Government of Jammu and Kashmir
General Administration Department,
(Services)

SRO-103. In exercise of the powers conferred by the proviso to section 124 of the Constitution of Jammu and Kashmir, the Governor hereby makes the following rules for the conduct of Combined Competitive Examination by the Public Service Commission, namely:-

1. Short title and application:- (1) These rules may be called the Jammu and Kashmir Combined Competitive Examination Rules, 2018.

(2) These rules shall apply to the conduct of Combined Competitive Examination by Public Service Commission for direct recruitment to the following services:

(i) Junior Scale of J&K Administrative Service.

(ii) J&K Police (Gazetted) Service.

(iii) J&K Accounts (Gazetted) Service.

2. Definitions:- In these rules unless the context otherwise requires:

(a) "Available Vacancies" mean the vacancies available in the direct recruitment quota of the services mentioned in rule 1 to be filled on the basis of Combined Competitive Examination;

(b) "Commission" means the Jammu and Kashmir Public Service Commission;

(c) "Examination" means the Combined Competitive Examination for recruitment to the direct recruitment posts of the services specified in rule 1;

(d) "Fee" means the fee which may be charged by the Commission from a candidate for the Preliminary/ Main Examination;

(e) "Government" means Government of Jammu and Kashmir;

(f) "List" means the list of candidates prepared on the basis of merit in the examination for the various services and posts.

Explanation:- Candidates shall be allotted to various services and posts keeping in view their merit in the examination and the preferences expressed by them for various services and posts;

(g) "Preference" means preference, for being selected for a service or post for which examination is being held under these rules, in the order in which these are mentioned by the candidate in the application form prescribed by the Commission;

(h) "Rules" means the Jammu and Kashmir Combined Competitive Examination Rules, 2018;

(i) "State" means the Jammu and Kashmir State.

3. Conduct of Examination:- (1) The examination shall be conducted by the Commission in accordance with the provisions of Jammu and Kashmir Public Service Commission (Conduct of Examination) Rules, 2005.

(2) The dates on which and the places at which the Preliminary and Main Examination will be held shall be fixed by the Commission.

4. Duration of examinations:- The examination shall be held at such intervals as the Government may in consultation with the Commission from time to time determine, but at least once in a calendar year unless there are good and sufficient reasons for not doing so and preferably, as far as practicable, after 15 days from the completion of UPSC Civil Services examination at each stage.

5. Indicating Preference:- (1) A candidate shall be required to indicate in his/her application form for the Main Examination his/her order of preferences for various services/posts for which he/she would like to be considered for appointment in case he/she is recommended for appointment by the Commission.

(2) No change in preference of services once indicated by a candidate would be permitted.

Explanation: The candidate has to be very careful while indicating preferences for various services/posts. The candidate has to indicate all the services/posts in the order of preference in his/her application form. In case he/she does not give any preference for any services/posts, it will be assumed that he/she has no specific preference for those services. If he/she is not allotted to any one of the services/posts for which he/she has indicated preference, he/she shall be allotted to any of the remaining services/posts in which

there are vacancies after allocation of all the candidates who can be allocated to services/posts in accordance with their preferences.

6. Number of vacancies to be filled up:- The number of vacancies to be filled on the result of the examination will be specified in the notice issued by the Commission. Reservation will be made for candidates belonging to the Scheduled Castes, Scheduled Tribes, RBA/Social Castes/ALC and Physically Challenged categories in respect of vacancies as may be fixed by the Government.

7. Number of Attempts:- Every candidate appearing in the examination who is otherwise eligible, shall be permitted six 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 RBA, Social Castes & ALC, who are otherwise eligible, shall be nine. The relaxation will be available to the candidates who are eligible to avail of reservation applicable to such candidates.

Provided also that a physically challenged candidate will get as many attempts as are available to other non-physically challenged candidates of his or her community, subject to the condition that a physically challenged candidate belonging to the General Category shall be eligible for nine attempts. The relaxation will be available to the physically challenged 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 Combined Competitive 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.

8. Conditions of Eligibility:- (1) In order to be eligible to compete in the examination, a candidate must satisfy the following conditions, namely:-

(i) that he is a permanent resident of the State;

(ii) that he has attained the age of 21 years but not attained the age of 32 years on 1st January of the year in which notification inviting applications is issued by the Commission:

Provided that the upper age limit shall be 34 years, in case of the following:

(a) Candidates belonging to Schedule Castes/Schedule Tribes/ RBA/Social Castes/ALC.
(b) Candidates holding a civil post in the State in substantive capacity:

Provided that the upper age limit for physically challenged candidates shall be 35 years irrespective of the category to which such a candidate belongs.

Provided further that a candidate who has completed 02 years service on 1st January of the year in which notification inviting applications is issued by the Commission in substantive capacity to be certified by his, Head of Department, shall alone, be eligible to claim the benefit of upper age limit under clause (b) above.

Provided also that for good and sufficient reasons, to be recorded in writing, the Government may prescribe for any particular examination any other upper age limit for open category and reserved category candidates.

(iii) that he holds, notwithstanding anything to the contrary contained in the recruitment rules of various services and posts mentioned in rule (1), a Bachelor's degree of a recognized University in India or of a foreign University declared by Government in consultation with the Commission to be equivalent to the degree of a recognized Indian University:

Provided that candidates who have appeared fully in any examination on or before the last date for receipt of application forms for preliminary examination for such degree from any such University the passing of which would render them eligible to appear in the examination, but the results of their examination has not been declared, or they have not been informed of the result, will also be eligible for admission and shall be allowed to appear in the preliminary examination. All such candidates who are declared

qualified by the Commission for taking the Combined Competitive (Main) Examination shall have to produce proof of passing such examination with their applications for the main examination failing which such candidates shall not be admitted to the main examination;

Explanation: 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 Combined Competitive (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.

Provided further that in respect of candidate for J&K Police (Gazetted) Service, the candidate should possess the following physical standards also, namely:-

I. **For Males:**

(a) Height	:	165cm
(b) Chest girth minimum	:	84cm Expansion 5cm

II. **For Females:**

(a) Height	:	150cm
(b) Chest girth minimum	:	79cm Expansion 5cm

III. **For candidates from Leh/ Kargil**

A For Males:

(i) Height	:	160cm
(ii) Chest girth minimum	:	79cm Expansion 5cm

b. For Females:

(i) Height	:	145cm
(ii) Chest girth minimum	:	74cm Expansion 5cm.

Provided also the candidate(s) already holding a civil post in the State shall submit their application through Head of Office with an advance copy of the application directly to Commission and in case the Commission receives an intimation withholding permission from the employer in respect of a candidate who has applied for, or is appearing in the Combined Competitive Examination, his/her application shall be rejected and candidature cancelled. Such a candidate may, however, be allowed to appear in the examination as fresh candidate subject to the condition that the said candidate is otherwise eligible under rules.

Explanation:- The expression "Civil post in the State" mentioned above means a post in any departmental service under the state and includes the posts in the High Court of J&K and J&K State Legislature.

(2) Candidate must pay the fees prescribed in the Commission's notice.

(3) The decision of the Commission as to the eligibility or otherwise of a candidate for admission to the examination shall be final. 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 Personality Test (Interview) 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 Personality Test (Interview), it is found that they do not fulfil any of the eligibility conditions, their candidature for the examination will be cancelled by the Commission.

(4). No candidate will be admitted to the Preliminary/ Main Examination unless he holds a certificate of admission for the Examination.

(5). No request for withdrawal of candidature received from a candidate after he has submitted his application will be entertained under any circumstances.

9. <u>Documents to be furnished by the candidates for the Combined Competitive (Preliminary) Examination:-</u> A candidate shall not be required to submit any certificate relating to his/her age, educational qualification, certificate of belonging to reserved category and holding of a civil post in the State, at the time of filling his/her application (OMR) form for the Combined Competitive (Preliminary) Examination. The admission to the preliminary examination shall be purely provisional and if on verification at any stage, it is found that the candidate has claimed eligibility for such examination by misrepresentation, concealment of any

material fact(s) or impersonation or fraud, his or her candidature shall be cancelled and he/she will be liable to prosecution/ disciplinary action by the Commission.

10. <u>Securing candidature by illegal means:-</u> A candidate who is or has been declared by the Commission to be guilty of:-

(i) Obtaining support for his 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) impersonation; 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 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 examination; or

(xi) being in possession of or using any 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 liable to criminal prosecution, be liable :-

(a) to be disqualified by the Commission from the Examination for which he 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 State Government from any employment under them; and

(c) if he is already in service under Government to disciplinary action under the appropriate rules:

Provided that no penalty under this rule shall be imposed except after:-

(i) giving the candidate an opportunity of making such representation in writing as he may wish to make in that behalf; and

(ii) taking the representation, if any, submitted by the candidate within the period allowed to him into consideration.

11. <u>Seeking Reservations:-</u> Candidates seeking reservation/relaxation benefits available for SC/ST/RBA/Social Castes/ALC/Physically Challenged Candidates must ensure that they are entitled to such reservation /relaxation as per eligibility prescribed in the Rules. They should also be in possession of all the requisite certificates in the prescribed format in support of their claim as stipulated in the Rules for such benefits, and these certificates should be dated earlier than the due date (closing date) of the application of Combined Competitive (Preliminary) Examination.

12. <u>Documents to be furnished by the candidates for the Combined Competitive (Main) Examination:-</u> Besides furnishing the documents that may be required by the Commission, the applications for the main examination shall be accompanied by attested copies of the following certificates:-

(a) Permanent resident of the State;
(b) Academic qualification;
(c) Age and Character;
(d) Category Certificate, in case of candidates belonging to any reserved category.

Note: (i) No certificate except the Matriculation certificate or an equivalent certificate thereto on the date of the submission of the application shall be admitted as proof of age and no subsequent request for its change will be considered or granted.

(ii) Character certificate shall mean a certificate issued by the Head of the Education Institute or by the University last attended by the candidate or by any gazetted officer of the State. In case of a candidate already in Government Service, the Character certificate shall mean a certificate issued by his Controlling Officer:

(iii) A candidate will be eligible to get the benefit of reservation under a particular reserved category indicated by him in his/her application form for Combined Competitive (Preliminary) Examination. If a candidate indicates in his/her application form for Combined Competitive (Preliminary) Examination that he/she belongs to General category but subsequently writes to the Commission to change his/her category to a reserved one, such request shall not be entertained by the Commission. Similar principle will be followed for physically challenged categories also.

Explanation:- While the above principle will be followed in general, there may be a few cases where there was a little gap (say 2-3 months) between the issuance of a Government Notification enlisting a particular community in the list of any of the reserved communities and the date of submission of the application by the candidate. In such cases, the request of change of community from general to reserved may be considered by the Commission on merit. In case of a candidate unfortunately becoming physically challenged during the course of the examination, the candidate should produce valid documents to enable the Commission to take a decision in the matter on merit.

Provided that the application forms submitted either for the Combined Competitive (Preliminary) or Main Examination, incomplete in any manner shall be rejected without notice to the candidate(s). However,

the Commission shall notify the list of such candidates whose candidature is rejected on account of incomplete forms.

13. Examination:- The Combined Competitive Examination shall comprise of two successive stages:-

(i) Combined Competitive (Preliminary) Examination (Objective Type) for the selection of candidates for Main Examination; and

(ii) Combined Competitive (Main) Examination (Written and Interview) for the selection of candidates for the various services and posts.

14. Preliminary Examination:- (1) The Preliminary Examination will consist of two papers of objective type (multiple choice questions) and carry a maximum of 400 marks as set out in part (A) of Appendix-I, as per the detailed syllabus in Appendix-II (Part-A). This examination is meant to serve as a screening test only. The marks obtained in the Preliminary Examination shall count only for short-listing of the candidates for the Main examination.

(2) Candidates who obtain such minimum qualifying marks in the General Studies Paper-I of Preliminary Examination as may be fixed by the Commission at their discretion and a minimum of 33% marks in General Studies Paper-II of Combined Competitive (Preliminary) Examination shall be admitted to the Main Examination. The Commission will draw a list of candidates to be qualified for Combined Competitive (Main) Examination based on the criterion of minimum qualifying marks of 33% in General Studies Paper-II of Combined Competitive (Preliminary) Examination and total qualifying marks of General Studies Paper-I of Combined Competitive (Preliminary) Examination as may be determined by the Commission. Questions pertaining to the State of J&K may also be asked in Paper I of the Combined Competitive (Preliminary) Examination.

(3) There will be negative marking for incorrect answers (as detailed below) for all questions:

(i) 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.

(ii) If a candidate gives more than one answer, it will be treated as a wrong answer even if one of the given answers happen to be correct and there will be same penalty as above for that question.

(iii) If a question is left blank i.e. no answer is given by the candidate, there will be no penalty for that question.

(4) The number of candidates to be admitted to the Main Examination shall be, as far as practicable, 1/3rd of the total number of candidates who appeared in the preliminary examination or twenty five times the total number of vacancies to be filled in the various services and posts, whichever is lower:

Provided that the Commission will draw a list of candidates qualified for Combined Competitive (Main) Examination based on the total qualifying marks, as may be determined by the Commission, at their discretion.

Provided further that 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.

15. MAIN EXAMINATION:- (1) The Main Examination shall consist of written examination and a Personality Test (Interview). The written examination will consist of eight (8) papers of conventional essay type in the papers set out in part (B) of Appendix-I as per the detailed syllabus in Appendix-II (part B), out of which one (01) paper will be of qualifying nature.

Provided the Government, in consultation with the Commission, may revise or update the syllabi for the Combined Competitive Examination from time to time.

(2) 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, in any or all the papers (Paper I to Paper VII) shall be summoned by them for an interview for a Personality Test, vide part 'C' of Appendix-I.

(3) A candidate who fails to secure such minimum number of marks as are fixed by the Commission in their discretion in one or more than one paper, shall, however, not be eligible to be called for Personality Test (interview).

(4) The number of candidates to be summoned for the Personality Test (interview) will not be more than thrice the number of vacancies to be filled. The Personality Test (interview) will carry 250 marks (with no minimum qualifying marks). Failure to appear in the interview shall render a candidate ineligible for being recommended for appointment notwithstanding the marks obtained by him in the written examination.

(5) The candidates shall be short-listed for interview on the basis of overall merit obtained by them in the Main Examination irrespective of the category(ies) to which he/she/they belong:

Provided that if the number of candidates belonging to any reserved category, who qualify for the interview on the basis of the above short-listing criteria, falls short of upto three times the number of vacancies reserved for such a category, the Commission shall call the candidates belonging to such category over and above the number short-listed for interview.

16. Merit List:- (1) Marks thus obtained by the candidates in the Main Examination (written part as well as interview) would determine the final order of merit. Candidates shall be allotted to the various services keeping in view their inter-se merit in the examination and the preferences expressed by them for the various services and posts at the time of his/her submission of the application form for the main examination. The allotment of candidates to various services shall be made by the Commission in accordance with the rules/regulations in force as applicable to the respective services at the time of making such allotment and the provisions relating to reservation of posts and appointments for Scheduled Castes, Schedule Tribes/ RBA/Social Castes/ALC for the time being in force in the State, which shall be strictly adhered to:

Provided that a candidate belonging to a reserved category, though not qualifying by the standard prescribed by the Commission may be declared suitable for appointment thereto by reduced standards with due regard to the maintenance of efficiency in administration, and recommended for appointment to vacancies reserved for members of such class in that service.

Provided also that physically challenged candidates shall be considered for selection in the services and against the posts identified for their respective categories in terms of "The Jammu and Kashmir Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Rules, 2003" and in accordance with their merit-cum-preference, if otherwise found suitable for selection. The eligibility for availing reservation against the vacancies reserved for the physically challenged persons shall be the same as prescribed in "The Jammu and Kashmir Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1998" read with Government Order No. 147-SW of 2014 dated 17.06.2014 or such other Government Order/Circular instructions, as applicable at the relevant point of time.

Provided further that the minimum qualifying marks as specified herein above may be relaxable at the discretion of the

Commission in favour of physically challenged candidates in order to fill up the vacancies reserved for them.

(2) The form and manner of communication of the results of the examination to the individual candidates shall be decided by the Commission in their discretion.

17. Medical fitness:- A candidate must be in good mental and bodily health and free from any physical defect likely to interfere with the discharge of his duties as an officer of the service. A candidate who after such medical examination as Government may prescribe is found not to satisfy these requirements will not be recommended by the Commission for appointment. The medical examination shall be conducted by the Commission before forwarding the select list to the government in accordance with the rules:

Provided that Medical Board shall intimate the nature and degree of disability of physically challenged candidate in terms of "The Jammu and Kashmir Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1998" and Rules made thereunder as amended from time to time with specific recommendation, if any, in respect of each of such candidate(s) for appointment to various posts through the Combined Competitive Examination.

Provided further that Government may constitute a Special Medical Board with experts in the area for conducting the medical examination of Physically Challenged candidates.

Explanation: Instructions to appear before Medical Board shall not be deemed to mean that a candidate for direct recruitment if found fit is necessarily given an appointment. The medical examination will be conducted by a Medical Board to be arranged by the Commission in accordance with Appendix–III for the candidates for J&K Police (Gazetted) Service and Appendix-IV for other candidates. The candidates will have to pay a fee as prescribed from time to time to the Medical Board.

18. Determination of order of merit in the event of a tie:- In the event of a tie, the order of merit shall be determined in accordance with the highest marks secured in the Personality Test (interview). Should the marks in the Personality Test (interview) Test of the candidates be also equal, the order of merit shall be decided in accordance with the highest marks obtained by such candidates in the aggregate of the compulsory paper. However, in case the marks obtained in compulsory papers are also equal, the order of merit shall be determined in accordance with the marks obtained in General Studies Papers. Similarly, if the marks obtained in General Studies Papers be also equal, then the order of merit shall be determined in descending order of the date of birth of the candidates.

19. Record of Satisfaction by the Government:- Success in the examination confers no right to appointment unless Government is satisfied after such enquiry as may be considered necessary that the candidate is suitable in all respects for appointment to the service.

20. Repeal and savings:- (1) All rules corresponding to these rules including SRO 387 dated 1st of December 2008, shall in so far they are inconsistent with these rules, stand repealed.

(2) Notwithstanding such repeal, any order made or action taken under the provisions of the rules so repealed shall be deemed to have been made or taken under the corresponding provisions of these rules.

By order of the Government of Jammu and Kashmir.

Sd/-
(Khurshid Ahmed), IAS
Commissioner/Secretary to the Government,

No:GAD(Ser)Genl/126/2013 Dated: 23.02.2018

Copy to the:

1. All Financial Commissioners.
2. Principal Resident Commissioner, J&K Government, New Delhi.
3. Director General of Police, J&K.
4. Principal Secretary to the Governor.
5. All Principal Secretaries to the Government.
6. Chief Electoral Officer, J&K.
7. Principal Secretary to the Chief Minister.
8. All Commissioners/Secretaries to the Government.
9. Chairperson, J&K Special Tribunal.
10. Divisional Commissioner, Jammu/Kashmir.
11. All Heads of Departments/Managing Directors.
12. Secretary, J&K Public Service Commission.
13. Director Estates, J&K.
14. Director Information, J&K.
15. Director Archives, Archaeology and Museums.
16. Secretary, J&K Legislative Assembly/Council.
17. Secretary, J&K Services Selection Board.
18. OSD with the Deputy Chief Minister.
19. General Manager, Government Press, Srinagar/ Jammu.
20. Private Secretaries to all Cabinet Ministers/Ministers of State.
21. Private Secretary to the Chief Secretary.

22. Private Secretary to Commissioner/Secretary to the Government, General Administration Department.
23. Incharge website, GAD.
24. Government Order file/Stock file.

(G.R. Mir) KAS
Additional Secretary to the Government

APPENDIX I

SCHEME AND SUBJECTS FOR THE PRELIMINARY AND MAIN EXAMINATION.

A. Preliminary Examination

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

NOTE:

(i) Both the question papers will be of the ob ective type (multiple choice questions).

(ii) The General Studies Paper-II of th Comb ed Competitive (Preliminary) Examination will be a qu lifying paper with minimum qualifying marks fix d a 33%.

(iii) The question papers will be t in Eng sh.

(iv) Each paper will be o tw hour ' duration. Blind candidates and the candidates with Lo omotor Disability and Cerebral Palsy where domin nt (writing) extremity is affected to the extent of slow ng the perfo mance or function (minimum of 40% impairme t) will however; be allowed an extra time of twenty utes p hour for each paper.

B. Main Examination:

1. The written ex mination will consist of the following papers:

Qual ying Pa er:

English 300 Marks

Paper o be counted for merit:

P per-I

Essay 250 Marks

Paper-II

General Studies–I 250 Marks

(Indian Heritage and Culture, History and Geography of the World and Society)

Paper-III

General Studies –II 250 Marks

(Governance, Constitution, Polity,
Social Justice and International relations)

Paper-IV

General Studies –III 250 Marks

(Technology, Economic Development,
Bio-diversity, Environment, Security and
Disaster Management)

Paper-V

General Studies –IV 250 Marks

(Ethics, Integrity and Aptitude)

Paper-VI

Optional Subject – Paper -I 250 Marks

Paper-VII

Optional Subject – Paper-II
250 Marks

Sub Total (Written test) 1750 Marks

Personality Test (interv ew) 250 Marks

Grand Total: 2000 Marks

NOTE:

(i) T e paper on English will be of Matriculation or equ alent standard and will be of qualifying nature. The marks obtained in this paper will not be counted for ra king.

(ii) Evaluation of the papers, namely, 'Essay', 'General Studies' and Optional Subject of all the candidates would be done simultaneously along with evaluation of their qualifying paper on English but the papers on 'Essay', General Studies and Optional Subject of only such candidates will be taken cognizance of who obtain 25% marks in 'English' as minimum qualifying standard in this qualifying paper.

(iii) Marks obtained by the candidates for the Paper I-VII only will be counted for merit ranking. However, the Commission will have the discretion to fix qualifying marks in any or all of these papers.

2. Candidates may choose any one of the optional subjects from amongst the list of the subjects given below:-

1) Agriculture:

2) Animal Husbandry and Veterinary Science:

3) Anthropology:

4) Botany:

5) Chemistry:

6) Civil Engineering:

7) Commerce and Accoun ncy:

8) Economics:

9) Electrical Engineering:

10) Geography

11) Geology;

12) Histo y:

13) Law;

14) Management;

15) Mathematics;

16) Mechanical Engineering;

17) Medical science**;**

18) Philosophy;

19) Physics;

20) Political Science & International Relations;

21) Psychology;

22) Public Administration:

23) Sociology;

24) Statistics;

25) Zoology;

26) Literature of any one of the following anguage

Arabic, Dogri, English, Hindi, Kashm ri, Persian, Punjabi, Sanskrit and Urdu.

NOTE:

I. The question papers o the examination will be of conventio al (es ay) type.

II Each aper ill be of three hours' duration.

III. he details of the syllabi are set out in Appendix-II.

C. Pe sonality T st (Interview):

. he candidate will be interviewed by a panel of Members of he Commission who will have before them a record of his/her a He/She will be asked questions on matters of general nterest. The object of the interview is to assess the personal su ability of the candidate for a career in public service. The interview test is intended to judge the mental calibre of a candidate. I broad terms, this is really an assessment of not only his in ellectual 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 Commission shall also be assisted during the Interview by Expert(s) in Behavioural Sciences and Public Administration as may be selected/nominated by the Chairman of the Commission.

3. 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.

4. The interview test is not intended to be a te either of the specialized or general knowledge of the candidates which has been already tested through their written papers. Cand dat s are expected to have taken an intelligent interest not only in the speci l subjects of academic study but also in the events w ich are happening around them both within and outside r own S ate or Country as well as in modern currents of thoug t and n new discoveries which should rouse the curiosity of well ed cated yo h.

GENERAL INSTRUCTIONS FOR PRELIMINARY AS WELL AS MAIN EXAMINATION:

1. It is mandatory fo the candidate to appear in both the papers of Comb ed omp titive reliminary) Examination for the purpose of evaluatio Theref re, a candidate will be disqualified in case he/she does n t appear in both the papers of Combined Competitive (Preliminary) Exa ination.

2. Candida es must write the papers in their own hand. In no ircumsta s, they will be allowed the help of a scribe to write the swers for them. However, blind candidates and the candidates with Locomotor Disability and Cerebral Palsy where dominant (riting) extremity is affected to the extent of slowing the performance or function (minimum of 40% impairment) will be llowed to write the examination with the help of a scribe in both the C mbined Competitive (Preliminary) as well as in the Combined Competitive (Main) Examination.

3. Compensatory time of twenty minutes per hour shall be permitted for the Blind candidates and candidates with Locomotor Disability and Cerebral Palsy where dominant (writing) extremity is affected to the extent of slowing the performance or function

(minimum of 40% impairment) in both the Combined Competitive (Preliminary) as well as in the Combined Competitive (Main) Examination.

4. 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 Combined Competitive Examination shall be governed by the instructions issued by the Public Service Commission 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 y other action that the Public Service Commission may take agai st the scribe.

5. For purpose of these rules, the candidat shall e deemed to be a blind candidate if the percentage of vis al impairment is Forty per cent (40%) or more. The criteria for rmining he percentage of visual impairment shall be as follows -

	All with co rections		
	Better	Worse eye	Percentage
1	2	3	4
Category O	6 9—6 18	6/24 to 6/36	20%
Category I	6/18—6/ 6	6/60 to nil	40%
Category II	6 60—4/60 or f ld of vision 0°—20°	3/60 to nil	75%
Cate y III	/60—1/60 or ield of vision 10°	F.C. at 1 ft to nil	100%
Category IV	F.C. at 1 ft to Nil field of vision 100°	F.C. at 1 ft to Nil field of vision 100°	100%
One eyed erson	6/6	F.C. at 1 ft to Nil	30%

6. For availing of the concession admissible to a blind candidate, the candidate concerned shall produce a certificate in the prescribed p oforma from a Medical Board constituted by the Government along with their application for the Main Examination.

7. The concession admissible to blind candidates shall not be admissible to those suffering from Myopia.

8. The Commission have discretion to fix qualifying marks in any or all the subjects of the examination.

9. 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.

10. Marks will not be allotted for mere superficial knowledge.

11. Credit will be given for orderly, effective and exact expression combined with due economy of words in all subjects of the examination.

12. In the question papers, wherever required, SI units will be used.

13. Candidates should use only Internation l form of Indian numerals (i.e. 1, 2, 3, 4, 5, 6 etc.) while answerin question papers.

14. Candidates will be allowed the use of Scientific (Non-Programmable type) Calculators at th conventi nal (Essay) type examination of the Public Service Commis on. Programmable type calculators will, however, not be llowed nd the use of such calculators shall tantamount t resor g to unfair means by the candidates. Loaning or intercha ging of calculators in the Examination Hall is not per itted.

It is also impor nt to no hat candidates are not permitted to use calculators fo answering objective type papers (Test Booklets) Th y sh uld n therefore, bring the same inside the Examination Hall.

APPENDIX II

SYLLABI FOR THE EXAMINATION

PART-A

PRELIMINARY EXAMINATION

Paper I–(200 marks) **Du ation Tw hours**

- Current events of National and Internation porta ce;
- History of India and Indian National Mov ment;
- Indian and World Geography–Physic ocial, Eco omic Geography of India and the world;
- Indian Polity and Governanc Constitut n Political System, Panchayati Raj, Public Policy Right ssues etc;
- Economic and Social Deve pmen Sustainable Development, Poverty, Inclusion, Demographics, Social Sector Initiatives etc;
- General issues on nv nmental cology, Bio-diversity and Climate Change–that do not requi subje t specialization;
- General Science;

Note: Questions pertaini to the ate of Jammu & Kashmir may also be asked in this paper.

Paper II–(200 marks) **Duration: Two hours**

- Comprehen n;
  Interper nal skills including communication skills;
- Logical easoning and analytical ability;
- De sion-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)

Note 1 Paper–II of the Combined Competitive (Preliminary) Examination will be a qualifying paper with minimum qualifying marks fixed at 33%.

Note 2: The questions will be of multiple choice, objective type.

Note 3: It is mandatory for the candidate to appear in both the Papers of Combined Competitive (Preliminary) Examination for the purpose of evaluation. Therefore, a candidate will be disqualified in case he/she does not appear in both the papers of Combined Competitive (Preliminary) Examination.

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 nature and standard of questions in the General Studies papers (Paper II to Paper V) will be such that a well-educated person will be able to answer hem thout any specialized study. The questions will be such as to test a candidate's ge eral aware ess of a variety of subjects, which will have relevance for a career in Civil Servi es The qu stions are likely to test the candidate's basic understanding of all rel issu and ability to analyze, and take a view on conflicting socio- economic goa s, obje ves and demands. The candidates must give relevant, meaningful and succin wers.

The scope of the syllabus for optional subject p pers (Pap r VI and Paper VII) for the examination is broadly of the honours degree lev l i.e. a level higher than the bachelors' degree and lower than the masters' egre In the ase of Engineering, Medical Science and law, the level corresponds to the bachelors degree.

The syllabi of the papers includ d in th schem of Combined Competitive (Main) Examination is given as follows:-

QUALIFYING PAPER ON ENGLISH:

The aim of the pap is to tes the candidate's ability to read and understand serious discursive pro nd to xpress his ideas clearly and correctly.

The pattern f question would be broadly as follows:

i. Compr hensio of given passages.
ii. Precis Writing.
i U and Vocabulary.
iv. Short Essays.

The paper will be of Matriculation or equivalent standard and will be of qualifying nature only. The marks obtained in this paper will not be counted for final ranking.)

PAPER-I

Essay: Candidates may be required to write essays on multiple topics. 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.

PAPER-II

General Studies-I: Indian Heritage and Culture, History and Geography of the World and Society.

- Indian culture will cover the salient aspects of Art Forms, Literature and Architecture from ancient to modern times.
- Modern Indian history from about the middle of the eighteenth century until the present- significant events, personalities, issues.
- The Freedom Struggle - its various stages and important contributors /contributions from different parts of the country.
- Post-independence consolidation and reorganization with n the c untry.
- History of the world will include events from 18th centur such as in ustrial revolution, world wars, redrawal of national boundar s, colo zation, decolonization, political philosophies like comm nism capita , socialism etc.- their forms and effect on the society.
- Salient features of Indian Society, Diversit of In
- Role of women and women's organ tion, pop lation and associated issues, poverty and developmental issues, rbanization, their problems and their remedies.
- Effects of globalization on Indi n society
- Social empowerment, commun lism, regio alism & secularism.
- Salient features of world' physi l geogr phy.
- Distribution of key natur resources across the world (including South Asia and the Indian subcontinen factors responsible for the location of primary, seconda an terti y sect industries in various parts of the world (including In i).
- Important Ge physical phenomena such as earthquakes, Tsunami, Volca c activity, Cyclone etc., geographical features and their location-cha ges in critical geographical features (including water bodies and ice-caps and in flo and fauna and the effects of such changes.

PAPER-III

General tudies-II: Governance, Constitution, Polity, Social Justice and Internat nal re ations.

- Indian Constitution- historical under pinnings, evolution, features, mendments, significant provisions and basic structure.
- Functions and responsibilities of the Union and the States, issues and challenges pertaining to the federal structure, devolution of powers and finances up to local levels and challenges therein.
- Separation of powers between various organs dispute redressal mechanisms and institutions.
- Comparison of the Indian constitutional scheme with that of other countries.

- Parliament and State Legislatures - structure, functioning, conduct of business, powers & privileges and issues arising out of these.
- Structure, organization and functioning of the Executive and the Judiciary Ministries and Departments of the Government; pressure groups and formal/informal associations and their role in the Polity.
- Salient features of the Representation of People's Act.
- Appointment to various Constitutional posts, powers, functions and responsibilities of various Constitutional Bodies.
- Statutory, regulatory and various quasi-judicial bodies.
- Government policies and interventions for development in various sectors and issues arising out of their design and implementation.
- Development processes and the development industry- he role of NGOs, SHGs, various groups and associations, donors, chariti s, in titutio al and other stakeholders.
- Welfare schemes for vulnerable sections of th pop lation he Centre and States and the performance of these schemes; echanisms, laws, institutions and Bodies constituted for the otec n and bet erment of these vulnerable sections.
- Issues relating to development and manag ment of Social Sector/Services relating to Health, Education, Hu an sourc s
- Issues relating to poverty and hunger.
- Important aspects of gover nce, tran parency and accountability, e-governance- application , mod s suc esses, limitations, and potential; citizens charters, transp ency & accountability and institutional and other measures.
- Role of c il ser ices a dem racy.
- India and its ghborho d- relations.
- Bilateral, regio al and global groupings and agreements involving India and/o affecting In ia's interests .
- Effe of policies and politics of developed and developing countries on India s interests ndian diaspora.
- Import t Inte national institutions, agencies and fora- their structure, mandate.

PAPER-IV

General Studies-III: Technology, Economic Development, Bio diversity, Environment, ecurity and Disaster Management.

- Indian Economy and issues relating to planning, mobilization of resources, growth, development and employment.
- Inclusive growth and issues arising from it.
- Government Budgeting.
- Major crops cropping patterns in various parts of the country, different types of irrigation and irrigation systems storage, transport and marketing of

agricultural produce and issues and related constraints; e-technology in the aid of farmers.

- Issues related to direct and indirect farm subsidies and minimum support prices; Public Distribution System- objectives, functioning, limitations, revamping; issues of buffer stocks and food security; Technology missions; economics of animal-rearing.
- Food processing and related industries in India- scope and significance, location, upstream and downstream requirements, supply chain management.
- Land reforms in India.
- Effects of liberalization on the economy, changes in industrial policy and their effects on industrial growth.
- Infrastructure: Energy, Ports, Roads, Airports, Railways et
- Investment models.
- Science and Technology- developments and their applicati s and e ects in everyday life.
- Achievements of Indians in science & technology; indigenization of technology and developing new technology
- Awareness in the fields of IT, Space, Co puters, ro otics, nano-technology, bio-technology and issues relating to intelle ual proper y rights.
- Conservation, environmental p ut and degradation, environmental impact assessment.
- Disaster and disaster managem nt.
- Linkages between develo ment a d sprea of extremism.
- Role of external state an non-state actors in creating challenges to internal security.
- Challenge to ntern securi through communication networks, role of media and s c al networ ng sites in internal security challenges, basics of cyber security; oney-laundering and its prevention.
- Securit challenge and their management in border areas; linkages of orga zed crime with errorism.
- Vario s Security orces and agencies and their mandate.

PAPER-V

Gene al Studies-IV: Ethics, Integrity, and Aptitude.

This paper will include questions to test the candidates' attitude and pproach to issues relating to integrity, probity in public life and his problem solving approach to various issues and conflicts faced by him in dealing with society. Questions may utilize the case study approach to determine these aspects. The following broad areas will be covered.

- Ethics and Human Interface: Essence, determinants and consequences of Ethics in human actions; dimensions of ethics; ethics in private and public relationships. Human Values – lessons from the lives and teachings of great

leaders, reformers and administrators; role of family, society and educational institutions in inculcating values.

- Attitude: content, structure, function; its influence and relation with thought and behavior; moral and political attitudes; social influence and persuasion.
- Aptitude and foundational values for Civil Service, integrity, impartiality and non-partisanship, objectivity, dedication to public service, empathy, tolerance and compassion towards the weaker sections.
- Emotional intelligence-concepts, and their utilities and application in administration and governance.
- Contributions of moral thinkers and philosophers from India and world.
- Public/Civil service values and Ethics in Public administrati Status and problems; ethical concerns and dilemmas in government a d private institutions; laws, rules, regulations and conscience as sour es o ethical guidance; accountability and ethical governance; streng ning o ethical and moral values in governance; ethical issues n inte ationa ations and funding; corporate governance.
- Probity in Governance: Concept of publ ser e; Philos phical basis of governance and probity; Informatio sharing and transparency in government, Right to Information, Code of Ethics, Codes of Conduct, Citizen's Charters, Work culture Q ity of rvice delivery, Utilization of public funds, challenges of cor uption.
- Case Studies on above issues

PAPER- I & PAPER-VII

Optional Subject Pap r I & II
Candidates may choos any optional subject from amongst the list of the subject in Appendix I The detailed syllabus for each optional subject is give below:

AGRICULTURE

PAPER-I

cology nd its relevance to man, natural resources, their sustainable management and con ervatio . Physical and social environment as factors of crop distribution and production Agro ecology; cropping pattern as indicators of environments. Environmental pollution an associated hazards to crops, animals and humans. Climate change— International c ventions 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 stab lising griculture production in rainfed areas.

Water-use efficiency in relation to crop production, criteria for schedul ng irri ations, ways and means of reducing run-off losses of irrigation water. Rainwate harvesti g. Drip and sprinkler irrigation. Drainage of water-logged soils, quality of irr ation , effect of industrial effluents on soil and water pollution. Irrigation project in India

Farm management, scope, importance and charact ris s farm pl ning. Optimum resource use and budgeting. Economics of different types of fa ing systems. Marketing management strategies for development, market intellig nce. Pric fluctuations and their cost; role of co-operatives in agricultural economy; typ and systems of farming and factors affecting them. Agricultural price policy rop suranc

Agricultural extension, its importance a d role, m thods of evaluation of extension programmes, socio-economic survey and st tus of big small and marginal farmers and landless agricultural labourers; Training progr mmes for extension workers. Role of Krishi Vigyan Kendra's (KVK) in dissemin i n of Ag lt ral technologies. Non-Government Organisation (NGO) and self-help group pproach for rural development.

PAP R-II

Cell structure, function d cell cycle. Synthesis, structure and function of genetic material. Laws of he edity. Chro osome structure, chromosomal aberrations, linkage and cross-over, and th ir significance n recombination breeding. Polyploidy, euploids and aneuploids. Mutat n—and t eir role in crop improvement. Heritability, sterility and incompatibilit clas fication and their application in crop improvement. Cytoplasmic inher nce, s x-linked, nfluenced and sex-limited characters.

Hi ry f plant breeding. Modes of reproduction, selfing and crossing techniques. Origin, ev on a omestication of crop plants, center of origin, law of homologous serie crop enetic resources—conservation and utilization. Application of principles of plant b eding, mprovement of crop plants. Molecular markers and their application in plant imp ovement. Pure-line selection, pedigree, mass and recurrent selections, combining a ility, its significance in plant breeding. Heterosis and its exploitation. Somatic hybridization. reeding for disease and pest resistance. Role of interspecific and intergeneric h bridization. Role of genetic engineering and biotechnology in crop improvement Gernetically 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. Intergrated pest and diseases management. Storage pests and their management. Biological control of pests and diseases. Epidemiology and fo ecasting of major crop pests and diseases. Plant quarantine measures. Pesticide th ir formulation and modes of action.

Food production and consumption trends in India. F od curity growing population—vision 2020. Reasons for grain surplus. National and International food policies. Production, procurement, distribution constraint . A ilability o foodgtrains, per capita expenditure on food. Trends in poverty, Publi Distrib ion System and Below Poverty Line population, Targeted Public Distribution Sy em (PDS) policy implementation in context to globalization. Processing constraints Relatio of food production to National Dietary Guidelines and food consumption p tern Food sed dietary approaches to eliminate hunger. Nutrient deficiency—Mi o nutrie t deficiency : Protein Energy Malnutrition or Protein Calorie Malnutrition (EM or PC), Micro nutrient deficiency and HRD in context of work capacity of women an children Food grain productivity and food security.

ANIMAL HUSBANDRY AND VETERINARY SCIENCE

PAPER-I

1. Animal Nutritio :

1 1 Partit ning o food nergy within the animal. Direct and indirect calorimetry. Carbo —nitrogen balance and comparative slaughter methods. Systems for e re g energy value of foods in ruminants, pigs and poultry. Energy req ments for maintenance, growth, pregnancy, lactation, egg, wool, and meat produ on.

1.2 L test ad ances in protein nutrition. Energy protein inter-relationships. Evaluation of p otein quality. Use of NPN compounds in ruminant diets. Protein requirements for m tenance, growth, pregnancy, lactation, egg, wool and meat production.

1.3 Major a d trace minerals—Their sources, physiological functions and deficiency symptoms. Toxic minerals. Mineral interactions. Role of fatsoluble 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 harmones 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. En ocrin glands in health and disease.

2.2 Blood constituents.—Properties and functions-blood cell forma on Haem globin synthesis and chemistry-plasma proteins production, classificatio and properties, coagulation of blood; Haemorrhagic disorders—anti-c agu nts—b groups—Blood volume—Plasma expanders-Buffer systems in b ood. Bi hemical tests and their significance in disease diagnosis.

2.3 Circulation.—Physiology of heart, cardiac c cle, h rt sounds, heartbeat, electrocardiograms. Work and efficiency of hea —effect of ns on heart function-metabolism of cardiac muscle, nervous and chem al regulation of heart, effect of temperature and stress on heart, bl od p ssure and hypertension, osmotic regulation, arterial pulse, vasomotor r gulation circulation, shock. Coronary and pulmonary circulation, Blood-Brain ba er Cerebr spinal fluid-circulation in birds.

2.4 Respiration.—Mechanism of re iratio Transp t and exchange of gases-neural control of respiration-Chemo-r c ptors-hyp i espiration in birds.

2.5 Excretion.—Structure and functio of kidney-formation of urine-methods of studying renal function-renal regul n of ac base balance :
physiological con titu nts of ine-ren l failure-passive venous congestion-Urinary secretion in chicke Sweat glands and their function. Bio-chemical test for urinary dysfunction.

2.6 Endocrine g s.—Fu ctional disorders—their symptoms and diagnosis. Synthesis o hormones m hanism and control of secretion—hormonal receptors-classificatio and funct n.

2.7 Growth and nimal Production.—Prenatal and postnatal growth, maturation, growth curve meas s f growth, factors affecting growth, conformation, body omp sition, meat quality.

2.8 Ph si ogy f Milk Production, Reproduction and Digestion.—Current status of horm nal control of mammary development, milk secretion and milk ejection. Male nd Female reproductive organs, their components and functions. Digestive organs a d their functions.

2.9 Envi nmental Physiology.—Physiological relations and their regulation; mecha sms 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. Heard 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.— Developmen of p actical and economic rations for sheep, goats, pigs, rabbits and poultry. Sup ly of reens, fodder, feeding regimes for young and mature stock. New tre s in en ancing production and management. Capital and land requirement and s economic concept.

4.3 Feeding and management of animals under d oug flood a d other natural calamities.

5. Genetics and Animal Breeding :

5.1 History of animal genetics. Mitosis and Meiosis : M ndelian inheritance; deviations to Mendelian genetics; Expression of gen Link ge and crossing over; Sex determination, sex influenced and ex limite characters; Blood groups and polymorphism; Chromosome aberrat ns; Cytop smic inheritance, Gene and its structure; DNA as a genetic mater l; Gene c code and protein synthesis; Recombinant DNA technolo Mutati ypes of mutations, methods for detecting mutations and mutation ate, Transgenesis.

5.2 Population Genetics ap d to A mal Breeding— Quantitative Vs. Qualitative traits; Hardy W nbe g La Popu ion Vs. Individual; Gene and genotypic frequency; Forces nging ge frequency; Random drift and small populations; Theory of path coeffic nt; Inbreed ng, methods of estimating inbreeding coefficient, systems of in ding; Effective population size; Breeding value, estimation of breeding v ue, dominan and epistatic deviation; Partitioning of variation; Genotype X environme t correlation and genotype X environment interaction; role of mult ple m asureme ts; Resemblance between relatives.

5 3 Breed ng Syste s reeds of livestsock and Poultry. Heritability, repeatability and enet and phenotypic correlations, their methods of estimation and precision of es m es; d to selection and their relative merits; Individual, pedigree, family and hin family selection; Pregnancy testing; Methods of selection; Construction f selec on indices and their uses; Comparative evaluation of genetic gains through v ious selection methods; Indirect selection and correlated response; Inbreeding, out reeding, upgrading, cross-breeding and synthesis of breeds; Crossing of inbred es for commercial production; Selection for general and specific combining ability; B eeding 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 organells 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-Tera ology- ins and twinning-organogenesis-germ layer derivatives-endodermal, meso ermal and ectodermal derivatives.

1.3 **Bovine Anatomy.—**Regional Anatomy : Paranasal si ses OX— surface anatomy of salivary glands. Regional anatomy of in aorb l max y, mandi-buloalveolar, mental and cornnal nerve block. Regional anatomy of paravertebral nerves, pudental nerve, median, ulnar and radi ne estibial, fi ular and digital nerves—Cranial nerves-structures involved in ep dural an thesia-superficial lymph nodes-surface anatomy of visceral organs o horacic, bdominal and pelvic cavities-comparative-features of locomotor appara s and their application in the biomechanics of mammalian body.

1.4 **Anatomy of Fowl.**—Musculo-skelet system nctional anatomy in relation to respiration and flying, digestion and e g productio .

1.5 **Pharmacology and therapeut cs dr gs.**—Ce ular level of pharmacodynamics and pharmacokinetics. Drugs ng on flu nd electrolyte balance. Drugs acting on Autonomic nervous system. odern concepts of anesthesia and dissociative anaesthetics. Autocoids imicrob ls and principles of chemotherapy in microbial infections. Use o hor ones i therap utics—chemotherapy of parasitic infections. Drug and economic oncerns in the Edible tissues of animals— chemotherapy of Neoplastic diseases. oxicity due to “insecticides, plants, metals, non-metals, zootoxins an mycotoxin

1.6 **Veterinary ygiene with r ference to water, air and habitation.**—Assessment of pollution of water, air nd soil—Importance of climate in animal health—effect of enviro ment on an mal function and performance relationship between indus alisation d animal agriculture—animal housing requirements for specific teg ries of domestic animals viz. pregnant cows and sows, milking cows, broiler bir stres , ain and productivity in relation to animal habitation.

2. A imal D eases :

2.1 tiology epidemiology pathogenesis, symptoms, post-moretem lesions, diagnosis, an control of infectious diseases of cattle, sheep and goat, horses, pigs and poult

2.2 Etiolog epidemiology, symptoms, diagnosis, treatment of production diseases of cattle, h rse, 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, poisioning.

2.5 Diagnosis and treatment of neurological disorders.

2.6 **Principles and methods of immunisation of animals against specific diseases—hard immunity**—disease free zones—‘zero’ disease concept—chemoprophylaxis.

2.7 **Anaesthesia.** —local, regional and general-prenesthetic medication. Symptoms and surgical interference in fractures and dislocation. Hernia, choking abomassal displacement—Caesarian operations. Rumenotomy—Castrations.

2.8 **Disease investigation techniques.**—Materials for laboratory investigation—Establishment. Animal Health Centres—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 regulation, WTO, sanitary and phytosanitary measures.

3.3 **Veterinary Jurisprudence.**—Rules and Regulations for improv men of animal quality and prevention of animal diseases—State and Central R les fo prevention of animal and animal product borne diseases—S.P. C.A.—V ero egal ses—Certificates—Materials and Methods of collection of sample for vet rolegal investigation.

4. Milk and Milk Products Technology :

4.1 **Market Milk.**—Quality, testing and grading of r w k. Proce ing, packaging, storing, distribution, marketing defects and their control. P paration of the following milks : Pasteurized, standardized, toned, doub toned, s rilized, homogenized, reconstituted, recombined and flavoured milks. Preparation of cultured milks, cultures and their management, yoghu , Da Lassi nd Srikhand. Preparation of flavoured and sterilized milks. Legal standards Sanitation requirement for clean and safe milk and for the milk plant eq ipment.

4.2 **Milk Products Technology.**— elec n of ra materials, processing, storing, distributing and marketing m k product h as Cream, Butter, Ghee, Khoa, Channa, Cheese, condensed, e porated, dried milk and baby food, Ice cream and Kulfi; by-products, whey ducts, b tter milk, lactose and casein. Testing, grading, judging milk pro uct —BIS nd Agmark specifications, legal standards, quality control nutritive pro ties. Pac ging processing and operational control. Costing of dairy products.

5. Meat Hygiene and hnolo y :

5.1 **Meat Hygie e**

5.1.1 Ante mo em care nd management of food animals, stunning, slaughter and dre sing peration abattoir requirements and designs; Meat inspection pro edures d j dgment of carcass meat cuts— grading of carcass meat cut —duties and functions of Veterinarians in wholesome meat production.

5.1.2 **yg en thods of handling production of meat.**—
Sp lage of meat and control measures—Post-slaughter physicochemical chan es in meat and factors that influence them—Quality improvement methods—Adulteration of meat and detection— Regulatory provisions in Meat tr de and Industry.

5.2 **Meat Tec nology**

5.2.1 **Physical nd 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 utilisation—Edible and inedible by products— Social and economic implications of proper utilisation 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.

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, behavioura Sc nces, 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 evoluti
(b) Theories of Organic Evolution (Pre-Darwinian, Da inian and Post-Darwinian).
(c) Synthetic theory of evolution; Brief out ne terms nd concepts of evolutionary biology (Doll's rule, Cope's rule, Gau e's rule, arallel sm, convergence, adaptive radiation, and mosaic evolution).

1.5 Characteristics of Primates; Evolu onar Trend and Primate Taxonomy; Primate Adaptations; (Arboreal and Terres ri l) Prima Ta nomy; Primate Behaviour; Tertiary and Quaternary fossil primates; Liv g Major Primates; Comparative Anatomy of Man and Apes; Skeletal changes to ere posture and its implications.

1.6 Phylogenetic status, haracterist s and g graphical distribution of the following :

(a) Plio-preleistocene ominids in outh and East Africa—Australopithecines.
(b) *Homo erectus : Afri (Paranthr pus)*, Europe *(Homo erectus (heidelbergensis)*, Asia *(Homo us jav nicus, Homo erectus pekinensis.*
(c) Neanderth man—La- apelle-aux-saints (Classical type), Mt. Carmel (Progressi e type).
(d) Rhodesian an.
e) *Hom saoien* Cromagnon, Grimaldi and Chancelede.

1.7 The iolo cal basis of Life : The Cell, DNA structure and replication, Protein Synthesis, Gene, Mu a Chromosomes, and Cell Division.

1.8) Princ es of Prehistoric Archaeology. Chronology: Relative and Absolute Dating method

(b) C tural Evolution—Broad Outlines of Prehistoric cultures :
(i) P leolithic
(ii) Me olithic
(iii) Neo hic
(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-a-vis cultural Relativism.

2.2 **The Nature of Society :** Concept of Society; Society and Culture; Social Institution; Social groups; and Social stratification.

2.3 **Marriage :** Definition and universality; Laws of marriage (endogamy, exogamy, hypergamy, hypogamy, incest taboo); Type 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; Decent and Alliance.

3. **Economic Organization :** Meaning, scope and relevance of econo ic an ropology; Formalist and Substantivist debate; Principles governing producti n, dist bution and exchange (reciprocity, redistribution and market), in communities, su sist ng on unting and gathering, fishing, swiddening, pastoralism, horticulture, nd agr culture; globalization and indigenous economic systems.

4. **Political Organization and Social Control :** Band, tribe chiefdom, ingdom and state; concepts of power, authority and legitimacy; social ntr law and ustice in simple Societies.

5. **Religion:** Anthropological approaches to the udy of eligion (evolutionary, psychological and functional); monotheism and polyth m; sacred and profane; myths and rituals; forms of religion in tribal an pea nt So ieties (animism, animatism, fetishism, naturism and totemism); religio , magic a d science distinguished; magico-religious functionaries (priest, shaman m dicine man sorcerer and witch).

6. **Anthropological theories :**
   (a) Classical evolutionism (Tylor, Mo gan and r)
   (b) Historical particularism (Boas) Di sionism (British, German and American)
   (c) Functionalism (Malinowsk Structu l— Functionlism (Radcliffe-Brown)
   (d) Structuralism (L e i-St auss a d E. Le h)
   (e) Culture and person i (Benedi Mead, Linton, Kardiner and Cora-du Bois)
   (f) Neo—evolutionism (C lde, White, Steward, Sahlins and Service)
   (g) Cultural mater m (Ha s)
   (h) Symbolic an interpretive th ories (Turner, Schneider and Geertz)
   (i) Cognitive th ories (Tyle Conklin)
   (j) Post-modern m in anth opology.

7. **C lture, anguag nd Communication :**
   Nat e, o gin and characteristics of language; verbal and non-verbal communication; social on ex guage use.

8. **esearc methods in Anthropology :**
   (a) Fieldwo tradition in anthropology
   (b) D tinction between technique, method and methodology
   (c) Tool of data collection : observation, interview, schedules, questionnaire, case study, enealogy, life-history, oral history, secondary sources of information, particip ory 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 aberration- 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 f non metric and characters. Racial criteria, racial traits in relation to heredity and env onment; bi ogical basis of racial classification, racial differentiation and race crossing in an.

9.6 **Age, sex and population variation as genetic marker :**
ABO, Rh blood groups, HLA Hp, transferring, Gm, blood enzy es. Physiological characteristics-Hb level, body fat, pulse rate, res ira y functio s and sensory perceptions in different cultural and socio-ecomomic roups.

9.7 **Concepts and methods of Ecological Anthropolo y :**
Bio-cultural Adaptations—Genetic and Non-genetic factors. Man's physiological responses to environmental stresses: hot d ert, ld, hig altitude climate.

9.8 **Epidemiological Anthropology :** Healt and dise se. Infectious and non-infectious diseases, Nutritional deficiency related di ases.

10. **Concept of human growth and D velopment :** S ages of growth—pre-natal, natal, infant, childhood, adolescence, m ity, sene e.
—Factors affecting growth and d elopment genetic, environmental, biochemical, nutritional, cultural and socio onomic
—Ageing and senes nce Theor s and servations
—Biological and chr logical ngevity. Human physique and somatotypes. Methodologies for growth udies.

11.1 Relevance of m he, m nopause and other bioevents to fertility. Fertility patterns and differentia .

11.2 Demographic eories-bio gical, social and cultural.

11.3 Biologica and socio-eco ogical factors influencing fecundity, fertility, natality and ortality

12. **Ap lica ons of Anthropology :** Anthropology of sports, Nutritional anthropology, Anth p ogy designing of defence and other equipments, Forensic Anthropology, Method and principles of personal identification and reconstruction, Applied human ge etics— aternity diagnosis, genetic counseling and eugenics, DNA technology in dise es 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 the 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-case continuum.

3.3 Sacred Complex and Nature-Man-Spirit Complex.

3.4. Impact of Buddhism, Jainism, Islam and Christianity of Indian society

4. Emergence, growth and development in India— Contributions of he 18t , 19th and early 20th Century scholar-administrators. Contributions of Indian anth opolo sts to tribal and caste studies.

5.1 **Indian Village—**Significance of village study in India; India villa e as a al system; Traditional and changing patterns of settlement and in er-caste elations; Agrarian relations in Indian villages; Impact of globalization on I dia villages.

5.2 Linguistic and religious minorities and their social, po tical an economic status.

5.3 Indigenous and exogenous processes of socio-c tural cha ge in Indian society: Sanskritization, Westernization, Modernization; Inter-p y of little and great traditions; Panchayati Raj and social change; Media a d So al cha ge.

6.1 Tribal situation in India—Bio-genetic variabilit linguistic and socio-economic characteristics of the tribal populations an their distr ution.

6.2 **Problems of the tribal Communi es—** and alien tion, poverty, indebtedness, low literacy, poor educational faciliti s unemp nt, under-employment, health and nutrition.

6.3 Developmental projects an heir im act on tribal displacement and problems of rehabilitation. Deve pment of est po y and tribals. Impact of urbanisation and industrialization on trib opulation

7.1 Problems of exploitation nd deprivat on of Scheduled Castes, Scheduled Tribes and Other Backward sses Constitutional safeguards for Scheduled Tribes and Scheduled Cas es.

7.2 Social change and cont mporary tribal societies : Impact of modern democratic institution , dev opment ogrammes and welfare measures on tribals and weaker ctions.

7 3 Th con pt of ethnicity; Ethnic conflicts and political developments; Unrest among tribal ommu Regionalism and demand for autonomy; Pseudo-tribalism. Social ange mong the tribes during colonial and post-Independent India.

8.1 Imp ct of Hinduism, Buddhism, Christianity, Islam and other religions on tribal socie es.

8.2 Tribe and nation state—a comparative study of tribal communities in India and other countries.

9.1 History of dministration 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 eprod ction from evolutionary viewpoint; Distribution of Cryptogams in India and t ir cologi al and economic importance.
3. **Phanerogams :**
   Gymnosperms : Concept of Progymnosperms. Classi cation d distribution of gymnosperms. Salient features of Cycadales, Ginkg ales Coniferal and Gnetales, their structure and reproduction. General account of Cycado cales, Bennettitales and Cordiaitailes; Geological time scale; Type of fossils a d their stu y techniques.

   Angiosperms : Systematics, anatomy, embry l y palyn logy and phylogency.
   Taxonomic hierarchy; International Co e of B anica Nomenclature; Numerical taxomomy and chemotaxomomy; Eviden from ana my, embryology and palynology.

   Origin and evolution of angiosper s; C mparativ account of various systems of classification of angiosperms; S dy of a permic families— Mangnoliaceae, Ranunculaceae, Brassicaceae, Ro ceae, Fabaceae, Euphorbiaceae, Malvaceae, Dipterocarpaceae, Apiacea clepia ceae, Verbenaceae, Solanaceae, Rubiaceae, Cucurbitaceae, As rac ae, P aceae, Arecaceae, Liliaceae, Musaceae and Orchidaceae.

   Stomata and their t es; G andular and non-glandular trichomes; Unusual secondary growth; Anatom of C3 an C4 plants; Xylem and phloem differentiation; Wood anatomy.

   Development of ale and emale gametophytes, pollination, fertilization; Endosperm— it devel pment a d nction. Patterns of embryo development; Polyembroyony, apo ixes Applications of palynology; Experimental embryology including pollen storag a d tes e fertilization.
4. **P nt Res urce Development :**
   Domesticat n and introduction of plants; Origin of cultivated plants, Vavilov's centres of orig n Plants as sources for food, fodder, fibres, spices, beverages, edible oils, drugs, n cotics, insecticides, timber, gums, resins and dyes; latex, cellulose, starch and its pr ducts; 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) and membranes-cell adhesion, membrane transport and vesicular transport; Structure and function of cell organelles (chloroplasts, mitochondria, ER, dictyosomes ribosomes, endosomes, lysosomes, peroxisomes; Cytoskelaton 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, and gene versus allele concepts (Pseudoa eles) Qua itative genetics and multiple factors; Incomplete dominance, polygenic in tance, ultiple alleles; Linkage and crossing over of gene mapping includin lecul map (idea of mapping, function); Sex chromosomes and sex-linked inheritanc sex determination and molecular basis of sex differentiation; Mutations (bi mical and molecular basis); Cytoplasmic inheritance and cytoplasmic genes (inclu ng ge etics of male sterility).
   Structure and synthesis of nucleic acids and prote Geneti code and regulation of gene expression; Gene silencing; Multigene familie Organic evolution-evidences, mechanism and theories.

   Role of RNA in origin and evolution.
3. **Plant Breeding, Biotechnology and Bio tatistics :**
   Methods of plant breeding—intro uctio selecti n and hybridization (pedigree, backcross, mass selection, bulk ethod); tion, polyploidy, male sterility and heterosis breeding. Use of apomix in plant breeding; DNA sequencing; Genetic engineering—methods of t er of g es; Transgenic crops and biosafety aspects; Development and us of molecul marke s in plant breeding; Tools and techniques—probe, southern blotting DNA fing printing, PCR and FISH. Standard deviation and coefficient of variation (C Tests of significance (Z-test, t-test and chi-square tests). Probability and dist ibution (normal, binomial and Poisson). Correlation and regression.
4. **Physiology an Biochem stry :**
   Water r ation miner nutrition and ion transport, mineral deficiencies. P otosyn esis—ph t emical reactions, photophosphorylation and carbon fixation pathways C3, C4 and CAM pathways; Mechanism of pholem transport, Respiration (anero c and a bic, including fermentation)—electron transport chain and oxidative p ospho ation; Photorespiration; Chemiosmotic theory and ATP synthesis; Lipid me bolism; Nitrogen fixation and nitrogen metabolism. Enzymes, coenzymes; Energy transf and energy conservation. Importance of secondary metabolites. Pigments as photorec ptors (plastidial pigments and phytochrome). Plant movements; Photoperio sm 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. Concepts of biosphere; Ecosystems; Conservation; Pollution and its control (including phytoreme-diation); 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 of 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 in pendent); Interpretation of wave function, particle in one- dimensional box, uantu numbers, hydrogen atom wave functions; Shapes of s, p and d orbitals.
2. **Chemical bonding :**
   Ionic bond, characteristics of ionic compounds, lattice nerg Born er cycle; covalent bond and its general characteristics, polarities of onds in olecules and their dipole moments; Valence bond theory, concept of re on ce and re onance energy; Molecular orbital theory (LCAO method); bonding H2 +, H2 H $_2$ + to Ne_2, NO, CO, HF, CN^-, Comparison of valence bond and molecular bital the es, bond order, bond strength and bond length.
3. **Solid State :**
   Crystal systems; Designation of crystal f ces, lattic structures and unit cell; Bragg's law; X-ray diffraction by crystals; Close p cking, radiu ratio rules,
   calculation of some limiting radius tio v ues; Stru tures of NaCl, ZnS, CsCl, CaF_2; Stoichiometric and nonstoichiome i defects, ity defects, semi-conductors.
4. **The Gaseous State and Transport henomenon :**
   Equation of state for real g s, inter olecular interactions, and critical phenomena and liquefaction of g se Maxw ll's dis bution of speeds, intermolecular collisions, collisions on the wall a d effusion; ermal conductivity and viscosity of ideal gases.
5. **Liquid State :**
   Kelvin equation; ace t nsion and surface enercy, wetting and contact angle, interfacial tensi n and capillary ction.
6. **Thermodynam cs :**
   Work, hea and ternal en gy; first law of thermodynamics.
   S cond w of th mo ynamics; entropy as a state function, entropy changes in var us ocesses, entropy-reversibility and irreversibility, Free energy functions; Therm d na quation of state; Maxwell relations; Temperature, volume and p essure dependence of U, H, A, G, Cp and Cv, α and β ; J-T effect and inversion tem eratur criteria for equilibrium, relation between equilibrium constant and therm dynamic quantities; Nernst heat theorem, introductory idea of third law of thermod namics.
7. **Phase Equ bria and Solutions :**
   Clausius-C peyron 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 : amperometry, ion selective electrodes and their use.

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; Lan mu and B.E.T. adsorption isotherms; determination of surface area, characteristics a d mechanism of reaction on heterogeneous catalysts.

12. **Bio-inorganic Chemistry:**
Metal ions in biological systems and their role in ion ran ort acros the membranes (molecular mechanism), oxygen-uptake proteins, cy ochrom s and ferrodoxins.

13. **Coordination Chemistry :**
(i) Bonding in transition of metal complexes. Valence ond theory, crystal field theory and its modifications; applications of the ries the e planation of magnetism and elctronic spectra of metal complexes.
(ii) Isomerism in coordination compoun s; IUPAC nomenclature of coordination compounds; stereochemistry of ompl xes with 4 and 6 coordination numbers; chelate effect and polynuclear omplexes; effect and its theories; kinetics of substitution reactions in square lanar complexes; thermodynamic and kinetic stability of complexes.
(iii) EAN rule, Synthes structure nd reac vity of metal carbonyls; carboxylate anions, carbonyl hydrides an etal nitro l compounds.
(iv) Complexes with aroma systems, synthesis, structure and bonding in metal olefin complexes, alky com lexes and cyclopentadienyl complexes; coordinative unsaturation xidative additi reactions, insertion reactions, fluxional molecules and their characte zation; Compounds with metal—metal bonds and metal atom clusters.

14. **Main Group C emistry**
Borane borazin phosphazenes and cyclic phosphazene, silicates and silicones, In rha gen compounds; Sulphur—nitrogen compounds, noble gas compounds.

15. **Gen ra C i try of 'f' Block Element:**
Lantha des and actinides: separation, oxidation states, magnetic and spectral p pertie lanthanide contraction.

PAPER-II

1. **Delocali ed Covalent Bonding :**
Aromaticity, anti-aromaticity; annulenes, azulenes, tropolones, fulvenes, sydnones.

2. (i) **Reaction mechanisms :** General methods (both kinetic and non-kinetic) of study of mechanisms or organic reactions : isotopies, mathod 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 carboniumions and carbanions, free radicals, carbenes, benzynes and nitrenes.

(iii) **Substitution reactions :—** S_N 1, S_N 2, and S_N i, 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—acetate pyrolysis, 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 R chter reactions; Stobbe, benzoin and acyloin condensations; Fischer indole synthe is, Skraup synthesis, Bischler-Napieralski, Sandmeyer, Reimer-Tiemann an Refo matsky reactions.

3. **Pericyclic reactions :—**Classification and examples; Woodw rd-Ho n rules— electrocyclic reactions, cycloaddition reactions [2+2 and 4+2] an sigmatropic shifts [1, 3; 3, 3 and 1, 5], FMO approach.

4. (i) **Preparation and Properties of Polymers** Orga polymerspolyethylene, polystyrene, polyvinyl chloride, teflon, nylo terylene synthetic and natural rubber.

(ii) Biopolymers: Structure of proteins NA d RNA

5. **Synthetic Uses of Reagents:**

OsO_4, HIO_4, CrO_3, $Pb(OAc)_4$, SeO_2, N S, B_2H_6, a-Liquid NH_3, $LiAlH_4$, $NaBH_4$, n-BuLi, MCPBA.

6. **Photochemistry :—**Photochemica actions i le organic compounds, excited and ground states, singlet and triplet st es, Norrish-Type I and Type II reactions.

7. **Spectroscopy:**

Principle and appli tio s in str cture e cidation :

(i) **Rotational—**Diatom molecule isotopic substitution and rotational constants.

(ii) **Vibrational—**Diatomi molecules, linear triatomic molecules, specific frequencies of functional g ps in p yatomic molecules.

(iii) **Electronic—**Singlet and tr let states. $n \rightarrow \pi^*$ and $\pi \rightarrow \pi^*$ transitions; application to conjugated double b nds and conjugated carbonyls Woodward-Fieser rules; Charg trans r spectr

(i **Nucle r Magn ic R sonance (^{1}HNMR) :** Basic principle; chemical shift and spin-pin i eraction and coupling constants.

(v) **M s Sp metry :—**Parent peak, base peak, metastable peak, McLafferty rearr gement.

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 non-uniform 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: Mecaulay'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 :**

Castiglianio's theorems I and II, unit load method, of consistent de rmat on ap lied to beams and pin jointed trusses. Slope-deflection, moment distribution

Rolling loads and Influences lines : Influences lines for She Forc Bending moment at a section of a beam. Criteria for maximum shea force a d bending Moment in beams traversed by a system of moving loads. Influ s lines for imply supported plane pin jointed trusses.

Arches : Three hinged, two hinged and fixed arch rib sho ning and temperature effects.

Matrix mehods of analysis : Force metho an displa ment method of analysis of indeterminate beams and rigid frames.

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

Unsymmetrical bending : Moment o inertia, odu of inertia, position of Neutral Axis and Principal axes, calculation of be ding stresses.

2. Design of Structures : Steel Concre e and Masonry Structures.

2.1 Structural Steel De ign

Structural steel : Fact s of safety nd load factors. Riveted, bolted and welded joints and connections. Desig of tension and compression members, beams of built up section, riveted an elded late girders, gantry girders, stancheons with battens and lacings.

2.2 Design of Con rete and Masonry Structures :

Concept of mix esign. Re nforced Concrete : Working Stress and Limit State method f design— Reco mend tions of I. S. codes. Design of one way and two way slabs, sta case slabs, simple and continuous beams of rectangular, T and L sections. Comp es mbers under direct load with or without eccentricity.

antilev and Counter fort type retaining walls.

Wa r tank : Design requirements for Rectangular and circular tanks resting on groun

Prestres d Concrete : Methods and systems of prestressing, anchorages, Analysis and design f sections for flexure based on working stress, loss of prestress.

Design of b ick 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 curve 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, 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 correctio facto , specific energy and specific force, critical depth, rapidly varied flow, hydra c ju p, g dually varied flow, classification of surface profiles, control section, step me d of int gration of varied flow equation.

3.6 Hydraulic Machines and Hydropower :

Hydraulic turbines, types classification, Choice of turb s perform nce parameters, controls, characteristics, specific speed.

Principles of hydropower development.

4. Geotechnical Engineering :

Soil Type and Structure—gradation and parti l ize dis bution—consistency limits.

Water in soil—capillary and structural— ffective ress and pore water pressure—permeability concept—filed and laborat ry determ ation of permeability—Seepage pressure—quick sand conditions— hea strength determination— Mohr Coulomb concept.

Compaction of soil—Laboratory and ed test.

Compressibility an con olid on co ept— consolidation theory—consolidation settlement analysis.

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

Bearing capac y of soil— pproaches for analysis- Filed tests—settlement analysis—stability of slope of earth w k. Subsuface exploration of soils—methods

F undatio —Type d s lection criteria for foundation of structures—Design criteria for fou datio —Analysis of distribution of stress for footings and pile—pile group action—pile lo d t st

G ound im rovement techniques.

PAPER-II

1. Construc ion Technology, Equipment, Planning and Management

1.1 Construc on 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 stength concrete.

Timber; Properties 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.

Principle 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 indus y—Quality assurance principles.

Use Basic principle of network—analysis in form of CPM and PE T—thei use in construction monitoring, Cost optimization and resource a ocati

Basic principles of Economic analysis and methods.

Project profitability—Basic principles of Boot approa h to nancial pl ning-simple toll fixation criterions.

2. Surveying and Transportation Engineering

2.1 Surveying : Common methods and instruments for d tance and angle measurement for CE work—their use in plane table, tra erse urvey levelling work, triangulation, contouring and topographical map.

Basic principles of photogrammetry and r mote sens g.

2.2 Railways Engineering : Perman t wa — comp nents, types and their function-Functions and Design constitue s of turn d crossing— Necessity of geometric design of track—Design of station an yards.

2.3 Highway Engineering :

Principles of Highwa alignment —classi ation and geometrical design elements and standards for Roads.

Pavement structure for flexible and rigid pavements—Design principles and methodology of p ents.

Typical constru tion methods nd standards of materials for stabilized soil, WBM, Bituminous wo s and CC oads.

Surface a d sub surface d ainge arrangements for roads—culvert structures.

P vemen distress an strengthening by overlays.

Tra c su veys and their application in traffic planning—Typical design features for chann liz d, section rotary etc.—signal designs—standard Traffic signs and arking

3. Hy ology, Water Resources and Engineering :

3.1 Hydr logy :

Hydrolog cal cycle, precipitation, evaporation, transpiration, infiltration, overland flow, hydrograp flood frequency analyses, flood routing through a reservoir, channel flow routing—M skingam method.

3.2 Ground Water flow :

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

3.3 Water Resources Engineering :

Ground and surface water resources, 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 cannal 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 head work : Principles and design of weirs on 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 heir gnifica , physical, chemical and bacteriological analysis, waterborne dise ses, sta dards for potable water.

4.2 Intake of Water :

Water treatment: principles of coagulation, flocc ation and sedimentation; slow-, rapid-, pressure-, filters; chlorination, softening remo l of taste, odour and salinity.

4.3 Sewerage Systems :

Domestic and industrial wastes, store ewage— eparate and combined systems, flow through sewers, design of sewers.

4.4 Sewage Characterisation :

BOD, COD, solids, dissolved o y en, nitro nd TOC. Standards of disposal in normal water course and on land.

4.5 Sewage Treatment :

Working principles, unit , cham ers, s dimentation tank, trickling filters, oxidation ponds, activated sludg process, eptic tank, disposal of sludge, recycling of waste water.

4.6 Solid waste :

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

5. Environmental pollution :

ustaina le deve m t. Radioactive wastes and disposal. Environmental impact as ssm nt for thermal power plants, mines, river valley projects. Air pollution. Pollu n co cts.

COMMERCE AND ACCOUNTANCY

PAPER-I

Accounting and Finance

Accounting, Taxation & Auditing

1. Financing 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.
Emplyees Stock Option and Buy-Back of Securities.
Preparation and Presentation of Company Final Accounts.
Amalgamations, 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 T ol of P anning and Control. Standard Costing and Variance Analysis.
Responsibility Accounting and Divisional Perfor-mance Measurement

3. Taxation :

Income Tax: Definitions. Basis of charge; Incomes whic do no form part of total income. Simple problems of Computation of Income (in viduals on) under various heads, i.e., Salaries, Income from House Property P ofits an Gains from Business or Profession, Capital Gains, Income from other so ces, Inc e of other Persons included in Assessee's Total Income.
Set-off and Carry forward of Loss. Deduction from Gross otal Income.
Salient Features/Provisions Related to VAT and Serv es Tax.

4. Auditing :

Company Audit: Audit related to Divi ble P fits, Divi ends, Special investigations, Tax audit.
Audit of Banking, Insurance, Non-P fit Organization and Charitable Societies/Trusts/ Organizations.

Financial Managemen Financial I stitutio s and Markets

1. Financial Managemen

Finance Function : Nature Scope and Objectives of Financial Management : Risk and Return Relationshi
Tools of Financi Analysis: Rat Analysis, Funds-Flow and Cash-Flow Statement.
Capital Budgeti g Decision : Process, Procedures and Appraisal Methods. Risk and Uncertainty Anlys and Me ods.
C t of Ca ital : Co ept Computation of Specific Costs and Weighted Average Cost of Cap l C PM as aTool of Determining Cost of Equity Capital.
Financ g e : Theories of Capital Structure—Net Income (NI) Approach.
N t Ope ing Income (NOI) Approach, MM Approach and Traditional Approach. Des ning Capital structure: Types of Leverages (Operating, Financial and Comb ed), EBIT-EPS Analysis, and other Factors.
Dividend ecisions and Valuation of Firm :Walter's Model, MM Thesis, Gordan's Model Lintner's M del. Factors Affecting Dividend Policy.Working Capital Management: Planning of orking Capital. Determinants of Working Capital. Components of Working Capital—Cash,
Inventory and Receivables. Corporate Restructuring with focus on Mergers and Acquisitions (Financial aspect 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 Behaviours, Human Resource Management and Industrial Relations

Organisation Theory and Behaviour

1. **Organisation Theory :**

Nature and Concept of Organisation; External Environment of Organisation—Technological, Social, Political, Ecomomical and Legal; Organization Go ls Primary and Secondary Goals, Single and Multiple Goals; Management by Ob ectives

Evolution of Organisation theory : Classical Neo-classical and system app ach.

Modern Concepts of Organisation Theory : Organisational Desig Organi ational Structure and Organisational Culture.

Organisational Design—Basic Challenges; Differentiation and In ergration Process; Centralization and Decentralization Process; Standard a n/Formaliz tion and Mutual Adjustment. Coordinating Formal and Informal Organ zations Mechanistic and Organic Structures.

Designing Organizational structures—Authority and C ntrol; Line and Staff Functions, Specialization and Coordination. Types of g zation Structure—Functional. Matrix Structure, Project Structure. Nature and Basis of ower, Sources of Power, Power Structure and Politics. Impact of Informat n Technol y on Organizational Design and Structure.

Managing Organizational Culture.

2. **Organisation Behaviour :**

Meaning and Concept; Individual organization: Personality, Theories, and Determinants; Perec tion Meani g and P cess.

Motivation : Concepts, Theories an Applica-tions. Leadership—Theories and Styles. Quality of Work Life (QW): Meanin and its impact on Performance, Ways of its Enhancement. Qu Circl (QC)—Meaning and their Importance. Management of Conflicts in Or anizations. ans-actional Analysis, Organizational Effectiveness, Management of hange.

H man R sources Management and Industrial Relations

Huma R rces Management (HRM) :

Meaning ature and Scope of HRM, Human Resource Planning, Job Analysis, Job De ription Job Specification, Recruitment Process, Selection Process, Orientational and P aceme t, Training and Development Process, Performance Appraisal and 360° Feed B ck, Salary and Wage Administration, Job Evaluation, Employee Welfare, Promotion Transfers and Separations.

2. **Industrial R lations (IR) :**

Meaning, Nature, Importance and Scope of IR, Formation of Trade Union, 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 Labour Turnover in Indian Industries and their Causes and Remedies.
ILO and its Functions.

ECONOMICS

PAPER-I

1. Advanced Micro Economics :

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

2.Advance Macro Economics :

Approaches to Employment Income and Interest Rate dete inatio Classical, Keynes (IS)-LM) curve, Neo-classical synthesis and New c assical, heories of Interest Rate determination and Interest Rate Structure.

3. Money-Banking and Finance :

(a) Demand for and Supply of Money : Money M iplier Qua tity Theory of Money (Fisher, Pique and Friedman) and Keyne's Theory on Demand for Money, Goals and Instruments of Monetary Manag men in Clo ed and Open Economies. Relation between the Central Bank an the Trea ury. Proposal for ceiling on growth rate of money.
(b) Public Finance and its Role mar et Econ my : In stabilisation of supply, allocative, of resources an in distri i n and development. Sources of Government revenue, forms of xes and Subsidies, their incidence and effects. Limits to taxation, loan rowding out effects and limits to borrowings. Public expenditure and ef ects.

4. International Economic

(a) Old and New theories f International Trade.
(i) Comparat e advanta e,
(ii) Terms o Trade and Off Curve.
(iii) Produc Cycle and trategic Trade Theories.
(iv) Tr de as an engin of growth and theories of underdevelopment in an open ec nomy.
(b) orm of Protection : Tariff and quota.
(c) Ba n e o ents Adjustment : Alternative Approaches.
(i) P ce versus income, income adjustments under fixed exchange rates.
(ii) The ies of Policy Mix.
(i Exchange rate adjustments under capital mobility.
(iv) F ating Rates and their Implications for Developing Countries : Currency Bo ds.
(v) Tra e Policy and Developing Countries.
(vi) BOP, adjustments and Policy Coordination in open economy macromodel.
(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 Unbalanced Growth.
(iv) Human Capitals and Economic Growth.
(v) Research and Development and Economic Growth.

(b) Process of Economic Development of less developed courtries : Myrdal and Kuzments 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 an Non enewable Resources, Environmental Degradation, Intergenerational equity evelopment

PAPER-II

Indian Economics in Post-Independence Era :

Land System and its changes, Commercialization of agri ultur Drain the y, Laissez faire theory and critique. Manufacture and Transport : Jut , Cotto Railways, Money and Credit.

Indian Economy After Independence :

A. The Pre-Liberalization Era :
(i) Contribution of Vakil, Gadgil and V.K. V. Rao.
(ii) Agriculture: Land Reforms and land nure syst m, Green Revolution and capital formation in agriculture.
(iii) Industry Trends in composition nd growth le of public and private sector, small scale and cottage industries.
(iv) National and Per cap ncome Patterns, trends, aggregate and sectoral composition and anges the in.
(v) Broad factors deter ning Natio al Income and distribution, Measures of poverty, Trends in poverty and equality.

B. The Post-Liberal zation Era :
(i) New Economic Reform an Agriculture : Agriculture and WTO, Food processing, subsidies, gricultural prices and public distribution system, Impact of public expen iture agricult ral growth.
(New conomic l y and Industry : Strategy of industrialization, Privatization, sinv stments, Role of foreign direct investment and multinationals.
(iii) Ne cono Policy and Trade : Intellectual property rights : Implications of TRIP TRIMS, GATS and new EXIM policy.
(iv) ew Ex hange Rate Regime : Partial and full convertibility, Capital account co vertibility.
(v) New Economic Policy and Public Finance : Fiscal Responsibility Act, Twelfth Financ Commission and Fiscal Federalism and Fiscal Consolidation.
(vi) New Ec nomic Policy and Monetary System. Role of RBI under the new regime.
(vii) Planning : From central Planning to indivative 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. Circuits—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 and Systems :

Representation of continuous-time and discrete-time signals and systems; LTI systems; convolution; impulse response; time-domain analysis of LTI systems based on convolution and differential/difference equations. Fourier transform, Laplace transfo , Z transform, Transfer function. Sampling and recovery of signals DFT, FFT Pro essing of analog signals through discrete-time systems.

3. E.M. Theory :

Maxwell's equations, wave propagation in bounded media. Bou y con ions eflection and refraction of plane waves. Transmission lines : trav ling a d standing waves, impedance matching, Smith chart.

4. Analog Electronics :

Characteristics and equivalent circuits (large and sm signal) o Diode, BJT, JFET and MOSFET. Diode circuits : Clipping, clamping, rectifier. Biasing a d bias stability. FET amplifiers. Current mirror; Amplifiers : single d multi age, differential, operational feedback and power. Analysis of amplifiers frequen y-resp nse of amplifiers. OPAMP circuits. Filters; sinusoidal oscillators : criterio for oscilla on; single-transistor and OPAMP configurations. Function generators and ave shaping c cuits. Linear and switching power supplies.

5. Digital Electronics :

Boolean algebra; minimisation of Boolea functions; logic gates; digital IC families (DTL, TTL, ECL, MOS, CMOS). C mbin tional cuits : arithmetic circuits, code converters, multiplexers and decode equenti circuits: latches and flip-flops, counters and shift-registers. Comparators, time multivibr ors. Sample and hold circuits, ADCs and DACs. Semiconductor memori s Log implementation using programmable devices (ROM, PLA, FPGA).

6. Energy Conver on :

Principles of electr mechanica energy conversion : Torque and emf in rotating machines. DC machine : char teristi and performance analysis; starting and speed control of motor Tran ormers : principles of operation and analysis; regulation, efficiency; 3-phase nsform rs hase induction machines and synchronous machines : characteristics and performanc nalysis; speed control.

7. Po er Ele ronics and Electric Drives :

Semi-co ductor ower devices : diode, transistor, thyristor, triac, GTO and MOSFET-static characteri cs and principles of operation; triggering circuits; phase control rectifiers; bridge conve ers : 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; narrows band 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 or AM and FM receivers.

PAPER-II

1. Control Systems :
Elements of control systems; block-diagram representations; 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 polor plots, Nyquist's criterion; Design of lead-lad compensators. Proportional, PI, PID controllers. State-variable representation and analysis of control systems.

2. Microprocessors and Microcomputers :
PC organisation; CPU, instruction set, register settiming diagram, progr mming, int rrupts, memory interfacing, I/O interfacing, programmable peripheral devices.

3. Measurement and Instrumentation :
Error analysis; measurement of current voltage, power, ener y, pow r-factor, resistance, inductance, capacitance and frequency; bridge measureme t Signal nditioning circuit; Electronic measuring instruments : multimeter, CRO, dig tal v meter, frequency counter, Q-meter, spectrum-analyser, distoration-meter. Tran d cers : t rmocouple, thermistor, LVDT, strain-guage, piezo-electric crystal.

4. Power Systems: Analysis and Control :
Steady-state performance of overhead transm ssion es an cables; principles of active and reactive power transfer and distributi n; per-uni quantities; bus admittance and impedance matrices; load flow; voltage co rol and p wer factor correction; economic operation; symmetrical components, a alysis f symmetrical and unsymmetrical faults. Concepts of system stability : swing c ves and eq al area criterion. Static VAR system. Basic concepts of HVDC transmission.

5. Power System Prot ction
Principles of overcurrent, diff ential a d distance protection. Concept of solid state relays. Circuit brakers. Computer a ed protect n : introduction; line, bus, generator, transformer protection; numeric relays and pplication of DSP to protection.

6. Digital Communi ation :
Pulse code mod ation (PCM), defferential pulse code modulation (DPCM), delta modulation (DM), gital mod ation and demodulation schemes : amplitude, phase and frequency ke ng sc emes (SK, PSK, FSK). Error control coding : error detection and corre on, lin ar block c s, convolation codes. Information measure and source coding. Data ne work 7 layer architecture.

GEOGRAPHY

PAPER-I

PRINCIPLES O GEOGRAPHY

Physical Geography :

1. **Geomorphology :** Factors controlling landform development; endogenetic and exogenetic forces; Origin and evolution of the earth's crusts; Fundamentals of geomagnetism; Physical conditions of the earth's interior; Geosynclines; Continental drift; Isostasy; Plate tectonics; Recent views on mountain building; Volcanicity; Earthquakes and Tsunamis; Concepts of geomorphic cycles and Land scape development; Denudation chronology; Channel morphology; Erosion

surfaces; Slope development; Applied Geomorphology; Geomorphology, 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; Temperate and tropical cyclones; Types and distribution of precipitation; Weather and Climate; Koppen's Thornthwaite's and Trewar Tha's classification of world climate; 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 ea d marine pollution.
4. **Biogeography :** Genesis of soils; Classification and distribution f so s; Soi profile; Soil erosion, Degrada-tion and conservation; Factors influencing orld dis ibution of plants and animals; Problems of deforestation a d co servat measures; Social forestry, agro-forestry; Wild life; Major gene pool centres.
5. **Environmental Geography :** Principle ecology Hu an ecolog al adaptations; Influence of man on ecology and environmen Globa and regional ecological changes and imbalances; Ecosystem their anagem t and conservation; Environmental degradation, management and onservation; Biodiversity and sustainable development; Environme tal p licy; nvironmental hazards and remedial measures; Environmental ed cation an legislation.

Human Geography :

1. **Perspectives in Human Geog aphy** Areal d ferentiation; Regional synthesis; Dichotomy and dualism; Env mentalis Quantitative revolution and locational analysis; Radical, behavioural, human and welfare approaches; Languages, religions and secularisa ; Cultu l regions of the world; Human development indix.
2. **Economic Geogra y :** Wo d economic development: measurement and problems; World resou es and the r distribution; Energy crisis; the limits to growth; World agricult typo gy of agricultural regions; Agricultural inputs and productivity; ood and nutr ons problems; Food security; famine: causes, effects and remedie ; World in ustries: location patterns and problems; Patterns of world trade.
3. **Popul ion an Se tlement Geography :** Growth and distribution of world p pula on; Demographic attributes; Causes and consequences of migration; Co e ts ver-under-and optimum population; Population theories, world popul on problems and policies, Social well-being and quality of life; Population as cial ca ital.

   Typ s and patterns of rural settlements; Environmental issues in rural settlements; Hiera hy of urban settlements; Urban morphology; Concept of primate city and rank-siz rule; Functional classification of towns; Sphere of urban influence; Rural-urban fr ge; 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 :**
   System 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. Heart-land and Rimland theories; Laws of international boundaries and frontiers.

PAPER-II

GEOGRAPHY OF INDIA

1. **Physical Setting :** Space relationship of India with neighbouring 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; E ergy c is.
3. **Agriculture :** Infrastructure: irrigation, seeds, fertilizers, power; nstitut nal factors; land holdings, land tenure and land reforms; Cropping p tte n, agr ultural productivity, agricultural intensity, crop combination, land ability; Agro and social-forestry; Green revolution and its socio-economic nd e logical mplications; Significance of dry farming; Livestock resources and w ite revol ion; Aqua-culture; Sericulture, Agriculture and poultry; Agricultural re iona ation; Agr -climatic zones; Agro-ecological regions.
4. **Industry :** Evolution of industries; Locational fact s of cotto jute, textile, iron and steel, aluminium, fertiliser, paper, chemical and phar aceutical, automobile, cottage and ago-based industries; Industrial ho ses a d comp exes including public sector underkings; Industrial regionalisation New ind strial policy; Multinationals and liberalisation; Special Economic Zones Tourism in uding ecotourism.
5. **Transport, Communication and Tra :** Roa , railway, waterway, airway and pipeline net works and their co lementary es in regional development; Growing importance of ports on national nd foreign trade; Trade balance; Trade Policy; Export processing zo ; Develo ments in communication and information technology and th impacts o economy and society; Indian space programme.
6. **Cultural Setting :** torical Pe spective of Indian Society; Racial linguistic and ethnic diversities; religi us minorities; Major tribes, tribal areas and their problems; Cultural regions; Growth distribution and density of population; Demographic attributes: s x-ratio, age s ucture, literacy rate, work-force, dependency ratio, longevity; m ration (int -regional, interaregional and international) and associated proble s; Pop lation p blems and policies; Health indicators.
7. **Settle ents :** s, patterns and morphology of rural settlements; Urban d velo ments; Morphology of Indian cities; Functional classification of Indian cities; Con ations nd metropolitan regions; Urban sprawl; Slums and asssociated proble s; Town planning; Problems of urbanisation and remedies.
8. **R giona Development and Planning:** Experience of regional planning in India; Fiv Year Plans; Integrated rural development programmes; Panchayati Raj and decen alised planning; Command area development; Watershed management; Planning for backward area, desert, drought-prone, hill tribal area development; Multi-lev l 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 related 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; lcanoes—causes and products, Volcanic belts. Earthquakes—causes, effects, seism c of zone of India; Island arcs, trenches and mid-ocean ridges; Continental drift; e loor s eading, plate tectonics. Isostasy.

2. Geomorphology and Remote Sensing :

Basic concepts of geomorphology. Weathering and soil fo ions; Landforms, slopes and drainage. Geomorphic cycles and their interpretation Morp ology and its relation to structures and lithology; Coastal geomorphology; App c tions of omorphology in mineral prospecting, civil engineering; hydrology and environm ntal stud s; Geomorphology of Indian sub-continent.

Aerial photographs and their interpretation—merits d lim tions; The Electromagnetic spectrum. Orbiting Satellites and Sensor ystems. dian Remote Sensing Satellites. Satellite data products; Applications re ote sens ng in geology; The Geographic Information System (GIS) and Global Positionin System (GPS)—its applications.

3. Structural Geology :

Principles of geologic mapping and map reading, projection diagrams, Stress and strain ellipsoid and stress-st ain rel tion hips o elastic, plastic and viscous materials; Strain markers in deformed roc Behaviou of minerals and rocks under deformation conditions. Folds and faults classifica n and m chanics; Structural analysis of folds, foliations, lineations, joints and faults, u conformities; Time-relationship between crystallization and deformation.

4. Paleontology :

Species—definition and nome clature; Megafossils and Microfossils. Modes of preservation of fossils; Dif rent k ds of m rofossils; Application of microfossils in correlation, petroleum explo tion, p leoclimatic and paleoceanographic studies; Evolutionary trend in Hominidae, Equidae nd oboscidae. Siwalik fauna.

Gondwana a and fauna and its importance; Index fossils and their significance.

5. In an Str igraphy :

Classifi tion o stratigraphic sequences: lithostrati-graphic, biostratigraphic, chrono-stratigraph and magnetostratigraphic and their interrelationships; Distribution and classification f Precambrian rocks of India; Study of stratigraphic distribution and lithology of Phanerozoic ocks of India with reference to fauna, flora and economic importance. Major boundary prob ems—Cambrian/ Precambrian, Permian/Triassic, Cretaceous/Tertiary and Pliocene/Pleistocene; Study of climatic conditions, paleogeography and igneous activity in the Indian sub-continent 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, exti ction a gle, double refraction, birefringence, twinning and dispersion in minerals.

2. Igneous and Metamorphic Petrology :

Generation and crystallisation of magmas. Crystallisation of b —an thite diopside—anorthite and diopside— wollastonite—silica systems. Bowen' Reacti n Principle; Magmatic differentiation and assimilation. Petrogenetic significance he textur and structures of igneous rocks. Petrography and petrogenesis of granite, syenit diorite, basic and ultrabasic groups, charnockite, anorthosite and alkaline rocks. Ca onatites. ccan volcanic province.

Types and agents of metamorphism. Metamorphic grade and zones; Phase rule. Facies of regional and contact metamorphism; ACF and F diagr ms; Textures and structures of metamorphic rocks. Metamorphism of arena eous, a illaceo s and basic rocks; Minerals assemblages. Retrograde metamorphism; Metasoma m and granitisation, migmatites. Granulite terrains of India.

3. Sedimenary Petrology :

Sedimentas and Sedimentary rocks: rocesses of formation; digenesis and lithification; Clastic and non-clastic rocks-their classif ation, petrography and depositional environment; Sedimentary facies an prov nanc Sedim ntary structures and their significance. Heavy minerals and their signific c . Sedim tary basins of India.

4. Economic Geology :

Ore, ore mineral and ngue tenor of ore. Classification of ore deposits; Processes of formation of miner deposits; ntrols of ore localisation; Ore texures and structures; Metallogenic epoc s and pro nces; Geology of the important Indian deposits of aluminium, chromium, copper, old, iron ead, zinc, manganese, titanium, uranium and thorium and indu trial mi erals; eposit of coal and petroleum in India, National Mineral Policy; Conse vation and utilization of mineral resources. Marine mineral resources and Law of Sea.

Mining Ge gy :

Methods prospecting—geological, geophysical, geochemical and geobotanical; Techn ques o sampling. Estimation of reserves of ore; Methods of exploration and mining-metallic res, industrial minerals, marine mineral resources and building stones. Mineral beneficiati and ore dressing.

6. Geochemi try and Environmental Geology :

Cosmic abund ce 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 account: 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 ar hitecture.

4. Megalithic Cultures :

Distribution of pastoral and farming cultures outside the Indus, Develop ent of c mmunity life, Settlements, Development of agriculture, Crafts, Pottery, an lro indus y

5. Aryans and Vedic Period :

Expansions of Aryans in India :

Vedic Period: Religious and philosophic literature; Tran format n from Rig Vedic period to the later Vedic period; Political, social and economic ife; Sign cance of the Vedic Age; Evolution of Monarchy and Varna system.

6. Period of Mahajanapadas :

Formation of States (Mahajanapada): Repub ics and monar hies; Rise of urban centres; Trade routes; Economic growth; Introductio of coinag Spread of Jainism and Buddism; Rise of Magadha and Nandas.

Iranian and Mecedonian invasions and t eir imp t

7. Mauryan Empire :

Foundation of the Mauryan Empire, Ch ndragupta, Kautilya and Arthashastra; Ashoka; Concept of Dharma; E ts; P lity, dminist tion, Economy; Art, architecture and sculpture; External contacts; Religion Spread of ligion; Literature.

Disintegration of the empire; ungas and anvas.

8. Post-Mauryan P iod (I do-Greeks, Sakas, Kushanas, Western Kshatrapas) :

Contact with outsid world; gro h of urban centres, economy, coinage, development of religions, Mahayan social co ditions, art, architecture, culture, literature and science.

9. Early State a d Society in Eastern India, Deccan and South India:

Khar vela, T e Sata hana Tamil States of the Sangam Age; Administration, Economy, land g nts, oinage, trade guilds and urban centres; Buddhist centres; Sangam literature d cultu ; A d architecture.

10. Guptas akatakas and Vardhanas:

Polity nd adm nistration, Economic conditions, Coinage of the Guptas, Land grants, Decline of urban centres, Indian feudalism, Caste system, Position of women, Education and educationa institutions; Nalanda, Vikramshila and Vallabhi, Literature, scientific literature, art and architect e.

11. Regional S ates during Gupta Era:

The Kadambas, Pallavas, Chalukyas of Badami; Polity and Administration, Trade guilds, Literature; growth of Vaishnava and Saiva religions. Tamil Bhakit movement, Shankaracharya; Vedanta; Institutions of temple and temple architecture; Palas, Senas, Rashtrakutas, Paramaras, Polity and administration; Cultural aspects. Arab conquest of Sind; Alberuni, The Chaluky as 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: Skankaracharya and Vedanta, Ramanuja and Vishishtadvaita, Madhva and Brahma-Mimansa.
— Religion: Forms and features of religion, Tamil devotional cult, growth o Bh ti Islam and its arrival in India, Sufism.
— Literature: Literature in Sanskrit, growth of Tamil literature, lite atur in t e 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 in ns - fact s behind Ghurian success.
— Economic, Social and cultural consequences.
— Foundation of Delhi Sultanate and early Turkish Sultan
— Consolidation: The rule of Iltutmish and Balba

16. The Fourteenth Century:

— “The Khalji Revolution”.
— Alauddin Khalji: Conquests and territo l exp nsion, ag arian and economic measure.
— Muhammad Tughluq: Major project , agrar n me sures, bureaucracy of Muhammad Tughluq.
— Firuz Tugluq: Agrarian measu es, ach vements in civil engineering and public works, decline of the Sultanate foreign con cts and bn Battuta's account.

17. Society, Culture and c nomy in he Thirteenth and Fourteenth Centuries:

— Society: composition of ral society ruling classes, town dwellers, women, religious classes, caste and sla und the Sultanate, Bhakti movement, Sufi movement.
— Culture: Persian li erature, litera re in the regional languages of North India, literaute in the languages of South ndia, Sult nate architecture and new structural forms, painting, evolution of a composite cultu e.
— Ec nomy: gricultu l Pro uction, rise of urban economy and non-agricultural production, trade a d commerce.

. The F fte nd Early Sixteenth Century-Political Developments and Economy:

— Ri e of Pr ncial Dynasties : Bengal, Kashmir (Zainul Abedin), Gujarat.
— Ma wa, Bah anids.
— The V ayanagara Empire.
— Lodis.
— Mughal Em ire, first phase : Babur, Humayun.
— The Sur Em re : Sher Shah’s administration.
— Portuguese colonial enterprise, Bhakti and Sufi Movements.

19. The Fifteenth and Early Sixteenth Century- Society and culture:

— Regional cultures specificities.
— Literary traditions.
— Provincial architectural.
— Society, culture, literature and the arts in Vijayanagara Empire.

20. Akbar:

— Conquests and consolidation of 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 16th and 17th Centuries:

— Population Agricultural and craft production.
— Towns, commerce with Europe through Dutch, English and French c mpa es : a trade revolution.
— Indian mercantile classes. Banking, insurance and credit systems.
— Conditions of peasants, Condition of Women.
— Evolution of the Sikh community and the Khalsa Panth

23. Culture during Mughal Empire:

— Persian histories and other literature
— Hindi and religious literatures.
— Mughal architecture.
— Mughal painting.
— Provincial architecture and painting.
— Classical music.
— Science and technology.

24. The Eighteenth Century:

— Factors for the decline of the Mugh l Empire.
— The regional principalities: Nizam's D can, Bengal, Awadh.
— Maratha ascendancy under th Peshwa
— The Maratha fiscal and financial s tem.
— Emergence of Afghan p er Battle Panipat, 1761.
— State of, political, cultural d economi , on eve of the British conquest.

PAPER-II

1. European enetra on into ndia:

The E rly E ropean Se ements; The Portuguese and the Dutch; The English and the French ast dia Companies; Their struggle for supremacy; Carnatic Wars; Bengal-The conflict bet en the English and the Nawabs of Bengal; Siraj and the English; The Battle of Plass y; Sign cance of Plassey.

2. Britis Expa ion in India:

Bengal-Mi Jafar and Mir Kasim; The Battle of Buxar; Mysore; The Marathas; The three Anglo-Marath Wars; The Punjab.

3. Early Struct re of the British Raj:

The Early administrative structure; From diarchy to direct contol; 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 Brahmo 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 movement and tribal uprisings in the 18th and 19th centuries i cludin the Rangpur Dhing (1783), the Kol Rebellion (1832), the Mopla Rebellion in Mala ar (841-1 20), the Santal Hul (1855), Indigo Rebellion (1859-60), Deccan Uprising (18 and the Munda Ulgulan (1899-1900); The Great Revolt of 1857 —Origin, cha acte casu failure, the consequences; The shift in the character of peasant uprisings in the ost-1857 period; the peasant movements of the 1920s and 1930s.

8. Factors leading to the birth of Indian Nationa ism; P litics of Association; The Foundation of the Indian National Congress; The Safe valve the s relating to the birth of the Congress; Programme and objectives of Early Congr s; the social composition of early Congress leadership; the Moderates and Extr mis The artition of Bengal (1905); The Swadeshi Movement in Bengal; the economi and poli al aspects of Swadeshi Movement; The beginning of revolutionary extremism in I dia.

9. Rise of Gandhi; Character of Ga hian ationalis ; Gandhi's popular appeal; Rowlatt Satyagraha; the Khilafat Movement; h Non-c er on Movement; National politics from the end of the Non-cooperation mov ment to the beginning of the Civil Disobedience Movement; the two phases of th Civil D obedience Movement; Simon Commission; The Nehru Report; the Rou d T ble C nferenc ; Nationalism and the Peasant Movements; Nationalism and Working s movem nts; Women and Indian youth and students in Indian politics (1885-1947); the elec on of 1937 and the formation of ministries; Cripps Mission; the Quit India Movement; Wave Plan; The Cabinet Mission.

10. Constitutiona Development in the Colonial India between 1858 and 1935.

11. Other strand in the Na nal Movement.

The Revolutionaries Bengal, t e Punjab, Maharashtra, U.P. the Madras Presidency, Outside India

The L t; Th Left within the Congress: Jawaharlal Nehru, Subhas Chandra Bose, the Congress So a P rty; the Communist Party of India, other left parties.

12. Politic of Separatism; the Muslim League; the Hindu Mahasabha; Communalism and the po ics of p tition; Transfer of power; Independence.

13. Co solidation as a Nation; Nehru's Foreign Policy; India and her neighbours (1947-1964); The linguistic reorganisation of States (1935-1947); Regionalism and regional inequality; Inte ration 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 na onal ies a oss 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-imperialis

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 C nsequ ces.
(iii) World War II : Ca es nd Co sequen s.

23. The World after Wo l War II:

(i) Emergence of Two po r blocs.
(ii) Emergence of T Worl and non-alignment
(iii) UNO and the global dispute

24. Liberation f om Colon l Rule :

(i) Latin America Bolivar.
(ii) Arab World-Egyp
(iii) Africa- partheid to Democracy.
(iv) So h- a ia Vietnam.

25. Deco nization and Underdevelopment :

(i) actors nstraining Development ; Latin America, Africa.

26. Un fication of Europe :

(i) Post War Foundations ; NATO and European Community.
(ii) Consol ation and Expansion of European Community
(iii) Europea Union.

27. Disintegration of Soviet Union and the Rise of the Unipolar World :

(i) Factors leading to the collapse of Soviet Communism and Soviet Union, 1985-1991.
(ii) Political Changes in East 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 the 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 th State .
   (b) Local Bodies.
   (c) Administrative relationship among Union, State and Local B ies.
   (d) Eminent domain-State property-common property com unity p ty.
8. Legislative powers, privileges and immunities.
9. Services under the Union and the States:
   (a) Recruitment and conditions of se ices; Constitutional safeguards; Administrative tribunals.
   (b) Union Public Service Commission and St e Public Service Commissions—Power and functions.
   (c) Election Commission—Power a d functio
10. Emergency provisions.
11. Amendment of the Constitution.
12. Principle of Natural Justice—Eme ging tre ds an judicial approach.
13. Delegated legislation and its cons utionality.
14. Separation of powers and nstituti al governance.
15. Judicial review of dmin strati action
16. Ombudsman: Lokay k a, Lokpal tc.

International Law :

1. Nature and D finition of Inte ational Law.
2. Relationship etween In ernational Law and Municipal Law.
3. State Recogn ion and S ate Succession.
4. **Law o the se** Inlan Waters, Territorial Sea, Contiguous Zone, Continental Shelf, xclus e Economic Zone and High Seas.
5. **Ind vid** Nationality, statelessness; Human Rights and procedures available for their orcement.
6. erritori jurisdiction of States, Extradition and Asylum.
7. **Tr aties :** Formation, application, termination and reservation.
8. **Unit d Nations** : Its principal organs, powers and functions and reform.
9. Peacef settlement of disputes—different modes.
10. Lawful re ourse to force : aggressions, 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, CTST.
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. Preparations 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 legisla ve develop ents.
16. Plea bargaining.

Law of Torts

1. Nature and definition.
2. Liability based upon fault and strict liability; Absol e liabil y
3. Vicarious liability including State Liability
4. General defences.
5. Joint tort fessors.
6. Remedies.
7. Negligence.
8. Defamation.
9. Nuisance.
10. Conspiracy.
11. False imprisonment.
12. Malicious prosec ion
13. Consumer Prot ction Act, 198

Law of Contracts a d Mercan le Law

1. Nature and form tion of co tract/E-contract.
2. F ctors v ating fre o ent.
3 Voi voi able, illegal and unenforceable agreements.
4. Perfor a ce discharge of contracts.
5. uasi-co tracts.
6. Co sequen es of breach of contract.
7. Contr ct of indemnity, guarantee and insurance.
8. Contrac of agency.
9. Sale of go ds and hire purchase.
10. Formation nd 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.

MANAGEMENT

The candidate should make a study of the concept of development of Management as science and art drawing upon the contributions of leading thinkers of management and apply the concepts to the real life of government and business decision-making keeping in view the changes in the strategic and operative environment.

PAPER-I

1. Managerial Function and Process :
Concept and foundations of management, Evolution of Mana ement Thoughts; Managerial Functions—Planning, Organizing, Controlling; Decisio aking; R le of Manager, Managerial skills; Entrepreneurship; Management of nnov on; Managing in a global environment, Flexible Systems Management; Social esponsibi y and managerial ethics; Process and customer orientation; Managerial processe on direct a d indirect value chain.

2. Organisational Behaviour and Design :
Conceptual model of organization behaviour; he ind dual p cesses—personality, values and attitude, perception, motivation, learni and rein orcement, work stress and stress management; The dynamics of Organi atio behaviou —power and politics, conflict and negotiation, leadership process a d sty s co munication; The Organizational Processes—decision-making, job d ign; Classical, Neoclassical and Contingency approaches to organizational design; ganizational theory and design—Organizational culture, managing cul ural d ers y lear ng Organization; Organizational change and development; Knowledg Based E erprise—systems and processes; Networked and virtual organizations.

3. Human Resource Management :
HR challenges; HRM functions; The future challenges of HRM; Strategic Management of human resources Human resour e planning; Job analysis; Job evaluation, Recruitment and selection; aining and development; Promotion and transfer; Performance managemen Com ensatio management and bnenefits; Employee morale and prod tivity; Managem of Organizational climate and Industrial relations; Human esourc a unting and audit; Human resource information system; International human resource m ageme .

4. A ounting for Managers :
Financ l acco nting—concept, importance and scope, generally accepted accounting principles preparation of financial statements with special reference to analysis of a balance she t and measurment of business income, inventory valuation and depreciation, financial state ent analysis, fund flow analysis, the statement of cash flows; Management accounting c ncept, need, imporance and scope; Cost accounting—records and processes, cost ledger and control accounts, reconciliation and integration bwtween financial and cost accounts; Overhead cost and control, Job and process costing, Budget and budgetary control, Performance budgeting, Zero-base budgeting, relevant costing and costing for decision-making, standard costing and variance analysis, marginal costing and absorption costing.

5. Financial Management :
Goal of Finance Function. Concepts of value and return. Valuation of bonds and Shares;

Management of working capital : Estimation and Financing; Management of cash, receivables, inventory and current liabilities; Cost of capital ; Capital budgeting; Financial and operating leverage; Design of capital structure: theories and practices; Shareholder value creation: dividend policy, corporate financial policy and strategy, management of corporate distress and restructuring strategy; Capital and money markets: institutions and instruments; Leasing hire purchase and venture capital; Regulation of capital market; Risk and return: portfolio theory; CAPM; APT; Financial derivatives: option, futures, swap; Recent reforms in financial sector.

6. Marketing Management :

Concept, evolution and scope; Marketing strategy formulation and components of marketing plan; Segmenting and targeting the market; Positioning and differentiating the market offering; Analyzing competition; Analyzing consumer markets; Industrial buyer behaviour; Market research; Product strategy; Pricing strategies; Designing and managing Marketing channels; Integrated marketing communications; Building cus omer taisfaction, Value and retention; Services and non-profit marketing; Ethics in m rketin Consumer protection; Internet marketing; Retail management; Customer relatio ship mana ement; Concept of holistic marketing.

PAPER-II

1. Quantitative Techniques in Decision-making :

Descriptive statistics—tabular, graphical and numerical ethods, i oduction to probability, discrete and continuous probability distributions, inferenti statistics-sampling distributions, central limit theorem, hypothesis testing for fferen es be ween means and proportions, inference about population variances, Chi quare an ANOVA, simple correlation and regression, time series and forecasting decision heory, index numbers; Linear programming— problem formulation, mple method and graphical solution, sensitivity analysis.

2. Production and Operations Manag ment :

Fundamentals of operations m gement; Organizing for production; Aggregate production planning, capacity pla ing plant design: rocess planning, plant size and scale of operations, Management f facilitie Line balancing; Equipment replacement and maintenance; Production con ol; Supply, chain management—vendor evaluation and audit; Quality managemen ; tatistic l process control, Six Sigma; Flexibility and agility in manufacturing sys ems; World c ss manufaturing; Project management concepts, R&D management, Ma agement f service operations; Role and importance of materials management valu analysi make or buy decision; Inventory control, MRP; Waste man gemen

3. Man gement Information System :

Conceptu l oun s of information systems; Information theory; Information resource ma geme Types of information Systems; Systems Development—Overview of Systems and D sign; S tem Development management life-cycle, Designing online and distributed environm nts; Implementation and control of project; Trends in information technology; Managing ata resources—Organising data. DSS and RDBMS; Enterprise Resource Planning (ER), Expert systems, e-Business architecture, e-Governance; Information systems plan ng, Flexibility in information systems; User involvement; Evaluation of information systems.

4. Government Business Interface :

State participation in business, Interaction between Government, Business and different Chambers of Commerce and Industry in India; Government's ploicy with regard to Small Scale Industries; Government clearances for establishing a new enterprise; Public Distribution System; Government control over price and distribution; Consumer Protection Act (CPA) and The Role of Voluntary Organizations in protecting consumers' rights; New

Industrial Policy of the Government : liberalization, deregulation and privatisation; Indian planning system; Government policy concerning development of Backward areas/regions; The Responsibilities of the business as well as the Government to protect the environment; Corporate Governance; Cyber Laws.

5. Strategic Cost Management :

Business policy as a field of study; Nature and scope of strategic management, Strategic intent, vision, objectives and policies; Process of strategic planning and implementa-tion; Environmental analysis and internal analysis; SWOT analysis; Tools and techniques for strategic analysis—Impact matrix: The experience curve, BCG matrix, GEC mode, Industry analysis, Concept of value chain; Strategic profile of a firm; Framework for analysing competition; Competitive advantage of a firm; Generic competitive strategies; Growth strategies— expansion, integration and diversification; Concept of core competence, Strategic flexibility; Reinventing strategy; Strategy and structure; chief Executive and Board; turnaround management; Management of strategic change; Strategic llian s, Mergers and Acquisitions; Strategy and corporate evolution in the Indian context

6. International Business :

International Business Environment : Changing composition of trade in g ods and ervices; India's Foreign Trade: Policy and trends; Financing of I ern ional d Regional Economic Cooperation; FTAs; Internationalisation of service ms; Int national production; Operation Management in International companies; In rnational Taxation; Global competitiveness and technological developments; Gl bal E- usiness; Designing global organisational structure and control; Multicultural man gement; obal business strategy; Global marketing strategies; Export Management; xport-Import procedures; Joint Ventures; Foreign Investment: Foreign direct i ve ent a d foreign portfolio investment; Cross-border Mergers and Acquisitions; Fo eign Exc nge Risk Exposure Management; World Financial Markets and International anking; Ex ernal Debt Management; Country Risk Analysis.

MATHEMATICS

PAPER-I

(1) Linear Algebra :

Vector spaces ov R and C, lin ar dependence and independence, subspaces, bases, dimensions, Linea transform ions, rank and nullity, matrix of a linear transformation.

Algebra of M trices Row and column reduction, Echelon form, congruence's and similarity; Ran of a m rix; Inve e o a matrix; Solution of system of linear equations; Eigenvalues and e enve tors, characteristic polynomial, Cayley-Hamilton theorem, Symmetric, skew-symmetr He skew-Hermitian, orthogonal and unitary matrices and their eig value

(2) Ca ulus :

Real nu bers, functions of a real variable, limits, continuity, differentiability, mean-value theorem, ylor's theorem with remainders, indeterminate forms, maxima and minima, asymptotes; urve tracing; Functions of two or three variables; Limits, continuity, partial derivatives, m xima and minima, Lagrange's method of multipliers, Jacobian.

Riemann's definition of definite integrals; Indefinite integrals; Infinite and improper integral; 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 liner equations with constant coefficients, complementary function, particular integral and general solution.

Section 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 and Statics :

Rectilinear motion, simple harmonic motion, motion in a plane, proje iles; Constrained motion; Work and energy, conservation of energy; Kepler's laws, bits under central forces.

Equilibrium of a system of particles; Work and potential energy, friction, ommon atenary; Principle of virtual work; Stability of equilibrium, equilibrium of f ces n thre di nsions.

(6) Vector Analysis :

Scalar and vector fields, differentiation of vector fiel o scalar riable; Gradient, divergence and curl in cartesian and cylindrical coo dinates Higher order derivatives; Vector identities and vector equation.

Application to geometry : Curves in space, curvature and rsion; Serret-Furenet's formulae. Gauss and Stokes' theorems, Green's indentiti .

PAPE -II

(1) Algebra :

Groups, subgroups, cyclic groups, c sets, Lagrange's Theorem, normal subgroups, quotient groups, homomorphi of gro s, basic isomorphism theorems, permutation groups, Cayley's theore

Rings, subrings and idea homomo hisms of rings; Integral domains, principal ideal domains, Euclidean domains nd unique factorization domains; Fields, quotient fields.

(2) Real Analysis :

Real number system as an ordere field with least upper bound property; Sequences, limit of a sequence, C uchy sequ nce, completeness of real line; Series and its convergence, absolute and condi nal con ergence of series of real and complex terms, rearrangement of s ies. Co tinuity a form continuity of functions, properties of continuous functions on com act ets.

Riemann t gral, oper integrals; Fundamental theorems of integral calculus.

Uni rm con ergence, continuity, differentiability and integrability for sequences and series of fun ons; P tial derivatives of functions of several (two or three) variables, maxima and minima.

(3) Comple Analysis :

Analytic func on, Cauchy-Riemann equations, Cauchy's theorem, Cauchy's integral formula, powe 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-Jorden (direct), Gauss-Seidel (iterative) methods. Newton's (forward and backward) and interpolation, Lagrange's interpolation.

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

Numerical solution of ordinary differential equations : Eular and Runga 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 ga es and truth tables, Boolean algebra, normal forms.

Representation of unsigned integers, signed integers and reals double ecision eals and long integers.

Algorithms and flow charts for solving numerical analysis prob ems.

(7) Mechanics and Fluid Dynamics :

Generalised coordinates; D'Alembert's principle and Lagra ge's equations; Hamilton equations; Moment of inertia; Motion of rigid bodies in t o dimensi s.

Equation of continuity; Euler's equation of motion for inv cid flow; Stream-lines, path of a particle; Potential flow; Two-dimensional and ax mmetr motion; Sources and sinks, vortex motion; Navier-Stokes equation for a v scous flu

MECHANICAL ENGINEERING

PAPER-I

1. Mechanics :

1.1 Mechanics of Rigid B ies :

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

1.2 Mechanics of eformabl Bodies :

Generalized Hooke law and ts application; design problems on axial stress, shear stress and earing tress; ma i properties for dynamic loading; bending shear and stresses in beams; dete mination of principle stresses and strains-analytical and graphical; compound and comb d stre s; bi-axial stresses-thin walled pressure vessel; material behaviour and esign ctors for dynamic load; design of circular shafts for bending and torsional load only; d flection f beam for statically determinate problems; theories of failure.

2. Engin ering Materials :

Basic conc ts on structure of solids, common ferrous and non-ferrous materials and their applications; h at-treatment of steels; non-metalsplastics, cermics, composite materials and nano-material

3. Theory of Machines :

Kinematic and dynamic analysis of plane mechanisms. Cams, Gears and empicyclie gear trains, flywheels, governors, balancing of rigid rotors, balancing of single and multicy-linder 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 - Merhant'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 guages; 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 blancing of multi model and stochastic assembly lines; inventory management-probablistic inventory models for order time and order quanitity determination; JIT yste s; strategic sourcing; managing inter plant logistics.
System operations and control: Scheduling algorithms for job sh ps; applic ons of statistical methods for product and process quality control applications control harts for mean, range, percent defective, number of defectives and efec per it quality cost systems; management of resources, organizations and risks in project
System improvement: Implementation of systems, su h total qu ty management, developing and managing flexible, lean and agile Organ zations

PAPER-II

2. Thermodynamics, Gas Dynamics Turbi e :

1.1 Basic concept of First-law and Seco d law of T rmodynamics; concept of entropy and reversibility; availability and unavai bility d irreve sibility.

1.2 Classification and propertie of fluids; mpressible and compressible fluids flows; effect of Mach number and c mpressibility; continuity momentum and energy equations; normal and oblique ks; one dimensional isentropic flow; flow or fluids in duct with frictions that transfe

1.3 Flow through fa blowers and compressors; axial and centrifugal flow configuration; design of fans nd compressors; single problems compresses and turbine cascade; open and losed cyc gas turbines; work done in the gas turbine; reheat and regenerators.

2. Heat Transfer :

2.1 Con uction heat tra sfer—general conduction equation-Laplace, Poisson and Fou r equa ons; Fou l w of conduction; one dimensional steady state heat conduction applied o si ple wall, solid and hollow cylinder and spheres.

2.2 C n ectio at transfer—Newton's law of convection; free and forces convection; hea transfe during laminar and turbulent flow of an incompressible fluid over a flat plate; concep s of N sselt number, hydrodynamic and thermal boundary layer their thickness; Prandtl umber; analogy between heat and momentum transfer—Reynolds, Colbum, Prandtl ana gies; heat transfer during laminar and turbulent flow through horizontal tubes; free convectio 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. Engines :

3.1 Classification, themodynamic cycles of operation; determination of break 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 Ranking 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 fa or; r eating and regeneration, methods of governing; back pressure and pass out turbin s.

4.4 Steam power plants—combined cycle power generation; h at r cove steam generators (HRSG) fired and unfired, co-generation plants.

5. Refrigeration and Air-conditioning :

5.1 Vapour compression refrigeration cycle—cycle on p- & T-s agrams; ecofriendly refrigerants—R 134a. 123; Systems like evaporators, co de ers, comp essor, expansion devices. Simple vapour absorption systems.

5.2 Psychrometry—properties; processes; chart sensibl 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 erve s pply of upper and lower limbs and joints of shoulder, hip and knee.

Gross anatomy, blood supply nd lymphatic drainage of tongue, thyroid, mammary gland, stomach, liver, prostat , gonads a d uterus.

Applied anatomy of aphragm perin um and inguinal region.

Clinical anatomy of k dney, urin y bladder, uterine tubes, vas deferens.

Embryology Place ta and p acental barrier. Development of heart, gut, kidney. uterus, ovary, stis a d their co n congenital abnormalities.

Central d P ripheral Autonomic Nervous System :

Gross and li cal a my of ventricles of brain, circulation of cerebrospinal fluid; Neural pathw ys and sions of cutaneous sensations, hearing and vision; Cranial nerves distribution and clini l signi ance; Components of autonomic nervous system.

2. Human hysiology :

Conduction d transmission of impulse, mechanism of contraction, neuromuscular transmission, r flexes, control of equilibrium, posture and muscle tone, descending pathways, funct ns 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 : Pregnancy 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 ischaemic 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, Saimonella
* 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 asodilato Antiviral, Antiparasitic, Antifungal, Immunosuppressants,
* Anticancer.

7. Forensic Medicine and Toxicology

Forensic examination of injuries and wound Examina on of blood and seminal stains; Poisoning, sedative overdose, hanging, d wnin burns, DNA and finger print study.

PAPER-II

1. General Medicine

Etiology, clinical features, gnosis an principles of management (including prevention) of—Typhoid, Rabies, AIDS, De gue, Kala-azar, Japanese Encephalitis.
Etiology, clinical featur s, iagno s and principles of management of :
Ischaemic heart disease, pulmonary mbolism. Bronchial asthma.
Pleural effusion, tub rculosis, Malabsorption syndromes; acid peptic diseases, Viral hepatitis and cirrhosis o liver.
Glom ulonep ritis and y onephritis, renal failure, nephrotic syndrome, renovascular hyperten ion, omplications of diabetes mellitus, coagulation disorders, leukaemia, Hypo and hyper thyro is , m itis and encephalitis.
Imag g in m cal problems, ultrasound, echo-cardiogram, CT scan, MRI.
Anxiety nd Dep ssive Psychosis and schizophrenia and ECT.

2. Paediat cs

Immunization Baby friendly hospital, congenital cyanotic heart disease, respiratory distress syndrome, bron ho— pneumonias, kernicterus. IMNCI classification and management, PEM grading and ma agement. 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 tumour, oral and esophageal tumours.
Peripheral arterial diseases, varicose veins, coarctation of aorta.

Tumours of Thyroid, Adrenal, Glands.
Abscess cancer, fibroadenoma and adenosis of breast.
Bleeding peptic ulcer, tuberculosis of bowel, ulcerative colitis, cancer stomach.
Renal mass, cancer prostatie.
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.
Laprascopic Surgery.

5. Obstetrics and Gynaecology including Family Planning

Diagnosis of pregnancy.
Labour management, complications of 3rd stage, Antepartum and postpa tum morrhage, resuscitation of the newborn, Management of abnormal life and difficult l bour. Management of small for date or premature newborn.
Diagnosis and management of anemia. Preeclampsia and Toxaem of pr gnancy, Management of Post-menopausal Syndrome.
Intra-uterine devices, pills, tubectomy and vasectomy. Medi al term ation of pregnancy including legal aspects.
Cancer cervix.
Leucorrhoea, pelvic pain; infertility, dysfunctional uter e bleedin (DUB), amenorrhoea, Fibroid and prolapse of uterus.

6. Community Medicine (Preventive and Soci M icine)

Principles, methods approach and measureme ts of
Epidemiology.
Nutrition, nutritional diseases/diorders an Nutr on
Programmes.
Health information Collection, Analysis nd
Presentation.
Objectives, components nd c tical alysis f National programmes for control/eradication of :
Malaria, Kala-azar, Filaria and uberculosi , HIV/AIDS, STDs and Dengue.
Critical appraisal of He care d livery system.
Health management and administr on; Techniques, Tools, Programme Implementation and Evaluation.
Objectives, Compon ts, Goals and Status of Reproductive and Child Health, National Rural Health Mission and Mill nium Development Goals.
Manage ent hospital and industrial waste.

PHILOSOPHY

PAPER-I

History and Pr blems 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; Sying 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, Sarte, 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. Carvaka : Theory of Knowlegde; Rejection of Transcendent Entities.
13. Jainism : Theory of Reality; Saptabhanginaya; Bondage and Liberation.
14. Schools of Buddhism : Prat Ityasamutpada; Ksanikavada, Nairatmyavada.
15. Nyaya—Vaiesesika : Theory of Categories; Theory of Appearance; heo y of P amana; Self, Liberation; God; Proofs for the Existence of God; Theory of C sation; Atomistic Theory of Creation.
16. Samkhya; Prakrit; Purusa; Causation; Liberation.
17. Yoga; Citta; Cittavrtti; Klesas; Samadhi; Kaivalya.
18. Mimamsa: Theory of Knowlegde.
19. Schools of Vedanta : Brahman; Isvara; Atman; Jiva; J at; Maya; Avida; Adhyasa; Moksa; Aprthaksiddhi; Pancavidhabheda.
20. Aurobindo: Evolution, Involution; Integral Yoga

PAPE -II

Socio-Political Philosophy

1. Social and Political Ideals : Equality, Ju ce, Liberty.
2. Sovereignty : Austin, Bodin, L sk Kautily
3. Individual and State : R hts Duties nd Accountability.
4. Forms of Government : M archy; The cracy and Democracy.
5. Political Ideologies: Anarchis Marxism and Socialism.
6. Humanism; Secula ism; Multi-c uralism.
7. Crime and Punishment : Corruption, Mass Violence, Genocide, Capital Punishment.
8. Development and Social Pro ess.
9. Gender Dis iminat n : Female Foeticide, Land and Property Rights; Empowerment.
10. Cas Discr mination : ndhi and Ambedkar.

Ph losoph of eligion

1. Notions o od : Att utes; Relation to Man and the World. (Indian and Western).
2. Pro fs for th Existence of God and their Critique (Indian and Western).
3. Proble of Ev
4. Soul : Im ortality; Rebirth and Liberation.
5. Reason, R elation and Faith.
6. Religious Exp rience : 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 inelasti llisions; Rigid Body; Degrees of freedom, Euler's theorem, angular velocity, angular momentum moments of inertia, theorems of parallel and perpendicular axes, equation of motion f rotat on; Molecular rotations (as rigid bodies); Di and tri-atomic molecules; Precessional motio t p, gyro cope.

(c) Mechanics of Continuous Media :

Elasticity, Hooke's law and elastic constants of isotropic s ids a d their inter-relation; Streamline (Laminar) flow, viscosity, Poiseuille's equation, B oulli's eq ation, Stokes' law and applications.

(d) Special Relativity :

Michelson-Morely experiment and its implications; Lorentz ansforma ons length contraction, time dilation, addition of relativistic velocities, abe ation a d Doppler effect, mass-energy relation, simple applications to a decay pro ess. F ur dim nsional momentum vector; Covariance of equations of physics.

2. Waves and Optics :

(a) Waves :

Simple harmonic motion, damped os ation, forced oscillation and resonance; Beats; Stationary waves in a string; Pulses and wa e packets; Phase and group velocities; Reflection and refraction from Huygens' pri ipl

(b) Geometrial Optics :

Laws of reflection and refract from Fer at's principle; Matrix method in paraxial optic-thin lens formula, nodal planes syste of two thin lenses, chromatic and spherical aberrations.

(c) Interference :

Interference of light - oung's experiment, Newton's rings, interference by thin films, Michelson interferometer; Multip beam int ference and Fabry Perot interferometer.

(d) Diffraction

Fraunh er diff ction - sing slit, double slit, diffraction grating, resolving power; Diffraction by a rcular ert and the Airy pattern; Fresnel diffraction: half-period zones and zone plates, circular aper .

(e) Pol isation and Modern Optics :

Productio and d ection of linearly and circularly polarized light; Double refraction, quarter wave plate; Optical activity; Principles of fibre optics, attenuation; Pulse dispersion in step index and par olic index fibres; Material dispersion, single mode fibers; Lasers-Einstein A and B coefficient Ruby and He-Ne lasers. Characteristics of laser light-spatial and temporal coherence; Focu ing 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, polarisation. Solutions to boundary-value problems-conducting and dielectric spheres in a

uniform electric field; Magnetic shell, uniformly magnetised 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 rms values in AC circuits; DC and AC circuits with R, L and C components; Series and parallel resonance; Quality factor; Principle of transformer.

4. 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.

5. Thermal and Statistical Physics :

(a) Thermodynamics :

Laws of thermodynamics, reversible and irreversible processes, entropy; Is ermal, diabatic, isobaric, isochoric processes and entropy changes; Otto and D ese engine G bs' phase rule and chemical potential; Van der Waals equation of state of a real g s critical constants; Maxwell-Boltzmann distribution of molecular velocities, tr nsp rt phenom na, equipartition and virial theorems; Dulong-Petit, Einstein, and Debye's heorie of specific heat of solids; Maxwell relations and application; Clausius-Clapeyron e uation. A batic demagnetisation, Joule-Kelvin effect and liquefaction of gases.

(b) Statistical Physics :

Macro and micro states, statistical distributions Maxwell-B ltzmann, Bose-Einstein and Fermi-Dirac Distributions, applications to specific hea of gases a d blackbody radiation; Concept of negative temperatures.

PAPER-II

1. Quantum Mechanics :

Wave-particle duality; Schro nger equ ion and expectation values; Uncertainty principle; Solutions of the one-dimensio l Schroed nger equation for free particle (Gaussian wave-packet), particle in a b x, particl in a finite well, linear harmonic oscillator; Reflection and transmission by a step potential and y a rectangular barrier; Particle in a three dimensional box, density of state free ele ron theory of metals; Angular momentum; Hydrogen atom; Spin half particl s, pro erties of auli spin matrices.

2. Ato ic and Molecul Ph sics :

Stern-Ge ch xperiment, electron spin, fine structure of hydrozen atom; L-S coupling, J-J coupling; Sp c osc notation of atomic states; Zeeman effect; Franck-Condon principle and ap lication Elementary theory of rotational, vibrational and electronic spectra of diatomic molecule Rama effect and molecular structure; Laser Raman spectroscopy; Importance of neutral hyd ogen atom, molecular hydrogen and molecular hydrogen ion in astronomy. Fluorescence nd Phosphorescence; Elementary theory and applications of NMR and EPR; Elementary idea about Lamb shift and its significance.

3. Nuclear and P rticle Physics :

Basic nuclear properties-size, binding energy, angular momentum, parity, magnetic moment; Semi-empirical mass formula and applications. Mass parabolas; Ground state of a deuteron, magnetic moment and non-central forces; Meson theory of nuclear forces; Salient features of nuclear forces; Shell model of the nucleus - success 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 semi-conductors; Thermal properties of solids, specific heat, Debye theory; Magnetism: dia, para and ferromagnetism; Elements of super-conductivity, Meissner effect, Josephson junctions and applications; Elementary ideas about high temperature super-conductivity.

Intrinsic and extrinsic semi-conductors- 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 RE ATION

PAPER-I

Political Theory and Indian Politics :

1. Political Theory: meaning and approaches.
2. Theories of state : Liberal, Neo-liberal, Marxist, Pluir ist, post-c lonial and Feminist.
3. Justice : Conceptions of justice with special r ference Rawl's theory of justice and its communitarian critiques.
4. Equality : Social, political and econom relations p between equality and freedom; Affirmative action.
5. Rights : Meaning and theories; diff ent ki ds of rig ts; Concept of Human Rights.
6. Democracy : Classical and cont porary theories; different models of democracy—representative, participatory and de erative.
7. Concept of power hegemony ideolog and legitimacy.
8. Political Ideologies Liberalis Soc alism, Marxism, Fascism, Gandhism and Feminism.
9. Indian Political Thought: *Dharamshastra, Arthashastra* and Buddhist Traditions; Sir Syed Ahmed K an, Sri Auro indo, M. K. Gandhi, B. R. Ambedkar, M. N. Roy.
10. Western Polit al Thought : P ato, Aristotle, Machiavelli, Hobbes, Locke, John S. Mill, Marx, Gramsc Hannah A endt.

Indian Gover ment d Politi s

1. dian Nationalism

a) Po cal Strategies of India's Freedom Struggle : Constitutionalism to mass Satya ha, N n-cooperation, Civil Disobedience; Militant and Revolutionary Moveme ts, Peasant and Workers Movements.

(b) Pe pectiv on Indian National Movement; Liberal, Socialist and Marxist; Radical Hum ist and Dalit.

2. Making f the Indian Constitution : Legacies of the British rule; different social and political p spectives.
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.
   (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.
4. Grassroots Democracy : Panchayati Raj and Municipal Government; Significance of

73rd and 74th Amendments; Grassroot movements.

5. 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.
6. Federalism : Constitutional provisions; changing nature of centre-state relations; integrationist tendencies and regional aspirations; inter-state disputes.
7. 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.
8. Caste, Religion and Ethnicity in Indian Politics.
9. Party System : National and regional political parties, ideological and social bases of parties; Patterns of coalition politics; Pressure groups, trends in e ctor behaviour; changing socio-economic profile of Legislators.
10. Social Movement : Civil liberties and human rights movements; w me s mo ements; environmentalist movements.

PAPER-II

Comparative Politics and International Relations
Comparative Political Analysis and International P tics :

1. Comparative Politics : Nature and major appro ches; olitical economy and political sociology perspectives; Limitations of th compara ve method.
2. State in Comparative Perspective : Cha acteristics nd changing nature of the State in capitalist and socialist economies, nd ad anced in ustrial and developing societies.
3. Politics of Representation and rticipatio P litical parties, pressure groups and social movements in advanced ind trial and developing societies.
4. Globalisation : Responses m devel ed and developing societies.
5. Approaches to th St dy of Interna nal Relations : Idealist, Realist, Marxist, Functionalist and Sys s theory.
6. Key Concepts in Inter ational Re ations : National interest, security and power; Balance of pow r and de rrence; Transational actors and collective security; World capitalist econ my and globa ation.
7. Changing Inte national P itical Order :

(a) Rise of uper owers; S rategic and ideological Bipolarity, arms race and cold war; Nuclear hreat;
(b) N -alig ed Movement : Aims and achievements.
(c) Colla s of S viet Union; Unipolarity and American hegemony; Relevance of non-alignm t in the contemporary world.

8. E olution f the International Economic System : From Brettonwoods to WTO; Socialist eco mies and the CMEA (Council for Mutual Economic Assistance); Third World deman for new international economic order; Globalisation of the world economy.
9. United N tions : Envisaged role and actual record; Specialized UN agencies—aims and functi ning; need for UN reforms.
10. Regionalisation of World Politics : EU, ASEAN, APEC, AARC, 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; the 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 crises in Afghanistan, Iraq and West Asia, growing relations with US and Isre l; Vi n of a new world order.

PSYCHOLOGY

PAPER-I

Foundations of Psychology

1. Introduction : Definition of Psychology; Historical antece nts of Psychology and trends in the 21st centrury; Psychology and scientific me hods; sycho gy in relation to other social sciences and natural sciences; Application of P ychology t societal problems.
2. Methods of Psychology : Types of rese rch : Des iptive, evaluative, diagnostic and prognostic; Methods of Research : S rvey, bservat n, case-study and experiments; Characteristics of experimental design nd non- imental designs; quasi-experimental designs; Focussed group discussions, brai storming, grounded theory approach.
3. Research methods : Maj eps in psychological research (problem statement, hypothesis formulation, re ea h des n, sam ling, tools of data collection, analysis and interpretation and report wri g); Funda ental versus applied research; Methods of data collection (interview, observatio questionnaire and case study). Research Designs (Ex-post facto and experiment l). Applic ion of statistical techniques (t-test, two-way ANOVA, correlation and regre sion and factor nalysis) item response theory.
4. Development o Human Behaviour : Growth and development; Principles of development, Role of genetic nd environmental factors in determining human behaviour; Influen of ultural fa in socialization; Life span development—Characteristics, de elopm t ta ks promoting psychological well-being across major stages of the life span.
5. Sensatio Atten and Perception : Sensation: concepts of threshold, absolute and differe e thres olds, signal-detection and vigilance; Factors influencing attention including set and char cteristi of stimulus; Definition and concept of perception, biological factors in perception; erceptual organization-influence of past experiences, perceptual defence-factor influencing sp ce and depth perception, size estimation and perceptual readiness; The plasticity of pe ception; Extrasensory perception; Culture and perception, Subliminal perception.
6. Learning : Concepts and theories of learning (Behaviourists, Gestaltalist and Information processing models). The processes of extinction, discrimination and generalisation. Programmed learning, probability learning, self instructional learning, concepts, types and the schedules of reinforcement, escape, avoidance and punishment, modelling and social learning.
7. Memory : Encoding and remembering; Shot-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 judgement; 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, Gulford Vernon, Sternberg and J.P. Das; Emotional Intelligence, Social intelligence, measurement of intelligence and aptitudes, concept of I Q deviation I Q, constancy of I Q; Measurement of multiple intelligence; Flu d int igence and crystallized intelligence.

11. Personality : Definition and concept of personality; Theo es f pe sonality (psychoanalytical, socio-cultural, interpersonal, developmental, humanistic, ehaviour stic, trait and type approaches); Measurement of personality (projective t sts, encil test); The Indian approach to personality; Training for personality development; L est approaches like big 5 factor theory; The notion of self in different traditions.

12. Attitudes, Values and Interests : Definitions o attitud s, values and interests; Components of attitudes; Formation and maintenance of titudes. M asurement of attitudes, values and interests. Theories of attitude changes, strategie for fostering values. Formation of stereotypes and prejudices; Changing other's eh our, eories of attribution; Recent trends.

13. Language and Communication : Human anguage— Properties, structure and linguistic hierarchy, Language acquisition—predi otio critical period hypothesis; Theories of Language development—Skinner and Chomsky; Pro ss and types of communication—effective commu-nication training.

14. Issues and Perspectives in M dern C temporary Psychology : Computer application in the psychological bor tory nd p chological testing; Artificial intelligence; Psychocybernetics; Study o onsciousn sleep-wak schedules; dreams, stimulus deprivation, meditation, hypnotic/ drug indu ed states; xtrasensory perception; Intersensory perception; Simulation studies.

PAPER-II

Psych logy : I sues an app ications

1. Psycho g cal urement of Individual Differences :

The ture o individual differences. Characteristics and construction of standardized psycholo ical tes Types of psychological tests. Use, misuse and limitation of psychological tests. Ethic issues in the use of psychological tests.

2. Psycholo ical well being and Mental Disorders :

Concept of hea -ill health positive health, well being casual factores in Mental disorders (Anxiety disorde s, mood disorders; schizophrenia and delusional disorders; personality disorders, substance abuse disorders). Factors influencing positive health, well being; lifestyle and quality of life; Happiness disposition

3. Therapeutic Approaches :

Psychodynamic therapies. Behaviour therapies. Client centered therapy. Cognitive therapies. Indigenous therapies (Yoga, Meditation). Biofeedback 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 leadersip; Senitivity 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 counselling. 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. G up decision making and leadership for social change. Effective strategies for social change.

7. Rehabilitation Psychology :

Primary, secondary and tertiary prevention programmes—role of psycholog ts. Org nising of services for rehabilitation of physically, mentally and socially cha eng d pers i cluding old persons. Rehabilitation of persons suffering from substance abuse, j venile delinquency, criminal behaviours. Rehabilitation of victims of violence. R h litation of HIV/AIDS victims, the role of social agencies.

8. Application of Psychology to disadvantaged group :

The concepts of disadvantaged, deprivation social, p ysical, cultural and economic consequences of disadvantaged and deprive g ps. Educating and motivating the disadvantaged towards development; Relative and prolong d deprivation.

9. Psychological problem of social integrat on :

The concept of social integration. The pro em f caste, c ss, religion and language conflicts and prejudice. Nature and manifestati n of prej dice etween the ingroup and outgroup. Casual factors of such conflicts and pr udices. Psychological strategies for handling the conflicts and prejudices. Measures t achiev social integration.

10. Application of Psych logy in Inf mation Technology and Mass Media :

The present scenario of inf mation tec nology and the mass media boom and the role of psychologists. Selection and tr ning of Psy hology professionals to work in the field of IT and mass media. Distance ning rough IT and mass media. Entrepreneurship through e-commerce. Multilevel marketing. Imp ct of TV and fostering value through IT and mass media. Psychological conse uences of cent developments in Information Technology.

11. Psychology and conomic development :

Achiev ment otivatio and economic development. Characteristics of entrepreneurial behaviou Mot ating and Training people for entrepreneurship and economic development; Consumer ig s d consumer awareness, Government policies for promotion of entrep eneurs p among youth including women entreprenures.

12. App ation f Psychology to environment and related fields :

Environme al Psychology effects of noise, pollution and crowding. Population Psychology : Psychologica onsequence of population explosion and high population density. Motivating for small family no ms. Impact of rapid scientific and technological growth on degradation of environment

13. Application of psychology in other fields :

(a) Military Psychology

Devising psycological 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 anti-social 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

Administration Theory

1. Introduction :
Meaning, scope and significance of Public Administra-tion, Wilson's vi ion of Public Administration, Evolution of the discipline and its present status. New Pub ic Adm nistra-tion, Public Choice approach; Challenges of liberalization, Privatisation, lobali ation; Good Governance: concept and application; New Public Management.

2. Administrative Thought :
Scientific Management and Scientific Management movement Clas ical Th ry; Weber's bureaucratic model its critique and post-Weberian Developments; Dyn mic Admi-nistration (Mary Parker Follett); Human Relations School (Elton M yo a d others); Functions of the Executive (C.I. Barnard); Simon's decision-making th o y; Parti pative Man-agement (R. Likert, C. Argyris, D. McGregor.)

3. Administrative Behaviour :
Process and techniques of decision-making; C mmun cation Morale; Motivation Theories content, process and contemporary; Theories o Leadersh Traditional and Mo-dem:

4. Organisations :
Theories systems, contingency; Stru ure d forms: Ministries and Departments, Corporations, Companies; Boards and C mmission hoc, and advisory bodies; Headquar-ters and Field relationships; Regulatory Au orities; Public-Private Partnerships.

5. Accountability and Control
Concepts of accountabili a d cont l; Leg lative, Executive and judicial control over administration; Citizen and ministrati ; Role of media, interest groups, voluntary or-ganizations; Civil society; Citizen Charters; Right to Infor-mation; Social audit.

6. Administrative La :
Meaning, scope an significance; Dicey on Administrative law; Delegated legislation; Administrative Tri-bu als.

7. Comparative Pub Admin stration :
Historic l and s ciologica ors affecting administra-tive systems; Administration and politics in differen co n tries; Current status of Comparative Public Administration; Ecology and administratio iggsi models and their critique.

8. De elopm t Dynamics :
Concept f devel ment; Changing profile of develop-ment administration; 'Anti-development thesis'; Bur ucracy and development; Strong state versus the market debate; Impact of liberalisation o administration in developing countries; Women and development the self-help group movemen

9. Personnel A ministration :
Importance of human resource development; Recruitment, training, career advancement, position classifi-cation, discipline, performance appraisal, promotion, pray 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 Adminstrative Improvement :

Organisation and methods, Work study and work man-agement; e-governance and information technology; Man-agement 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 Arthashastra; Mughal administration; Legacy of British rule in politics and administration Indianization of Public services, revenue administration, dist ict Ad inistration, 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 Und rta gs; Probl ms of autonomy, accountability and control; Impact of liberalization and priva ization

4. Union Government and Administration :

Executive, Parliament, Judiciary-structure, functions
work processes; Recent trends; Intra-governm ntal lation Cabinet Secretariat; Prime Minister's Office; Central Secretariat; Ministri s and D partments; Boards; Commissions; Attached offices; Field organizations.

5. Plans and Priorities :

Machinery of planning; Role, compositi n and fun of the Planning Commission and the National Development Council; 'Indicative lanning; Process of plan formulation at Union and State levels; Constitutional Ame ents (92) and decentralized planning for economic development and social ju ice

6. State Government and A inistratio :

Union-State administrative, l islative and financial relations; Role of the Finance Commission; Governor Ch ef Min er; Council of Ministers; Chief Secretary; State Secretariat; Directorates.

7. District Administ tion sinc Independence :

Changing role of th Collecto Union-State-local relations; Imperatives of development manag ment nd law d rder administration; District administration and democratic decentral ation

8. Civil Ser c s :

Const tional position; Structure, recruitment, training and capacity building; Good governan e initia ves; Code of conduct and discipline; Staff associations; Political rights; Grievance r dressal mechanism; Civil service neutrality; Civil service activism.

9. Financial M nagement :

Budget as a po cal instrument; Parliamentary control of public expenditure; Role of finance ministry in monet y 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 para military 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 emergen e of Socio gy.
(b) Scope of the subject and comparison with othe social s ences.
(c) Sociology and common sense.

2. Sociology as Science:
(a) Science, scientific method and critiqu
(b) Major theoretical strands of research metho logy.
(c) Positivism and its critique.
(d) Fact value and objectivity.
(e) Non-positivist meth dologi s.

3. Research Methods and n ysis:
(a) Qualitative and quantitat methods
(b) Techniques of data collecti
(c) Variables, sampl ng, hypothe reliability and validity.

4. Sociological Thi kers:
(a) Karl Marx - Hist ical mate alism, mode of production, alienation, class struggle.
(b) Emile Du hteim Division of labour, social fact, suicide, religion and society.
(c) M Web r - Social on, ideal types, authority, bureaucracy, protestant ethic and the spirit f ca italism.
(d) Talcolt sons cial system, pattern variables.
(e) R bert K. Merton - Latent and manifest functions, conformity and deviance, reference grou s.
(f) Mead Self and identity.

5. Stratificati n and Mobility :
(a) Concepts - quality, inequality, hierarchy, exclusion, poverty and deprivation.
(b) Theories of social stratification - Structural func tionalist 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 :
(e) 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 :

(e) Sociological theories of religion.
(f) Types of religious practices: animism, monism, pluralism, sects, cults.
(g) Religion in modern society: religion and science, secularization, religious revivalism, fundamentalism.

9. Systems of Kinship:

(h) Family, household, marriage.
(i) Types and forms of family.
(j) Lineage and descent.
(k) Patriarchy and sexual division of labour.
(l) Contemporary trends.

10. Social Change in Modern Society :

(m) Sociological theories of social change.
(n) Development and dependency.
(o) Agents of social change.
(p) Education and social change.
(q) Science, technology and social change.

PAP R-II

INDIAN SOCIETY : STRUCTURE AND CHANGE

A. Introducing Indian Society :

(i) Perspectives on the St dy of India Society :

(a) Indology (G.S. Ghure).
(b) Structural functionalis (M. N Srinivas).
(c) Marxist sociology A. R. Desai).

(ii) Impact of colon l rule on I dian society :

(a) Social backgroun of Indian ationalism.
(b) Modernizat n of In n trad ion.
(c) Prot ts an movements during the colonial period.
(d Social for

B. So ial Stru ture:

(i) Rura and Ag arian Social Structure:

(a) The ide of Indian village and village studies.
(b) Agrarian s ial structure— evolution of land tenure system, land reforms.

(ii) Caste Syste :

(a) Perspectives n the study of caste systems: G. S. 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 Deve opment Programme, cooperatives, poverty alleviation schemes.
(b)Green revolution and social change.
(c)Changing modes of production in Indian agric ur
(d)Problems of rural labour, bondage, migratio

(iii) Industrialization and Urbanisation in Ind :

(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 n urban are s

(IV) Politics and Society :

(a)Nation, democracy and citiz nship.
(b)Political parties, pre grou s, social and political elite.
(c)Regionalism and ecentralization of power.
(d)Secularization.

(v) Social Movemen in Mode n India :

(a)Pe sants a d farme mov ments.
(b)Wom n's m vement.
(c)Backwa d c s & Dalit movements.
(d)En ironme al movements.
(e)Ethn ity and dentity movements.

(vi) Popula on Dynamics :

(a)Populatio size, growth, composition and distribution.
(b)Components f population growth: birth, death, migration.
(c)Population Po cy and family planning.
(d)Emerging issues: ageing, sex ratios, child and infant mortality, reproductive health.

(vii) Challenges of Social Transformation :

(e)Crisis of development : displacement, environmental problems and sustainability.
(f) Poverty, deprivation and inequalities.
(g)Violence against women.
(h)Caste conflicts.
(i) Ethnic conflicts, communalism, religious revivalism.
(j) 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 con-tinuous-type random variable, probability mass function, prob-ability density function, vector-valued random variable, mar-ginal 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 path 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 Kolmogoroffs theorems, probability generating function, moment generating func on, c aracteristic function, inver-sion theorem, Linderberg and Levy forms of central lim theo em, tandard discrete and continuous probability distribu-tions.

2. Statistical Inference:

Consistency, unbiasedness, efficiency, sufficiency, com-pl tenes ancil y statistics, factorization theorem, exponen-tial family of distribution and s proper es, uniformly mini-mum variance unbiased (UMVU) estimation, Rao Blackwe and ehmann- cheffe theorems, Cramer-Rao inequality for single Parameter. Estimation by metho of moments, maxi-mum likelihood, least squares, minimum chisquare and modi-fi minimum hisquare, properties of maximum likelihood and other estimators, asymptotic fficiency, prior and posterior distributions, loss function, risk function, and min max e i-mato Bayes estimators.

Non-randomised and randomised tests, critica function, MP tests, Neyman-Pearson lemma, UMP tests, monotone like-lihood ratio: simila and unbi sed tests, UMPU tests for single paramet likelihood ratio test and its a ympto c distribution. Confidence bounds and its relation with tests.

Kolmogorov's test for goodness of fit d its consis-tency, sign test and its optimality. Wilcoxon signedranks test and onsiste cy, Kolmogorov-Smirnov two sample test, run test, Wilcoxon-Mann-Wh ey test a d med an test, their consistency and asymptotic normality.

Wald's SPRT and its propertie Oc and ASN functions for tests regarding parameters for Bernoulli, Pois-son, n mal and e onential distributions. Wald's fundamen-tal identity.

3. Linear Inference and Multivaria e Analysis :

Linear statistical models, theor of least squares and analysis of variance, Gauss-Markoff theory normal equat ns, leas squares estimates and their precision, test of signifi-cance and in rval e timates b on least squares theory in oneway, two-way and three-way cl ssified data regression analysis, linear regression, curvilinear regression and orthogo-nal polynomials multiple ression, multiple and partial cor-relations, estimation of variance and covar nce co ponents, multivariate normal distribution, Mahalanobis's D^2 and Hotelling's T^2 statistics and th applications and properties, discriminant analysis, canonical correlations, principal co -ponent analysis.

4. Sampling heory and Design of Experiments :

An outline of fix d-population and super-population approaches, distinctive features of finite population samp ing, propability sampling designs, simple random sampling with and without replacement, stratified random sampling, sys-tematic sampling and its efficacy, cluster sampling, twostage 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 ob-servation per cell), CRD, RBD, LSD and their analyses, incom-plete block designs, concepts of orthogonality and balance, BIBD, missing plot technique, factorial experiments and 2^4 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, X, R, s, p, np and 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-Romin tables.

Concept of reliability, failure rate and reliability functions, reliability of eries nd parallel systems and other simple configurations, renewal density and rene al fun tion Failure models: exponential, Weibull, normal, lognormal. Problems in life te ing censo ed and truncated experiments for exponential models.

2. Optimization Techniques :

Different types of models in Operations Research, their construction an general methods of solution, simulation and Monte-Carlo methods formulat on Linear P ogramming (LP) problem, simple LP model and its graphical solution, the simple procedure, the two-phase metbod and the M-technique with artificial variables, he du-alit theory of LP and its economic interpretation, sensitivity analysis, transpotat n and assignment problems, rectangu-lar games, two-person zerosum games, ethod of solution (graphical and algebraic).

Replacement of failing or deteriorating item group an individual replacement policies, concept of scientific inven-tory managem nt a d analytic l structure of inventory prob-lems, simple models with deterministic and ochastic d d with and without lead time, storage models with particular reference to dam ty e.

Homogeneous discrete-time Ma v chain transition probability matrix, classification of states and ergodic the rem , hom geneo continuous-time Markov chains, Pois-son process, elements of queuin heory, M/M M/M/K, G/ M/l and M/G/1 queues.

Solution of statistical problems on comput rs using well-known statistical software packages like SPSS.

3. Quantitative Eco omics and Of cial Statistics:

Determination of tr nd, seaso al and cyclical components, Box-Jenkins method, tests for stationary seri s, AR MA mode s and determination of orders of autoregressive and moving averag comp nents, fo c ting.

Common y us d index numbers - Laspeyre's, Paasche's and Fisher's ideal index numbers, cham-base ndex n r, uses and limitations of index numbers, index number of wholesale price consu er price, agricultural production and industrial production, test fot index number propo onality, time-reversal, factor-reversal and circular.

General li ar model, ordinary least square and generalized least squares methods of estimation, p blem of multi-collinearity, consequences and solutions of multi-collinearity, autocorrelation nd its consequences, heteroscedasticity of disturbances and its testing, test for independenc of disturbances concept of structure and model for simultaneous equations, problem of identification-rank and order conditions of identifiability, two-stage least sauare 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 sub lasses Acoelo ate and Coelomate, Protostomes and Deuterostomes, Bilateria and Rad ta; Sta s of Protista, Parazoa, Onychophora and Hemichordata; Symmetry
(b) Protozoa: Locomotion, nutrition, reproduction, sex; ene l features and life history of *Paramaecium, Monocystis. Plasmodium* and *Leishmania.*
(c) Porifera: Skeleton, canal system and reproduction.
(d) Cnidaria: Polymorphism, defensive structures and t ir mechanism; coral reefs and their formation; metagenesis; general fea ures an life h ory of *Obelia* and *Aurelia.*
(e) Platyhelminthes: Parasitic adaptation; g neral feat es and life history of Fasciola and Taenia and their-Pathogenic symptoms
(f) Nemathelminthes: General featur s, life istory, arasitic adaptation of Ascaris and *Wuchereria.*
(g) Annelida: Coelom and metamerism modes of life in polychaetes; general features and life history of Nereis, earth and le ch.
(h) Arthropoda: Larva for s and parasit m in Crustacea; vision and respiration in arthropods (Prawn, c roach an scorpion); modification. of mouth, parts in insects (cockroach, mosquito, h usefly, honey bee and butterfly), metapmor phosis in insect and its hormon regulation socialbehaviour ofApis and termites.
(i) Molluscs: Fe ding, respirati n, locomotion, general features and life history of Lamellidens, la and Se a. Torsion and detorsion in gastropods.
(j) Echinod rmata Feeding espiration, locomotion, larval forms, general features and life istory *Asterias*
(k) Pr och rdata: Origin of chordates; general features and life history of *Branchiostoma* and *e dman*
(l) Pisces: espiration, locomotion and migration.
(m) A phibia: rigin of tetrapods, parental care, paedomorphosis.
(n) Rep ia; Origin of reptiles, skull types, status of *Sphenodon* and crocodiles.
(o) Aves: igin of birds, flight adaptation, migration.
(p) Mammali Origin of mammals, dentition, general features of egg laying mammals, pouchedmammals, 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, urinogenital 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 orga izati in insects;
(c) Orientation, navigation, homing; biological rhythms: biological c ck, tidal, seasonal and circadian rhythms.
(d) Methods of studying animal behaviour including sexual conflict, fishnes kinship and altruism.

4. Economic Zoology :

(e) Apiculture, sericulture, lac culture, carp culture p arl cultur prawn culture, vermiculture.
(f) Major infectious and communicable diseases (mal a, filaria, berculosis, cholera and AIDS) their vectors, pathogens and prevention.
(g) Cattle and livestock diseases, their path ge (helmin hs) and vectors (ticks, mites, Tabanus, Stomoxys).
(h) Pests of sugar cane (*Pyrilla perpusiell* oil seed *Achaeajanata)* and rice *(Sitophilus oryzae).*
(i) Transgenic animals.
(j) Medical biotechnology, human gen tic disease and genetic counselling, gene therapy.
(k) Forensic biotechnology.

5. Biostatistics:

Designing of experime s null hy othesis; correlation, regression, distribution and measure of central tendenc chi square student-test, F-test (one-way & two-way F-test).

6. Instrumentation m ds :

(a) Spectrophotometer, phase c ntrast and fluorescence microscopy, radioactive tracer, ultra centrifug gel . elec ophoresis, PCR, ELISA, FISH and chromosome painting.
(b) Electron micro opy (TEM, SEM).

PAPER-II

1. Cell Biolo y :

(a) ructure and function of cell and its organelles (nucleus, plasma membrane, mit chondr a, Golgi bodies, endoplasmic reticulum, ribosomes and lysosomes), cell divisi (mitosis and meiosis), mitotic spindle and mitotic apparatus, chromosome moveme t chromosome type ploytene and lambrush, organization of chromatin, heterochr matin, 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, transgenics, 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 AFLF and application of RFLP in DNA finger-printing, ribozyme technologies, human genome project, genomics and protomics.

3. Evolution :

(a) Theories of origin of life.
(b) Theories of evolution; Natural selection, role of mutation 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 a d biodiversity.

5. Biochemistry :

(a) Structure and role of carbohydrates, fats, fatty acids, cholesterol, p teins an amino-acids, nucleic acids. Bioenergetics.
(b) Glycolysis and Krebs cycle, oxidation and reductio , oxida ve phosphorylation; energy conservation and release, ATP, cycl cyclic A s structure nd role.
(c) Hormone classification (steroid and peptide hormo es), bi ynthesis 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 bloo blood gro ps and Rh factor in man; factors and mechanism of coagulatio iro metabo sm, acid-base balance, thermo regulation, anticoagulants.
(b) Haemoglobin: Composition, types nd role in trans-port of oxygen and carbon dioxide.
(c) Digestion and absorption Role o salivary glands, liver, pancreas and intestinal glands.
(d) Excretion: nephron regulatio of urine forma-tion; osmo-regulation and excretory product.
(e) Muscles: Types chan m of contraction of skel-etal muscles, effects of exercise on muscles.
(f) Neuron: ner impulse— ts conduction and synap-tic transmission; neurotransmitters.
(g) Vision, hearin and olfac on in man.
(h) Physio gy of re oduc on puberty and menopause in human.

7. Deve pmental Biology :

(a) Ga et g is; spermatogenesis, composition of semen, *in vitro* and *in vivo* capa tion of mammalian sperm, Oogenesis, totipotency; fertilization, orphog nesis and morphogen; blastogeneis, establishment of body axes formation, fat map, gestulation in frog and chick; genes in development in chick homeotic gene development of eye and heart, placenta in mammals.
(b) Cell lin age, cell to cell interaction, Genetic and in-duced teratogenesis, role of thyroxine n control of metamorphosisin amphibia, paedogenesis and neo-teny, 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.
(f)

LANGUAGES:

ARABIC

PAPER-I

1. (a) Origin and Development of the language in outline.
(b) Significant features of the grammar of the language, Rhetoric's, Prosody.
2. Literary History and Literary criticism—Literary movements, classical background ; Socio-Cultural influences, and modern trends, Origin and development of modern literary geners including drama, novel, short story, essay.
3. Short Essay—in Arabic

PAPER-II

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

POETS

1. Imraul Qais: His Maullaqah: "Qifaa Nabki mim Zikraa H wibin W Manzil" (Complete)

2. Zohair Bin Abi Sulma: His maullaqah:- "A min A dimna n lam takaleami" (Complete)

3. Hassan Bin Thabit : The following live Q said from is Diwan: From Qasidah No.1 to Qasidah IV and the Qasidah: "Lillahi, D ru i aabatin N damtuhum + Yauman bijlilaqa."

4. Umar Bin Abi Rabiah: 5 Ghazals from is Diwan :

i) Falanma to aqafn wa sallant oshwaqat + Wujudhum Zahahal Husnu and tataq n a, (Com lete)
ii) Lalta Hindan anjaz ta ma taid Washaft anfusona mimma tajidu (Complete)
iii) Katabtuilaiki mi bala + Kitaba muwallahin Kamadi (Complete).
iv) Amin aali Numin anta aadin famubkiru ghadata ghadia amraaihum famuhajjaru (Comple e).
v) Qaalaii Fe ha Attequ Maqaalan + FajaratMimma Yaqooluddumoou. (Complete)

5. Far daq : he following 4 Qasaid from his Diwan:

i) "H zallazi taariful Bathaau watatahu" in praise of Zainul Abideen Ali Bin Hussain.
ii) "Zarr t Sakeenatu atlaahan anakha bihim in praise of Umar Bin A. Aziz.
iii) "Wa Ko min tanamul adhyal ainan" in praise of Saeed Bin al- aas. (Complete).
iv) "Wa atlasa assaalinwa maakano sahiban" in praie of "the Wolfs"

6. Bashhar Bin Murd. The following two Qasaid from his Diwan:

i) "Izaa balaghar raaiul mashwarata fastain + Biraai naseehinaw naseehate haazimi (Complete)

Khaliaiya min Kaabin aeenaa akhookumma - Allaa darahi innal Kareem muinu. (Complete).

7. Abu Nawas . First three Qasaid from his Diwan.

8. Shaqui : The following five Qasaid from his Diwan “Al- Shauqiyal”.

i) “Ghaaba Boloum” (Complete).
ii) “Kaneesaturn saarat ilia masjidi” (Complete).
iii) “Ashloo hawaki liman yaloomu fayaozaru” (Complete).
iv) “Salaamummin sabaa Baradaa araqqu" (Nakbatu Dimashk). (Complete).
“Salaamun Neel yaa Gandhi - Wa hazaz Zahru min indi” (Complete)

Authors:

1 Ibnul Muqalf: “Kaliala Wa Dimna” excluding Muqaddamah:- Chapter 1 : Complete "Al Asad wa-al thaus."

2. Al-Jahiz: Al-Bayan Wat Tab'in : VII Edited by Abdul Salam Moh roon. Cairo, Egypt from pp. 31 to 85.

3. Ibn Khaldun: his Muqaddamah : 39 pages; part six from the firs c apter From “Affaslul saadis minal kitaabil awal” to “wa min Fur ihi al J bruwal uqabla”

4. Mohmud Timur: Story "Amml Mutawallji" from his book Qaa r Raav

5. Taufiq Al-Hakim: Drama: "Sinnul muntahiraa" from h s book "M srahiyatu Tahtiqal Hakim".

Note:—Candidates will be required to answer ome que tions carrying not less than 25 percent marks in Arabic also.

DOGRI

PAPER-I

story of D gri Language and Literature

(A swers must be written in Dogri)

Section-A

His ry of D gri Lang ag

. D g L age: Origin and development through different stages.
2. Ling istic boundaries of Dogri and its dialects.
3. Chara eristic features of Dogri Language.
4. S ucture of Dogri Language:
a) Sound Structure:
Segmental: Vowels and Consonants
Non-segmental: Length, Stress, Nasalization, Tone and Junture.
b) Morphology of Dogri:
i. Inflection Categories: Gender, Number, Case, Person, Tenser 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 Persia.

Section-B

History of Dogri Language

1. A brief account of Pre-independence Dogri Literature: Poetry and Prose.
2. Development of modern Dogri Poetry and main trends in Dogri Poetry.
3. Development of Dogri short-story, main trends and prominent short-storywriters.
4. Development of Dogri Novel, main trends and contribution of Dogri Novelists.
5. Development of Dogri Drama and contribution of prominent playwrights.
6. Development of Dogri Prose: essays, Memoirs and travelogues.
7. An introduction to Dogri Folk Literature-Folk songs, folk tales 7 ba

PAPER-–II

Textual Criticism of Dogri Literature.

(Answers must be writt n in D gri)

Sectio

Poetry

1. Azadi Paihle Di Dogri Kavita
The following poets:
Devi Ditta, Lakkhu, Ganga Ram, amdhan, Hardutt, Pahari Gandhi Babak Kanshi Ram and Perm nand Alma t
2. Modern Dogri Po r
Azadi Bad Di Dogri vita
The following ets:
Kishan Sm ilpuri, Tara S ailpurim Mohan Lal Sapolia, Yash Sharma, K.S.Madh kar,, Padma Sachdev, Jitendra Udhampuri, Charan Singh and Prakash Prem
3. She raza Do ri Number 102, Ghazal Ank
The ollowing poets:
am l Sharma, Ved Pal Deep, N.D.Jamwal, Shiv Ram Deep, Ashwini Magotra an Virendra Kesar
4. Shee za Dogri Number 147, Ghazal Ank
The foll wing poets:
R Shastri, Jitendra Udhampuri, Champa Sharma and Darsha Darshi.
5. Ram yan (Epic) by Shambhu Nath Sharma (up to 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 Khajuri and B.P. Sathe

2. Ajakani Dogri Kahani Part-II
The following Short Story Writers:
Ved Rahi, Narsingh Dev Jamwal, Om Goswami, Chahttrapal, 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. Kaiddi (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 play wrights :
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 ath, Shy m Lal Sharma, Lakshmi Narayan, D.C. Prashant, Ved Ghai, Kun r Viyo

ENGLISH

The syllabus consists of two papers, designed to test a first hand and critical reading of texts prescribed from the following periods i Engl Liter ure: Paper I: 1600-1900 and Paper II: 1900–1990.

(There will be two compulsory questio s in ch pape (a) A short-notes question related to the topics for general study, an ( ) A crit l analysis of UNSEEN passages both in prose and verse.)

PAPER-I

nswers m st be written in English)

Texts for detaile study are li ted below. Candidates will also be required to show adequate knowl dge of the following topics and movements:

Th Renais ance; E abet an and Jacobean Drama; Metaphysical Poetry; The Epic and the M ck-e c; Neoclassicism; Satire; The Romantic Movement; The Rise of the Novel; The Vict ian Ag

Section A

1. William hakespeare : King Lear and The Tempest.
2. John Don 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 w itte in Eng sh)

Texts for detailed study are listed below Candida s will also be required to show adequate knowledge of the followin topi and mo ements:

Modernism; Poets of the Th rtie The s am of consciousness Novel; Absurd Drama; Colonialism and Post-C on alism; In ian Writing in English; Marxist, Psychoanalytical and Feminist approaches to lite ure; Post- odernism.

Section A

1. William Butler eats. The ollowing poems:
– Ea ter 191
– Th Second Coming.
– raye my daughter.
– S ing to Byzantium.
The wer.
– mong School Children.
– Le a and the Swan.
– Mer
– 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 Cousin on a Swing
- – A River
- – Of Mothers, among other Th gs
- – Love Poem for a Wife 1
- – Small-Scale Reflections on a G at House
- – Obituary

(All these poems are ava e in the thology Ten Twentieth Century Indian Poets, edited by R. Parthasarthy, publishe by Oxford University Press, New Delhi).

Section B

1. Joseph Conrad ord Jim.

2. ames Joyce. Por ait of the Artist as a Young Man.

3. D. Law ence. Sons and Lovers.

4. E.M. F r er. sage to India.

5. rginia oolf. Mrs. Dalloway.

6. Raj Rao. K nthapura.

7. V.S. N ipaul. A House for Mr. Biswa

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 a 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 t ion of wr ng History of Hindi Literature.
II. Literary trends of the following four periods of histo of Hindi erature.

A: Adikal—Sidh, Nath and Ra o Sahity Prom nent poets—Chandvardai, Khusaro,Hemchandra, Vidya ati.
B: Bhaktikal—Sant Kavyad ara, ufi Kavya hara, Krishna Bhaktidhara n Ram B ktidhara. Prominent Poets—Kab Jayasi, Sur & Tulsi.
C: Ritikal—Ritikavy Ritibad kavya & Riti Mukta Kavya. romi ent P ets—K hav, Bihari, Padmaka d Ghana nd.
D: Adhunik Kal
a naiss ce, the development of Prose, Bharatendu Mandal. Prominent Writers—Bharatendu, Bal Krishna Bhatt & Pratap Narain Mishra.
c Promine t trends of modern Hindi Poetry: Chhayavad, Pragativad, Pr y gvad, Nai Kavita, Navgeet and Contemporary poetry and Janvadi Kavita. Prominent Poets—Maithili Sharan Gupta, Prasad, Nirala, Mahadevi, Dinkar, Agyeya, Muktibodh, Nagarjun

3. Katha S hitya

A: Upanyas & Realism
B: The origin and development of Hindi Novels.
C: Prominent Novelists—Premchand, Jain-endra, Yashpal,Renu and Bhism Sahani.
D: The origin and development of Hindi short story.
E: Prominent Short Story Writers—Premchand,Prasad, Agyeya, Mohan Rakesh & Krishna Sobti.

4. 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.

5. 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.

6. The other form of Hindi prose—Lalit Nibandh,Rekhachitra, Sansmaran, Yatra-vrittant

PAPER-II

(Answers must be written in Hindi)

The paper will require first-hand reading of the presc ibed te s and will test the critical ability of the candidates.

Secti n A

1.	Kabir	K bir Granth wali, Ed. Shyam Sundar Das (Fi t hundre Sakhis)
2.	Surdas	Bhramar Gitsar, Ed. Ramchandra Shukla First hundred Padas)
3.	Tuls s	Ramcharit Manas (Sundar Kand) Kavitawali (Uttarkand)
4.	Jayasi	Padmawat Ed. Shyam Sundar Das (Sinhal Dwip Khand and Nagmativiyog Khan)
5.	ri	Bihari Ratnakar Ed. Jagnnath Prasad Ratnakar (First 100 Dohas)
6.	Maithili Sharan Gupta	Bharat Bharati
7.	Prasad	Kamayani (Chinta and Shraddha Sarg)
8.	Nirala	Rag-Virag, Ed. Ram Vilas Sharma (Ram Ki Shakti Puja & Kukurmutta)
9.	Dinkar	Kurukshetra
10.	Agyeya	Angan Ke Par Dwar (Asadhya Vina)

11.	Mukiboth	Brahm Rakhashas
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, hraddha Aur Bhakti)
4.	Dr. Satyendra	Nibandh Nilaya—Bal rishna B att, Premchand, Gulab Rai, ajari Pr sad Dwivedi, Ram ilas Sharm gyeya, Kuber Nath Rai
5.	Premchand	Godan, P ehchan ki Sarvashreshtha Kahaniyan Ed. Am rt Rai/Manjusha-Prem Cha d ki Sarvashreshtha Kahaniy Ed. mrit Rai.
6.	Prasad	Skandgup
7.	Yashpal	Divya
8.	Pha iswar at Renu	Maila Anchal
9.	Mannu Bh dari	Mahabhoj
10.	Rajendra Yadav	Ed Dunia Sammantar (All Stories)

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 (geographical/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 statements;
- ii. Coordination;
- iii. Relativisation.

Section-B

1. Kashmiri literature in the 14th century (Socio-cultural and intellectual background with special reference to *Lal Dyad* and *Sheikhul Alam).*
2. Nineteenth century Kashmiri literature (development of various ge es : *v tsun; ghazal and mathnavi.*
3. Kashmiri literature in the first half of the twentieth centur ith sp cial re rence to Mahjoor and Azad; various literary influences).
4. Modern Kashmiri literature (with special reference to th velopmen of the short story, drama, novel and nazm).

PAPER-II

(Answers must b written in ashmiri)

Sectio A

1. Intensive study of Kashmiri try upto he nineteenth century:
- (i) Lal Dya
- (ii) Sheikhul A m
- (iii) Habba Khato

2. Kashmiri poetry 19th Century
- (iv) M mood Ga i *(Vatsans)*
- (v) Ma bool shah *Gulrez)*
-) Raso Mir *hazals)*
- i)Abdul Ahad Nadim *(N'at)*
- (v i) Kris njoo Razdan *(Shiv Lagun)*
- ( ) Sufi Poets (Test in *Sanglaab*, published by the Department of Kashmiri, niversity of Kashmir)

3. Twenti h Century Kashmiri poetry (text in *Azich Kashir Shairi,* published by the Deptt. of Kashm University of Kashmir).
4. Literary cri ism 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 Kashmir.
- (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 the Sahitya Akademi.
- (iii) *Razi Oedipus,* tr. Naji Munawar, published by the Sahitya Akademi.

4. Kashmiri Folk Literature :
- (i) *Kashur Luki Theatre* by Mohammad Subhan Bhaga publi hed by the Deptt. of Kashmiri, University of Kashmir.
- (ii) *Kashiry Luki Beeth* (all volumes) published by th &K Cu ural Ak demy.

PERSIAN

PAPER-I

1. a) Origin and development of the la guag (in outlin)
b) Significant features of the grammar of the ngu ge Rhetorics Prosody

2. Literary History and Literary criticis Literary movements, classical backgrounds, Socio Cultural influences and M rn tren ; Origin and development of modern literary genres, including dr ma novel, ort stor , essay.

3. Short Essay in Persian

PAPER-II

This paper will re uire first-hand reading of the texts prescribed and will be designed to tes he can date's c ical bility.

1. Firda si h N ma:
- i) D stan Rustam wa Suhrab
- ii) Da an Vizanba Maniza

2. N zammi Aruzi Samarquadi
Cha ar Maqala

3. Khayy m, Rabaiyat (Radif Alif, Be, Dal)

4. Minucheheri - Qasaid (Racif Lam and Mim)

5. Maulana Rum Masunawi (1st Vol. 1st Half)

6. Sadi Shirazi Gulistan

7. Amir Khusrau
Majma-i-Dawawin Khusrau (Radif Alif and Te)

8. Hafiz
Diwan -i-Hafiz (1st half)

9. Abdul Fazi
Ain-i-Akbari

10. Bahar Mashhadi
Diwan-i-Bahar (I Vol.) (1st half)

11. Jawal Zadesh
Yake Bud Yake Na Bud

Note:—Candidates will be required to answer in Persian questions carrying not less than 25 per cent marks.

PUNJABI

PAPER-I

(Answers must be written in Punjabi in Gurumukhi s pt)

Section-A

(a) Origin of Punjabi Language; different stage of development and recent development in Punjabi Language; haracte stics Punjabi phonology and the study of its tones; classification of vowels and c sonants.

(b) Punjabi morphology; the numb gen er system (animate and inanimate), prefixes, affixes and different categori s of Post ositi s; Punjabi word formation; **Tatsam. Tad Bhav.** forms; Sentence st cture, the notion of subject and object in Punjabi; Noun and verb phrase

(c) Language and d le t : the n ions o dialect and idiolect: major dialects of Punjabi : Pothohari, Majhi, D abi, Malw Paudhi; the validity of speech variation on the basis of social tratifi tion, the distinctive features of various dialects with special reference o tones Lang age and script; origin and development of Gurumukhi; Suitability f Gurumu hi for Punjabi.

(d) Clas ical b ckground : Nath Jogi Sahit. Medieval Literature : Gurmat, Suti, Kissa and Var : jana khis.

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, avinder Ravi, Ajaib Kamal). Aesthetes (Harbhajan Singh, Tara Singh). Neo-progressive (Pash, Jagtar, Patar).

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 Tiwa a, S aran Chandan).
	Short Story	(Sujan Singh, K. S. V Prem rkash, Waryam Sandhu).
d	Socio-cultural Literary influences;	Sans Persian nd Western
	Essay	(P ran Singh Teja Singh, Gurbaksh Sin h).
	Literary Critici m	(S. Sekhon, Attar Singh, Kishan Singh, Harbhajan Singh, Najam Hussain Sayyad).

PAPER-II

(Answers must be written in Punjabi in Gurumukhi script)

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

Section A

Sheikh Farid	The complete Bani as included in the Adi Granth.

Guru Nanak	Japu Ji. Baramah. Asa di Var.
Bulleh Shah	Kafian
Waris Shah	Heer

Section B

Shah Mohammad	Jangnama (Jang Singhante Firangian)
Dhani Ram Chatrik	Chandan Vari
(Poet)	Sufi Khana
	Nawan Jahan
Nanak Singh	Chitta Lahu
(Novelist)	Pavittar P pi
	Ek M an Do alwara
Gurbaksh Singh	Zi dagi-di Ras
(Essayist)	Nawan Shivala
	Merian Abhul Yadaan.
Balra Sahni	Mera Roosi Safarnama
(Travelogu)	Mera Pakistani Safarnama
Balwant G rgi	Loha Kutt
(Dramatist)	Dhuni-di-Agg
	Sultan Razia
Sant Singh Sekhon	Sahityarth
(Critic)	Parsidh Punjabi Kavi
	Punjabi Kav Shiromani.

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 English.)

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 feature 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 litera ners o
      Mahakavya
      Rupaka (drama)
      Katha
      Akhyayika
      Campu
      Khandakavya
      Muktaka K ya.

Section-B

4. Essential of I n Cu re with stress on:

   (a) Puru rthas
   (b) Sams ãras
   (c) Varnãsra avy vasthã
   (d) Arts and fine arts
   (e echni Sciences.

5. T nds of ndian Philosophy

   (Mïmansã
   (b) edãnta
   (c) Ny ya
   (d) Va sesika
   (e) Sãnkhya
   (f) Yoga
   (g) Bauddha
   (h) Jaina
   (i) Carvãka

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. Questions from Groups 1, 2 and 3 are to be answered either in Sanskrit or in English.)

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. Varn ar

Group 2
(a) Isãvãsyopanisad
(b) Bhagavadgitã
(c) Sundarakanda of Valmiki's R mayana
(d) Arthasastra of Ka lya

Group 3
(a) Svapanavas vadatt m—Bha a
(b) Abhijnanas untalam—Kalidasa
(c) Mricchakatikam—Sudraka
d) Mudrara asam—Visakhadatta
(e) U ararama ritam—Bhavbhuti
(f) Ra avali—Sriharshavardhana
(g) Venis mharam—Bhattanarayan

Group 4
Short notes n Sanskrit on the following :—
(a) Me hadutam—Kalidasa
(b) Nit satakam—Bhartrhari
(c) Pancatantra—
(d) Rajatarangini—Kalhana
(e) Harsacaritam—Banabhatta
(f) Amarukasatakam—Amaruka
(g) Gitagovindam—Jayadeva.

Section B

This section will require first hand reading of the following selected texts:— (Questions from Groups 1 & 2 are to be answered in Sanskrit only) Questions from Groups 3 and 4 are to be answered either in Sanskrit or English.

Group 1
(a) Raghuvamsam—Canto I, Verses 1 to 10
(b) Kumarasambhavam—Canto I, Verses 1 to 10

(c) Kiratarjuniyaue—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—Sukanasopadesa (only)

Group 4
(a) Svapnavasavadattam Act VI
(b) Abhijnansakuntalam Act IV Verses 15 to 30 (M.R. Kale Edition)
(c) Uttararamacaritam Act I Verses 31 to 47 (M.R. Kale Edition).

URDU

PAPER-I

(Answers must be written in U du)

Section A

Development of Urdu Language

(a) Development of Indo-Aryan
  (i) Old Indo-Aryan
  (ii) Middle Indo-Aryan
  (iii) New Indo-Ary n.

(b) Western Hindi nd ts diale ts Brij Bhasha Khadi Boli, Haryanavi, Kannauji, Bundeli—
Theories abo e orig of Urdu language.

(c) Dakhani rdu—origi and development, its significant linguistic features.

(d) Social and Cultural roots of Urdu language— and its distinctive features.
Scri , Phono gy Morphology, Vocabulary.

Section B

(a) enres and their development :
  (i) P etry: Ghazal, Masnavi, Qasida, Marsia, Rubai Jadid Nazm.
  (ii) Pro e: Novel, Short Story, Dastan, Drama, Inshaiya, Khutoot, Biography.

(b) Signi cant features of : (i) Deccani, Delhi and Lucknow schools, (ii) Sir Syed movement, 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

Mir Amman	Bagho-Babar
Ghalib	Intikhab-e-Khutoot-e Ghalib
Mohd. Husain Azad	Nairang-e-Khayal
Prem Chand	Godan
Rajendra Singh Bedi	Apne Dukh M jhe D do
Abul Kalam Azad	Ghubar K tir

Section B

Mir	Int ab-e-K lam-e-Mir (Ed. A dul Haq.)
Mir Hasan	Sahru Bayan
Ghalib	Diwan-e-Ghalib
Iqb l	Bal-e-Jibrail
Firaq	Gul-e-Naghma
Faiz	Dast-e-Saba
Akhtruliman	Bint-e-Lamhat

APPENDIX –III

Regulations for the Medical Examination of Candidates for admission to the Jammu and Kashmir Police (Gazetted) Service.

These regulations are intended merely for the guidance of the Medical Examiners and are not meant to restrict their di cretio in any manner.

1. To be passed as medically fit for admissi to th J&K Police (Gazetted) Service, a candidate must be in good mental nd bodily health and free from any physical defect likely to rfere wi the efficient performance of the duties of his appointment

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

He will remove his shoes a d be pla ed against the standard with his feet together, and the w ght throw on the heels and not on the toes of outer sides of t e feet He will tand erect without rigidity and with the heel calves, ttocks an shoulders touching the standard; the chin will be depress d to bring the vertex of the heel level under the hori ontal ar, nd the eight will be recorded in centimetres and millimeter

3. The andidate's est will be measured as follows:-

He w ll be ma e to stand erect with his feet together and to raise his arms o er hi head. The tape will be so adjusted round the chest that its upper edge touches the interior angles of the shoulder blades beh d and its lower edge the upper part of the nipple in front. The arms will then be lowered to hand loosely by the side, and care be t ken that shoulders are not thrown upwards or backwards so as to displace the tape.

he candidate will then be directed to take deep inspiration several times, and the maximum expansion of the chest will be carefully noted. The range of the expansion should not be less than 5 cm. The minimum and maximum will then be recorded in cms-84-89,86-91 etc.

In recording the measurement, the following table is given for the guidance of Medical Officer.

		CHEST.	
Age last Birthday	**Height without shoes in cms**	**Girth when fully expanded (cm)**	**Range of expansion not less that (cm)**
21 and upwards	159 and under 165	88	5
	165 and under 173	89	5
	173 and under 178	90	
	178 and under 183	91	5
	183 and upwards	93	5”

4. The candidate will also be weighed and h weight recorded in Kilograms. Fractions of Kilograms should not e noted.

5. The following conditions should be serv d in connection with the test for acuteness of vision:-

Vision of Candidates.

(a) No andida will be accepted whose vision is less han:

Better eye	Worse eye
V 5/6 Reads 6.	V-6/12 Reads 1.

Specta es will be allowed for either eye upto plus 5.0 or minus .0 D, provided that there are no morbid changes in the fundus.

(b) In myopia, if there is a posterior staphyloma, the spectacles must not exceed 2.5 D in either eye.

(c) In case of astigmatism, the combined lenses must not exceed 5 Diopters and there should be no fundus changes.

(d) Squint or any other morbid condition of the eyes of the lids of either eye liable to the risk of aggravation or recurrence will cause the rejection of the candidate.

(e) Each eye must have a full field of vision as tested by hand movements.

(f) Any defect in colour vision will be noted, but will not cause rejection of the candidate.

(g) In case of doubt or of serious abnormality, the opinion of the Ophthalmic Specialist will be obtained.

(h) No candidate will be accepted whose standard of vision does not come up to the specified requirements without the use of the contact glasses.

6. The Urine (passed in presence of the Examiner) should be examined and the result recorded.

7. The following additional points should be observed:

(a) That the candidate's hearing in ch ea is good, and that there is no sign of disease of the ear;

(b) that his speech is without impe ment;

(c) that his teeth are in good rder and that he is provided with dentures w re cessary for effective mastication (well filled teeth will be considered as sound).

(d) that his hest is w ormed and his chest expansion sufficient, nd that his heart and lungs are sound;

(e) hat the is no evidence of abdominal disease;

(f) th t he is not raptured;

(g) at he does not suffer from hydrocelea severe degree o varicose, varico sevens or piles.

(h) that his limbs, hands and feet are well formed and developed and that there is free and perfect motion of all his joints;

(i) that he does not suffer from any inveterate etc. skin disease;

(j) that there is no congenital malformation or defect;

(k) that he does not bear traces of acute or chronic disease pointing to an impaired constitution;

(L) that he bears marks of efficient vaccination and evidence of re-vaccination within the last 12 months.

When any defect is found, it must be noted in the certificate and the medical examiner should state his opinion whether or not it is likely to interfere with the efficient performance of the duties which will be required of the candidate. If the condition is remediable by operation, it should be stated.

The following intimation is made for the guidance of the Medical Examiner:-

1. In the medical examination of candidates, Medical Officers are specially required to use tact and judgment and to take proper precaution to secure privacy with the object of removing any objection which may be made by individuals to stripping.

2. Should a candidate object to the Exposure of his pe son f the detection of haemorrhoide, venereal diseases, herni and sease of the testicles, scrotum and rectum, the candidate must if this xamination in his case is in the opinion of the Board necessary, b jected.

3. The opinion of the Board accepting rejectin a candidate is final and cannot be questioned on this ground. he Board is debarred from disclosing to any candidate, permane tly nfit; th reasons for his rejection. In these cases, their opinion a d report is to be treated as strictly confidential and for the informatio of Gove ment only. Where, however the Board detects a temp ary efect amendable to treatment, the candidate may be so info ed in o that he may have the defect remedied and present himself r re-examination.

4. No person wi be deemed qualified for admission to the service who shall not satisfy th Governm nt that he has no disease, constitutional affection or b dily in rmity unfitting him or likely to unfit him, for that service.

5. It sh uld be nderstood that the question of fitness involves the futur as well s th present, and the main object of medical examination is se ure continuous effective service, and in the case of candidates for pe m nent pointment to prevent early pension or payment in case of prem ture death. It is, at the same time, to be noted that the question is ne of t e likelihood of continuous effective service and that the rejection of candidate need not be advised on account of the presence of a defect which only in a small proportion of cases is found to interfere with continu us effectively service.

The candidate must make the statement required below prior to his medical examination and must sign the declaration appended thereto. His attention is specially directed to the warning contained in the note below:

1. State your name in full.

2. State your age and birth place.

3. (a) have you ever had small pox intermittent or any other fever, enlargement of suppuration of glands, spitting of blood, asthama, inflammation of lungs, heart disease, fainting attacks, rheumatism, or appendicitis.

(b) any other disease or accident requiring confinement to bed, and medical or surgical treatment.

OR

(c) have you ever been rejected by a medical Board or a duly constituted Medi al Aut ority?

4. When were you last vaccinated?

5. Have you or any of your neare relat ns been affected with consumption, scrof l astham fits, epilepsy, or insanity?

6. Have you suffered from a y form of nervousness due to overwork a othe ause?

7. Furnish the fo wing par ulars concerning your family:

I	II	III	IV
Father's age if living and stat of health	F her age at death and cause f death	Number of brothers living, their age and state of health	Number of brothers dead, their age and cause of death

V	VI	VII	VIII
Mo r s ag if living and state f health	Mother's age at death and cause of death	Number of sisters living, their age and state of health	Number of sisters dead, their age and cause of death

I declare all the above answers to be, to the best of my belief, true and correct and accept the findings of the Board as final.

Candidate's Signature

MEDICAL EXAMINER'S REPROT:

Question	Answers	Remarks
1. Has the declaration of the preceding page been signed by the candidate?		
2. Are there any evidences of malformation congenital or acquired ?		
3. Is he free from scars and has he the full use of all limbs?		
4. Are there any indications of a decided cashetic or diathetic state of constitution?		
5. Are there any signs of disease of the nervous system ?		
6. Is the hearing good? Is there any sign of any ear disease?		
7. Has the candidate been vaccinated within the last 12 months ?		
8. What is the candidate's vision? R.E.V. with glass. Reads. L.E V. with glasses. Spectacles if a y R.E.L.E.		
9. Is the candidate free from stamer or othe seri us d fect in speech ?		
10. Are there any si ns of disease of the bone , jo nts or arts connecte therewith?		
11. Is the any seri us infection of th skin?		
12.) Is the heart and arteries ea ? b) Blood pressure- Systo /Diastolic?		
3 Has the candidate haemorrhoide, vericoele or other affect n of veins?		
14. Is there any sign of disease of the digestive organs?		
15. Are there any signs of disease of the respiratory organs?		
16. Is the candidate free from rapture?		
17. Is there any indication of disease of the genital organs?		

18. (A) Is the urine free from: (1) Albumen (2) Sugar (B) Is the urine otherwise normal?
19. Is there anything in the health of the candidate likely to render him/her unfit for the efficient discharge of his/her duties in the service for which he is a candidate?
20. Do you consider the candidate in all respects qualified for the efficient and continuous discharge of his/her duties in the service for which he/she is a candidate? (I) Height without shoes, (II) Girth of Chest (full inspiration). (III) Weight
President. Member Memb r Dated:…… ……

Note 1- he cand date will be held responsible for the accuracy of the abov stateme y willfully suppressing any information, he will incur the r k o losing the appointment and, if appointed of forfeiting all claims to sup annuation allowance or gratuity.

Note 2 A candidate for direct recruitment should attach with the pre cribed application a treasury receipt for an amount of Rs.100 on accou t of Medical Examination fee which shall not be refundable in the event o the candidates failing to be selected by the Medical Board.

APPENDIX-IV

REGULATIONS RELATING TO THE PHYSICAL EXAMINATION OF CANDIDATES.

These regulations are notified for the convenience of candidates and in order to enable them to ascertain the probability of their coming up to the required physical standard. But it must be clearly understood that the Government reserves an absolute discretion to reject as unfit any candidate whom it may consider on the report of the Medical Board, to be physically disqualified and that its discretion, i in n respect limited by these regulations. These regulations are intended mer y for the guidance of Medical Examiners and are not meant to restr t the disc etion of the Government in any way.

(1) To be passed as fit for appointment, a andidate must be in good mental and bodily health and free om y physical defect likely to interfere with the efficient performance o t e duties f his appointment.

Provided that the Medic ard s all intimate the nature and degree of disability of physicall challe ged andidate in terms of Government Order No. 147-SW of 20 4 dated 17.06.2014 with specific recommendations, if ny, i respect of each of such candidate(s) for appointment to variou posts th gh the Combined Competitive Examination.

(2) n the atter of correlation of age, height and chest girth of candidate, s left to th Medical Board to use whatever correlation figures are co idere most suitable as a guide in the examination of the candidates If there be y disproportion with regard to height, weight and chest girth the can date should be hospitalized for investigation and X-Ray of the hest tak n before the candidate is declared fit or not fit by the Boar

(3) The candidate will be weighed and his weight recorded in kil grams; fractions of a half a kilogram should not be noted:-

(4) The candidate's eye sight will be tested in accordance with t e following rules. The result of each test will be recorded:-

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

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

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

The standards for distant and near vision with or without glasses shall be as follows:-

Distant vision		Near visio	
Better eye	Worse eye	Better eye	Worse ye
6/9 or 6/6	6/9 or 6/12	Sn 0 6	Sn. 0

Note:- (1) Total amount of My pia (inc ding the cylinder) shall not exceed 8.00 D in e ch eye. T tal Hypermetropia shall not exceed + 6.00 D in ea eye

(2) Fundus Exam ation:- Wherever possible, fundus e amin ion will be arried out at the discretion of the Medical Bo d and res ts recorded.

(3) C lour V sion: - Colour perception should be graded into a higher a d a lower grade depending upon the size of the apertur in the lantern as described in the table below:-

Grade	Higher Grade of Colour perception	Lower Grade of Colour perception
1. Distance between the Lamp a d Candidate.	4.9 meters	4.9 meters
2. Siz of Aperture	1.8 mm	1.8 mm
3. Time of Exposure	5 sec.	5 sec.

(iii) Satisfactory colour vision constitutes recognition with ease and without hesitation of signal red, signal green and white colours. The use of Ishihara's Plates, shown in good light and suitable lantern like Edrige green's shall be considered quite dependable for testing colour vision. In doubtful cases, where a candidate fails to qualify when tested by only one of the two tests, both the tests should be employed.

(4) Field of Vision. The field of vision shall be tested in respect of all services by the confrontation method. Where such test gives unsatisfactory or doubtful results, the field of vision should be determined on the perimeter.

(5) Night Blindness:- 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 adaptation is prescribed. The medical board should be given the discretion to improvise such rough tests, e.g. recording the visual acuity with reduced illumination or by making the candidate recognize various objects in a darkened room after he/she has been there for 20 to 30 minutes. Candidate's own statements should not always be elied pon but they should be given due consideration.

(6) Ocular conditions other than visual acuit

(a) Any organic disease or a progres i refractiv error which is likely to result in lowering the visual activity sho d be considered as a disqualification.

(b) Trachoma:- Trachoma nle comp icated shall not ordinarily be a cause for disqualification.

(c) If a person has on eye r if he has one eye which has normal vision and the other eye is mbylopic has subnormal vision the usual effect is that the person is l king stereoscopic vision for perception of depth. Such vision n t nece sary for many civil posts. The medical board may reco mend as such persons provided the normal eye has

(a) 6/ distant vis n J1 near vision with or without correction with glasses / contact lens/efractive surgery like Lasik, ICL, IO etc.
(b) Has full field of vision.
(c) Normal colour vision wherever required: Provided the b ard 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 J&K Police (G) Service .

(7) Blood pressure:- The Board will use its discretion regarding Bloo Pressure. A rough method of calculating normal maximum systolic pressu is as follows:-

(i) With young subjects, 15-25 years of age, the average is about 100 plus the age.

(ii) With subjects over 25 years of age, the general rule of 110 plus half the age seems quite satisfactory.

N.B.:- As a rule any systolic pressure over 140 mm. and diastolic over 90 mm. should be regarded as suspicious and the candidate should be hospitalized by the Board before giving their final opinion regarding the candidate's fitness or otherwise. The hospitalization report should indicate whether the rise in Blood pressure is of a transient nature due to excitement etc. or whether it is due to any organic disease. In all such cases, X-Ray and electrocardiographic examinations of heart and blood urea clearance test should also be done as a routine. The final decision as to the fitness or otherwise of a candidate will, however, rest with the medical board only.

Method of taking Blood Pressure.

The mercury manometer type of instrument shoul be used as a rule. The measurement should not be taken within fi ee minu s of any exercise of excitement. Provided the patient and articu rly his arm is relaxed, he may be either lying or sitting. The arm s supported comfortably at the patient's side in a more or less horizont l osition. he arm should be free from the clothes to the shoulder. he c ff completely deflated should be applied with the middle of the r bber over he inner side of the arm, and its lower edge an inch or two abov the bend of the elbow. The following turns of cloth bandage shou sp ead e enly over the bag to avoid bulging during inflation.

The brachial art y is cated by palpitation at the bend of the elbow and the stethoscop s then ed lightly and centrally over it below, but not in contact with t cuff. The cuff is inflated to above 200 mm. Hg. and then slowly efl ed. Th level at which the column stands when soft successive u ds are eard represents the Systolic Pressure. When more air is allowe to escap the sounds will be heard to increase in intensity. The level a which the well-heard clear sound change to soft muffled f ding soun s represents the diastolic pressure. The measurem nts shou be taken in a fairly brief period of time as prolonged press re of he cuff irritating to the patient and will vitiate the readings. Re-c ecking, f n essary, should be done only a few minutes after omp ete deflation of the cuff. Sometime as the cuff is deflated, sounds are he r at a rtain level; they may disappear as pressure falls and re-appe rs at a still lower level. This "Silent gap" may cause error in reading.

8. The urine (passed in presence of the examiner) should be exam ed and the results recorded. Where a Medical Board finds sugar presen in a candidate's urine by the usual chemical tests, the Board will proceed with the examination with all its other aspects and will also specially note any signs or symptoms suggestive of diabetes. If except for the glycosauria the Board finds the candidate conforms to the standard of medical fitness required, they may pass the candidate. "fit subject to the glycosauria being non-diabetic" and the Board will refer the case to a specified specialist in Medicine who has hospital and laboratory facilities at his disposal . The Medical Specialist will carry out whatever examinations clinical and laboratory he considers necessary including a standard blood

sugar tolerance test and will submit his opinion to the Medical Board upon which the Medical Board will base its final opinion “fit” or “unfit”. The candidate will not be required to appear in person before the Board on the second occasion. To exclude the effects of medication it may be necessary to retain, a candidate for several days in hospital under strict supervision.

9. The following additional points should be observed:-

(a) that the candidate’s hearing in each ear is good and that there is no sign of disease of the ear. In case it is defective, the candidate should be examined by the ear specialist. Provided that if the defect in hearing is remediable by operation or by use of a hearing aid a candidate cannot be declared unfit on that account provided h /she has no progressive disease in the ear;

(b) that his/her speech is without impedime

(c) that his/her teeth, are in good order d that he he is provided with denture where necessary for effective mastica on (well filled teeth will be considered as sound);

(d) that the chest is well rm d an his/her chest expansion sufficient; and that his heart and lungs are s nd;

(e) that there is no iden e of any abdominal disease;

(f) that he/she is no aptured;

(g) tha h she do s not suffer from hydrocele, a severe degree of varicocele, varic e veins o piles;

(h) that his/he limbs, hands and feet are well formed and developed and that t ere is free and perfect motion of all his joints;

(i) at h /she does not suffer from any inveterate skin disease;

(j) that there is no congenital malformation or defect;

(that he/she does not bear traces of acute or chronic disease po ting to an impaired constitution;

) That he/she bears-marks/proof of efficient vaccination and

(m) that he/she is free from communicable disease.

10. Radiographic examination of the chest should be done as a routine in all cases for detecting any abnormality of the heart and lungs, which may not be apparent by ordinary physical examination.

11. When any defect is found it must be noted in the certificate and the medical examiner should state his opinion whether or not it is likely to interfere with the efficient performance of the duties which will be required of the candidate.

NOTE:- Candidates are warned that there is no right of appeal from a Medical Board, special or standing, appointed to determine their fitness for the above service. If however, the Government is satisfied on the evidence produced before it of the possibility of an error of judgment in the decision of the First Board, it is open to the Government to allow an appeal to a second Board. Such evidence should be submitted within one month of the date of the communication in which the decision of the first Medical Board is communicated to the candidate, otherwise no eque for an appeal to a second Medical Board, will be considered.

If any medical certificate is produced by a c didate s a p ece of evidence about the possibility of an error of judgm nt in e decision of the First Board, the certificate will not be taken i t conside ation unless it contains a note by the medical practitioner once ed to the effect that it has been given in full knowledge of the fac hat the c ndidate has already been rejected as unfit for service by the Medic l Board.

MEDICAL BOARD'S REPORT

The following intimati n is made for he guidance of the Medical Examiner:-

1. The standard p sical f ness to be adopted should make on due allowance for th ge and length of service, if any, of the candidate concerned.

No erson will b deemed qualified for admission to the Public Service w o shall no satisfy the appointing authority, as the case may be, that he/she has no disease, constitutional infection, or bodily infirmity unfitt g him, like y to unfit him/her for that service

It sh ld be understood that the question of fitness involves the futur as well as the present and that one of the main objects of medical xamin ion is to secure continuous effective service. It is at the same time to e noted that the question is one of the likelihood of continuous effective servi and that rejection of a candidate need not be advised on account of the resence of a defect which only in a small proportion of cases is found to interfere with continuous effective service.

A lady doctor will be co-opted as a member of the Medical Board whenever a woman candidate is to be examined.

The report of the Medical Board should be treated as confidential.

In case where a candidate is declared unfit for appointment in the Government Service the grounds for rejection may be communicated to the candidate in broad terms without giving minute details regarding the defect pointed out by the Medical Board.

In case where a Medical Board considers that a minor disability disqualifying a candidate for Government Service can be cured by treatment (medical or surgical), a statement to that effect should be recorded by the Medical Board. There is no objection to a candidate being informed of the Board's opinion to this effect by the appointing authority and when a cure has been effected it will be open to the authority concerned to ask for another Medical Board.

In the case of candidates who are to be declared "T mpor rily Unfit" the period specified for re-examination should not ordin rily exceed six months at the maximum. On re-examination after the ecifie perio these candidates should not be declared temporarily unf t for a further period but a final decision with regard to their fitness fo ppointme t or otherwise should be given.

(a) Candidate's statement and decla ation:

The candidate must take the statem nt required below prior to his Medical Examination and must gn the D claration appended thereto. His/her attention is specially recte to the arning contained in the Note below : -

1. S ate yo r n me in ll …….
   (in lo k letter
2. State our age a d birth place …….

3. (a) have yo ever had small-pox, intermi ent or any other fever, enlargement or suppuration of g and , spitting of blood, asthma heart disease, lung disease, ainting attacks, rheumatism, appendicitis? ……..

   (b) any other disease or accident requiring confinement to bed and medical or surgical treatment ? …….

4. When were you last vaccinated? …….

5. Have you or any of your near relations been affected with consumption, scrofula, gout, asthma, fits, epilepsy, or insanity ? ……

6. Have you suffered from any form of nervousness due to over-work or any other cause ? ……..

7. Furnish the following particulars concerning your family:-

I	II	III	IV
Father's age if living and state of health	Father's age at death and cause of death	Number of brothers living, their age and state of health	Number of brothers dead, their age and cause of death

V	VI	VII	VIII
Mother's age if living and state of health	Mother's age at death and cause of death	Number of sisters ving, their age and stat of health	Number of s ters dead, the age and cause of death

8. Have you been xami ed by a Medical Board before? …….

9. If answe he abo e is yes, ple se state w at ser ice/services you were amined f ? ……..

10. Who was t e examining authority ? ……

11. When a d where was the Medical oard held ? ……..

12 Result of the Medical Board's Examination if communicated to you or if known ? …….

I declare all the above answers to be, to the best of my belief, true and c rrect.

Candidate's Signature……

Signed in my presence.

Signature of the Chairman of the Board.

Note: The candidate will be held responsible for the accuracy of the above statement. By willfully suppressing any information, he/she will incur the risk of losing the appointment and, if appointed, of forfeiting all claims to Superannuation Allowance or Gratuity.

(b) Report of Medical Board on (name of candidate) physical examination.

1. General development:- Good…….Fair……. Poor……

Nutrition: Thin……..Average……Obese… …..
Height (Without shoes)……Weight……
Best Weight…….Any recent c ange in weight ……Temperatu e ……

Girth of Chest:-

(1) (After full inspiration)
(2) (After full expiration)

2. Skin: Any obvious diseas …….

3. Eyes:-

(1) Any disease ……..
(2) Night blind ess ……..
(3) Defect in colo r vision …….
(4) Field ision …….
(5) isual acuit ……

Acuity of visio	Naked eye	With glasses	Strength of glass Sph.	Cyl.	Axix
Dis nt Vision	RE				
	LE				
Near Visi n	RE				
	LE				

Hypermetropia (Manifest) RE/LE

Ears Inspection……..Hearing Right Ear…….. Left Ear……..

5. Glands……Thyroid……

. Condition of teeth……

7. Respiratory System:- Does physical examination reveal anything abnormality in the respiratory organs ? If yes, explain fully……..

8. Circulatory System:-

(a) Heart : Any organic lesions ? ……. Rate Standing……

(After hopping 25 times……..
2 minutes after hopping……..

(b) Blood Pressure: Systolic…….Diastolic……

9. Abdomen: Girth…….Tenderness…….

Hernia……..

(a) Palpable : Liver…….Spleen…….
Kidneys……Tumours……..

(b) Hemorrhoids…….Fistula……

10. Nervous system: Indication of nervous or me al disabilities.

11. Loco-Motor System: Any abnormality…… ……..

12. Genito Urinary System: Any evid nc of Hyder ele, Variocele etc.

Urine Analysis:-

(a) Physical appeara ce
(b) Sp. Gr…….
(c) Albumen…… ….
(d) Sugar……
(e) Castes……
(f) Cells……..

13. Report X Ray Ex mination of Chest.

14. Is th anything in the health of the candidate likely to render him/her unfit for the efficient discharge of his/her duties the service for which he/she is a candidate……

Note The Bo rd should record their findings under one of the f llow ng three categories:-

Fit.
(ii) Unfit on account of …….
ii) Temporary unfit on account of ……

Plac …….

Chairman…..……..

Member……..

Member……..

Dated……..