative merit between such candidates decided?

Ans. Tie-breaking principles are applied to decide inter se merit among candidates having the same overall marks. The principles adopted for each Examination are given in attached Annexure.

Q. Wherever evaluation standards are set or moderation is applied, are these different for different mediums (languages) in which a particular subject/paper Examination is written?

Ans. No. The evaluation standards/moderation for a Paper are not medium-specific. In other words, if the Rules of the Exam provide that a Paper can be written in any of ,say, English/Hindi/a recognized Indian language; then the medium in which a candidate writes the Paper will not be a factor in determining evaluation standards or the moderation to be applied.

Q. Is it possible that evaluation/assessment could be affected by the knowledge of a candidate's identity?

Ans. No. Before evaluation, the Roll no. written on every answer book is detached and computer-based randomized fictitious code no. is given. At no stage of the evaluation process (including the moderation stage) is the actual Roll no./ identity of the candidate known to any of the Examiners/officials associated in the process.

General Studies - 2010 (Mains)
Paper-1

Time Allowed : Three Hours

Maximum Marks : 300

Instructions

- Each question is printed both in Hindi and in English.
 - Answers must be written in the medium specified in the Admission Certificate issued to you, which must be stated clearly on the cover of the answer-book in the space provided for the purpose. No marks will be given for the answers written in a medium other than that specified in the Admission Certificate.
 - Candidates should attempt all questions strictly in accordance with the instructions given under each questions.
 - The number of marks carried by each question is indicated at the end of the question.
1. Answer the following (in about 250 words for each answer) 20 x 2 = 40
 - a) Disputes between the riparian states on sharing of river water in post-Independence India are becoming increasingly complex.” Objectively analyse the major disputes in this connection, with special reference to the Southern States.
 - b) Critically examine the differing estimates for (i) poverty figures, and (ii) GDP growth data for April-June, 2010, that have been in the news recently. In your view, what estimates are more reflective of the ground reality, and why?
 2. Answer any two of the following in about 150 words each: 12 x 2 = 24
 - a) “Dalhousie’s predecessors had acted on the general principles of avoiding annexations, if these could be avoided. Dalhousie acted on the principles of annexation, if he could do so legitimately. His annexations were both of war and peace.” Analyse.
 - b) With respect to Cooperative Societies, what are the salient features of the 106th and 111th Constitutional Amendment Bills as at present?
 - c) “Small-holder farms need to be strengthened to achieve national food security.” Do you agree with this assessment? Substantiate.

3. Answer any two of the following in about 150 words each: $12 \times 2 = 24$
- Comment on the spatial components in urban solid waste management in the country.
 - Assess the contributions made by the Indian Council of Agricultural Research (ICAR) in agricultural development.
 - List the significant local storms of the hot-weather season in the country and bring out their socio-economic impact.
4. Answer any two of the following in about 150 words each: $12 \times 2 = 24$
- What are the grounds of disqualification of a Member of Parliament from either House? Quote relevant provisions in your answer.
 - Distinguish between the objectives, structure and functioning of the 'Kendriya Vidyalaya Sangathan' and "Navodaya Vidyalaya Samiti".
 - Bring out the salient features of the evolution and the current status of the 'Bharat Stage' vehicle emission norms in the country.
5. Write brief but precise notes on any six of the following. Your answer should not exceed 50 words in each case. $5 \times 6 = 30$
- Transhumance in India
 - Frontogenesis and Frontolysis
 - Golden Revolution
 - Sea-floor spreading
 - Legislative powers assigned to the Rajya Sabha under Art. 249 and Art. 312 of the Constitution.
 - Causes for dominant dendritic pattern of drainage in the Gangetic plains.
 - 'Bread-of-bulk' towns.
6. Answer any three of the following in about 150 words each: $12 \times 3 = 36$
- While bringing out their salient features, distinguish between either 'Madhubani' Art and 'Manjusha' Art or 'Rajasthani' schools of painting and the 'Pahari' school of painting.
 - Bring out the powers and responsibilities attached to the office of the Speaker of the Lok Sabha.
 - Distinguish between the following four literary awards:
 - Jnanpith Award
 - Sahitya Akademi Award
 - Vyas Samman

- iv) Saraswati Samman
- d) After the September 1st changes, do you think that Unit Linked Insurance Plans (ULIPs) and Mutual Funds (MFs) are on a level playing field? Substantiate your answer from the perspective of an ordinary investor.
7. Answer any five of the following in about 150 words each: 12x5=60
- What do you understand by 'repo rate' and 'reverse repo rate'? What are the implications in raising these rates?
 - "Cost-benefit analysis should not be the sole consideration, while deciding to host events like the Commonwealth Games." Critically comment on this perspective.
 - List any eight 'Ramsar' wetland sites located in India. What is the 'Montreux Record' and what Indian sites are included in this Record?
 - Are the 'Dedicated Freight Corridor' railway project and the 'Golden Quadrilateral' road project mutually complementary or Competitive? Assess.
 - "Upliftment of the neglected sections of society will be best served with many more centres of the Indira Gandhi National Tribal University". Expand on the assertion made.
 - Comment on the salient features of the recent draft Model Real Estate (Regulation of Development) Act of the Ministry of Housing and Urban Poverty Alleviation of the Central Government.
8. Answer each of the following, briefly but precisely. Each answer should be less than 50 words. 5 x 6 = 30
- How is disagreement between the Legislative Council and the Legislative Assembly of a State in passing of an ordinary Bill, resolved?
 - Comment on the recent HFC-23 emissions controversy that includes in its ambit some Indian companies.
 - Comment on the recommendations of the Wadhwa Commission on the Public Distribution System.
 - What are the salient features of the National Oil Spill Disaster Contingency Plan?
 - You arrive first at the scene where a bus accident has just occurred. What emergency measures should you immediately and safely adopt?
 - Bring out the sectoral and state-wise distribution patterns of Foreign Direct Investment (FDI) inflows into the country.

9. Write brief notes on each of the following, in about 20 words each: $2 \times 8 = 16$
- Contributions of Latika Ghosh to the freedom struggle
 - Bhai Maharaj Singh as a freedom fighter
 - Chandrayaan-II
 - Agni-V
 - Babli Project
 - 'Swavalamban' Scheme
 - National Investment Fund
 - 'Aerostat' balloon
10. Who are the following and why have they been in the news recently? (Each answer should not exceed 20 words) $2 \times 8 = 16$
- Divya Ajjithkumar
 - N. C. Saxena
 - Islam A. Siddiqui
 - Swarnalatha Cherukutty
 - Nitin Nohria
 - Deepak Mondal
 - Gaurav Singh Saini
 - Upendra Liimaye

General Studies - 2010 (Mains)

Paper-2

Time Allowed : Three Hours

Maximum Marks : 300

Instructions

- Each question is printed both in Hindi and in English.
- Answers must be written in the medium specified in the Admission Certificate issued to you, which must be stated clearly on the cover of the answer-book in the space provided for the purpose. No marks will be given for the answers written in a medium other than that specified in the Admission Certificate.
- Candidates should attempt all questions strictly in accordance with the instructions given under each questions.
- The number of marks carried by each question is indicated at the end of the question.

1. Answer the following in not more than 250 words each: 20x2=40
 - a) Critically examine the implications of the disintegration of the Soviet Union on India's security and strategic perspectives. What further responses would you suggest in India's foreign policy to accommodate these implications.
 - b) Evaluate India's approach towards meeting the country's growing energy demands. Compare the success of this approach with that of another Asian giant which has perhaps the fastest growing energy demand.
2. Answer any four of the following in not more than 150 words each: 12x4=48
 - a) How far have Japan's principles of Hikaku San Gensoku impacted bilateral ties with India?
 - b) Assess the contributions of Indian diaspora in the Caribbean.
 - c) Do you agree with the view that Israel is a natural ally of India?
 - d) Bring out the FDI and employment implications of China being a manufacturing hub and India a services hub.
 - e) Have the Uruguay Round negotiations and the resultant Trade Related Intellectual Property Rights (TRIPS) agreement helped in resolving trade conflicts arising out of variations in different nations IPR regimes? Also list the steps taken by India to conform to TRIPS.
 - f) Examine the recent developments towards the solution of the Bangladesh-Myanmar maritime boundary dispute. What implications do these have for India?
3. Answer any eight of the following in not more than 50 words each: 5x8=40
 - a) Compare and contrast the role of the IMF with that of the World Bank.
 - b) What are the major capacity-building and reconstruction projects being undertaken by India in Aghanistan?
 - c) Bring out the significance of GDI and GEM as components of the UN's Human Development Report (HDR). Comment on India's relative rankings with regard to HDI and GDI.
 - d) What is 'Round Tripping' in the context of FDI inflow, and why has it been in the news recently in the case of India?
 - e) Comment on the reason for the recent hike in visa processing fees for certain categories of US visas. What is the likely impact of this hike on India?
 - f) In the context of the United Nations Framework Convention on Climate Change (UNFCCC), distinguish between 'Annex I' and 'Annex II' countries.
 - g) Highlight the role of the Indian peacekeeping contingent as part of MONUSCO.

- h) List the salient features of the Riyadh declaration and the bilateral agreements between India and Saudi Arabia signed earlier this year.
- i) Comment on the reasons for the recent economic crisis in the so-called 'PIGS' countries of Europe.
4. Answer any two of the following in not more than 150 words each: $12 \times 2 = 24$
- a) Examine the opportunities for a lasting West Asia peace solution in the context of the 'historic' talks started in September 2010.
- b) Has the February agreement between the Sudanese government and the Justice and Equality Movement (JEM) been more successful in ending the strife in Darfur than the Abuja peace agreement of 2006? Evaluate.
- c) Comment on the present status of the Biological Weapons Convention (BWC). What important issues, do you think, need to be taken up at the seventh review conference of the BWC scheduled for 2011?
5. Answer any four of the following in not more than 150 words each: $12 \times 4 = 48$
- a) Bring out the applications of computer models in studying climate changes, with special reference to the community earth system model (CESM).
- b) What is phytoremediation? Discuss its applications.
- c) Explain and differentiate among 'Plasma', 'LCD' and 'LED' television technologies.
- d) What is cloud computing? Bring out its essential features and list its advantages and limitations.
- e) Discuss the applications of nanotechnology in the health care sector.
6. Comment on any three of the following in not more than 50 words each: $5 \times 3 = 15$
- a) Rotterdam Convention
- b) The Mavi Marmara incident
- c) Significance of the Kampala declaration of the International Criminal Court (ICC)
- d) Trial chamber of the Extraordinary Chambers in the Courts of Cambodia (ECCC) and its recent verdict.
7. Comment on any six of the following in not more than 50 words each: $5 \times 6 = 30$
- a) MRSA infection
- b) HRP-2M Choromet
- c) Maglev vehicles
- d) Super absorbent polymers (SAP)

- e) Ginkgo biloba
 - f) CARTOSAT-2B
 - g) Various generations of mobile phone technology
8. Who/what are the following and why have they been in the news recently?
(Your answers should be in a sentence or two only): 3x8=24
- a) Craig Venter
 - b) Shahrar Amiri
 - c) Wolfram Alpha
 - d) 'Dreamliner' aircraft
 - e) Blue gene project
 - f) Predator drones
 - g) Deepwater Horizon incident
 - h) ACTN 3 gene
9. a) The distribution of rent of 150 residential houses surveyed in a locality is as follows:

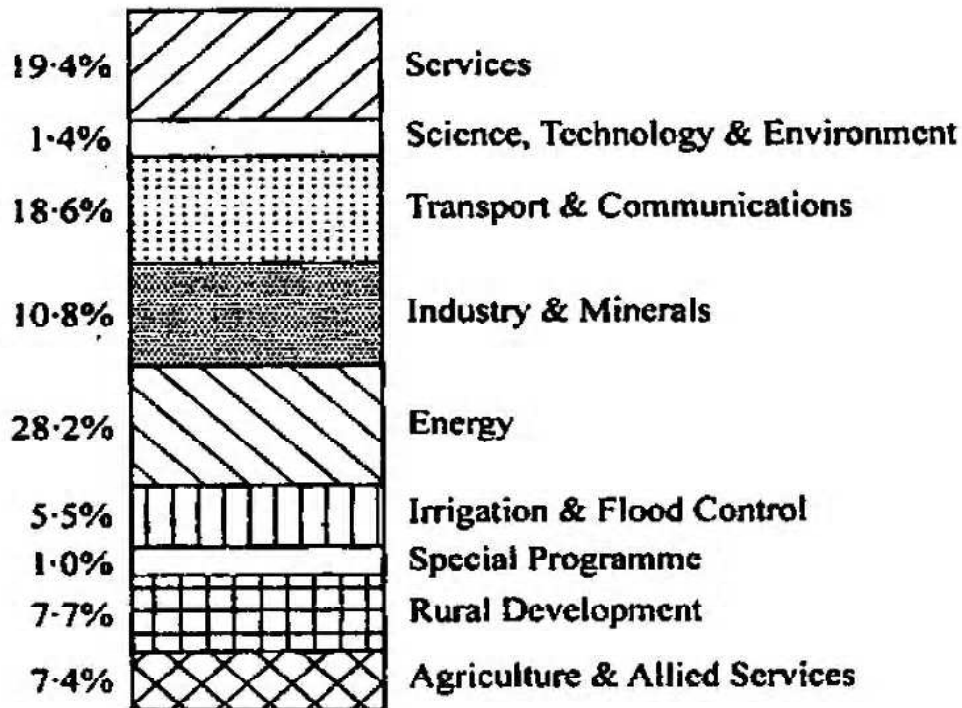
Rent in Rs.	Number of Houses
101-150	10
151-200	18
201-250	27
251-300	35
301-350	30
351-400	16
401-450	8
451-500	6

- Find
- i) The percentage of houses having rent higher than Rs. 300.
 - ii) The percentage of houses having rent more than Rs. 250 but less than Rs. 401. 5
- b) Work out the trend values by any suitable method from the following data showing the number of murders (in thousand) in a country for the years 1985-1995. 5

Year	1985	1986	1987	1988	1989	1990
Murders	19.0	20.6	20.1	20.7	21.5	24.7

Year	1991	1992	1993	1994	1995
Murders	24.7	23.8	24.5	23.3	21.6

- c) The data on the total investment on different heads under the eighth five year plan are shown below:



If the total proposed outlay on different heads is Rs. 4,34,100 crores at 1991-92 prices, obtain separately the proposed outlay on each of the heads and make an overall comment. 4

- d) Represent the following data through a suitable diagram: 3

Region	A	B	C	D
Married Criminals	95	80	63	32
Unmarried Criminals	72	25	41	26

10. a) Data on flight arrivals from several cities for two airlines are shown below for the last six months. 5

Table: Citywise “ontime and delayed flights” for airlines A and B

	Airline A		Airline B	
	Ontime	Delayed	Ontime	Delayed
City I	497	62	694	117
City II	221	12	4840	415
City III	212	20	383	65
City IV	503	102	320	129
City V	1841	305	201	61

It is known that City II was mostly sunny and City V was mostly foggy during the six month period of data collection. Compare the performance of the two airlines A and B over the cities in terms of percentage of delayed flights. What is your conclusion when the data on all the cities are combined?

- b) The arithmetic mean of two observations is 127.5 and their geometric mean is 60. Find (i) the two observations and (ii) their harmonic mean.
- c) The following table shows the number of bushels of wheat and corn produced in a farm during the years 1950-1960.

Express the yearly number of bushels of wheat and corn as percentages of total annual production. Graph the percentages by suitable bar charts and comment. 4

Year	No. of bushels of Wheat	No. of bushels of corn
1950	200	75
1951	185	90
1952	225	100
1953	250	85
1954	240	80
1955	195	100
1956	210	110
1957	225	105
1958	250	95
1959	230	110
1960	235	100

- d) Following are the maximum daily temperature ($^{\circ}\text{C}$) recorded in a week in a particular city:

38, 40, 36, 35, 30, 32, 34

During that week the average maximum daily temperature in another city was 92°F . Determine which city on the average, has higher maximum daily temperature during that week. 2

Essay

(Compulsory)

(Mains) - 2010

Time Allowed : Three Hours Hours

Maximum Marks : 200

INSTRUCTIONS

- The essay must be written in the medium specified in the Admission Certificate issued to you. The name of the medium must be stated clearly on the cover of the answer-book in the space provided for the purpose. No credit will be given to the essay written in a medium other than that specified in the Admission Certificate.
- (Examiners will pay special attention to the candidate's grasp of his material, its relevance to the subject chosen, and to his ability to think constructively and to present his ideas concisely, logically and effectively.)

Write an essay on any one of the following topics : 200

1. Geography may remain the same; history need not.
2. Should a moratorium be imposed on all fresh mining in tribal areas of the country?
3. Preparedness of our society for India's global leadership role.
4. From traditional Indian philanthropy to the Gates-Buffett model—a natural progression or a paradigm shift?

English (Compulsory)
(Mains) - 2010

Time allowed : Three hours

Maximum Marks : 300

INSTRUCTIONS

Candidates should attempt ALL questions.

The number of marks carried by each question is indicated at the end of the question.

Answers must be written in ENGLISH.

1. Write an essay in about 300 words on any one of the following: 100
 - a) Increasing consumerism in the middle class in India.
 - b) Are traditional forms of protest no longer effective?
 - c) The Nuclear Civil Liability Bill.
 - d) To feed our increasing population, forest areas need to be cleared to increase land area available for cultivation. Do you agree?
 - e) Need to check politicisation of Sports bodies in India.
2. Read the following passage carefully and based on it, answer the questions given below it in clear, correct and concise language: 5 x 15 = 75

According to the findings of a recent government survey there are an estimated 3.3 million registered NGOs working in the country one for every 400 Indians. Not only has the number of NGOs in India risen dramatically but so has their influence. In some of India's flagship development efforts—the National Rural Employment Guarantee Act, the National Rural Health Mission, the Right to Education or even the draft Right to Food Act—NGOs have been at the forefront both in formulating these laws and policies and in implementing them. NGOs have helped voice the concerns of some of India's most vulnerable groups and focus the attention of the government on critical, social and development issues. They have also spearheaded efforts to expose corruption and mal-administration in government bringing in much needed transparency.

But despite the growing influence of NGOs in India today, we know very little about them their structure, activities, sources of funding and, more importantly, how accountable they are to the people they represent. This is alarming given the crores of rupees in development aid that NGOs receive from the government and from donors every year. Ironically, though NGOs have been watchdogs of the government for many years, there has been little regulation or monitoring of

their own activities. Leading many to ask a very fundamental question who watches the watches?

Interestingly, although India has probably the world's highest NGO population, the debate on NGO accountability is still in its nascent stages. Across the world, NGOs have been experimenting with different ways of addressing the issue of accountability; Indian NGOs would do well by learning from these efforts. For example, NGOs in Kenya are legally required to comply with the Code of Conduct for NGOs developed by the National Council of NGOs, a self-regulatory body set up under the NGO Coordination Act in 1990. The code ensures that NGOs comply with basic ethical and governance standards. Similarly, in Uganda, the NGO Quality Assurance Mechanism (QuAM) certifies NGOs against a set of quality standards designed to ensure NGO credibility. In Chile, Chile Transparente has developed transparency standards for NGOs which required organisations to publish online information about their mission, vision, activities, staff, details of funding, etc.

1. What are India's important development schemes?
 2. How do NGOs help 'Vulnerable groups' in India?
 3. What do we know about the structure, activities and sources of funding of the NGOs in India?
 4. Whom does the author describe as watchers? Why?
 5. How do the NGOs in other nations deal with the issue of accountability?
3. Make a precis of the following passage in about 210-230 words. Failure to write within the stipulated word limit may result in deduction of marks. The precis must be written on the separate precis sheets _____

In many respects "Sakuntala" is comparable to the more idyllic comedies of Shakespeare and Kanva's hermitage is surely not far from the Forest of Arden. The plot of the play, like many of Shakespeare's plots, depends much on happy chances and on the super-natural, which, of course, was quite acceptable to the audience for which Kalidasa wrote. Its characters, even to the minor ones, are happily delineated individuals. Kalidasa makes no pretence to realism, but his dialogue is fresh and vigorous. In fact the dialogue of the better Sanskrit plays generally seems based on vernacular, and is full of idiomatic expressions. Indian playgoers did not demand the conflict of feelings and emotions which is the chief substance of serious European drama, but Kalidasa was quite capable of portraying such conflict effectively. His beauties and merits are tarnished by any translation, but few who can read him in the original would doubt that, both as poet and dramatist, he was one of the great men of the world.

There were many other dramatists. Sudraka, probably Kalidasa's approximate

contemporary, has left only one play. The Little Clay _____ (_____). This is the most realistic of Indian dramas, unravelling a complicated story, rich in humour and pathos and crowded with action of the love of a poor brahman, Carudatta for the virtuous courtesan Vasantasena; this story is interwoven with one of political intrigue, leading upto the overthrow of the wicked king Palaka, and the play contains a vivid trial scene, after which the hero is saved from execution at the last moment. It is notable for its realistic depiction of city life, and for its host of minor characters, all of whom are drawn with skill and individuality. It has more than once been performed in translation on the European stage, and, to a Western audience, is certainly the most easily appreciated of Indian plays.

Visakhadatta (?6th century) was the dramatist of politics. His only complete surviving play. The Minister's Signet Ring (Mudraraksasa), deals with the schemes of the wily Canakya to foil the plots of Raksasa, the minister of the last of the Nandas, and to place Candragupta Maurya firmly on the throne. The plot is exceedingly complicated, but is worked out with great skill, and the play is beautifully constructed to lead up, like "The Little Clay Cart", to a pathetic scene where one of the chief characters is saved from death by impalement at the last moment.

Second only to Kalidasa in the esteem of the critics was Bhavabbati, who lived at Kanyakubja in the early 8th century. Three of his plays survive—Malati and Madhava, "The Later Deeds of Rama" (Uttararamacarita). The first is a love story with a pseudo-realistic background, full of incident of an exciting or horrific type, in which the heroine is more than once rescued from death, while the two latter plays tell the story of Rama. By Western standards as a dramatist Bhavabhuti falls short of those we have mentioned earlier. His plots are weakly constructed and his characters lack individuality. His greatness rests on his deep understanding of sorrow; in his treatment of the pathetic and the terrible he perhaps excels Kalidasa.

4. a) Rewrite the following sentences after making necessary corrections, if any—
- i) I lie half of a mile from here.
 - ii) Do you like music? "I like".
 - iii) Do you like some more coffee?
 - iv) He worked like a waiter for two years.
 - v) Like what does she look?
 - vi) I know him since 1960.

- vii) I wasn't used to drive a big car.
 - viii) He suggested me to try the main car park.
 - ix) I have never met so nice person.
 - x) Too many Mathematics is usually taught in schools.
- b) Rewrite following sentences inserting suitable article(s), wherever necessary: 5
- i) My grandfather had had hard life.
 - ii) She hit him in stomach.
 - iii) Queen had dinner with President.
 - iv) My friend is in hospital.
- c) Rewrite the following sentences inserting suitable prepositions in the blank spaces: 5
- i) I am angry _____ her _____ lying.
 - ii) I was red _____ anger at his remarks.
 - iii) Could you explain this rule _____ me please?
 - iv) People have always been kind _____ men.
- d) Give the antonyms of the following adjectives: 5
- i) common
 - ii) loyal
 - iii) formal
 - iv) mature
 - v) sensitive
5. Answer as directed:
- a) Rewrite the following sentences using the passive structure: 5
- i) She gave her sister the car.
 - ii) I had already shown the suspect's photograph to the policewoman.
 - iii) They believe him to be dangerous.
 - iv) They made him tell them everything.
 - v) They elected me President.
- b) Change the following sentences into indirect speech: 5
- i) He wrote in his letter, "I saw Poonam at the theatre a couple of days ago."
 - ii) The forecast says, "It will rain tomorrow."

- iii) He said to me, "It would be nice if I could see you again."
 - iv) I said, "If I had any money I'd buy you a drink."
 - v) The teacher said, "Why don't you work harder?"
- c) Rewrite the following sentences, changing them into simple ones: 5
- i) I wonder who I should invite.
 - ii) Show him what he should do.
 - iii) She couldn't decide whether she should answer his letter.
 - iv) He didn't know where he should park his car.
 - v) Tell me when I should pay.
- d) Add a tag question at the end of each of the following sentences: 5
- i) Pooja can speak French.
 - ii) The meeting is at ten.
 - iii) You didn't speak to Mohan.
 - iv) She wouldn't like a pet.
 - v) Harish gave you a cheque.
- e) Rewrite the following sentences using 'it' in the beginning as a preparatory subject: 5
- i) To make mistakes is easy.
 - ii) To wait for people who were late made him angry.
 - iii) My ambition was to retire at thirty.
 - iv) Your task is to get across the river without being seen.
 - v) For you to ask Ramesh would be a big mistake.

**Indian Language
Hindi
(Compulsory) — 2010**

Time allowed : Three hours

Maximum Marks : 300

Instructions

Candidates should attempt ALL questions.

The number of marks carried by each question is indicated at the end of the question.

Answers must be written in Hindi (Devanagari Script) unless otherwise directed.

In the case of Question No. 3, marks will be deducted if the precis is much longer or shorter than the prescribed length.

- 1- fuFufyflk fo'k ea l s fdl h , d fo'k ij yxHk 300 'kila ea
fucak fyflk % 100
- i) Dk dkaw ^ekj {k gRk ä jkl l drk gS
- ii) [k feyloV dk [k jkA
- iii) vUfo'ok cule rd.kjdrkA
- iv) fkk vS l lekt d i f j or ZA
- v) Dkl puk dk v f d j v f ku; e loFN vS Uki vZi Zk u l fuf pr
dj l drk gS
- 2- fuFufyflk xl lak dls l lo/kuh l s i f <+ r Hk xl lak ds vU ea i Ns
x; si'zula ds Li 'V l gh vS
l ghr Hkk ea nu j nht , %6 x 10 = 60
l S At Z t k l eph At Zuohj.k dk fgl k gS i jkus bZula ij
gejh fuHrk de djusdk, de j l r k gS i jkus bZu dN le;
ds mijla T,kk egas vS fojy gus t k jgs gS l S At Zdk
m; k gejisiiFoh xg dsi; k j .h l aqy vS t jh xh gch
iHo dls de djusdh, de d qh gS l S At Zds mi; kh xola
dsclot n vH rd u rls bdk Qid iSkusij brsky fd; ktk
jgk gS vS u i jkus bZu o fodY ds : i ea b s loh fr fey
jgh gS ; g bl fy, Hh fd bl dh iSkdh viSk r T,kk egah

gSfQ Hh bl dh i Sldh ea; qkjdjh l dji fd, tkjgs gSt ls
 bl dh dler la eadeh yk jgs gS vls fuf pr :i ea lge uxf r ls
 gh l gh bl s, d Qogk Zfod Y cuk jgs gS l jdk }jik i ofr Z
 tolgj yky ug: l S Åt kZfe'ku bl fi'k ea, d /kj. l r Hk
 Åt kZds loN l k dh i H r dk vki kZch dne gS
 l S Åt kZ{ls jk xkj l fr djus dh fi'k ea vkk t xk k gS; g
 {ls 'kk vls i Sldh uopkj ea Hjh fuosk djrk gS r Hk jk xkj
 dh fi'k ea n p o fo' kH r in l fr djrk gS
 ; l fi fol q n Rku ea Hjr fo'o ea Ns lku ij gS r Hfi Hjr
 ea v Hh Hh xgjk fol q l dV gS l S Åt kZgh fol q l dV Rk
 l drh gS; g l avZi kji ffr dh ræ dk xBu djxk vls Åt kZds
 n Rku ds {ls ea ea dh c Hjh djxk v k v Rf/d ea olys
 l S in l S Åt kZ; æ lku uk vls v Hk k dh ifj: i fo/k ds
 {ls ea gS bl m k ds fodk ds fy, t: jh gS fd u; s d l S y dh
 of/4 }jik n Rku dh dler la eadeh dj o Qk jk Hj dler la ds
 l agu l s dler la eadeh yk Zt k A

- i) gea i qus bZu ij viuh fuH r k de D la djuh pfg, \
- ii) l S Åt kZds mi; k ds D k y H gS
- iii) l S Åt kZdk i izk Hh rd yk f i z D la ugha cuk k x; k
- iv) l S Åt kZds l k kJ t u k dh i g p ds {ls ea ykus ds fy, D l k k
 fd; k t k j g k gS
- v) ge l s; qv l s ds fy, n p f d l e ds in l S Åt kZ{ls d S s mi y Ck
 dj k l dr k gS
- vi) l S Åt kZfdl r j g de e g a h dh t k l dr h gS

3- fu f y f i k x l k k d k l a l s . k e y x l k k dh ' k d a ; k dh , d & r g b Z
 ea i r q d j s A ' k k Z l q k u k v f u o k Z u g a g s ' k d & l e k ds v u x z
 l a l s . k u d j u s i j v d d k V f y , t k a A l a l s . k v y x l s f u / k k r
 d k t l a i j g h f y [l a o n g a v N h r j g l s n u j & d r d k ds l H k
 c k k y %

;fn dyk dls gj fo'kk ; q dls vffHOD djuk gSrks fuf'pr gh
 m's chrs ; q dls l leku dls rkk gkk vls i qh dYuk ladh
 l leku o ekuf d <ps dls> Vduk gkkA t hou , d lrr iolg
 gAm dh xfr Qfr ; ladhif , kdsnlSu Rofr gshgSt c ifjorZ
 rhoz vls vleyw gss gA , bs nls ea l lekt d t : jra vxxleh
 l lfr d iofk ladsfy, nco cukhgS&, d rjg lsi qh t Ma
 dls <yk djrh gZt k i qh k i vls u ; st Us olys ds chp , d
 }a lfr djrh gA i phu l lfr ds leHkZ ifjorZ l s Ml dj
 t k rkk k l s ; HkHk cuk j [kus dk ; Ru djrs gS os Lo ; a
 dls us d e v l vls l Hrk dkl j d k k dj Myrs gSr Hk u
 v kus olys gj iolg dls Vyr sjrs gA b si f jorZ ds leHkZ uga
 plr sosi qh seku d vls fu ; eadh voK djrs gA l lekt d ifjorZ
 dh gj v l fr , d l lfr d iki dh eka djrh gSt ksviuh
 t : jrl dls Lo ; a OD djrh gSt Ss fd i qh fl s foxr ; q us
 jpk Hk vc ubZ kD vls ubZ rdul dk mi ; k uga dj ikh
 o viuh olr k k ea u ; s v k l kZ dls i fr ffr uga dj l dr hA
 bl l nHZe a i qh l lfr ; l ds leHkZ vl lfr d vls ; g lard
 fd ccZr k vZr j d l dls viuk s gS ft udh , d le ; nglas Lo ; a
 m k vls HRZ k dh HkA t c dls Z kD ixfr'ky uga jg ikh
 og neuudjh cu t k h gA uu ; k lekt gh l lfr vls foK ku dh
 gj ' k k ea dyk l dls l eps fodk ds fy, vol j i nku dj
 l drk gA
 vkt v Ooffr l ekt ds dlj . k t hou dk l aykk W pdk gS
 ft l ea gj ' k k dh xfr fo/k , d nly s l s vyxk xbZ gS nk kZ d
 o k k ud l s vyxk x ; k gS dyk l j ba hu ; j l s r Hk , d o l c
 v foHD t hou ds egu l o l eku l aky l s vyxk x ; s gA st c fd
 gj , d l a qu l lfr ; Z vls i vZ k ds j k l d l s t k s o lyk dlj d
 gA m l e j . k ds fy, vc ; k d ; a Hh : <+ x f . k h j k l l e a

fo'lk; gok vls /la dst Mvls vlozhu tud ugha ekust ks
 nuga lakt; i ls ulps dh /lrrh vls Aj ds eglols t bk gh
 Loldj fd; kt k k g\$ t s i lpu i jk k k l a ea u s q vls t l o r k
 ds xfreku o uk d Ri v Z o k Loldj fd, t k s g A ; a v k euq
 v a l s ds fo l r k j cu x; s g A os cr k s g S fd euq us ful x Z i j
 viuk op Z o I H k r fd; k g \$; g r R o l a i j m ds fot ;] v f H k u
 dh x H k g A ; g y M Z euq ft ruh gh i j k u h g A ; g l a k Z i f j i v Z
 l H ; Z y ;] l a h r v l s j a l s H k i j k g A
 vxj euq us viuh det l s h l s ; a l s d l s l o ; a i j i H R o dh v u e f r
 nh g S r l s ; g ; a d k n k k u g h a g S f t l s euq us l o ; a l t k g S m h
 ds } j k c u k k x ; k g S v l s u ' V f d ; k t k k g S i j f u a k dh ; g H k
 l o ; a e u q d l s H h x z y a j f v l s d o y euq ds Q Q M d k / o f u f o l r k j d
 g \$ V y l Q s m ds d k u d k A g o l b Z t g k i j R l s h p < l a k v l s
 [M M h x l e h k c y X M d k v u a e u d f o R U k H h u g h a g S ; g
 d o y n f d ; k u h l E n f ; d r k g A g y H h , d ; a k u d j h v k o ' d l j
 t S k f d v k V S j g A u ; s m i d j . l a d l s x < u s d h euq dh v { k
 i f H k dh m i s k d j u k l e k t d i f j o r Z l a d s f u ; e l a dh m i s k d j u k
 g \$ v l s d l s Z H h l P k d y k d j , s h m i s k dh l e f ; Z u g h a t o k
 l d r k A ^ , d d y k d j t S o d i z l s u t S k n R k u d j r k g \$, s h
 e k j r k g S i z ; k e S D d l o k h d y k d j f j o s k f M k l s dh f d t S s
 , d i M Q w v l s Q y i s k d j r k g S v l s c j l H j ds [l s s i = l a
 v l f n d k f o y l i u g h a d j r k t k a r s g q f d u ; s e l s e e a o g f Q j
 Q w k v l s Q y n x k A d y k d l s f l Q Z D k g S d l s f p f r u g h a d j u k
 g S v f i r q D k g k k u f d v l s r f e y l o v h v l d l a k v l a d l s u f l Q Z
 g r k k d j u s o k y h i j k ; l a d l s c f Y l : i k u f j r d j u s o k y h l H k o u k l a
 d l s v f H Q D d j u k g A

4- fu f u y f f k v a z h x l l a k d k f g u h e a v u o k n d h f , % 20

The world does not need extraordinarily talented people. It does not need highly skilled people either. It has plenty of super intelligent

people. We need ordinary people with extraordinary motivation. M. K. Gandhi was an ordinary man with amazing motivation to establish truth and justice. The Wright brothers were ordinary people with a dream of flying.

You can also achieve exceptional results if you are inspired with a higher ideal. Replacing inspiration with information has led to knowledge being viewed as drudgery rather than as pleasure. Education has degenerated to data being transmitted from teacher to the taught without igniting the minds of the young with a higher purpose.

How many of us wake up inspired, looking forward to a day of service? Who among us finds exhilaration in contributing to society? Life changes magically from boredom to excitement when you are inspired to serve. You redefine norms and achieve the impossible, paving the way to outstanding success. You find happiness at work, not in escaping from it. Most importantly, you evolve spiritually and attain Godhood.

Inspiration gives ordinary people the courage and hope to make life better for themselves and for the posterity. Find inspiration and life will transform into an exciting adventure of self-discovery.

- 5- ~~ful~~ ~~ufy~~ ~~f~~ ~~k~~ ~~fg~~ ~~uh~~ ~~xl~~ ~~lak~~ ~~dk~~ ~~v~~ ~~ax~~ ~~h~~ ~~ea~~ ~~vu~~ ~~qn~~ ~~dh~~ ~~f~~ ~~,~~ ~~%~~
vt foKlu ds l left d nf, Rla ds cjs ea clyr s gg eSmu ph la
ds cjs ea Hh ch y ak t ls ; qk y k la ds fy, vi s k r vt ku gS
fd U qc < h nez ds y k la ds l e > us ea d f Bu A ; g bl fy, fd ; qk
y k , d x q k l s l E U g S t k l l e k ; i e a d N c j l a c h n f l h y
i M t k k g S og g S d Y u k l y r k dk x q A d Y u k l y r k , k k x q k g S
t k foKlu dk vi f j g k Z v a g S v l S u S f x Z : i l s ; q k l a ds i n U k
g S n f a n c k ; gh g S f d c < h nez ds l l k ; g x q k l k t k k g S
f Q H h ; g x q k g S f l dh vt ds g e l s l a l j d l s i p j e k k ea

t : jr gA

fiNyh rhu l fr; la l s foKlu dh [ks la us l ek ij viuk i Ho
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fo' o dks m us d Ssi Hk for fd; k ngus bl dh ij olg Hh ugha dhA
UWu dsle; l seuq dks ck gq k fd i Sks dh l st ks fd foKlu
dh [ks la ij v kkr gS i p q v k le v S y Hk fy, t k l drs gA
rc yk la us t kauk v k Hk fd; k fd foKlu ds l axZl s cuh v S /
k la l s yak t hou ft ; k t k l drk gA

fy; k k Z n foah dsle; l s yk la us l j g u k dh fd foKlu ; 6/4
ea fot ; i kus dk Hk d l g; k h cu l drk gA t S s S s c j l ch r s
, d i Sks d Hk d o n fod fr g q k u; s i Sks d Klu dh e k
r s l s r r j g q Z T; k k l s T; k k y k o k l u d v S r d u l h fo' k k
cuus y x A

d) fu f y f [k e g o j l a v S y l s l d ; l a e a l s f d g h a i l p d k v H Z l i " V
d j r s g q m d k o k D l a e a i z k d h f , 5 x 4 = 20

- i) n k / l y k
- ii) v l e d s v l e x b y ; l a d s n l e
- iii) x l y c t k u k
- iv) f l j e a f s g h v l y s i M
- v) g H k d a u d l s v k l h D k
- vi) u l p u t l a s v l a u V e k
- vii) A p h n d l a Q u d s i d o k
- viii) n k d k n k i k u h d k i k u h
- ix) x j l e d h t k s l c d h H H h

[k] fu f y f [k o k D l a e a l s f d g h a i l p d s ' l q ; i f y f [k % 5 x 2 = 10

- i) e l a u s i e d l s y l s u s d k v k l f n ; k A
- ii) ; g l h l f r o H k d k e l e y k g A
- iii) H j r e a u s l d r k dh deh l s l e L ; k a c < + j g h g A

- iv) ~~lM nqZukls~~ ~~ea~~ ~~cgq~~ ~~yls~~ ~~ejrs~~ ~~gA~~
- v) ~~v~~ ~~[k]~~ ~~l~~ ~~a~~ ~~e~~ ~~a~~ ~~c~~ ~~r~~ ~~j~~ ~~g~~ ~~dh~~ ~~[k]~~ ~~a~~ ~~N~~ ~~r~~ ~~k~~ ~~g~~ ~~A~~
- vi) ~~W~~ ~~A~~ ~~c~~ ~~S~~ ~~l~~ ~~s~~ ~~r~~ ~~t~~ ~~n~~ ~~S~~ ~~h~~ ~~g~~ ~~A~~
- vii) ~~l~~ ~~j~~ ~~t~~ ~~if~~ ~~pe~~ ~~ea~~ ~~fud~~ ~~yr~~ ~~k~~ ~~g~~ ~~S~~ ~~v~~ ~~l~~ ~~S~~ ~~i~~ ~~je~~ ~~ea~~ ~~M~~ ~~r~~ ~~k~~ ~~g~~ ~~A~~
- viii) ~~o~~ ~~h~~ ~~r~~ ~~k~~ ~~eu~~ ~~q~~ ~~dh~~ ~~x~~ ~~q~~ ~~g~~ ~~A~~
- ix) ~~vt~~ ~~q~~ ~~v~~ ~~b~~ ~~Z~~ ~~n~~ ~~S~~ ~~h~~ ~~x~~ ~~k~~ ~~A~~
- x) ~~>~~ ~~d~~ ~~d~~ ~~j~~ ~~i~~ ~~z~~ ~~k~~ ~~e~~ ~~d~~ ~~j~~ ~~k~~ ~~A~~
- x) ~~fu~~ ~~F~~ ~~y~~ ~~f~~ ~~[k~~ ~~;~~ ~~h~~ ~~e~~ ~~a~~ ~~l~~ ~~s~~ ~~fd~~ ~~g~~ ~~h~~ ~~a~~ ~~i~~ ~~p~~ ~~dk~~ ~~o~~ ~~D~~ ~~l~~ ~~e~~ ~~a~~ ~~b~~ ~~r~~ ~~j~~ ~~g~~ ~~i~~ ~~z~~ ~~D~~
- ~~dh~~ ~~,~~ ~~fd~~ ~~m~~ ~~u~~ ~~d~~ ~~k~~ ~~v~~ ~~H~~ ~~Z~~ ~~i~~ ~~"~~ ~~V~~ ~~g~~ ~~s~~ ~~t~~ ~~k~~ ~~v~~ ~~S~~ ~~m~~ ~~u~~ ~~d~~ ~~s~~ ~~ch~~ ~~dk~~ ~~n~~ ~~q~~ ~~H~~
- ~~l~~ ~~e~~ ~~>~~ ~~e~~ ~~a~~ ~~v~~ ~~k~~ ~~t~~ ~~k~~ ~~%~~ ~~5~~ ~~x~~ ~~2~~ ~~=~~ ~~10~~
- i) ~~de~~ ~~Z~~ ~~&~~ ~~O~~ ~~e~~
- ii) ~~f~~ ~~k~~ ~~k~~ ~~k~~ ~~&~~ ~~i~~ ~~f~~ ~~k~~ ~~k~~ ~~k~~
- iii) ~~l~~ ~~h~~ ~~k~~ ~~&~~ ~~l~~ ~~h~~ ~~k~~ ~~j~~
- iv) ~~i~~ ~~z~~ ~~k~~ ~~h~~ ~~&~~ ~~i~~ ~~z~~ ~~k~~ ~~h~~
- v) ~~v~~ ~~j~~ ~~k~~ ~~l~~ ~~u~~ ~~&~~ ~~v~~ ~~j~~ ~~k~~ ~~l~~ ~~d~~
- vi) ~~f~~ ~~u~~ ~~x~~ ~~Z~~ ~~&~~ ~~f~~ ~~u~~ ~~x~~ ~~e~~
- vii) ~~d~~ ~~l~~ ~~e~~ ~~y~~ ~~&~~ ~~d~~ ~~l~~ ~~s~~ ~~y~~
- viii) ~~n~~ ~~y~~ ~~H~~ ~~&~~ ~~n~~ ~~q~~ ~~Z~~
- ix) ~~n~~ ~~R~~ ~~V~~ ~~&~~ ~~m~~ ~~H~~ ~~V~~
- x) ~~l~~ ~~a~~ ~~f~~ ~~r~~ ~~&~~ ~~f~~ ~~o~~ ~~l~~ ~~a~~ ~~f~~ ~~r~~

SAMPLE QUESTIONS BASED ON REVISED PATTERN OF CIVIL SERVICES (PRELIMS) EXAMINATION—2011

A set of 21 sample questions for Paper-I and Paper-II of the Civil Services (Preliminary) Examination, on the revised syllabus and pattern, are given below. These questions are indicative of the type of questions that may be constructed and used by UPSC in Paper-I and Paper II of Civil Services (Preliminary) examination, 2011. However, neither the content nor the structure/type of questions may be construed as being exhaustive or limiting the freedom of UPSC to set questions based on the syllabus prescribed for the examination.

It may be noted that as per the existing practice, both the question papers would be ***bilingual (English and Hindi)***, except for some questions specifically intended to test English Language Comprehension skills, which would be in English only.

PAPER-I

1. With reference to Simon Commission's recommendations, which one of the following statements is correct?
 - (a) It recommended the replacement of diarchy with responsible government in the provinces.
 - (b) It proposed the setting up of inter-provincial council under the Home Department.
 - (c) It suggested the abolition of bicameral legislature at the Centre
 - (d) It recommended the creation of Indian Police Service with a provision for increased pay and allowances for British recruits as compared to Indian recruits.

2. A geographic area with an altitude of 400 metres has following characteristics:

Month	J	F	M	A	M	J	J	A	S	O	N	D
Average Maximum Temp. °C	31	31	31	31	30	30	29	28	29	29	30	31
Average Minimum Temp. °C	21	21	21	21	21	21	20	20	20	20	20	20
Rainfall (mm)	51	85	188	158	139	121	134	168	185	221	198	86

If this geographic area were to have a natural forest, which one of the following would it most likely be?

- (a) Moist temperate coniferous forest (b) Montane subtropical forest
(c) Temperate forest (d) Tropical rain forest.
3. Other than *Jatropha curcas*, why is *Pongamia pinnata* also considered a good option for the production of bio-diesel in India?
1. *Pongamia pinnata* grows naturally in most of the arid regions of India.
 2. The seeds of *Pongamia pinnata* are rich in lipid content of which nearly half of oleic acid.

Which of the statements given above is/are correct?

- (a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2
4. If a potato is placed on a pure paper plate which is white and unprinted and put in a microwave oven, the potato heats up but the paper plate does not. This is because:
- (a) Potato is mainly made up of starch whereas paper is mainly made up of cellulose
(b) Potato transmits microwaves whereas paper reflects microwaves
(c) Potato contains water whereas paper does not contain water
(d) Potato is a fresh organic material whereas paper is a dead organic material

independence, India has achieved remarkable progress in overcoming its economic backwardness. From being a very poor country in the 1950s and a 'basket case' in the mid 1960s, it has emerged as the fourth largest economy in the world (in terms of purchasing power parity). Our economy has become one of the fastest growing economies in the world. Now the country is one of the leading players in the world knowledge economy with vast intellectual capital and booming software and information technology services. While our country has joined the league of the world's top five fastest growing economies, we are in the bottom 20 among all countries in terms of the Human Development Index. While the country is celebrating its growth rate and technological wonders, it is witnessing social contradictions and the paradox and ironies of development. Thus, there are 'two Indias' in contemporary India.

1. Why is the Indian economy considered 'a great paradox'?
 - (a) It is a leading player in information technology services with low levels of literacy.
 - (b) There is poverty amidst plenty in agricultural produce.
 - (c) It is one of the largest economies with low human development.
 - (d) It has scientific achievements with social contradictions.
2. Why is India being referred to as a leading player in the world knowledge economy?
 1. India's knowledge base in science and technology is one of the world's best.
 2. India has huge reserves of human intellectual capitals and information technology services.
 3. India is among the World's five fastest growing economics and technology reserves.
 4. India has a huge reservoir of human capital and scientific knowledge export potential.
3. What does the author imply by the phrase 'two Indias'?
 - (a) There is the India that has vast intellectual capital and the other that is largely illiterate.
 - (b) There is the India of burgeoning growth and the India of widespread want and misery.

- (c) There is the India of progressive mindsets and the other who are socially conservative.
- (d) There is an India of outstanding achievements combined with gigantic failures.
4. Consider the following statement and also the conclusions. Answer the question that follows:
Statement : Education is in the Concurrent List. The State government cannot bring reforms in education without the consent of Central Government.
Conclusion I : For bringing about quick reforms in education, it should be in the State List.
Conclusion II: States are not willing to bring about quick reforms in Education.
 Which one of the following is correct?
 (a) Conclusion –I only follows from the statement.
 (b) Conclusion –II only follows from the statement.
 (c) Both conclusions I & II follow from the statement
 (d) Neither conclusion I nor conclusion II follow from the statement
5. Five persons P, Q, R, S, T are sitting in a row. Q is between P and T. To find who among them is in the middle, which of the information given in the following statements is/are sufficient?
 1. P is left of Q and right of S.
 2. R is at the right end.
 Select the correct answer using the code given below:
 (a) 1 only (b) 2 only
 (c) Either 1 or 2 (d) Both 1 and 2
6. Which one among $\sqrt{2}$, $\sqrt[3]{3}$, $\sqrt[6]{6}$, $\sqrt[12]{12}$ is the smallest one?
 (a) $\sqrt{2}$ (b) $\sqrt[3]{3}$
 (c) $\sqrt[6]{6}$ (d) $\sqrt[12]{12}$
7. The following pie charts show that a man spends 10% on clothes, 20% on rent, 30% on food and rest on miscellaneous items in the month of January and spends 15% on clothes, 25% on rent, 35% on food and rest on miscellaneous items in the month of February.

9. You have come across a case wherein an old sick lady is unable to submit her life certificate and claim pension to meet her treatment expenses. Knowing your superior's procedural approach in handling issues, you...
- (a) Go strictly as per the procedures
 - (b) Take initiative to help the lady arranging for alternative documents
 - (c) Assist the lady with some money on your own but do not compromise on procedures.
 - (d) Avoid some procedural steps since you understand the necessity of the lady.
10. You along with your friend were chatting in a restaurant over a cup of coffee. Suddenly you heard an intense sound of blast very close by. You....
- (a) Jump on your feet and hold your friend tightly
 - (b) Take your look away from the source of noise and start praying for the best
 - (c) Start locating the source of noise
 - (d) Start shouting for help

TIME TABLE FOR CIVIL SERVICES (MAIN) EXAMINATION, 2010

Date/Day	Forenoon Session 9.00 A. M. to 12.00 P.M.	Afternoon Session 2.00 P. M. to 5.00 P. M.
29.10.2010 (Friday)	General Studies Paper-I	General Studies Paper-II
30.10.2010 (Saturday)	Essay	English
31.10.2010 (Sunday)	Indian Language {Assamese/Bengali/Bodo/Dogri/ Gujarati/Hindi/Kannada/Kashmiri/ Konkani/Maithili/Malayalam/ Manipuri/Marathi/Nepali/Oriya/ Punjabi/Sanskrit/Santali/Sindhi (Devanagari/Arabic Script)/Tamil/ Telugu/Urdu}	—
02.11.2010 (Tuesday)	Political Science & International Relations Paper-I/ Public Administration Paper-I	Political Science & International Relations Paper-II/ Public Administration Paper-II
03.11.2010 (Wednesday)	Geography Paper-I	Geography Paper-II
04.11.2010 (Thursday)	History Paper-I	History Paper-II
08.11.2010 (Monday)	Literature of Arabic/Assamese/Bengali/Bodo/ Chinese/Dogri/English/French/ German/Gujarati/Hindi/Kannada/ Kashmiri/Konkani/Maithili/ Malayalam/Manipuri/Marathi/Nepali/ Oriya/Pali/Persian/Punjabi/Russian/ Sanskrit/Santali/Sindhi (Devanagari/ Arabic Script)/Tamil/Telugu/Urdu Language Paper-I	Literature of Arabic/Assamese/Bengali/Bodo/ Chinese/Dogri/English/French/ German/Gujarati/Hindi/Kannada/ Kashmiri/Konkani/Maithili/ Malayalam/Manipuri/Marathi/Nepali/ Oriya/Pali/Persian/Punjabi/Russian/ Sanskrit/Santali/Sindhi (Devanagari/ Arabic Script)/Tamil/Telugu/Urdu Language Paper-II
09.11.2010 (Tuesday)	Philosophy Paper-I	Philosophy Paper-II
10.11.2010 (Wednesday)	Sociology Paper-I/ Anthropology Paper-I	Sociology Paper-II/ Anthropology Paper-II
11.11.2010 (Thursday)	Psychology Paper-I	Psychology Paper-II
12.11.2010	Zoology Paper-I	Zoology Paper-II

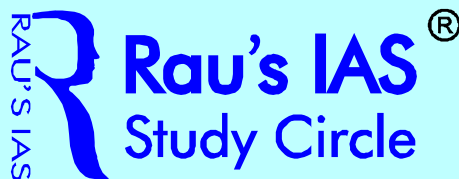
(Friday)		
13.11.2010	Law Paper-I	Law Paper-II
(Saturday)		
15.11.2010	Economics Paper-I	Economics Paper-II
(Monday)		
16.11.2010	Commerce & Accountancy Paper-I/ Management Paper-I	Commerce & Accountancy Paper-II Management Paper-II
(Tuesday)		
18.11.2010	Civil Engg. Paper-I/Electrical Engg. Paper-I/Mechanical Engg. Paper-I/ Medical Science Paper-I	Civil Engg.Paper-II/Electrical Engg. Paper-II/Mechanical Engg. Paper-II/ Medical Science Paper-II
(Thursday)		
19.11.2010	Botany Paper-I	Botany Paper-II
(Friday)		
20.11.2010	Mathematics Paper-I/ Statistics Paper-I	Mathematics Paper-II/ Statistics Paper-II
(Saturday)		
22.11.2010	Agriculture Paper-I/ Animal Husbandry & Veterinary Science Paper-I	Agriculture Paper-II/ Animal Husbandry & Veterinary Science Paper-II
(Monday)		
23.11.2010	Physics Paper-I	Physics Paper-II
(Tuesday)		
25.11.2010	Chemistry Paper-I	Chemistry Paper-II
(Thursday)		
26.11.2010	Geology Paper-I	Geology Paper-II
(Friday)		

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