Government strives to have a workforce which reflects gender balance and women candidates are encouraged to apply.

**EXAMINATION NOTICE NO. 04/2018-CSP**

DATE: 07/02/2018

(LAST DATE FOR RECEIPT OF APPLICATIONS: 06/03/2018) of CIVIL SERVICES EXAMINATION, 2018

(The Commission’s Website: www.upsc.gov.in)

**IMPORTANT**

1. **CANDIDATES TO ENSURE THEIR ELIGIBILITY FOR THE EXAMINATION:** The Candidates applying for the examination should ensure that they fulfill all eligibility conditions for admission to examination. Their admission to all the stages of the examination will be purely **provisional** subject to satisfying the prescribed eligibility conditions. Mere issue of admission certificate to the candidate will not imply that his/her candidature has been finally cleared by the Commission. The Commission takes up verification of eligibility conditions with reference to original documents only after the candidate has qualified for Interview/Personality Test.

2. **HOW TO APPLY:**

   Candidates are required to apply Online by using the website [http://www.upsconline.nic.in](http://www.upsconline.nic.in) Detailed instructions for filling up online applications are available on the above mentioned website. Brief Instructions for filling up the “Online Application Form” given in Appendix-II.

3. **LAST DATE FOR RECEIPT OF APPLICATIONS:**

   The online Applications can be filled up to 6th March, 2018 till 6:00 PM. The eligible candidates shall be issued an e-Admission Certificate three weeks before the commencement of the examination. The e-Admission Certificate will be made available in the UPSC website [www.upsc.gov.in](http://www.upsc.gov.in) for downloading by candidates. No Admission Certificate will be sent by post.

4. **PENALTY FOR WRONG ANSWERS:**

   Candidates should note that there will be penalty (negative marking) for wrong answers marked by a candidate in the Objective Type Question Papers.

5. **FACILITATION COUNTER FOR GUIDANCE OF CANDIDATES:**

   In case of any guidance/information/clarification regarding their applications, candidature etc. candidates can contact UPSC’s Facilitation Counter near gate ‘C’ of its campus in person or over Telephone No. 011-23385271/011-23381125/011-23098543 on working days between 10.00 hrs and 17.00 hrs.

6. **MOBILE PHONES BANNED:**

   (a) The use of any mobile phone (even in switched off mode), pager or any electronic equipment or programmable device or storage media like pen drive, smart watches etc. or camera or blue tooth devices or any other equipment or related accessories either in working or switched off mode capable of being used as a communication device during the examination is strictly prohibited. Any infringement of these instructions shall entail disciplinary action including ban from future examinations.

   (b) Candidates are advised in their own interest not to bring any of the banned items including mobile phones/pagers to the venue of the examination, as arrangement for safe-keeping cannot be assured.

8. Candidates are advised not to bring any valuable/costly items to the Examination Halls, as safe-keeping of the same cannot be assured. Commission will not be responsible for any loss in this regard.
F. No. 1/7/2017-E.I(B) : Preliminary Examination of the Civil Services Examination for recruitment to the Services and Posts mentioned below will be held by the Union Public Service Commission on 3rd June, 2018 in accordance with the Rules published by the Department of Personnel & Training in the Gazette of India Extraordinary dated 7th February, 2018.

(i) Indian Administrative Service.
(ii) Indian Foreign Service.
(iii) Indian Police Service.
(iv) Indian P & T Accounts & Finance Service, Group ‘A’.
(v) Indian Audit and Accounts Service, Group ‘A’.
(vi) Indian Revenue Service (Customs and Central Excise), Group ‘A’.
(vii) Indian Defence Accounts Service, Group ‘A’.
(viii) Indian Revenue Service (I.T.), Group ‘A’.
(ix) Indian Ordnance Factories Service, Group ‘A’ (Assistant Works Manager, Administration).
(x) Indian Postal Service, Group ‘A’.
(xi) Indian Civil Accounts Service, Group ‘A’.
(xii) Indian Railway Traffic Service, Group ‘A’.
(xiii) Indian Railway Accounts Service, Group ‘A’.
(xiv) Indian Railway Personnel Service, Group ‘A’.
(xv) Post of Assistant Security Commissioner in Railway Protection Force, Group ‘A’
(xvi) Indian Defence Estates Service, Group ‘A’.
(xvii) Indian Information Service (Junior Grade), Group ‘A’.
(xviii) Indian Trade Service, Group ‘A’.
(xix) Indian Corporate Law Service, Group "A".
(xx) Armed Forces Headquarters Civil Service, Group ‘B’ (Section Officer’s Grade).
(xxii) Delhi, Andaman & Nicobar Islands, Lakshadweep, Daman & Diu and Dadra & Nagar Haveli Civil Service, Group ‘B’.
(xxiv) Pondicherry Civil Service, Group ‘B’.
(xxv) Pondicherry Police Service, Group ‘B’.

The number of vacancies to be filled on the result of the examination is expected to be approximately 782 which include 32 vacancies reserved for Persons with Benchmark Disability Category, i.e. 13 vacancies for candidates of (a) blindness and low vision; 8 Vacancies for (b) deaf and hard of hearing; 9 Vacancies for (c) locomotor disability including cerebral palsy, leprosy cured, dwarfism, acid attack victims and muscular dystrophy; and 2 Vacancies for (e) multiple disabilities from amongst persons under clauses (a) to (c) including deaf-blindness. The final number of vacancies may undergo change after getting firm number of vacancies from Cadre Controlling Authorities. Reservation will be made for candidates belonging to Scheduled Castes. Scheduled Tribes, Other Backward Classes and Persons with Benchmark Disability in respect of vacancies as may be fixed by the Government.

As per the decision taken by the Government for increasing the access of unemployed to job opportunities, the Commission will publicly disclose the scores of the candidates (obtained in the Written Examination and Interview/Personality Test) through the public portals. The disclosure will be made in respect of only those candidates who will appear in the Interview/Personality Test for the Civil Service.

Government strives to have a workforce which reflects gender balance and women candidates are encouraged to apply.
Government strives to have a workforce which reflects gender balance and women candidates are encouraged to apply. Examination and are not finally recommended for appointment. The information shared through this disclosure scheme about the non-recommended candidates may be used by other public and private recruitment agencies to appoint suitable candidates from the information made available in the public portal.

Candidates will be required to give their options at the time of Interview/Personality Test, while acknowledging the e-saymon letter mailed to them for interview. A candidate may opt out of the scheme also and in that case his/her details will not be published by the Commission.

Besides sharing of the information of the non-recommended candidates for the examinations conducted by the Commission, the Commission will not assume any responsibility of liability for the method and manner in which information related to candidates who appear at the Commission’s Examinations/Selections is utilized by other private of public organizations.

A list of Services Identified suitable for Persons with Benchmark Disability along with the Physical Requirements and Functional Classifications:

<table>
<thead>
<tr>
<th>S.R. No.</th>
<th>Name of Service</th>
<th>Categories for which identified</th>
<th>Functional Classification</th>
<th>Physical Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Indian Administrative Service</td>
<td>Blindness and low vision</td>
<td>LV</td>
<td>MF, PP, S, ST, W, L, C, RW, H, KC, BN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Locomotor disability including Cerebral Palsy, Leprosy Cured, Dwarfism, Acid Attack Victims</td>
<td>OA, OL, BA, BH, MW, OAL, Cerebral Palsy, Leprosy Cured, Dwarfism, Acid Attack Victims</td>
<td>S, ST, W, SE, H, RW, C</td>
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<td></td>
<td></td>
<td></td>
<td>BLA, BLOA, BL</td>
<td>S, SE, H, RW, C</td>
</tr>
<tr>
<td>2</td>
<td>Indian Foreign Service</td>
<td>Blindness and low vision</td>
<td>LV</td>
<td>SE, RW</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Deaf and hard of hearing</td>
<td>PD</td>
<td>H</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Locomotor disability including Cerebral Palsy, Leprosy Cured, Dwarfism, Acid Attack Victims</td>
<td>OA, OL, OAL</td>
<td>S, ST, W, RW, C, MF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Multiple disability including only above three sub-categories</td>
<td>All mentioned in above rows</td>
<td>All mentioned in above rows</td>
</tr>
<tr>
<td>3</td>
<td>Indian Revenue Service (Customs &amp; Central Excise,Gr. 'A')</td>
<td>Blind and low vision</td>
<td>LV</td>
<td>MF, PP, L, KC, BN, ST, W, H, RW, C</td>
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<tr>
<td></td>
<td></td>
<td>Deaf and hard of hearing</td>
<td>B</td>
<td>MF, PP, L, KC, BN, ST, W, H, C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hard of Hearing*</td>
<td></td>
<td>MF, PP, L, KC, BN, ST, W, H, RW, C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Deaf*</td>
<td></td>
<td>MF, PP, L, KC, BN, ST, W, RW, C</td>
</tr>
</tbody>
</table>

Government strives to have a workforce which reflects gender balance and women candidates are encouraged to apply.
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</thead>
<tbody>
<tr>
<td></td>
<td>Locomotor disability including Cerebral Palsy, Leprosy Cured, Dwarfism, Acid Attack Victims and muscular dystrophy</td>
<td>OA, OL, OAL</td>
<td>S, ST, W, SE, RW, C</td>
<td></td>
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<tr>
<td></td>
<td>BL</td>
<td>S, SE, RW, C</td>
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<tr>
<td></td>
<td>Cerebral Palsy</td>
<td>S, W, SE, RW, C</td>
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<tr>
<td></td>
<td>Leprosy Cured</td>
<td>S, ST, W, SE, RW, C</td>
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<tr>
<td></td>
<td>Dwarfism</td>
<td>S, ST, W, SE, RW, C</td>
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<td></td>
<td>Acid Attack Victims</td>
<td>S, ST, W, SE, RW, C</td>
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<tr>
<td></td>
<td>Muscular Dystrophy</td>
<td>S, SE, RW, C</td>
<td></td>
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<tr>
<td></td>
<td>Multiple disabilities from amongst the persons under clauses (a) to (c) above including deaf-blindness in the posts identified for each disabilities.</td>
<td>S, C, MF</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>BA, BH</td>
<td>S, W, SE, RW, C, BN, ST, H, KC</td>
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<tr>
<td>5.</td>
<td>Indian Audit &amp; Accounts Service, Gr. 'A'</td>
<td>(i) Deaf and hard of hearing</td>
<td>Hard of Hearing (HH)</td>
<td>S, ST, W, BN, SE, RW, C</td>
<td></td>
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<tr>
<td></td>
<td>(ii) Locomotor disability including Cerebral Palsy, Leprosy Cured, Dwarfism, Acid Attack Victims</td>
<td>OA, OL, Leprosy Cured, Dwarfism, Acid Attack Victims</td>
<td>S, ST, W, BN, SE, RW, C</td>
<td></td>
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<td></td>
<td></td>
<td>All mentioned in above</td>
<td>S, ST, W, BN, SE, RW, C</td>
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<td></td>
<td>(iii) Multiple disability (2 or more disabilities among (i) and (ii) above</td>
<td>All mentioned in above</td>
<td>S, ST, W, BN, SE, RW, C</td>
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<tr>
<td></td>
<td>Deaf and hard of hearing</td>
<td>Hard of Hearing (HH)</td>
<td>S, ST, W, BN, SE, RW, C</td>
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<tr>
<td></td>
<td>Locomotor disability including Cerebral Palsy, Leprosy Cured,</td>
<td>OA, OL</td>
<td>S, ST, W, BN, SE, RW, C</td>
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</table>

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</table>
| Dwarfism, Acid Attack Victims | Multiple disability amongst the above three categories | (i) OA, LV  
(ii) OL, LV  
(iii) OA, HH  
(iv) OL, HH,  
(v) LV, HH |
|   |   |   |
|   |   |   | Blindness | MF, PP, L, KC, BN, ST, W, H, C |
|   |   | Deaf and hard hearing | Hard of Hearing | MF, PP, L, KC, BN, ST, W, H, RW, C |
|   |   |   | Deaf | MF, PP, L, KC, BN, ST, W, RW, C |
|   |   | Locomotor disability including Cerebral Palsy, Leprosy Cured, Dwarfism, Acid Attack Victims | OA, OL, OAL | S, ST, W, SE, RW, C |
|   |   |   | BL | S, SE, RW, C |
|   |   |   | Cerebral Palsy | S, W, SE, RW, C |
|   |   |   | Leprosy Cured | S, ST, W, SE, RW, C |
|   |   |   | Dwarfism | S, ST, W, SE, RW, C |
|   |   |   | Acid Attack Victims | S, ST, W, SE, RW, C |
|   |   |   | Muscular Dystrophy | S, SE, RW, C |
|   |   | Multiple Disabilities | Amongst persons under clauses (a) to (c) of Rule 34(1) of RPwD Act, 2016 including deaf-blindness in the posts identified for each disabilities. | S, C, MF |
| 8. | Indian Ordnance Factories Service, Gr. ‘A’ | (a) Blindness and Low Vision | LV | S, Mobility (M), RW, SE, H & C. |
|   |   | (b) Deaf and hard of hearing | HH (Hard of hearing) | S, Mobility (M), RW, SE, H (Speaking), C |
|   |   | (c) Locomotor disability including Cerebral Palsy, Leprosy Cured, Dwarfism, Acid Attack Victims | OL, OA | S, Mobility (M), RW, SE, H & C. |
|   |   | Multiple disability (amongst (a) to (c) above) | All mentioned in above rows | S, Mobility (M), RW, SE, H & C. |
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<tr>
<td></td>
<td>Deaf and hard of hearing</td>
<td>HH</td>
<td>S, ST, W, BN, RW, SE, H, C</td>
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<td></td>
<td>Locomotor disability including Cerebral Palsy, Leprosy Cured, Dwarfism, Acid Attack Victims</td>
<td>OA, OL, Cerebral Palsy, Leprosy Cured, Dwarfism, Acid Attack Victims</td>
<td>S, ST, W, BN, RW, SE, H, C</td>
<td></td>
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<tr>
<td></td>
<td>Multiple disabilities from amongst the above three categories including deaf-blindness in the posts identified for each disabilities</td>
<td>LV, HH, OA, OL, Cerebral Palsy, Leprosy Cured, Dwarfism, Acid Attack Victims</td>
<td>S, ST, W, BN, RW, SE, H, C</td>
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<tbody>
<tr>
<td></td>
<td>Locomotor disability including cerebral palsy</td>
<td>Leprosy Cured, Dwarfism, Acid Attack Victims</td>
<td>S, ST, BN, W, SE, MF, C, RW, H</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Leprosy Cured, Dwarfism, Acid Attack Victims</td>
<td>Leprosy Cured, Dwarfism, Acid Attack Victims</td>
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</tbody>
</table>

|------|-------------------------|----------------------|----------------|--------------------------------|

|       | Deaf and hard of hearing             | HH                       | S, ST, W, BN, RW, SE, H, C |
|       | Locomotor disability including Cerebral Palsy, Leprosy Cured, Dwarfism, Acid Attack Victims | OA, OL, Cerebral Palsy, Leprosy Cured, Dwarfism, Acid Attack Victims | S, ST, W, BN, RW, SE, H, C |
|       | Multiple disabilities from amongst the above three categories including deaf-blindness in the posts identified for each disabilities | LV, HH, OA, OL, Cerebral Palsy, Leprosy Cured, Dwarfism, Acid Attack Victims | S, ST, W, BN, RW, SE, H, C |

<p>|       | Deaf and hard of hearing             | HH                       | S, ST, W, BN, RW, SE, H, C |
|       | Locomotor disability including Cerebral Palsy, Leprosy Cured, Dwarfism, Acid Attack Victims | OA, OL, Cerebral Palsy, Leprosy Cured, Dwarfism, Acid Attack Victims | S, ST, W, BN, RW, SE, H, C |</p>
<table>
<thead>
<tr>
<th></th>
<th>Multiple disabilities from amongst the above three categories including deaf-blindness in the posts identified for each disabilities</th>
<th>LV, HH, OA, OL, Cerebral Palsy, Leprosy Cured, Dwarfism, Acid Attack Victims</th>
<th>S, ST, W, BN, RW, SE, H, C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blind and low vision</td>
<td>Low Vision (LV)</td>
<td>SE, RW</td>
<td></td>
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<tr>
<td>Deaf and hard of hearing</td>
<td>HH (Hard of Hearing)</td>
<td>H</td>
<td></td>
</tr>
<tr>
<td>Locomotor disability including Cerebral Palsy, Leprosy Cured, Dwarfism, Acid Attack Victims and muscular dystrophy</td>
<td>OA, OL</td>
<td>S, ST, W, SE, RW, C, MF</td>
<td></td>
</tr>
<tr>
<td>Multiple disability including only above three categories</td>
<td>All mentioned in above rows</td>
<td>All mentioned in above rows</td>
<td></td>
</tr>
<tr>
<td>Indian Defence Estates Service Gr. 'A'</td>
<td>(a) Blind and low vision</td>
<td>LV</td>
<td>MF, PP, L, KC, BN, ST, W, H, RW, C, SE</td>
</tr>
<tr>
<td>(b) Deaf and hard of hearing</td>
<td>B</td>
<td>MF, PP, L, KC, BN, ST, W, H, C</td>
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</tr>
<tr>
<td>(c) Locomotor disability including Cerebral Palsy, Leprosy Cured, Dwarfism, Acid Attack Victims and muscular dystrophy</td>
<td>HH</td>
<td>MF, PP, L, KC, BN, ST, W, H, RW, C</td>
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<td>(d)</td>
<td>FD</td>
<td>MF, PP, L, KC, BN, ST, W, RW, C</td>
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<tr>
<td>(e)</td>
<td>BL, BLOA</td>
<td>S, RW, SE, H, C</td>
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<tr>
<td>(f)</td>
<td>BLA</td>
<td>S, SE, H, C</td>
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<tr>
<td>(g)</td>
<td>BA, BH</td>
<td>S, ST, W, SE, H</td>
<td></td>
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<tr>
<td>(h)</td>
<td>OL, OA, MW, OAL</td>
<td>S, ST, W, SE, H, RW, C</td>
<td></td>
</tr>
<tr>
<td>Multiple disabilities from amongst the persons under clauses (a) to (c) above including deaf-blindness in the posts identified for</td>
<td>All the above mentioned in the categories in (a) to (c) above.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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|     |                            | Blind (B)            | MF, PP, L, KC, BN, ST, W, H, C |
|     |                            | Deaf and hard of hearing | Partially Deaf (PD) | MF, PP, L, KC, BN, ST, W, H, RW, C |
|     |                            |                     | Fully Deaf (FD) | MF, PP, L, KC, BN, ST, W, RW, C |
|     | Locomotor disability including Cerebral Palsy, Leprosy Cured, Dwarfism, Acid Attack Victims and muscular dystrophy | OL, OA, OAL, MW | S, ST, W, SE, H, RW, C |
|     |                                | BL, BLOA            | S, SE, H, RW, C |
|     |                                | BLA                | S, SE, H, C |
|     |                                | BA, BH             | S, ST, SE, H, C |
|     | Multiple disabilities from amongst persons under above categories except combination of full blind and full deaf. |                        |                        |
|     |                            | Deaf (D)            | SE, RW, C, M, S, BN, ST |
|     |                            | Hard of Hearing (HH) | SE, RW, C, M, S, BN, ST, H |
|     |                            | OA, OL, OAL         | SE, RW, C, M, S, BN, ST, H |
|     |                            | BL                  | SE, RW, C, M, S, BN, H |
|     | Locomotor disability including Cerebral Palsy, Leprosy Cured, Dwarfism, Acid Attack Victims and muscular dystrophy | Leprosy Cured (LC) | SE, RW, C, M, S, BN, ST, H |
|     |                                | Dwarfism (DW)       | SE, RW, C, M, S, BN, ST, H |
|     |                                | Acid Attack Victims (AAV) | SE, RW, C, M, S, BN, ST, H |
|     |                                | Muscular Dystrophy (MDy*) | SE, RW, C, M, S, BN, ST, H |
|     | Multiple disabilities (MD) [2 or more disabilities among the above three categories] | Multiple disabilities (MD) [2 or more disabilities among the above three categories] | SE, RW, C, M, S, BN |
| 18. | Armed Forces Headquarters Civil Service, Gr.’B’ (Section Officers’ Grade) | Blindness and Low Vision | B | S, ST, W, BN, MF, RW (in braille/software), H, C |
|     |                                | LV                  | S, ST, W, BN, MF, RW, H, C |
|     |                                | FD, HH              | S, ST, W, BN, MF, SE, RW, C |
|     |                                | BLOA, BL            | S, SE, H, RW, C |
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### CENTRES OF Civil Services (Preliminary) EXAMINATION

The Examination will be held at the following Centres:

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<tr>
<th>Centre Name</th>
<th>Centre Name</th>
<th>Centre Name</th>
</tr>
</thead>
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<td>AGARTALA</td>
<td>GHAZIABAD</td>
<td>GAUTAM BUDDH NAGAR</td>
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<tr>
<td>AGRA</td>
<td>GORAKHPUR</td>
<td>PANAJI (GOA)</td>
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<tr>
<td>AJMER</td>
<td>GURGAON</td>
<td>PATNA</td>
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<td>AHMEDABAD</td>
<td>GWALIOR</td>
<td>PORT BLAIR</td>
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<td>AIZAWL</td>
<td>HYDERABAD</td>
<td>PUDUCHERRY</td>
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<td>INDORE</td>
<td>RAIPUR</td>
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<td>ANANTPUR (ANDHRA PRADESH)</td>
<td>ITANAGAR</td>
<td>RAJKOT</td>
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<td>JABALPUR</td>
<td>RANCHI</td>
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<td>BAREILLY</td>
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<td>CUTTACK</td>
<td>KOZHIKODE</td>
<td>TIRUCHIRAPALLI</td>
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*For details about Functional Classification and Physical Requirements, para 8 of this Notice may please be referred.*

2. (A) (i) CENTRES OF Civil Services (Preliminary) EXAMINATION: The Examination will be held at the following Centres:
The centres and the date of holding the examination as mentioned above are liable to be changed at the discretion of the Commission. Applicants should note that there will be a ceiling on the number of candidates allotted to each of the Centres, except Chennai, Dispur, Kolkata and Nagpur. Allotment of Centres will be on the “first-apply-first allot” basis, and once the capacity of a particular Centre is attained, the same will be frozen. Applicants, who cannot get a Centre of their choice due to ceiling, will be required to choose a Centre from the remaining ones. Applicants are, thus, advised that they may apply early so that they could get a Centre of their choice. **NB: Notwithstanding the aforesaid provision,** the Commission reserves the right to change the Centres at their discretion if the situation demands. All the Examination Centres for CS (P) 2018 Examination will cater to examination for Low Vision Candidates in their respective centres. Candidates admitted to the examination will be informed of the time table and place or places of examination. The candidates should note that no request for change of centre will be entertained.

**(B) Plan of Examination:**

The Civil Services Examination will consist of two successive stages (vide Appendix I Section-I)

(i) Civil Services (Preliminary) Examination (Objective type) for the selection of candidates for the Main Examination; and

(ii) Civil Services (Main) Examination (Written and Interview) for the selection of candidates for the various Services and posts noted above.

Applications are now invited for the Civil Services (Preliminary) Examination only. Candidates who are declared by the Commission to have qualified for admission to the Civil Services (Main) Examination will have to apply online again, in the Detailed Application Form.
which would be made available to them. The Main Examination is likely to be held in September 2018.

3. **Eligibility Conditions:**

   (i) **Nationality**

   (1) For the Indian Administrative Service and the Indian Police Service, a candidate must be a citizen of India.

   (2) For other services, a candidate must be either:

   (a) a citizen of India, or

   (b) a subject of Nepal, or

   (c) a subject of Bhutan, or

   (d) a Tibetan refugee who came over to India before 1st January, 1962 with the intention of permanently settling in India, or

   (e) a person of Indian origin who has migrated from Pakistan, Burma, Sri Lanka, East African countries of Kenya, Uganda, the United Republic of Tanzania, Zambia, Malawi, Zaire, Ethiopia and Vietnam with the intention of permanently settling in India.

   Provided that a candidate belonging to categories (b), (c), (d) and (e) shall be a person in whose favour a certificate of eligibility has been issued by the Government of India.

   Provided further that candidates belonging to categories (b), (c) and (d) above will not be eligible for appointment to the Indian Foreign Service.

   A candidate in whose case a certificate of eligibility is necessary, may be admitted to the examination but the offer of appointment may be given only after the necessary eligibility certificate has been issued to him/her by the Government of India.

   (ii) **Age Limits:**

   (a) A candidate must have attained the age of 21 years and must not have attained the age of 32 years on the 1st of August, 2018 i.e., he must have been born not earlier than 2nd August, 1986 and not later than 1st August, 1997. Necessary action to make corresponding changes in respective Rules/Regulations pertaining to various services is being taken separately.

   (b) The upper age-limit prescribed above will be relaxable:

   (i) up to a maximum of five years if a candidate belongs to a Scheduled Caste or a Scheduled Tribe;

   (ii) up to a maximum of three years in the case of candidates belonging to Other Backward Classes who are eligible to avail of reservation applicable to such candidates;

   (iii) up to a maximum of three years in the case of Defence Services Personnel, disabled in operations during hostilities with any foreign country or in a disturbed area and released as a consequence thereof;

   (iv) up to a maximum of five years in the case of ex-servicemen including Commissioned Officers and ECOs/SSCOs who have rendered at least five years Military Service as on 1st August, 2018 and have been released;

   (a) on completion of assignment (including those whose assignment is due to be Government strives to have a workforce which reflects gender balance and women candidates are encouraged to apply.
completed within one year from 1st August, 2018 otherwise than by way of dismissal or discharge on account of misconduct or inefficiency; or

(b) on account of physical disability attributable to Military Service; or

(c) on invalidment.

(v) up to a maximum of five years in the case of ECOs/SSCOs who have completed an initial period of assignment of five years of Military Service as on 1st August, 2018 and whose assignment has been extended beyond five years and in whose case the Ministry of Defence issues a certificate that they can apply for civil employment and that they will be released on three months’ notice on selection from the date of receipt of offer of appointment.

(vi) up to a maximum of 10 years in the case of (a) blindness and low vision; (b) deaf and hard of hearing; (c) locomotor disability including cerebral palsy, leprosy cured, dwarfism, acid attack victims and muscular dystrophy; (d) autism, intellectual disability, specific learning disability and mental illness; and (e) multiple disabilities from amongst persons under clauses (a) to (d) including deaf-blindness.

**Note I:**—Candidates belonging to the Scheduled Castes and the Scheduled Tribes and the Other Backward Classes who are also covered under any other clauses of Rule 6(b) above, viz. those coming under the category of Ex-servicemen, (a) blindness and low vision; (b) deaf and hard of hearing; (c) locomotor disability including cerebral palsy, leprosy cured, dwarfism, acid attack victims and muscular dystrophy; (d) autism, intellectual disability, specific learning disability and mental illness; and (e) multiple disabilities from amongst persons under clauses (a) to (d) including deaf-blindness etc. will be eligible for grant of cumulative age-relaxation under both the categories.

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

**Note III:**—The age concession under Rule 6(b)(iv) and (v) will not be admissible to Ex-servicemen and Commissioned Officers including ECOs/SSCOs, who are released on own request.

**Note IV:**—Notwithstanding the provision of age relaxation under Rule 6(b)(vi) above, candidates of Persons with Benchmark Disability will be considered to be eligible for appointment only if he/she (after such physical examination as the Government or appointing authority, as the case may be, may prescribe) is found to satisfy the requirements of physical and medical standards for the concerned Services/Posts to be allocated to the Persons with Benchmark Disability by the Government.

Save as provided above, the age-limits prescribed can in no case be relaxed.

The date of birth, accepted by the Commission is that entered in the Matriculation or Secondary School Leaving Certificate or in a certificate recognised by an Indian University as equivalent to Matriculation or in an extract from a Register of Matriculates maintained by a University which extract must be certified by the proper authority of the University or in the Higher Secondary or an equivalent examination certificate. These certificates are required to be submitted only at the time of applying for the Civil Services (Main) Examination. No other document relating to age like horoscopes, affidavits, birth extracts from Municipal Government strives to have a workforce which reflects gender balance and women candidates are encouraged to apply.
Government strives to have a workforce which reflects gender balance and women candidates are encouraged to apply.

The expression Matriculation/Higher Secondary Examination Certificate in this part of the Instruction include the alternative certificates mentioned above.

**Note 1:**—Candidate should note that only the date of birth as recorded in the Matriculation/Secondary Examination certificate or an equivalent certificate on the date of submission of application will be accepted by the Commission, and no subsequent request for its change will be considered or granted.

**Note 2:**—Candidates should also note that once a date of birth has been claimed by them and entered in the records of the Commission for the purpose of admission to an Examination, no change will be allowed subsequently or at any other Examination of the Commission on any grounds whatsoever.

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

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

**Note I:** Candidates who have appeared at an examination the passing of which would render them educationally qualified for the Commission’s examination but have not been informed of the results as also the candidates who intend to appear at such a qualifying examination will also be eligible for admission to the Preliminary Examination. All candidates who are declared qualified by the Commission for taking the Civil Services (Main) Examination will be required to produce proof of passing the requisite examination with their application for the Main Examination failing which such candidates will not be admitted to the Main Examination. The applications for the Main Examination will be called sometime in the month of July/August, 2018.

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

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

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

(iv) Number of attempts: Every candidate appearing at 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 Other Backward Classes, 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 further that candidates of Persons with Benchmark Disability will get as many attempts as are available to other candidates who do not belong to Persons with Benchmark Disability of his or her community, subject to the condition that a candidate of Persons with Benchmark Disability belonging to the General Category shall be eligible for nine attempts. Necessary action to make corresponding changes in respective Rules/regulations pertaining to various services is being taken separately. The relaxation will be available to the candidates of Persons with Benchmark Disability 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 Civil Services 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.

(v) Restrictions on applying for the examination: (a) A candidate who is appointed to the Indian Administrative Service or the Indian Foreign Service on the results of an earlier examination and continues to be a member of that service will not be eligible to compete at this examination. In case such a candidate is appointed to the IAS/IFS after the Preliminary Examination of Civil Services Examination, 2018 is over and he/she continues to be a member of that service, he/she shall not be eligible to appear in the Civil Services (Main) Examination, 2018 notwithstanding his/her having qualified in the Preliminary Examination, 2018.

Also provided that if such a candidate is appointed to IAS/IFS after the commencement of the Civil Services (Main) Examination, 2018 but before the result thereof and continues to be a member of that service, he/she shall not be considered for appointment to any service/post on the basis of the result of this examination viz. Civil Services Examination, 2018.

(b) A candidate who is appointed to the Indian Police Service on the results of an earlier examination and continues to be a member of that service will not be eligible to opt for the Indian Police Service in Civil Services Examination, 2018.

(vi) Physical Standards: Candidates must be physically fit according to physical standards for admission to Civil Services Examination, 2018 as per guidelines given in Appendix-III of Rules for Examination published in the Gazette of India Extraordinary dated 7th February, 2018.

4. FEE:

Government strives to have a workforce which reflects gender balance and women candidates are encouraged to apply.
Candidates (excepting Female/SC/ST/Persons with Benchmark Disability Candidates who are exempted from payment of fee) are required to pay fee of Rs. 100/- (Rupees One Hundred only) either by remitting the money in any Branch of State Bank of India or by using Visa/Master/RuPay Credit/Debit Card or by using Internet Banking of SBI. Applicants who opt for "Pay by Cash" mode should print the system generated Pay-in-slip during part II registration and deposit the fee at the counter of SBI Branch on the next working day only. "Pay by Cash" mode will be deactivated at 23.59 hours of 05.03.2018 i.e. one day before the closing date; however applicants who have generated their Pay-in- Slip before it is deactivated may pay at the counter of SBI Branch during banking hours on the closing date. Such applicants who are unable to pay by cash on the closing date i.e during banking hours at SBI Branch, for reasons whatsoever, even if holding valid pay-in-slip will have no other offline option but to opt for available online Debit/Credit Card or Internet Banking payment mode on the closing date i.e. till 18:00 Hours of 06.03.2018.

For the applicants in whose case payments details have not been received from the bank they will be treated as fictitious payment cases and a list of all such applicants shall be made available on the Commission website within two weeks after the last day of submission of online application.

These applicants shall also be intimated through e-mail to submit copy of proof of their payment to the Commission at the address mentioned in the e-mail. The applicant shall be required to submit the proof within 10 days from the date of such communication either by hand or by speed post to the Commission. In case, no response is received from the applicants their applications shall be summarily rejected and no further correspondence shall be entertained in this regard.

All female candidates and candidates belonging to Scheduled Caste/ Scheduled Tribe/ Persons with Benchmark Disability categories are exempted from payment of fee. No fee exemption is, however, available to OBC candidates and they are required to pay the prescribed fee in full. Persons with Benchmark Disability are exempted from the payment of fee provided they are otherwise eligible for appointment to the Services/Posts to be filled on the results of this examination on the basis of the standards of medical fitness for these Services/Posts (including any concessions specifically extended to the Persons with Benchmark Disability). A candidate of Persons with Benchmark Disability claiming fee concession will be required by the Commission to submit along with their Detailed Application Form, a certified copy of the Certificate of Disability from a Government Hospital/Medical Board in support of his/her claim for belonging to Persons with Benchmark Disability.

**NB:** Notwithstanding, the aforesaid provision for fee exemption, a candidate of Persons with Benchmark Disability will be considered to be eligible for appointment only if he/she (after such physical examination as the Government or the Appointing Authority, as the case may be, may prescribe) is found to satisfy the requirements of physical and medical standards for the concerned Services/Posts to be allocated to candidates of Persons with Benchmark Disability by the Government.

**Note I:** Applications without the prescribed Fee (Unless remission of Fee is claimed) shall be summarily rejected.

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

Government strives to have a workforce which reflects gender balance and women candidates are encouraged to apply.
**Note III:** If any candidate who took the Civil Services Examination held in 2017 wishes to apply for admission to this examination, he/she must submit his/her application without waiting for the results or an offer of appointment.

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

5. **How to Apply:**

(a) Candidates are required to apply online using the website [http://www.upsconline.nic.in](http://www.upsconline.nic.in). Detailed instructions for filling up online applications are available on the above mentioned website. The applicants are advised to submit only one application; however, if due to any unavoidable situation, if he/she submits another/multiple applications, then he/she must ensure that application with the higher RID is complete in all respects like applicants’ details, examination centre, photograph, signature, fee etc. The applicants who are submitting multiple applications should note that only the applications with higher RID (Registration ID) shall be entertained by the Commission and fee paid against one RID shall not be adjusted against any other RID.

(b) All candidates, whether already in Government Service, Government owned industrial undertakings or other similar organizations or in private employment should submit their applications direct to the Commission. Persons already in Government Service, whether in a permanent or temporary capacity or as work charged employees other than casual or daily rated employees or those serving under the Public Enterprises are however, required to submit an undertaking that they have informed in writing to their Head of Office/Department that they have applied for the Examination. Candidates should note that in case a communication is received from their employer by the Commission withholding permission to the candidates applying for/ appearing at the examination, their application will be liable to be rejected/candidature will be liable to be cancelled.

**NOTE 1:** While filling in his/her Application Form, the candidate should carefully decide about his/her choice of centre for the Examination. If any candidate appears at a centre other than the one indicated by the Commission in his/her Admission Certificate, the papers of such a candidate will not be evaluated and his/her candidature will be liable to cancellation.

**NOTE-2:** Suitable provisions for information regarding use of scribes by the blind candidates and candidates with Locomotor Disability and Cerebral Palsy where dominant (writing) extremity is affected to the extent of slowing the performance of function (minimum of 40% impairment) have been made in the online application at the time of the initial online application itself.

**NOTE-3:** Candidates appearing in CS (P) Examination, 2018 will be required to indicate information such as (a) detail of centres for Civil Services (Main) Examination and Indian Forest Service (Main) Examination (b) Optional subject to be selected for the examination, (c) medium of examination for Civil Services (Main) Examination, (d) Medium of Examination for Optional Subject if he/she chooses any Indian Language as the Medium of Examination for Civil Services (Main) Examination and (e) compulsory Indian Language for Civil Services (Main) Examination at the time of the filling up online application itself.

**NOTE 4:** Candidates are not required to submit along with their applications any certificate in support of their claims regarding Age, Educational Qualifications, Scheduled Castes/Scheduled Tribes/Other Backward Classes and Persons with Benchmark Disability etc. which will be verified at the time of the Main examination only. The candidates applying for the Government strives to have a workforce which reflects gender balance and women candidates are encouraged to apply.
Government strives to have a workforce which reflects gender balance and women candidates are encouraged to apply.

examination should ensure that they fulfil all the eligibility conditions for admission to the Examination. Their admission at all the stages of examination for which they are admitted by the Commission viz. Preliminary Examination, Main (Written) Examination and Interview Test will be purely provisional, subject to their satisfying the prescribed eligibility conditions. If on verification at any time before or after the Preliminary Examination, Main (written) Examination and Interview Test, it is found that they do not fulfil any of the eligibility conditions; their candidature for the examination will be cancelled by the Commission. If any of their claims is found to be incorrect, they may render themselves liable to disciplinary action by the Commission in terms of Rule 14 of the Rules for the Civil Services Examination, 2018 reproduced below:

A candidate who is or has been declared by the Commission to be guilty of:

(i) Obtaining support for his/her candidature by the following means, namely:-
   (a) offering illegal gratification to, or
   (b) applying pressure on, or
   (c) blackmailing, or threatening to blackmail any person connected with the conduct of the examination, or
(ii) impersonating, or
(iii) procuring impersonation by any person,
or
(iv) submitting fabricated documents or documents which have been tampered with, or
(v) making statements which are incorrect or false or suppressing material information, or
(vi) resorting to the following means in connection with his/her candidature for the examination, namely
   (a) obtaining copy of question paper through improper means,
   (b) finding out the particulars of the persons connected with secret work relating to the examination.
   (c) influencing the examiners, or
   (vii) using unfair means during the examination, or
   (viii) writing obscene matter or drawing obscene sketches in the scripts, or
   (ix) misbehaving in the examination hall including tearing of the scripts, provoking fellow examinees to boycott examination, creating a disorderly scene and the like, or
   (x) harassing or doing bodily harm to the staff employed by the Commission for the conduct of their examinations, or
   (xi) being in possession of or using any mobile phone (even in switched off mode), pager or any electronic equipment or programmable device or storage media like pen drive, smart watches etc. or camera or blue tooth devices or any other equipment or related accessories either in working or switched off mode capable of being used as a communication device during the examination; or
   (xii) violating any of the instructions issued to candidates along with their Admission Certificates permitting them to take the examination, or
   (xiii) attempting to commit or as the case may be abetting the Commission of all or any of the acts specified in the foregoing clauses; may in addition to rendering himself/herself liable to criminal prosecution, be liable.

(a) to be disqualified by the Commission from the examination for which he/she is a candidate and/or
(b) to be debarred either permanently or for a specified period
(i) by the Commission from any examination or selection held by them;
(ii) by the Central Government from any employment under them; and
Government strives to have a workforce which reflects gender balance and women candidates are encouraged to apply.
(c) if he/she is already in service under Government to disciplinary action under the appropriate Rules.

Provided that no penalty under these Rules shall be imposed except after
(i) giving the candidate an opportunity of making such representation, in writing as he/she may wish to make in that behalf; and
(ii) taking the representation, if any, submitted by the candidate within the period allowed to him/her into consideration.

6. Last date for receipt of applications: The Online Applications can be filled up to 6th March, 2018 till 18:00 Hrs.

7. Correspondence with the Commission:
The Commission will not enter into any correspondence with the candidates about their candidature except in the following cases:
(i) The eligible candidates shall be issued an e-Admission Certificate three weeks before the commencement of the examination. The e-Admission Certificate will be made available on the UPSC website [www.upsc.gov.in] for downloading by candidates. No Admission Certificate will be sent by post. If a candidate does not receive his e-Admission Certificate or any other communication regarding his/her candidature for the examination three weeks before the commencement of the examination, he/she should at once contact the Commission. Information in this regard can also be obtained from the Facilitation Counter located in the Commission’s Office either in person or over toll-free Nos. 011-23381125/011-23385271/011-23098543. In case no communication is received in the Commission’s Office from the candidate regarding non-receipt of his/her e-Admission Certificate at least 3 weeks before the examination, he/she himself/herself will be solely responsible for non-receipt of his/her e-Admission Certificate. No candidate will ordinarily be allowed to take the examination unless he/she holds a certificate of admission for the examination. On downloading of e-Admission Certificate, check it carefully and bring discrepancies/errors, if any, to the notice of UPSC immediately.
The candidates should note that their admission to the examination will be purely provisional based on the information given by them in the Application Form. This will be subject to verification of all the eligibility conditions by the UPSC.
The mere fact that a certificate of admission to the Examination has been issued to a candidate, will not imply that his/her candidature has been finally cleared by the Commission or that entries made by the candidate in his/her application for the Preliminary examination have been accepted by the Commission as true and correct. Candidates may note that the Commission takes up the verification of eligibility conditions of a candidate, with reference to original documents, only after the candidate has qualified for Civil Services (Main) Examination. Unless candidature is formally confirmed by the Commission, it continues to be provisional.
The decision of the Commission as to the eligibility or otherwise of a candidate for admission to the Examination shall be final.
Candidates should note that the name in the Admission Certificate in some cases, may be abbreviated due to technical reasons.
(ii) In the event of a candidate downloading more than one Admission Certificate from the Commission’s website, he/she should use only one of these Admission Certificates for appearing in the examination and report about the other(s) to the Commission’s Office.

Government strives to have a workforce which reflects gender balance and women candidates are encouraged to apply.
(iii) Candidates are informed that as the Preliminary Examination is only a screening test, no marks sheets will be supplied to successful or unsuccessful candidates and no correspondence will be entertained by the Commission, in this regard.

(iv) Candidates must ensure that their emails IDs given in their online application are valid and active.

**Important:** All communications to the Commission should invariably contain the following particulars.
1. Name and year of the examination.
2. Registration ID (RID)
3. Roll Number (if received)
4. Name of candidate (in full and in block letters)
5. Complete postal address as given in the application.

**N.B. I.** Communication not containing the above particulars may not be attended to.

**N.B. II.** Candidates should also note down their RID number for future reference. They may be required to indicate the same in connection with their candidature for the Civil Services (Main) Examination.

8. The eligibility for availing reservation against the vacancies reserved for the physically disabled persons shall be the same as prescribed in "The Rights of Persons with Disabilities Act, 2016." Provided further that the candidates of Persons with Benchmark Disability shall also be required to meet special eligibility criteria in terms of physical requirements/functional classification (abilities/disabilities) consistent with requirements of the identified Service/Post as may be prescribed by its Cadre Controlling Authority at note-II of Para-1 of this Notice.

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

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<thead>
<tr>
<th>Code</th>
<th>Physical Requirements</th>
<th>Code</th>
<th>Functional Classification</th>
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<td>Orthopaedically Handicapped</td>
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<tr>
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<td>Standing</td>
<td>VH</td>
<td>Visually Handicapped</td>
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<td>Walking</td>
<td>HH</td>
<td>Hearing Handicapped</td>
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<td>H</td>
<td>Hearing/Speaking</td>
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<td>C</td>
<td>Communication</td>
<td>BH</td>
<td>Both Hands</td>
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<td>MW</td>
<td>Muscular Weakness</td>
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<td>Pushing &amp; Pulling</td>
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<td>BLA</td>
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<td>Kneeling and Croutching</td>
<td>BLOA</td>
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<td>DW</td>
<td>Dwarfism</td>
<td>BL</td>
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</table>

**Note:** The above list is subject to revision.

9. A candidate will be eligible to get the benefit of community reservation only in case the particular caste to which the candidates belong is included in the list of reserved communities.
issued by the Central Government. If a candidate indicates in his/her application form for Civil Services (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 candidates of Persons with Benchmark Disabilities categories also. While the above principle will be followed in general, there may be a few cases where there was a gap of not more than 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 disabled during the course of the examination process, the candidate should produce valid document showing him/her acquiring a disability to the extent of 40% or more as defined under The Rights of Persons with Disabilities Act, 2016 to enable him/her to get the benefits of PwBD reservation.

10. Candidates seeking reservation/relaxation benefits available for SC/ST/OBC/Persons with Benchmark Disability/Ex-servicemen must ensure that they are entitled to such reservation/relaxation as per eligibility prescribed in the Rules/Notice. 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/Notice for such benefits, and these certificates should be dated earlier than the due date (closing date) of the application for Civil Services (Prelims) Examination, 2018.

11. Withdrawal of applications: NO request for withdrawal of candidature received from a candidate after he/she has submitted his/her application will be entertained under any circumstances.

(Raj Kumar)
JOIN SECRETARY
UNION PUBLIC SERVICE COMMISSION

Government strives to have a workforce which reflects gender balance and women candidates are encouraged to apply.
APPENDIX I

SECTION I

PLAN OF EXAMINATION

The competitive examination comprises two successive stages:

(i) Civil Services (Preliminary) Examination (Objective Type) for the selection of candidates for Main Examination; and

(ii) Civil Services (Main) Examination (Written and Interview) for the selection of candidates for the various Services and posts.

2. The Preliminary Examination will consist of two papers of Objective type (multiple choice questions) and carry a maximum of 400 marks in the subjects set out in sub-section (A) of Section II. This examination is meant to serve as a screening test only; the marks obtained in the Preliminary Examination by the candidates who are declared qualified for admission to the Main Examination will not be counted for determining their final order of merit. The number of candidates to be admitted to the Main Examination will be about twelve to thirteen times the total approximate number of vacancies to be filled in the year through this examination. 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.

Note I: The Commission will draw a list of candidates to be qualified for Civil Services (Main) Examination based on the criterion of minimum qualifying marks of 33% in General Studies Paper-II of Civil Services (Preliminary) Examination and total qualifying marks of General Studies Paper-I of Civil Services (Preliminary) Examination as may be determined by the Commission.

Note II: There will be negative marking for incorrect answers (as detailed below) for all questions except some of the questions where the negative marking will be inbuilt in the form of different marks being awarded to the most appropriate and not so appropriate answer for such 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.

3. The Main Examination will consist of written examination and an interview test. The written examination will consist of 9 papers of conventional essay type in the subjects set out in sub-section (B) of Section II out of which two papers will be of qualifying in nature. Also see Note (ii) under Para I of Section II (B) Marks obtained for all the compulsory papers (Paper-I to Paper-VII) and Marks obtained in Interview for Personality Test will be counted for ranking.

4.1 Candidates who obtain such minimum qualifying marks in the written part of the Main Examination as may be fixed by the Commission at their discretion, shall be summoned by them for an interview for a Personality Test, vide sub-section ‘C’ of Section II. The number of candidates to be summoned for interview will be about twice of the number of vacancies to be filled. The interview will carry 275 marks (with no minimum qualifying marks).

4.2 Marks thus obtained by the candidates in the Main Examination (written part as well as interview) would determine their final ranking. Candidates will be allotted to the various Services keeping in view their ranks in the examination and the preferences expressed by them for the various Services and posts.

SECTION II

Scheme and subjects for the Preliminary and Main Examination.

A. PRELIMINARY EXAMINATION:

The Examination shall comprise of two compulsory Papers of 200 marks each.

Note:

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

(ii) The General Studies Paper-II of the Civil Services (Preliminary) Examination will be a qualifying paper with minimum qualifying marks fixed at 33%.

(iii) The question papers will be set both in Hindi and English.

(iv) Details of the syllabi are indicated in Part A of Section III.

(v) Each paper will be of two hours duration. Blind candidates and the candidates with Locomotor Disability and Cerebral Palsy where dominant (writing) extremity is affected to the extent of slowing the performance of function (minimum of 40% impairment) will; however, be allowed an extra time of twenty minutes per hour for each paper.

B. MAIN EXAMINATION:

The written examination will consist of the following papers:

Qualifying Papers:

Paper-A

(One of the Indian Language to be selected by the candidate from the Languages included in the Eighth Schedule to the Constitution).

300 Marks
Paper-B
English  300 Marks

Papers to be counted for merit
Paper-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 1  250 Marks

Paper-VII
Optional Subject - Paper 2  250 Marks
Sub Total (Written test)  1750 Marks
Personality Test  275 Marks
Grand Total  2025 Marks

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

NOTE:
(i) The papers on Indian languages and English (Paper A and paper B) will be of Matriculation or equivalent standard and will be of qualifying nature. The marks obtained in these papers will not be counted for ranking.
(ii) Evaluation of the papers, namely, 'Essay', 'General Studies' and Optional Subject of all the candidates would be done simultaneously along with evaluation of their qualifying papers on 'Indian Languages' and 'English' but the papers on 'Essay', General Studies and Optional Subject of only such candidates will be taken cognizance who attain 25% marks in 'Indian Language' and 25% in English as minimum qualifying standards in these qualifying papers.
(iii) The paper A on Indian Language will not, however, be compulsory for candidates hailing from the States of Arunachal Pradesh, Manipur, Meghalya, Mizoram, Nagaland and Sikkim. (iv) The paper A on Indian Language will not, however, be compulsory for Candidates belonging to Persons with Benchmark Disability (only Hearing Impairment sub-category) provided that they have been granted such exemption from 2nd or 3rd language courses by the concerned education Board/University. The candidate needs to provide an undertaking/self declaration in this regard in order to claim such exemption to the Commission.
(v) 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.
(vi) For the Language medium/literature of languages, the scripts to be used by the candidates will be as under :

<table>
<thead>
<tr>
<th>Language</th>
<th>Script</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assamese</td>
<td>Assamese</td>
</tr>
<tr>
<td>Bengali</td>
<td>Bengali</td>
</tr>
<tr>
<td>Gujarati</td>
<td>Gujarati</td>
</tr>
<tr>
<td>Hindi</td>
<td>Devanagari</td>
</tr>
<tr>
<td>Kannada</td>
<td>Kannada</td>
</tr>
<tr>
<td>Kashmiri</td>
<td>Persian</td>
</tr>
<tr>
<td>Konkani</td>
<td>Devanagari</td>
</tr>
<tr>
<td>Malayalam</td>
<td>Malayalam</td>
</tr>
<tr>
<td>Manipuri</td>
<td>Bengali</td>
</tr>
<tr>
<td>Marathi</td>
<td>Devanagari</td>
</tr>
<tr>
<td>Nepali</td>
<td>Devanagari</td>
</tr>
<tr>
<td>Odia</td>
<td>Odia</td>
</tr>
<tr>
<td>Punjabi</td>
<td>Gurumukhi</td>
</tr>
<tr>
<td>Sanskrit</td>
<td>Devanagari</td>
</tr>
<tr>
<td>Sindhi</td>
<td>Devanagari or Arabic</td>
</tr>
<tr>
<td>Tamil</td>
<td>Tamil</td>
</tr>
<tr>
<td>Telugu</td>
<td>Telugu</td>
</tr>
<tr>
<td>Urdu</td>
<td>Persian</td>
</tr>
<tr>
<td>Bodo</td>
<td>Devanagari</td>
</tr>
<tr>
<td>Dogri</td>
<td>Devanagari</td>
</tr>
<tr>
<td>Maithili</td>
<td>Devanagari</td>
</tr>
<tr>
<td>Santhali</td>
<td>Devanagari or Olchiki</td>
</tr>
</tbody>
</table>

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

2. List of optional subjects for Main Examination :
   (i) Agriculture
   (ii) Animal Husbandry and Veterinary Science
   (iii) Anthropology
   (iv) Botany
   (v) Chemistry
   (vi) Civil Engineering
   (vii) Commerce and Accountancy
   (viii) Economics
   (ix) Electrical Engineering
(x) Geography
(xi) Geology
(xii) History
(xiii) Law
(xiv) Management
(xv) Mathematics
(xvi) Mechanical Engineering
(xvii) Medical Science
(xviii) Philosophy
(xix) Physics
(xx) Political Science and International Relations
(xxi) Psychology
(xxii) Public Administration
(xxiii) Sociology
(xxiv) Statistics
(xxv) Zoology
(xxvi) Literature of any one of the following languages:
    Assamese, Bengali, Bodo, Dogri, Gujarati, Hindi, Kannada, Kashmiri, Konkani, Maithili, Malayalam, Manipuri, Marathi, Nepali, Odia, Punjabi, Sanskrit, Santhali, Sindhi, Tamil, Telugu, Urdu and English.

NOTE:

(i) The question papers for the examination will be of conventional (essay) type.
(ii) Each paper will be of three hours duration.
(iii) Candidates will have the option to answer all the question papers, except the Qualifying Language Papers, Paper-A and Paper-B, in any one of the languages included in the Eighth Schedule to the Constitution of India or in English. Notwithstanding this, the Candidate will have the choice to write the Optional Papers in English also if candidates opt to write Paper I-V except the Qualifying Language Papers, Paper-A and Paper-B, in any one of the language included in the Eighth Schedule to the Constitution of India.
(iv) Candidates exercising the option to answer Papers in any one of the languages included in the Eight Schedule to the Constitution of India mentioned above may, if they so desire, give English version within brackets of only the description of the technical terms, if any, in addition to the version in the language opted by them. Candidates should, however, note that if they misuse the above rule, a deduction will be made on this account from the total marks otherwise accruing to them and in extreme cases; their script(s) will not be valued for being in an unauthorized medium.
(vi) The question papers (other than the literature of language papers) will be set in Hindi and English only.

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

**General Instructions (Preliminary as well as Main Examination):**

(i) Candidates must write the papers in their own hand. In no circumstances will they be allowed the help of a scribe to write the answers for them. However, blind candidates and candidates with Locomotor Disability and Cerebral Palsy where dominant (writing) extremity is affected to the extent of slowing the performance of function (minimum of 40% impairment) will be allowed to write the examination with the help of a scribe in both the Civil Services (Preliminary) as well as in the Civil Services (Main) Examination.

(ii) Compensatory time of twenty minutes per hour shall be permitted for the Blind candidates and the candidates with locomotor disability and cerebral palsy where dominant (writing) extremity is affected to the extent of slowing the performance of function (minimum of 40% impairment) in both the Civil Services (Preliminary) as well as in the Civil Services (Main) Examination.

**Note (1):** The eligibility conditions of a scribe, his/her conduct inside the examination hall and the manner in which and extent to which he/she can help the blind candidate in writing the Civil Services Examination shall be governed by the instructions issued by the UPSC in this regard. Violation of all or any of the said instructions shall entail the cancellation of the candidature of the blind candidate in addition to any other action that the UPSC may take against the scribe.

**Note (2):** For purpose of these rules the candidate shall be deemed to be a blind candidate if the percentage of visual impairment is Forty per cent (40%) or more. The criteria for determining the percentage of visual impairment shall be as follows:—

<table>
<thead>
<tr>
<th>Category</th>
<th>All with corrections</th>
<th>Better eye</th>
<th>Worse eye</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Category O</td>
<td>6/9—6/18</td>
<td>6/24 to 6/36</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>Category I</td>
<td>6/18—6/36</td>
<td>6/60 to nil</td>
<td>40%</td>
<td></td>
</tr>
<tr>
<td>Category II</td>
<td>6/60—4/60 or field of vision 10°—20°</td>
<td>3/60 to nil</td>
<td>75%</td>
<td></td>
</tr>
<tr>
<td>Category III</td>
<td>3/60—1/60 or field of vision 10°</td>
<td>F.C. at 1 ft to nil</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Category IV</td>
<td>F.C. at 1 ft to nil field of vision 100°</td>
<td>F.C. at 1 ft to nil</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>One eyed person</td>
<td>6/6</td>
<td>F.C. at 1 ft to nil</td>
<td>30%</td>
<td></td>
</tr>
</tbody>
</table>
**Note (3)**: For availing of the concession admissible to a blind candidate, the candidate concerned shall produce a certificate in the prescribed proforma from a Medical Board constituted by the Central/State Governments along with their application for the Main Examination.

**Note (4)**: The concession admissible to blind candidates shall not be admissible to those suffering from Myopia.

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

(iii) 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.

(iv) Marks will not be allotted for mere superficial knowledge.

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

(vi) In the question papers, wherever required, SI units will be used.

(vii) Candidates should use only International form of Indian numerals (i.e. 1, 2, 3, 4, 5, 6 etc.) while answering question papers.

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

It is also important to note that candidates are not permitted to use calculators for answering objective type papers (Test Booklets). They should not therefore bring the same inside the Examination Hall.

**C. Interview Test**

The candidate will be interviewed by a Board who will have before them a record of his career. He will be asked questions on matters of general interest. The object of the interview is to assess the personal suitability of the candidate for a career in public service by a Board of competent and unbiased observers. The test is intended to judge the mental calibre of a candidate. In broad terms this is really an assessment of not only his intellectual qualities but also social traits and his interest in current affairs. Some of the qualities to be judged are mental alertness, critical powers of assimilation, clear and logical exposition, balance of judgement, variety and depth of interest, ability for social cohesion and leadership, intellectual and moral integrity.

2. The technique of the interview is not that of a strict cross-examination but of a natural, though directed and purposive conversation which is intended to reveal the mental qualities of the candidate.

3. The interview test is not intended to be a test either of the specialised or general knowledge of the candidates which has been already tested through their written papers. Candidates are expected to have taken an intelligent interest not only in their special subjects of academic study but also in the events which are happening around them both within and outside their own State or Country as well as in modern currents of thought and in new discoveries which should rouse the curiosity of well educated youth.

**SECTION III**

**SYLLABI FOR THE EXAMINATION**

**NOTE**: Candidates are advised to go through the Syllabus published in this Section for the Preliminary Examination and the Main Examination, as periodic revision of syllabus has been done in several subjects.

**Part A—Preliminary Examination**

**Paper I - (200 marks) Duration : Two hours**

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

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

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

**Note 1**: Paper-II of the Civil Services (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 Civil Services (Prelim) Examination for the purpose of evaluation. Therefore a candidate will be disqualified in case he/she does not appear in both the papers of Civil Services (Prelim) 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 them without any specialized study. The questions will be such as to test a candidate’s general awareness of a variety of subjects, which will have relevance for a career in Civil Services. The questions are likely to test the candidate’s basic understanding of all relevant issues, and ability to analyze, and take a view on conflicting socio-economic goals, objectives and demands. The candidates must give relevant, meaningful and succinct answers.

The scope of the syllabus for optional subject papers (Paper VI and Paper VII) for the examination is broadly of the honours degree level i.e. a level higher than the bachelors’ degree and lower than the masters’ degree. In the case of Engineering, Medical Science and law, the level corresponds to the bachelors’ degree.

Syllabi of the papers included in the scheme of Civil Services (Main) Examination are given as follows :

QUALIFYING PAPERS ON INDIAN LANGUAGES AND ENGLISH

The aim of the paper is to test the candidates’s ability to read and understand serious discursive prose, and to express his ideas clearly and correctly, in English and Indian language concerned.

The pattern of questions would be broadly as follows :

(i) Comprehension of given passages.
(ii) Precis Writing.
(iii) Usage and Vocabulary.
(iv) Short Essays.

Indian Languages:

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

Note 1: The papers on Indian Languages and English will be of Matriculation or equivalent standard and will be of qualifying nature only. The marks obtained in these papers will not be counted for ranking.

Note 2: The candidates will have to answer the English and Indian Languages papers in English and the respective Indian language (except where translation is involved).

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 within the country.
- History of the world will include events from 18th century such as industrial revolution, world wars, redrawal of national boundaries, colonization, decolonization, political philosophies like communism, capitalism, socialism etc.—their forms and effect on the society.
- Salient features of Indian Society, Diversity of India.
- Role of women and women’s organization, population and associated issues, poverty and developmental issues, urbanization, their problems and their remedies.
- Effects of globalization on Indian society.
- Social empowerment, communalism, regionalism & secularism.
- Salient features of world’s physical geography.
- Distribution of key natural resources across the world (including South Asia and the Indian sub-continent); factors responsible for the location of primary, secondary, and tertiary sector industries in various parts of the world (including India).
- Important Geophysical phenomena such as earthquakes, Tsunami, Volcanic activity, cyclone etc., geographical features and their location-changes in critical geographical features (including water-bodies and ice-caps) and in flora and fauna and the effects of such changes.

PAPER-III

General Studies- II: Governance, Constitution, Polity, Social Justice and International relations.

- Indian Constitution—historical underpinnings, evolution, features, amendments, significant provisions and basic structure.
PAPER-IV

General Studies-III: Technology, Economic Development, Biodiversity, Environment, Security 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 etc.
- Investment models.
- Science and Technology- developments and their applications and effects in everyday life.
- Achievements of Indians in science & technology; indigenization of technology and developing new technology.
- Awareness in the fields of IT, Space, Computers, robotics, nano-technology, bio-technology and issues relating to intellectual property rights.
- Conservation, environmental pollution and degradation, environmental impact assessment.
- Disaster and disaster management.
- Linkages between development and spread of extremism.
- Role of external state and non-state actors in creating challenges to internal security.
- Challenges to internal security through communication networks, role of media and social networking sites in internal security challenges, basics of cyber security; money-laundering and its prevention.
- Security challenges and their management in border areas - linkages of organized crime with terrorism.
- Various Security forces and agencies and their mandate.
PAPER-V

General Studies- IV: Ethics, Integrity and Aptitude

This paper will include questions to test the candidates’ attitude and approach 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 utilise 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 behaviour; 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 administration: Status and problems; ethical concerns and dilemmas in government and private institutions; laws, rules, regulations and conscience as sources of ethical guidance; accountability and ethical governance; strengthening of ethical and moral values in governance; ethical issues in international relations and funding; corporate governance.
- Probity in Governance: Concept of public service; Philosophical basis of governance and probity: Information sharing and transparency in government, Right to Information, Codes of Ethics, Codes of Conduct, Citizen’s Charters, Work culture, Quality of service delivery, Utilization of public funds, challenges of corruption.
- Case Studies on above issues.

PAPER-VI & PAPER VII

Optional Subject Papers I & II

Candidate may choose any optional subject from amongst the List of Optional Subjects given in Para 2.

AGRICULTURE

PAPER-I


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 conservation, integrated watershed management. Soil erosion and its management. Dry land agriculture and its problems. Technology for stabilising agriculture production in rainfed areas.


Farm management, scope, importance and characteristics, farm planning. Optimum resource use and budgeting. Economics of different types of farming systems. Marketing management strategies for development, market intelligence. Price fluctuations and their cost; role of cooperatives in agricultural economy; types and systems of farming and factors affecting them. Agricultural price policy. Crop Insurance.

Agricultural extension, its importance and role, methods of evaluation of extension programmes, socio-economic survey and status of big, small and marginal farmers and
landless agricultural labourers; Training programmes for extension workers. Role of Krishi Vigyan Kendra's (KVK) in dissemination of Agricultural technologies. Non-Government Organisation (NGO) and self-help group approach for rural development.

**PAPER-II**


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; C3, C4 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—drought, salt and water stress.


**ANIMAL HUSBANDRY AND VETERINARY SCIENCE**

**PAPER-I**

1. Animal Nutrition :


1.3 Major and 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 hormones and antibiotics—latest concepts.

1.5 Conservation of fodders. Storage of feeds and feed ingredients. Recent advances in feed technology and feed processing. Anti-nutritional and toxic factors present in livestock feeds. Feed analysis and quality control. Digestibility trials—direct, indirect and indicator methods. Predicting feed intake in grazing animals.


1.8 Poultry nutrition. Special features of poultry nutrition. Nutrient requirements for meat and egg production. Formulation of rations for different classes of layers and broilers.

2. Animal Physiology:

2.1 Physiology of blood and its circulation, respiration; excretion. Endocrine glands in health and disease.


2.3 Circulation.—Physiology of heart, cardiac cycle, heart sounds, heart beat, electrocardiograms. Work and efficiency of heart—effect of ions on heart function-metabolism of cardiac muscle, nervous and chemical regulation of heart, effect of temperature and stress on heart, blood pressuer and hypertension, osmotic regulation, arterial pulse, vasomotor regulation of circulation, shock. Coronary and pulmonary circulation, Blood-Brain barrier Cerebrospinal fluid-circulation in birds.

2.4 Respiration.—Mechanism of respiration, Transport and exchange of gases-neural control of respiration-Chemo-receptors-hypoxia-respiration in birds.


2.6 Endocrine glands.—Functional disorders—their symptoms and diagnosis. Synthesis of hormones, mechanism and control of secretion—hormonal receptors-classification and function.

2.7 Growth and Animal Production.—Prenatal and postnatal growth, maturation, growth curves, measures of growth, factors affecting growth, conformation, body composition, meat quality.

2.8 Physiology of Milk Production, Reproduction and Digestion.—Current status of hormonal control of mammary development, milk secretion and milk ejection. Male and Female reproductive organs, their components and functions. Digestive organs and their functions.

2.9 Environmental Physiology.—Physiological relations and their regulation; mechanisms of adaptation, environmental factors and regulatory mechanisms involved in animal behaviour, climatology—various parameters and their importance. Animal ecology. Physiology of behaviour. Effect of stress on health and production.

3. Animal Reproduction:

3.1 History of animal genetics. Mitosis and Meiosis: Mendelian inheritance; deviations to Mendelian...
5. Extension:

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

PAPER-II

1. Anatomy, Pharmacology and Hygiene:

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

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

1.3 Bovine Anatomy.—Regional Anatomy: Paranasal sinuses of ox—surface anatomy of salivary glands. Regional anatomy of infraorbital, maxillary, mandibular, veolar, mental and cornal nerve block. Regional anatomy of paravertebral nerves, pudental nerve, median, ulnar and radial nerves—Cranial nerves—structures involved in epidural anaesthesia—superficial lymph nodes—surface anatomy of visceral organs of thoracic, abdominal and pelvic cavities—comparative—features of locomotor apparatus and their application in the biomechanics of mammalian body.

1.4 Anatomy of Fowl.—Musculo-skeletal system—functional anatomy in relation to respiration and flying, digestion and egg production.

1.5 Pharmacology and Therapeutics:—Cellular level of pharmacodynamics and pharmacokinetics. Drugs acting on fluids and electrolyte balance. Drugs acting on Autonomic nervous system. Modern concepts of anaesthesia and dissociative anaesthetics. Autocoids. Antimicrobials and principles of chemotherapy in microbial infections. Use of hormones in therapeutics—chemotherapy of parasitic infections. Drug and economic concerns in the Edible tissues of animals—chemotherapy of Neoplastic diseases. Toxicity due to “insecticides, plants, metals, non-metals, zootoxins and mycotoxins”.

1.6 Veterinary Hygiene with reference to water, air and habitation:—Assessment of pollution of water, air and soil—Importance of climate in animal health—effect of environment on animal function and performance relationship between industrialisation and animal agriculture—animal housing requirements for specific categories of domestic animals viz. pregnant cows and sows, milking cows, broiler birds—stress, strain and productivity in relation to animal habitation.

2. Animal Diseases:

2.1 Etiology, epidemiology, pathogenesis, symptoms, post-mortem lesions, diagnosis, and control of infectious diseases of cattle, sheep and goat, horses, pigs and poultry.
2.2 Etiology, epidemiology, symptoms, diagnosis, treatment of production diseases of cattle, horse, pig and poultry.

2.3 Deficiency diseases of domestic animals and birds.

2.4 Diagnosis and treatment of non-specific conditions like impaction, Bloat, Diarrhoea, Indigestion, dehydration, stroke, poisoning.

2.5 Diagnosis and treatment of neurological disorders.

2.6 Principles and methods of 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.


4. Milk and Milk Products Technology :


4.2 Milk Products Technology.—Selection of raw materials, processing, storing, distributing and marketing milk products such as Cream, Butter, Ghee, Khoa, Channa, Cheese, condensed, evaporated, dried milk and baby food, Ice cream and Kulfi; by-products, whey products, butter milk, lactose and casein. Testing, grading, judging milk products—BIS and Agmark specifications, legal standards, quality control nutritive properties. Packaging processing and operational control. Costing of dairy products.

5. Meat Hygiene and Technology :

5.1 Meat Hygiene

5.1.1 Ante mortem care and management of food animals, stunning, slaughter and dressing operations; abattoir requirements and designs; Meat inspection procedures and judgement of carcass meat cuts—grading of carcass meat cuts—duties and functions of Veterinarians in wholesome meat production.

5.1.2 Hygienic methods of handling production of meat.—Spoilage of meat and control measures—Post-slaughter physicochemical changes in meat and factors that influence them—Quality improvement methods—Adulteration of meat and detection—Regulatory provisions in Meat trade and Industry.

5.2 Meat Technology

5.2.1 Physical and chemical characteristics of meat.—Meat emulsions—Methods of preservation of meat—Curing, canning, irradiation, packaging of meat and meat products, processing and formulations.

5.3 By-products.—Slaughter house by-products and their utilisation—Edible and inedible by-products—Social and economic implications of proper utilisation of slaughter house by-products—Organ products for food and pharmaceuticals.


5.5 Rabbit/Fur Animal farming.—Rabbit meat production. Disposal and utilization of fur and wool and recycling of waste by products. Grading of wool.

ANTHROPOLOGY

PAPER-I

1.1 Meaning, Scope and development of Anthropology.

1.2 Relationships with other disciplines : Social Sciences, behavioural Sciences, Life Sciences, Medical Sciences, Earth Sciences and Humanities.

1.3 Main branches of Anthropology, their scope and relevance :
1. Social-cultural Anthropology.

2. Biological Anthropology.

3. Archaeological Anthropology.

4. Linguistic Anthropology.

1.4 Human Evolution and emergence of Man:

(a) Biological and Cultural factors in human evolution.

(b) Theories of Organic Evolution (Pre-Darwinian, Darwinian and Post-Darwinian).

(c) Synthetic theory of evolution; Brief outline of terms and concepts of evolutionary biology (Doll’s rule, Cope’s rule, Gause’s rule, parallelism, convergence, adaptive radiation, and mosaic evolution).

1.5 Characteristics of Primates; Evolutionary Trend and Primate Taxonomy; Primate Adaptations; (Arboreal and Terrestrial) Primate Taxonomy; Primate Behaviour; Tertiary and Quaternary fossil primates; Living Major Primates; Comparative Anatomy of Man and Apes; Skeletal changes due to erect posture and its implications.

1.6 Phylogenetic status, characteristics and geographical distribution of the following:

(a) Plio-preleistocene hominids in South and East Africa—Australopithecines.

(b) Homo erectus: Africa (Paranthropus), Europe (Homo erectus (heidelbergenis)), Asia (Homo erectus javanicus, Homo erectus pekinensis).

(c) Neanderthal man—La-chapelle-aux-saints (Classical type), Mt. Carmel (Progressive type).

(d) Rhodesian man.

(e) Homo saoiens—Cromagnon, Grimaldi and Chancelede.

1.7 The biological basis of Life: The Cell, DNA structure and replication, Protein Synthesis, Gene, Mutation, Chromosomes, and Cell Division.

1.8 (a) Principles of Prehistoric Archaeology.

(b) Cultural Evolution—Broad Outlines of Prehistoric cultures:

(i) Paleolithic

(ii) Mesolithic

(iii) Neolithic

(iv) Chalcolithic

(v) Copper-Bronze Age

(vi) Iron Age

2.1 The Nature of Culture: The concept and Characteristics of culture and civilization; Ethnocentrism vis-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 economic anthropology; Formalist and Substantivist debate; Principles governing production, distribution and exchange (reciprocity, redistribution and market), in communities, subsisting on hunting and gathering, fishing, swiddening, pastoralism, horticulture, and agriculture; globalization and indigenous economic systems.

4. Political Organization and Social Control: Band, tribe, chiefdom, kingdom and state; concepts of power, authority and legitimacy; social control, law and justice in simple Societies.

5. Religion: Anthropological approaches to the study of religion (evolutionary, psychological and functional); monotheism and polytheism; sacred and profane; myths and rituals; forms of religion in tribal and peasant Societies (animism, animatism, fetishism, naturism and totemism); religion, magic and science distinguished; magico-religious functionaries (priest, shaman, medicine man, sorcerer and witch).

6. Anthropological theories:

(a) Classical evolutionism (Tylor, Morgan and Frazer)

(b) Historical particularism (Boas) Diffusionism (British, German and American)

(c) Functionalism (Malinowski); Structural—Functionlism (Radcliffe-Brown)
(d) Structuralism (L’evi-Strauss and E. Leach)
(e) Culture and personality (Benedict, Mead, Linton, Kardiner and Cora-du Bois)
(f) Neo—evolutionism (Childe, White, Steward, Sahlins and Service)
(g) Cultural materialism (Harris)
(h) Symbolic and interpretive theories (Turner, Schneider and Geertz)
(i) Cognitive theories (Tyler, Conklin)
(j) Post-modernism in anthropology.

7. Culture, Language and Communication:
Nature, origin and characteristics of language; verbal and non-verbal communication; social context of language use.

8. Research methods in Anthropology:
(a) Fieldwork tradition in anthropology
(b) Distinction between technique, method and methodology
(c) Tools of data collection: observation, interview, schedules, questionnaire, case study, genealogy, life-history, oral history, secondary sources of information, participatory methods.
(d) Analysis, interpretation and presentation of data.

9.1 Human Genetics: Methods and Application:
Methods for study of genetic principles in man-family study (pedigree analysis, twin study, foster child, co-twin method, cytogenetic method, chromosomal and karyo-type analysis), biochemical methods, immunological methods, D.N.A. technology and recombinant technologies.

9.2 Mendelian genetics in man-family study, single factor, multifactor, lethal, sub-lethal and polygenic inheritance in man.

9.3 Concept of genetic polymorphism and selection, Mendelian population, Hardy-Weinberg law; causes and changes which bring down frequency-mutation, isolation, migration, selection, inbreeding and genetic drift. Consanguineous and non-consanguineous mating, genetic load, genetic effect of consanguineous and cousin marriages.

9.4 Chromosomes and chromosomal aberrations in man, methodology.
(a) Numerical and structural aberrations (disorders).
(b) Sex chromosomal 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 of non-metric and characters. Racial criteria, racial traits in relation to heredity and environment; biological basis of racial classification, racial differentiation and race crossing in man.

9.6 Age, sex and population variation as genetic marker: ABO, Rh blood groups, HLA Hp, transferring, Gm, blood enzymes. Physiological characteristics-Hb level, body fat, pulse rate, respiratory functions and sensory perceptions in different cultural and socio-economic groups.

9.7 Concepts and methods of Ecological Anthropology:
Bio-cultural Adaptations—Genetic and Non-genetic factors. Man’s physiological responses to environmental stresses: hot desert, cold, high altitude climate.

9.8 Epidemiological Anthropology: Health and disease. Infectious and non-infectious diseases, Nutritional deficiency related diseases.

10. Concept of human growth and Development:
Stages of growth—pre-natal, natal, infant, childhood, adolescence, maturity, senescence.
—Factors affecting growth and development genetic, environmental, biochemical, nutritional, cultural and socio-economic.
—Aging and senescence. Theories and observations

11.1 Relevance of menarche, menopause and other bioevents to fertility. Fertility patterns and differentials.

11.2 Demographic theories-biological, social and cultural.

11.3 Biological and socio-ecological factors influencing fecundity, fertility, natality and mortality.

12. Applications of Anthropology: Anthropology of sports, Nutritional anthropology, Anthropology in designing of defence and other equipments, Forensic Anthropology, Methods and principles of personal identification and reconstruction, Applied human genetics—Paternity diagnosis, genetic counselling and eugenics, DNA technology in diseases and medicine, serogenetics and cytogenetics in reproductive biology.

PAPER-II

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—Yamashram, 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, Vajmami 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 the 18th, 19th and early 20th Century scholar-administrators. Contributions of Indian anthropologists to tribal and caste studies.

5.1 **Indian Village**—Significance of village study in India; Indian village as a social system; Traditional and changing patterns of settlement and inter-caste relations; Agrarian relations in Indian villages; Impact of globalization on Indian villages.

5.2 Linguistic and religious minorities and their social, political and economic status.

5.3 Indigenous and exogenous processes of socio-cultural change in Indian society: Sanskritization, Westernization, Modernization; Inter-play of little and great traditions; Panchayati Raj and social change; Media and Social change.

6.1 **Tribal situation in India**—Bio-genetic variability, linguistic and socio-economic characteristics of the tribal populations and their distribution.

6.2 **Problems of the tribal Communities**—Land alienation, poverty, indebtedness, low literacy, poor educational facilities, unemployment, under-employment, health and nutrition.

6.3 Developmental projects and their impact on tribal displacement and problems of rehabilitation. Development of forest policy and tribals. Impact of urbanisation and industrialization on tribal populations.

7.1 Problems of exploitation and deprivation of Scheduled Castes, Scheduled Tribes and Other Backward Classes. Constitutional safeguards for Scheduled Tribes and Scheduled Castes.

7.2 Social change and contemporary tribal societies: Impact of modern democratic institutions, development programmes and welfare measures on tribals and weaker sections.

7.3 The concept of ethnicity; Ethnic conflicts and political developments; Unrest among tribal communities; Regionalism and demand for autonomy; Pseudo-tribalism. Social change among the tribes during colonial and post-Independent India.

8.1 Impact of Hinduism, Buddhism, Christianity, Islam and other religions on tribal societies.

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

9.1 History of administration of tribal areas, tribal policies, plans, programmes of tribal development and their implementation. The concept of PTGs (Primitive Tribal Groups), their distribution, special programmes for their development. Role of N.G.O.s in tribal development.

9.2 Role of anthropology in tribal and rural development.

9.3 Contributions of anthropology to the understanding of regionalism, communalism and ethnic and political movements.

**BOTANY**

**PAPER-I**

1. **Microbiology and Plant Pathology**:
   Structure and reproduction/multiplication of viruses, viroids, bacteria, fungi and mycoplasma; Applications of microbiology in agriculture, industry, medicine and in control of soil and water pollution; Prion and Prion hypothesis.

   Important crop diseases caused by viruses, bacteria, mycoplasma, fungi and nematodes; Modes of infection and dissemination; Molecular basis of infection and disease resistance/defence; Physiology of parasitism and control measures. Fungal toxins. Modelling and disease forecasting; Plant quarantine.

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

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

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

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

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

Stomata and their types; Glandular and non-glandular trichomes; Unusual secondary growth; Anatomy of C3 and C4 plants; Xylem and phloem differentiation; Wood anatomy.

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

4. **Plant Resource Development**

Domestication and introduction of plants; Origin of cultivated plants, Vavilov’s centres of origin. Plants as sources for food, fodder, fibres, spices, beverages, edible oils, drugs, narcotics, insecticides, timber, gums, resins and dyes; latex, cellulose, starch and its products; Perfumery; Importance of Ethnobotany in Indian context; Energy plantations; Botanical Gardens and Herbaria.

5. **Morphogenesis**

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

**PAPER-I**

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; Cytoskeleton and microtubules; Nucleus, nucleolus, nuclear pore complex; Chromatin and nucleosome; Cell signalling and cell receptors; Signal transduction; Mitosis and meiosis; molecular basis of cell cycle. Numerical and structural variations in chromosomes and their significance; Chromatin organization and packaging of genome; Polytene chromosomes; B-chromosomes—structure, behaviour and significance.

2. **Genetics, Molecular Biology and Evolution**

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

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

Role of RNA in origin and evolution.

3. **Plant Breeding, Biotechnology and Biostatistics**

Methods of plant breeding—introduction, selection and hybridization (pedigree, backcross, mass selection, bulk method); Mutation, polyploidy, male sterility and heterosis breeding. Use of apomixes in plant breeding; DNA sequencing; Genetic engineering—methods of transfer of genes; Transgenic crops and biosafety aspects; Development and use of molecular markers in plant breeding; Tools and techniques—probe, southern blotting, DNA fingerprinting, PCR and FISH.


4. **Physiology and Biochemistry**

Water relations, mineral nutrition and ion transport, mineral deficiencies. Photosynthesis—photochemical reactions, photophosphorylation and carbon fixation pathways; C3, C4 and CAM pathways; Mechanism of phloem transport. Respiration (anaerobic and aerobic, including fermentation)—electron transport...
chain and oxidative phosphorylation; Photorespiration; Chemiosmotic theory and ATP synthesis; Lipid metabolism; Nitrogen fixation and nitrogen metabolism. Enzymes, coenzymes; Energy transfer and energy conservation. Importance of secondary metabolites. Pigments as photoreceptors (plastidial pigments and phytochrome). Plant movements; Photoperiodism and flowering, vernalization, senescence; Growth substances—their chemical nature, role and applications in agriculture; 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 phytoremediation); Plant indicators; Environment (Protection) Act.

Forest types of India—Ecological and economic importance of forests, afforestation, deforestation and social forestry; Endangered plants, endemic 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; Environment Impact Assessment; Phytogeographical regions of India.

CHEMISTRY

PAPER-I

1. Atomic Structure:
Heisenberg’s uncertainty principle Schrödinger wave equation (time independent); Interpretation of wave function, particle in one-dimensional box, quantum numbers, hydrogen atom wave functions; Shapes of s, p and d orbitals.

2. Chemical bonding:
Ionic bond, characteristics of ionic compounds, lattice energy, Born-Haber cycle; covalent bond and its general characteristics, polarities of bonds in molecules and their dipole moments; Valence bond theory, concept of resonance and resonance energy; Molecular orbital theory (LCAO method); bonding H₂⁺, H₂, H₂⁺, NO, CO, HF, CN⁻. Comparison of valence bond and molecular orbital theoretics, bond order, bond strength and bond length.

3. Solid State:
Crystal systems; Designation of crystal faces, lattice structures and unit cell; Bragg’s law; X-ray diffraction by crystals; Close packing, radius ratio rules, calculation of some limiting radius ratio values; Structures of NaCl, ZnS, CsCl, CaF₂; Stoichiometric and nonstoichiometric defects, impurity defects, semi-conductors.

4. The Gaseous State and Transport Phenomenon:
Equation of state for real gases, intermolecular interactions, and critical phenomena and liquefaction of gases; Maxwell’s distribution of speeds, intermolecular collisions, collisions on the wall and effusion; Maxwell’s distribution of speeds, intermolecular collisions, collisions on the wall and effusion; Thermal conductivity and viscosity of ideal gases.

5. Liquid State:
Kelvin equation; Surface tension and surface energy, wetting and contact angle, interfacial tension and capillary action.

6. Thermodynamics:
Work, heat and internal energy; first law of thermodynamics.

Second law of thermodynamics; entropy as a state function, entropy changes in various processes, entropy-reversibility and irreversibility. Free energy functions; Thermodynamic equation of state; Maxwell relations; Temperature, volume and pressure dependence of U, H, A, G, Cᵥ and C_p; J-T effect and inversion temperature; criteria for equilibrium, relation between equilibrium constant and thermodynamic quantities; Nernst heat theorem, introductory idea of third law of thermodynamics.

7. Phase Equilibria and Solutions:
Clausius-Clapeyron equation; phase diagram for a pure substance; phase equilibria in binary systems, partially miscible liquids—upper and lower critical solution temperatures; partial molar quantities, their significance and determination; excess thermodynamic functions and their determination.

8. Electrochemistry:
Debye-Hückel theory of strong electrolytes and Debye-Hückel 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; Langmuir and B.E.T. adsorption isotherms; determination of surface area, characteristics and mechanism of reaction on heterogeneous catalysts.

12. **Bio-inorganic Chemistry:**
    Metal ions in biological systems and their role in ion-transport across the membranes (molecular mechanism), oxygen-uptake proteins, cytochromes and ferrodoxins.

13. **Coordination Chemistry:**
    (i) Bonding in transition of metal complexes. Valence bond theory, crystal field theory and its modifications; applications of theories in the explanation of magnetism and electronic spectra of metal complexes.
    (ii) Isomerism in coordination compounds; IUPAC nomenclature of coordination compounds; stereochemistry of complexes with 4 and 6 coordination numbers; chelate effect and polynuclear complexes; trans effect and its theories; kinetics of substitution reactions in square-planar complexes; thermodynamic and kinetic stability of complexes.
    (iii) EAN rule, Synthesis structure and reactivity of metal carbonyls; carboxylate anions, carbonyl hydrides and metal nitrosyl compounds.
    (iv) Complexes with aromatic systems, synthesis, structure and bonding in metal olefin complexes, alkyne complexes and cyclopentadienyl complexes; coordinative unsaturation, oxidative addition reactions, insertion reactions, fluxional molecules and their characterization; Compounds with metal—metal bonds and metal atom clusters.

14. **Main Group Chemistry:**
    Boranes, borazines, phosphazenes and cyclic phosphazene, silicates and silicones, Interhalogen compounds; Sulphur—nitrogen compounds, noble gas compounds.

15. **General Chemistry of ‘f’ Block Element:**
    Lanthanides and actinides; separation, oxidation states, magnetic and spectral properties; lanthanide contraction.

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**PAPER-II**

1. **Delocalised 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, madhod crossover 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 carbonanions, 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:** —$E_1$, $E_2$ and $E_1cb$ mechanisms; orientation in $E_2$ 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, Wittig, Clemmensen, Wolff-Kishner, Cannizzaro and von Richter reactions; Stobbe, benzoic and acyloin condensations; Fischer indole synthesis, Skraup synthesis, Bischler-Napieralski, Sandmeyer, Reimer-Tiemann and Reformatsky reactions.

3. **Pericyclic reactions:** —Classification and examples; Woodward-Hoffmann rules—electrocyclic reactions, cycloaddition reactions $[2+2$ and $4+2]$ and sigmatropic shifts $[1, 3; 3, 3$ and $1, 5]$, FMO approach.

(ii) Biopolymers: Structure of proteins, DNA and RNA.

5. Synthetic Uses of Reagents:
   OsO₄, HIO₄, CrO₃, Pb(OAc)₄, SeO₂, NBS, B₂H₆, Na-Liquid NH₃, LiAlH₄, NaBH₄, n-BuLi, MCPBA.

6. Photochemistry: Photochemical reactions of simple organic compounds, excited and ground states, singlet and triplet states, Norrish-Type I and Type II reactions.

7. Spectroscopy:
   Principle and applications in structure elucidation:
   (i) Rotational—Diatomic molecules; isotopic substitution and rotational constants.
   (ii) Vibrational—Diatomic molecules, linear triatomic molecules, specific frequencies of functional groups in polyatomic molecules.
   (iii) Electronic—Singlet and triplet states, n→π* and π→π* transitions; application to conjugated double bonds and conjugated carbonyls Woodward-Fieser rules; Charge transfer spectra.
   (iv) Nuclear Magnetic Resonance (¹H NMR): Basic principle; chemical shift and spin-spin interaction and coupling constants.

CIVIL ENGINEERING

PAPER-I


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 deformation applied to beams and pin jointed trusses. Slope-deflection, moment distribution.

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

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


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

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

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

2.1 Structural Steel Design:
   Structural steel: Factors of safety and load factors. Riveted, bolted and welded joints and connections. Design of tension and compression members, beams of built up section, riveted and welded plate girders, gantry girders, stancheons with battens and lacings.

2.2 Design of Concrete and Masonry Structures:

Cantilever and Counter fort type retaining walls.
Water tanks: Design requirements for Rectangular and circular tanks resting on ground.

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

Design of brick masonry as per I.S. Codes

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

3.1 Fluid Mechanics:
Fluid properties and their role in fluid motion, fluid statics including forces acting on plane and 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 correction factors, specific energy and specific force, critical depth, rapidly varied flow, hydraulic jump, gradually varied flow, classification of surface profiles, control section, step method of integration of varied flow equation.

3.6 Hydraulic Machines and Hydropower:
Hydraulic turbines, types classification, Choice of turbines performance parameters, controls, characteristics, specific speed.

Principles of hydropower development.

4. Geotechnical Engineering:
Soil Type and Structure—gradation and particle size distribution—consistency limits.

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

Compaction of soil—Laboratory and filed test.

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

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

Bearing capacity of soil—approaches for analysis—Filed tests—settlement analysis—stability of slope of earth walk.

Subsurface exploration of soils—methods

Foundation—Type and selection criteria for foundation of structures—Design criteria for foundation—Analysis of distribution of stress for footings and pile—pile group action—pile load test.

Ground improvement techniques.

PAPER—II

1. Construction Technology, Equipment, Planning and Management

1.1 Construction Technology

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

Specific use of ferro cement, fibre reinforced C. C., High 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 industry—Quality assurance principles.

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

Basic principles of Economic analysis and methods.

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

2. Surveying and Transportation Engineering

2.1 Surveying:

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

Basic principles of photogrammetry and remote sensing.

2.2 Railways Engineering:

Permanent way—components, types and their function—Functions and Design constituents of turn and crossing—Necessity of geometric design of track—Design of station and yards.

2.3 Highway Engineering:

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

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

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

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

Pavement distresses and strengthening by overlays.

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

3. Hydrology, Water Resources and Engineering:

3.1 Hydrology:

Hydrological cycle, precipitation, evaporation, transpiration, infiltration, overland flow, hydrograph, flood frequency analyses, flood routing through a reservoir, channel flow routing—Muskingley 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 canna 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 their significance, physical, chemical and bacteriological analysis, waterborne diseases, standards for potable water.

4.2 Intake of Water:

Water treatment: principles of coagulation, flocculation and sedimentation; slow-, rapid-, pressure-, filters; chlorination, softening, removal of taste, odour and salinity.
4.3 Sewerage Systems:
Domestic and industrial wastes, store sewage—separate and combined systems, flow through sewers, design of sewers.

4.4 Sewage Characterisation:
BOD, COD, solids, dissolved oxygen, nitrogen and TOC. Standards of disposal in normal water course and on land.

4.5 Sewage Treatment:
Working principles, units, chambers, sedimentation tank, trickling filters, oxidation ponds, activated sludge process, septic tank, disposal of sludge, recycling of waste water.

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

5. Environmental pollution:

COMMERCIAL 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.

Employees Stock Option and Buy-Back of Securities.

Preparation and Presentation of Company Final Accounts.

Amalgamations, Absorption and Reconstruction of Companies.

2. Cost Accounting:

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.


Responsibility Accounting and Divisional Performance Measurement.

3. Taxation:
Income Tax: Definitions, Basis of charge; Incomes which do not form part of total income. Simple problems of Computation of Income (of individuals only) under various heads, i.e., Salaries, Income from House Property, Profits and Gains from Business or Profession, Capital Gains, Income from other sources, Income of other Persons included in Assessee’s Total Income.

Set-off and Carry forward of Loss.

Deductions from Gross Total Income.

Salient Features/Provisions Related to VAT and Services Tax.

4. Auditing:
Company Audit: Audit related to Divisible Profits, Dividends, Special investigations, Tax audit.

Audit of Banking, Insurance, Non-Profit Organization and Charitable Societies/Trusts/Organizations.

Financial Management, Financial Institutions and Markets
1. Financial Management:


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


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

2. Financial Markets and Institutions:

Indian Financial System: An Overview


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, Economical and Legal; Organizational Goals Primary and Secondary Goals, Single and Multiple Goals; Management by Objectives.

Evolution of Organisation theory: Classical Neoclassical and system approach.


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


Managing Organisational Culture.

2. Organisation Behaviour:

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


Human Resources Management and Industrial Relations

1. Human Resources Management (HRM):


2. Industrial Relations (IR):


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

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

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

4. International Economics :
   (a) Old and New theories of International Trade.
      (i) Comparative advantage,
      (ii) Terms of Trade and Offer Curve.
      (iii) Product Cycle and Strategic Trade Theories.
      (iv) Trade as an engine of growth and theories of
underdevelopment in an open economy.
   (b) Forms of Protection : Tariff and quota.
   (c) Balance of Payments Adjustment : Alternative
Approaches.
      (i) Price versus income, income adjustments
under fixed exchange rates.
      (ii) Theories of Policy Mix.
      (iii) Exchange rate adjustments under capital
mobility.

      (iv) Floating Rates and their Implications for
Developing Countries : Currency Boards.
   (v) Trade Policy and Developing Countries.
   (vi) BOP, adjustments and Policy Coordination in
open economy 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
countries : 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 and Non-renewable Resources,
Environmental Degradation, Intergenerational equity
development.

PAPER—II

Indian Economics in Post-Independence Era :
Land System and its changes, Commercialization of
agriculture Drain theory, Laissez faire theory and critique.
Manufacture and Transport : Jute, Cotton, Railways, Money
and Credit.

Indian Economy after Independence :
A. The Pre-Liberalization Era :
   (ii) Agriculture : Land Reforms and land tenure system,
Green Revolution and capital formation in agriculture.
   (iii) Industry Trends in composition and growth, Role of
public and private sector, small scale and cottage
industries.
   (iv) National and Per capita income : Patterns, trends,
aggregate and sectoral composition and changes therein.

B. The Post-Liberalization Era:

(i) New Economic Reform and Agriculture: Agriculture and WTO, Food processing, subsidies, Agricultural prices and public distribution system, Impact of public expenditure on agricultural growth.


(iv) New Exchange Rate Regime: Partial and full convertibility, Capital account convertibility.


(vi) New Economic Policy and Monetary System: Role of RBI under the new regime.

(vii) Planning: From central Planning to indicative planning, Relation between planning and markets for growth and decentralized planning: 73rd and 74th Constitutional amendments.


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 transform, Z-transform, Transfer function. Sampling and recovery of signals DFT, FFT Processing of analog signals through discrete-time systems.

3. E.M. Theory:


4. Analog Electronics:


5. Digital Electronics:

Boolean algebra; minimisation of Boolean functions; logic gates; digital IC families (DTL, TTL, ECL, MOS, CMOS). Combinational circuits: arithmetic circuits, code converters, multiplexers and decoders. Sequential circuits: latches and flip-flops, counters and shift-registers. Comparators, timers, multivibrators. Sample and hold circuits, ADCs and DACs. Semiconductor memories. Logic implementation using programmable devices (ROM, PLA, FPGA).

6. Energy Conversion:

Principles of electromechanical energy conversion: Torque and emf in rotating machines. DC machines: characteristics and performance analysis; starting and speed control of motors. Transformers: principles of operation and analysis; regulation, efficiency; 3-phase transformers. 3-phase induction machines and synchronous machines: characteristics and performance analysis; speed control.

7. Power Electronics and Electric Drives:

Semi-conductor power devices: diode, transistor, thyristor, triac, GTO and MOSFET-static characteristics and principles of operation; triggering circuits; phase control rectifiers; bridge converters: fully-controlled and half-controlled; principles of thyristor choppers and inverters; DC-DC converters; Switch mode inverter; basic concepts of speed control of dc and ac motor drives applications of variable-speed drives.

8. Analog Communication:

Random variables: continuous, discrete; probability, probability functions. Statistical averages; probability models; Random signals and noise: white noise, noise equivalent bandwidth; signal transmission with noise; signal to noise ratio. Linear CW modulation: Amplitude modulation: DSB, DSB-SC and SSB. Modulators and Demodulators; Phase and Frequency modulation: PM & FM signals; narrow 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 polar 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 set timing diagram, programming, interrupts, memory interfacing, I/O interfacing, programmable peripheral devices.

3. Measurement and Instrumentation :

Error analysis; measurement of current voltage, power, energy, power-factor, resistance, inductance, capacitance and frequency; bridge measurements. Signal conditioning circuit; Electronic measuring instruments : multimeter, CRO, digital voltmeter, frequency counter, Q-meter, spectrum-analyser, distortion-meter. Transducers : thermocouple, thermistor, LVDT, strain-gauge, piezo-electric crystal.

4. Power Systems: Analysis and Control :

Steady-state performance of overhead transmission lines and cables; principles of active and reactive power transfer and distribution; per-unit quantities; bus admittance and impedance matrices; load flow; voltage control and power factor correction; economic operation; symmetrical components, analysis of symmetrical and unsymmetrical faults. Concepts of system stability : swing curves and equal area criterion. Static VAR system. Basic concepts of HVDC transmission.

5. Power System Protection :


6. Digital Communication :


GEOGRAPHY

PAPER I

PRINCIPLES OF GEOGRAPHY

Physical Geography :

1. Geomorphology : Factors controlling landform development; endogenetic and exogenetic forces; Origin and evolution of the earth’s 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 fronts; 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 sea and marine pollution.

4. Biogeography :

Genesis of soils; Classification and distribution of soils; Soil profile; Soil erosion, Degradation and conservation; Factors influencing world distribution of plants and animals; Problems of deforestation and conservation measures; Social forestry, agro-forestry; Wild life; Major gene pool centres.

5. Environmental Geography :

Principle ecology; Human ecological adaptations; Influence of man on ecology and environment; Global and regional ecological changes and imbalances; Ecosystem their management and conservation; Environmental degradation, management and conservation; Biodiversity and sustainable development; Environmental policy; Environmental hazards and remedial measures; Environmental education and legislation.

Human Geography :

1. Perspectives in Human Geography : Areal differentiation; Regional synthesis; Dichotomy and
dualism; Quantitative revolution and locational analysis; Radical, behavioural, human and welfare approaches; Languages, religions and secularisation; Cultural regions of the world; Human development index.

2. **Economic Geography**: World economic development: measurement and problems; World resources and their distribution; Energy crisis: the limits to growth; World agriculture: typology of agricultural regions; Agricultural inputs and productivity; Food and nutrition problems; Food security; famine: causes, effects and remedies; World industries: location patterns and problems; Patterns of world trade.

3. **Population and Settlement Geography**: Growth and distribution of world population; Demographic attributes; Causes and consequences of migration; Concepts of over-under-and optimum population; Population theories, world population problems and policies; Social well-being and quality of life; Population as social capital.

   Types and patterns of rural settlements; Environmental issues in rural settlements; Hierarchy of urban settlements; Urban morphology; Concept of primate city and rank-size rule; Functional classification of towns; Sphere of urban influence; Rural-urban fringe; Satellite towns; Problems and remedies of urbanization; Sustainable development of cities.

4. **Regional Planning**: Concept of a region; Types of regions and methods of regionalisation; Growth centres and growth poles; Regional imbalances; Regional development strategies; Environmental issues in regional planning; Planning for sustainable development.

5. **Models, Theories and Laws in Human Geography**: 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; Energy crisis.

3. **Agriculture**: Infrastructure: irrigation, seeds, fertilizers, power; Institutional factors; land holdings, land tenure and land reforms; Cropping pattern, agricultural productivity, agricultural intensity, crop combination, land capability; Agro and social-forestry; Green revolution and its socio-economic and ecological implications; Significance of dry farming; Livestock resources and white revolution; Aqua-culture; Sericulture, Agriculture and poultry; Agricultural regionalisation; Agro-climatic zones; Agro-ecological regions.

4. **Industry**: Evolution of industries; Locational factors of cotton, jute, textile, iron and steel, aluminium, fertiliser, paper, chemical and pharmaceutical, automobile, cottage and ago-based industries; Industrial houses and complexes including public sector undertakings; Industrial regionalisation; New industrial policy; Multinationals and liberalisation; Special Economic Zones; Tourism including ecotourism.

5. **Transport, Communication and Trade**: Road, railway, waterway, airway and pipeline net works and their complementary roles in regional development; Growing importance of ports on national and foreign trade; Trade balance; Trade Policy; Export processing zones; Developments in communication and information technology and their impacts on economy and society; Indian space programme.

6. **Cultural Setting**: Historical Perspective of Indian Society; Racial linguistic and ethnic diversities; religious minorities; Major tribes, tribal areas and their problems; Cultural regions; Growth, distribution and density of population; Demographic attributes: sex-ratio, age structure, literacy rate, work-force, dependency ratio, longevity; migration (inter-regional, interregional and international) and associated problems; Population problems and policies; Health indicators.

7. **Settlements**: Types, patterns and morphology of rural settlements; Urban developments; Morphology of Indian cities; Functional classification of Indian cities; Conurbations and metropolitan regions; Urban sprawl; Slums and associated problems; Town planning; Problems of urbanisation and remedies.

8. **Regional Development and Planning**: Experience of regional planning in India; Five Year Plans; Integrated rural development programmes; Panchayati Raj and decentralised planning; Command area development; Watershed management; Planning for backward area, desert, drought-prone, hill tribal area
development; Multi-level planning; Regional planning and development of island territories.

9. Political Aspects: Geographical basis of Indian federalism; State reorganisation; Emergence of new states; Regional consciousness and inter-state issues; International boundary of India and related issues; Cross-border terrorism; India’s role in world affairs; Geopolitics of South Asia and Indian Ocean realm.

10. Contemporary Issues: Ecological issues: Environmental hazards; landslides, earthquakes, Tsunamis, floods and droughts, epidemics; Issues 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

PARALLEL PAPER I

1. General Geology:

The Solar System, meteorites, origin and interior of the earth and age of earth; Volcanoes—causes and products, Volcanic belts. Earthquakes—causes, effects, seismic zone of India; Island arcs, trenches and mid-ocean ridges; Continental drift; Seafloor spreading, plate tectonics. Isostasy.

2. Geomorphology and Remote Sensing:

Basic concepts of geomorphology. Weathering and soil formations; Landforms, slopes and drainage. Geomorphic cycles and their interpretation. Morphology and its relationship to structures and lithology; Coastal geomorphology; Applications of geomorphology in mineral prospecting, civil engineering; hydrology and environmental studies; Geomorphology of Indian sub-continent.


3. Structural Geology:

Principles of geologic mapping and map reading, projection diagrams, Stress and strain ellipsoid and stress-strain relationships of elastic, plastic and viscous materials; Strain markers in deformed rocks. Behaviour of minerals and rocks under deformation conditions. Folds and faults classification and mechanics; Structural analysis of folds, foliations, lineations, joints and faults, unconformities; Time-relationship between crystallization and deformation.

4. Paleontology:

Species—definition and nomenclature; Megafauna and Microfossils. Modes of preservation of fossils; Different kinds of microfossils; Application of microfossils in correlation, petroleum exploration, paleoclimatic and paleoceanographic studies; Evolutionary trend in Hominidae, Equidae and Proboscidea. Siwalik fauna.

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

5. Indian Stratigraphy:

Classification of stratigraphic sequences: lithostratigraphic, biostratigraphic, chron stratigraphic and magnetostratigraphic and their interrelationships; Distribution and classification of Precambrian rocks of India; Study of stratigraphic distribution and lithology of Phanerozoic rocks of India with reference to fauna, flora and economic importance. Major boundary problems—Cambrian/Precambrian, Permian/Triassic, Cretaceous/Tertiary and Pliocene/Pleistocene; Study of climatic conditions, paleogeoography 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.

PARALLEL PAPER II

1. Mineralogy:

Classification of crystals into systems and classes of symmetry; International system of crystallographic notation; Use of projection diagrams to represent crystal symmetry; Elements of X-ray crystallography.

Physical and chemical characters of rock forming silicate mineral groups; Structural classification of silicates; Common minerals of igneous and metamorphic rocks; Minerals of the carbonate, phosphate, sulphide and halide groups; Clay minerals.
Optical properties of common rock forming minerals; Pleochroism, extinction angle, double refraction, birefringence, twinning and dispersion in minerals.

2. Igneous and Metamorphic Petrology:
   - Types and agents of metamorphism. Metamorphic grades and zones; Phase rule. Facies of regional and contact metamorphism; ACF and AKF diagrams; Textures and structures of metamorphic rocks. Metamorphism of arenaceous, argillaceous and basic rocks; Minerals assemblages. Retrograde metamorphism; Metasomatism and granitisation, migmatites. Granulite terrains of India.

3. Sedimentary Petrology:
   - Sediments and Sedimentary rocks: Processes of formation; digenesis and lithification; Clastic and non-clastic rocks—their classification, petrography and depositional environment; Sedimentary facies and provenance. Sedimentary structures and their significance. Heavy minerals and their significance. Sedimentary basins of India.

4. Economic Geology:
   - Ore, ore mineral and gangue, tenor of ore. Classification of ore deposits; Processes of formation of mineral deposits; Controls of ore localisation; Ore textures and structures; Metallogenic epochs and provinces; Geology of the important Indian deposits of aluminium, chromium, copper, gold, iron, lead, zinc, manganese, titanium, uranium and thorium and industrial minerals; Deposits of coal and petroleum in India, National Mineral Policy; Conservation and utilization of mineral resources. Marine mineral resources and Law of Sea.

5. Mining Geology:
   - Methods of prospecting—geological, geophysical, geochemical and geobotanical; Techniques of sampling. Estimation of reserves of ore; Methods of exploration and mining-metallic ores, industrial minerals, marine mineral resources and building stones. Mineral beneficiation and ore dressing.

6. Geochemistry and Environmental Geology:
   - 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

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 architecture.

4. Megalithic Cultures:
   - Distribution of pastoral and farming cultures outside the Indus, Development of community life, Settlements, Development of agriculture, Crafts, Pottery, and Iron industry.

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

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

7. Mauryan Empire:
   - Foundation of the Mauryan Empire, Chandragupta, Kautilya and Arthashastra; Ashoka; Concept of Dharma; Edicts; Polity, Administration, Economy; Art, architecture and sculpture; External contacts; Religion; Spread of religion; Literature.
   - Disintegration of the empire; sungas and Kanvas.

8. Post-Mauryan Period (Indo-Greeks, Sakas, Kushanas, Western Kshatrapas):
   - Contact with outside world; growth of urban centres, economy, coinage, development of religions, Mahayana, social conditions, art, architecture, culture, literature and science.
9. Early State and Society in Eastern India, Deccan and South India:
   Kharavela, The Satavahanas, Tamil States of the Sangam Age; Administration, Economy, land grants, coinage, trade guilds and urban centres; Buddhist centres; Sangam literature and culture; Art and architecture.

10. Guptas, Vakatakas and Vardhanas:
   Polity and administration, Economic conditions, Coinage of the Guptas, Land grants, Decline of urban centres, Indian feudalism, Caste system, Position of women, Education and educational institutions; Nalanda, Vikramshila and Vallabhi, Literature, scientific literature, art and architecture.

11. Regional States during Gupta Era:
   The Kadambas, Pallavas, Chalukyas of Badami; Polity and Administration, Trade guilds, Literature; growth of Vaishnava and Saiva religions. Tamil Bhakti movement, Shankaracharya; Vedanta; Institutions of temple and temple architecture; Palas, Senas, Rashtrakutas, Paramaras, Polity and administration; Cultural aspects. Arab conquest of Sind; Alberuni, The Chalukyas of Kalyana, Cholas, Hoysalas, Pandyas; Polity and Administration; Local Government; Growth of art and architecture, religious sects, Institution of temple and Mathas, Agraharas, education and literature, economy and society.

12. Themes in Early Indian Cultural History:
   Languages and texts, major stages in the evolution of art and architecture, major philosophical thinkers and schools, ideas in Science and Mathematics.

13. Early Medieval India, 750-1200:
   — Polity: Major political developments in Northern India and the peninsula, origin and the rise of Rajputs.
   — The Cholas: administration, village economy and society “Indian Feudalism”.
   — Agrarian economy and urban settlements.
   — Trade and commerce.
   — Society: the status of the Brahman and the new social order.
   — Condition of women.
   — Indian science and technology.

14. Cultural Traditions in India, 750-1200:
   — Philosophy: Skankaracharya and Vedanta, Ramanuja and Vishishtadvaita, Madhva and Brahma-Mimansa.
   — Religion: Forms and features of religion, Tamil devotional cult, growth of Bhakti, Islam and its arrival in India, Sufism.
   — Literature: Literature in Sanskrit, growth of Tamil literature, literature in the newly developing languages, Kalhan’s Rajtarangini, Alberuni’s India.
   — Art and Architecture: Temple architecture, sculpture, painting.

15. The Thirteenth Century:
   — Economic, Social and cultural consequences.
   — Foundation of Delhi Sultanate and early Turkish Sultans.
   — Consolidation: The rule of Ilutmish and Balban.

16. The Fourteenth Century:
   — “The Khalji Revolution”.
   — Alauddin Khalji: Conquests and territorial expansion, agrarian and economic measure.
   — Muhammad Tughluq: Major projects, agrarian measures, bureaucracy of Muhammad Tughluq.
   — Firuz Tugluq: Agrarian measures, achievements in civil engineering and public works, decline of the Sultanate, foreign contacts and Ibn Battuta’s account.

17. Society, Culture and Economy in the Thirteenth and Fourteenth Centuries:
   — Society: composition of rural society, ruling classes, town dwellers, women, religious classes, caste and slavery under the Sultanate, Bhakti movement, Sufi movement.
   — Culture: Persian literature, literature in the regional languages of North India, literata in the languages of South India, Sultanate architecture and new structural forms, painting, evolution of a composite culture.
   — Economy: Agricultural Production, rise of urban economy and non-agricultural production, trade and commerce.

18. The Fifteenth and Early Sixteenth Century-Political Developments and Economy:
   — Rise of Provincial Dynasties: Bengal, Kashmir (Zainul Abedin), Gujarat.
   — Malwa, Bahmanids.
   — The Vijayanagara Empire.
   — Lodis.
   — Mughal Empire, first phase: Babur, Humayun.
   — The Sur Empire: Sher Shah’s administration.
   — Portuguese colonial enterprise, Bhakti and Sufi Movements.

19. The Fifteenth and Early Sixteenth Century- Society and culture:
   — Regional 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 companies: 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 Mughal Empire.
— The regional principalities: Nizam’s Deccan, Bengal, Awadh.
— Maratha ascendancy under the Peshwas.
— The Maratha fiscal and financial system.
— Emergence of Afghan power Battle of Panipat, 1761.
— State of, political, cultural and economic, on eve of the British conquest.

PAPER-II

1. European Penetration into India:
The Early European Settlements; The Portuguese and the Dutch; The English and the French East India Companies; Their struggle for supremacy; Carnatic Wars; Bengal-The conflict between the English and the Nawabs of Bengal; Siraj and the English; The Battle of Plassey; Significance of Plassey.

2. British Expansion in India:
Bengal-Mir Jafar and Mir Kasim; The Battle of Buxar; Mysore; The Marathas; The three Anglo-Maratha Wars; The Punjab.

3. Early Structure of the British Raj:
The Early administrative structure; From diarchy to direct control; The Regulating Act (1773); The Pitt’s India Act (1784); The Charter Act (1833); The Voice of free trade and the changing character of British colonial rule; The English utilitarian and India.

4. Economic Impact of British Colonial Rule:
(a) Land revenue settlements in British India; The Permanent Settlement; Ryotwari Settlement; Mahalwari Settlement; Economic impact of the revenue arrangements; Commercialization of agriculture; Rise of landless agrarian labourers; Impoverishment of the rural society.
(b) Dislocation of traditional trade and commerce; De-industrialisation; Decline of traditional crafts; Drain of wealth; Economic transformation of India; Railroad and communication network including telegraph and postal services; Famine and poverty in the rural interior; European business enterprise and its limitations.

5. Social and Cultural Developments:
The state of indigenous education, its dislocation; Orientalist-Anglicist controversy, The introduction of western education in India; The rise of press, literature and public opinion; The rise of modern vernacular literature; Progress of Science; Christian missionary activities in India.

6. Social and Religious Reform Movements in Bengal and Other Areas:
Ram Mohan Roy, The 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 including the Rangpur Dhing (1783), the Kol Rebellion (1832), the Mopla Rebellion in Malabar (1841-1920), the Santal Hul (1855), Indigo Rebellion (1859-60), Deccan Uprising (1875) and the Munda Ulgulan (1899-1900); The Great Revolt of 1857—Origin, character, causes of failure, the consequences; The shift in the character of peasant uprisings in the post-1857 period; the peasant movements of the 1920s and 1930s.

8. Factors leading to the birth of Indian Nationalism; Politics of Association; The Foundation of the Indian National Congress; The Safety-valve thesis relating to the birth of the Congress; Programme and objectives of Early Congress; the social composition of early Congress leadership; the Moderates and Extremists; The Partition of Bengal (1905); The Swadeshi Movement in Bengal; the economic and political aspects of Swadeshi Movement; The beginning of revolutionary extremism in India.

9. Rise of Gandhi; Character of Gandhian nationalism; Gandhi's popular appeal; Rowlatt Satyagraha; the Khilafat Movement; the Non-cooperation Movement; National politics from the end of the Non-cooperation movement to the beginning of the Civil Disobedience Movement; the two phases of the Civil Disobedience Movement; Simon Commission; The Nehru Report; the Round Table Conferences; Nationalism and the Peasant Movements; Nationalism and Working class movements; Women and Indian youth and students in Indian politics (1885-1947); the election of 1937 and the formation of ministries; Cripps Mission; the Quit India Movement; the Wavell Plan; The Cabinet Mission.

10. Constitutional Developments in the Colonial India between 1858 and 1935.

11. Other strands in the National Movement.

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

The Left; The Left within the Congress: Jawaharlal Nehru, Subhas Chandra Bose, the Congress Socialist Party; the Communist Party of India, other left parties.

12. Politics of Separatism; the Muslim League; the Hindu Mahasabha; Communualism and the politics of partition; Transfer of power; Independence.

13. Consolidation as a Nation; Nehru's Foreign Policy; India and her neighbours (1947-1964); The linguistic reorganisation of States (1935-1947); Regionalism and regional inequality; Integration of Princely States; Princes in electoral politics; the Question of National Language.

14. Caste and Ethnicity after 1947; Backward Castes and Tribes in post-colonial electoral politics; Dalit movements.

15. Economic development and political change; Land reforms; the politics of planning and rural reconstruction; Ecology and environmental policy in post-colonial India; Progress of Science.

16. Enlightenment and Modern ideas:

(i) Major Ideas of Enlightenment : Kant, Rousseau.
(ii) Spread of Enlightenment in the colonies.
(iii) Rise of socialist ideas (up to Marx); spread of Marxian Socialism.

17. Origins of Modern Politics :

(i) European States System
(ii) American Revolution and the Constitution
(iii) French Revolution and Aftermath, 1789-1815
(iv) American Civil War with reference to Abraham Lincoln and the abolition of slavery.
(v) British Democratic politics, 1815-1850 : Parliamentary Reformers, Free Traders, Chartists.

18. Industrialization:

(i) English Industrial Revolution : Causes and Impact on Society.
(ii) Industrialization in other countries : USA, Germany, Russia, Japan.
(iii) Industrialization and Globalization.

19. Nation-State System :

(i) Rise of Nationalism in 19th century.
(ii) Nationalism : State-building in Germany and Italy.
(iii) Disintegration of Empires in the face of the emergence of nationalities across the World.

20. Imperialism and Colonialism :

(i) South and South-East Asia.
(ii) Latin America and South Africa.
(iii) Australia.
(iv) Imperialism and free trade: Rise of neo-imperialism.

21. Revolution and Counter-Revolution :

(i) 19th Century European revolutions.
(iii) Fascist Counter-Revolution, Italy and Germany.

22. World Wars :

(i) 1st and 2nd World Wars as Total Wars : Societal implications.
(ii) World War I : Causes and Consequences.
(iii) World War II : Causes and Consequences.
23. The World after World War II:
   (i) Emergence of Two power blocs.
   (ii) Emergence of Third World and non-alignment
   (iii) UNO and the global disputes.

24. Liberation from Colonial Rule:
   (i) Latin America-Bolivar.
   (ii) Arab World-Egypt.
   (iii) Africa-Apartheid to Democracy.
   (iv) South-East Asia-Vietnam.

25. Decolonization and Underdevelopment:
   (i) Factors constraining Development; Latin America, Africa.

26. Unification of Europe:
   (i) Post War Foundations; NATO and European Community.
   (ii) Consolidation and Expansion of European Community
   (iii) European Union.

27. Disintegration of Soviet Union and the Rise of the Unipolar World:
   (i) Factors leading to the collapse of Soviet Communism
   (iii) End of the Cold War and US Ascendancy in the World
       as the lone superpower.

International Law:
1. Nature and Definition of International Law.
2. Relationship between International Law and Municipal Law.
5. Individuals: Nationality, statelessness; Human Rights and procedures available for their enforcement.
6. Territorial jurisdiction of States, Extradition and Asylum.
7. Treaties: Formation, application, termination and reservation.
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.
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.
10. Offences against human body.
11. Offences against property.
12. Offences against women.

Law of Torts

2. Liability based upon fault and strict liability; Absolute liability.
3. Vicarious liability including State Liability.
5. Joint tortfeasors.
6. Remedies.
8. Defamation.
11. False imprisonment.
12. Malicious prosecution.

Law of Contracts and Mercantile Law

2. Factors vitiating free consent.
4. Performance and discharge of contracts.
5. Quasi-contracts.
6. Consequences of breach of contract.
7. Contract of indemnity, guarantee and insurance.
10. Formation and dissolution of partnership.

Contemporary Legal Developments

1. Public Interest Litigation.
2. Intellectual property rights—Concept, types/prospects.
3. Information Technology Law including Cyber Laws—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.

Literature of the following languages :

NOTE (i).—A candidate may be required to answer some or all the Questions in the language concerned.
NOTE (ii).—In regard to the languages included in the Eighth Schedule to Constitution, the scripts will be the same as indicated in Section II (B) of Appendix I relating to the Main Examination.
NOTE (iii).—Candidates should note that the questions not required to be answered in a specific language will have to be answered in the language medium indicated by them for answering papers on Essay, General Studies and Optional Subjects.

ASSAMESE

PAPER I

[Answers must be written in Assamese]

Section A

Language

(a) History of the origin and development of the Assamese Language —its position among the Indo-Aryan language—periods in its history.
(b) Development of Assamese prose.
(c) Vowels and consonants of the Assamese Language— Rules of phonetic changes with stress on Assamese coming down from Old Indo-Aryan.
(d) Assamese vocabulary—and its sources.
(e) Morphology of the language—conjugation—enclitic definitives and pleonastic suffixes.
(f) Dillectical divergences—the Standard colloquial and the Kamrupi dialect in particular.
(g) Assamese script—its evolution through the ages till 19th century A.D.

Section B

Literary Criticism and Literary History

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

PAPER II

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

[Answers must be written in Assamese]

Section A

Râmâyana (A yodhyâ Kânda —by Madhava Kandali only)
Pârijât-Harana —by Sankaradeva.
Râsakrîdâ —by Sankaradeva (From Kirtana Ghosa)
Bârgeet —by Madhavadeva.
Râjasûya —by Madhavadeva.
Kathâ-Bhâgavata —by Baikurthanath (Books I and II)
Gurucarit-Kathâ —ed. by Maheswar Neog.
(Sankaradeva’s Part only)

SECTION B

Mor Jeevan Soñwaran —by Lakshminath Bezbaroa.
Kripâbar Borbaruâr —by Lakshminath Bezbaroa.
Kakatar Topola —by Chandra Kumar Agarwalla.
Pratimâ —by Padmanath Gohain Barua.
Gâonburhâ —by Rajanikanta Bordoloi.
Manomati —by Bankanta Kakati.
Kârengar Ligirî —by Bina Barva (Birinchi Kumar Barua).
Mrityunjoy —by Birendrakumar Bhattacharyya
Samrât —by Navakanta Barua

BENGALI

PAPER I

History of Language and Literature.

[Answers must be written in Bengali]

Section A: Topics from the History of Bangla language

1. The chronological track from Proto Indo-European to Bangla (Family tree with branches and approximate dates).
2. Historical stages of Bangla (Old, Middle, New) and their linguistic features.
3. Dialects of Bangla and their distinguishing characteristics.
4. Elements of Bangla Vocabulary.
5. Forms of Bangla Literary Prose—Sadhu and Chalit.
6. Processes of language change relevant for Bangla: Apinihiti (Anaptyxis), Abhishruti (umlaut), Murdhanyibhavan (cerebralization), Nasikyibhavan (Nasalization), Samibhavan (Assimilation), Sadrishya (Analogy), Svaragama (Vowel insertion) —Adi Svaragama, Madhya Svaragama or Svarabhakti, Antya Svaragama, Svarasangati (Vowel harmony), y—shruti and w—shruti.
7. Problems of standardization and reform of alphabet and spelling, and those of transliteration and Romanization.
8. Phonology, Morphology and Syntax of Modern Bangla. (Sounds of Modern Bangla, Conjunctions; word formations, compounds; basic sentence patterns.)

Section B: Topics from the History of Bangla Literature.
1. Periodization of Bangla Literature: Old Bangla and Middle Bangla.
2. Points of difference between modern and pre-modern Bangla Literature.
3. Roots and reasons behind the emergence of modernity in Bangla Literature.
4. Evolution of various Middle Bangla forms: Mangal Kavyas, Vaishnava lyrics, Adapted narratives (Ramayana, Mahabharata, Bhagavata) and religious biographies.
5. Secular forms in middle Bangla literature.
9. Tagore and post-Tagoreans.
10. Fiction, major authors: Bankimchandra, Tagore, Saratchandra, Bibhutibhusan, Tarasankar, Manik).
11. Women and Bangla literature: creators and created.

PAPER II

Prescribed texts for close study

[Answers must be written in Bengali]

Section A

1. Vaishnava Padavali (Calcutta University)
   Poems of Vidyapati, Chandidas, Jnanadas, Govindadas and Balaramdas.
2. Chandimangal Kalketu episode by Mukunda (Sahitya Akademi).
3. Chaitanya Charitamrita, Madhya Lila by Krishnadas Kaviraj (Sahitya Akademi).
5. Kapalkundala by Bankimchandra Chatterjee.
6. Samya and Bangadesher Krishak by Bankimchandra Chatterjee.
7. Sonar Tari by Rabindranath Tagore.
8. Chhinmapatralavi by Rabindranath Tagore.

Section B
9. Raktakarabi by Rabindranath Tagore.
10. Nabajatak by Rabindranath Tagore.
15. Shrestha Kavita by Jibanananda Das.
17. Eham Indrajit by Badal Sircar.

PAPER I

History of Bodo Language and Literature

Section A
1. Homeland, language family, its present status and its mutual contact with Assamese.
2. Phonemes: Vowel and Consonant Phonemes
   - Tones.
4. Vocabulary and its sources.
5. Syntax: Types of sentences, Word Order
6. History of scripts used in writing Bodo Language since inception.

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

Paper II
The paper will require first-hand reading of the texts prescribed and will be designed to test the critical ability of the candidates.

(Answers must be written in Bodo)

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

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

DOGRI

PAPER I

HISTORY OF DOGRI LANGUAGE AND LITERATURE

Section A
1. Dogri language: Origin and development through different stages.
2. Linguistic boundaries of Dogri and its dialects.
3. Characteristic features of Dogri Language.
4. Structure of Dogri Language:
   (a) Sound Structure:
      - Segmental: Vowels and Consonants
      - Non-segmental: Length, Stress, Nasalization, Tone and Junture.
   (b) Morphology of Dogri:
      - Inflection Categories: Gender, Number, Case, Person, Tense and Voice.
      - Word Formation: use of prefixes, infixes and suffixes.
      - Vocabulary: tatsam, tadbhav, foreign and regional.
   (c) Sentence Structure: Major Sentence-types and their constituents, agreement and concord in Dogri syntax.
Section B

History of Dogri Language

1. A brief account of Pre-independence Dogri Literature: Poetry & Prose.
5. Development of Dogri Drama and contribution of prominent playwrights.
7. An introduction to Dogri Folk Literature—Folk songs, Folk tales 7 Ballads.

PAPER II

TEXTUAL CRITICISM OF DOGRI LITERATURE
(Answers must be written in Dogri)

Section A

Poetry

1. Azadi Paihle Di Dogri Kavita
   The following poets:
   Devi Ditta, Lakkhu, Ganga Ram, Ramdhan, Hardutt, Pahari Gandhi Baba Kanshi Ram & Permanand Almast
2. Modern Dogri Poetry
   Azadi Bad Di Dogri Kavita
   The following poets :
   Kishan Smailpuri, Tara Smailpuri, Mohan Lal Sapolia, Yash Sharma, K.S. Madhukar, Padma Sachdev, Jitendra Udhampuri, Charan Singh and Prakash Premi
3. Sheeraza Dogri Number 102, Ghazal Ank
   The following poets :
4. Sheeraza Dogri Number 147, Ghazal Ank
   The following poets:
   R.N. Shastri, Jitendra Udhampuri, Champa Sharma and Darshan Darshi.
5. Ramayan (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.
5. Kaiddi (Novel) by Desh Bandhu Dogra Nutan.
7. Nayaan (Drama) by Mohan Singh.
8. Satrang (A collection of one act plays).
   The following playwrights :
   Vishwa Nath Khajuria, Ram Nath Shastri, Jitendra Sharma, Lalit Magotra and Madan Mohan Sharma.
9. Dogri Lalit Nibandh
   The following authors:

ENGLISH

The syllabus consists of two papers, designed to test a first-hand and critical reading of texts prescribed from the following periods in English Literature: Paper 1: 1600-1900 and Paper 2: 1900-1990.

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

PAPER I

(Answers must be written in English)

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

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

Section A

1. William Shakespeare: King Lear and The Tempest.
2. John Donne. The following poems:
   – Canonization;
   – Death be not proud;
   – The Good Morrow;
   – On his Mistress going to bed;
   – The Relic;
3. John Milton: Paradise Lost, I, II, IV, IX.
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.

**Section B**

6. Thomas Hardy. Tess of the d’Urbervilles.
7. Mark Twain. The Adventures of Huckleberry Finn.

**PAPER II**

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

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

**Section A**

1. William Butler Yeats. The following poems:
   - Easter 1916.
   - The Second Coming.
   - A Prayer for my daughter.
   - Sailing to Byzantium.
   - The Tower.
   - Among School Children.
   - Leda and the Swan.
   - Meru.
   - Lapis Lazuli.
   - The Second Coming.
   - Byzantium.
2. T.S. Eliot. The following poems:
   - The Love Song of J. Alfred Prufrock.
   - Journey of the Magi.
   - Burnt Norton.
3. W.H. Auden. The following poems:
   - Partition
   - Musee des Beaux Arts
   - In Memory of W.B. Yeats
   - Lay your sleeping head, my love
   - The Unknown Citizen
   - Consider
   - Mundus Et Infans
   - The Shield of Achilles
   - September 1, 1939
   - Petition
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 Things
   - Love Poem for a Wife 1
   - Small-Scale Reflections on a Great House
   - Obituary

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

**Section B**

4. E.M. Forster. A Passage to India.

**GUJARATI**

**PAPER I**

*Answers must be written in Gujarati*

**Section A**

Gujarati Language: Form and History

1. History of Gujarati Language with special reference to New Indo-Aryan i.e. last one thousand years.
Significant features of the Gujarati language: phonology, morphology and syntax.
Major dialects: Surti, pattani, charotari and Saurashtri.

History of Gujarati literature

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

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

Section B

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

(a) Medieval
1. Narratives: Rasa, Akhyan and Padyavarta
2. Lyrical: Pada

(b) Folk
3. Bhavai

(c) Modern
4. Fiction: Novel and Short Story
5. Drama
6. Literary Essay
7. Lyrical Poetry

(d) Criticism
8. History of theoretical Gujarati criticism
9. Recent research in folk tradition.

PAPER II

(Answers must be written in Gujarati)
The paper will require first-hand reading of the texts prescribed and will be designed to test the critical ability of the candidate.

Section A

1. Medieval
(i) Vasantvilas phagu—AJNATKRUT
(ii) Kadambari—BHALAN
(iii) Sudamacharitra—PREMANAND
(iv) Chandrachandravatini varta—SHAMAL
(v) Akhegeeta—AKHO

2. Sudharak yug & Pandityug
(vi) Mari Hakikat—NARMADASHA
(vii) Farbasveerah—DALPATRAM

(viii) Saraswatichandra-Part 1—GOVARDHANRAM TRIPATHI
(ix) Purvaalap—‘KANT’ (MANISHANKAR RATNAJI BHATT)
(x) Raino Parvat—RAMANBHAI NEELKANTH

Section B

1. Gandhiyug & Anu Gandhiyug
(i) Hind Swaraj—MOHANDAS KARAMCHAND GANDHI
(ii) Patanni Prabhuta—KANHAIYALAL MUNSHI
(iii) Kavyani Shakti—RAMNARAYANVISHWANATH PATHAK
(iv) Saurashtrani Rasdhar-Part 1—ZAVERCHAND MEGHANI
(v) Manvini Bhavai—PANNALAL PATEL
(vi) Dhvani—RAJENDRA SHAH

2. Adhunik yug
(vii) Saptapadi—UMASHANKAR JOSHI
(viii) Janantike—SURESH JOSHI
(ix) Ashwatthama—SITANSHU YASHASCHANDRA.
2. History of Hindi Literature

I. The relevance and importance of Hindi literature and tradition of writing History of Hindi Literature.

II. Literary trends of the following four periods of history of Hindi Literature.


D: Adhunik Kal—
   a. Renaissance, the development of Prose, Bharatendu Mandal.

3. Katha Sahitya

B

A: Upanyas & Realism

B: The origin and development of Hindi Novels.

C: Prominent Novelists—Premchand, Jainendra, 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 Sobi.

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, Manovisheshanvadi & Nai Alochana.

B: Prominent critics—Ramchandra Shukla, Hajiari 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 prescribed texts and will test the critical ability of the candidates.

Section A

1. Kabir : Kabir Granthawali, Ed. Shyam Sundar Das (First hundred Sakhis)

2. Soordas : Bhramar Geetsar, Ed. Ramchandra Shukla (First hundred Padas)

3. Tulsidas : Ramcharit Manas (Sundar Kand & Nagnativiyo Khand)


5. Bihari : Bihari Ratnakar Ed. Jagannath Prasad Ratmakar (First 100 Dohas)

6. Maithili Sharan Gupta : Bharat Bharati

7. Prasad : Kamayani (Chinta and Shraddha Sarg)


9. Dinkar : Kurukshetra

10. Agyeya : Angan Ke Par Dwar (Asadhya Veena)

11. Muktiboth : Brahmaparakhas


Section B

1. Bharatendu : Bharat Durdasha

2. Mohan Rakesh : Ashadh Ka Ek Din

3. Ramchandra Shukla : Chintamani (Part I) (Kavita Kya Shukla Hai, Shraddha Aur Bhakti)


6. Prasad : Skandgupta

7. Yashpal : Divya

8. Phaniswar Nath Renu : Maila Anchal

9. Mannu Bhandari : Mahabhoj

10. Rajendra Yadav : Ek Dunia Samanantar (All Stories)
PAPER-I

(Answers must be written in Kannada)

Section A

A. History of Kannada Language

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

Dialects of Kannada Language: Regional and Social. Various aspects of developments of Kannada Language: phonological and semantic changes. Language borrowing.

B. History of Kannada Literature

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


Medieval Poets: Harivara, Raghavanka, Kumara-Vyasa.

Dasa literature: Purandara and Kanaka.

Sangataya: Ratnakaravarni

C. Modern Kannada literature: Influence, trends and ideologies, Navodaya, Pragatishila, Navya, Dalita and Bandaya.

Section B

A. Poetics and Literary Criticism

Definition and concepts of poetry; Word, Meaning, Alankara, Reeti, Rasa, Dwani, Auchitya.


B. Cultural History of Karnataka

Contribution of Dynasties to the culture of Karnataka: Chalukyas of Badami and Kalyani, Rashtrakutas, Hoysalas, Vijayanagara rulers, in literary context. Major religions of Karnataka and their cultural contribution.


PAPER-II

(Answers must be written in Kannada)

The Paper will require first-hand reading of the Texts prescribed and will be designed to test the critical ability of the candidates.
KASHMIRI

PAPER-I

(Answers must be written in Kashmiri)

Section A

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 genres: vatsun; ghazal and mathnavi).
3. Kashmiri literature in the first half of the twentieth century (with special reference to Mahjoor and Azad; various literary influences).
4. Modern Kashmiri literature (with special reference to the development of the short story, drama, novel and nazm).

PAPER-II

(Answers must be written in Kashmiri)

Section A

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

Section B

1. An analytical study of the short story in Kashmiri.
   (i) Afsana Majmu’a, published by the Deptt. of Kashmiri, University of 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
   (iii) Razi Oedipus, tr. Naji Munawar, published by the Sahitya Akademi.
4. Kashmiri Folk Literature:
   (i) Kashur Luki Theatre by Mohammad Subhan Bhagat, published by the Deptt. of Kashmiri, University of Kashmir.
   (ii) Kashiry Luki Beeth (all volumes) published by the J&K Cultural Akademy.

KONKANI

PAPER-I

(Answers must be written in Konkani)

Section A

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

Section B

History of Konkani Literature
Candidates would be expected to be well-acquainted with Konkani literature and its social and cultural background and consider the problems and issues arising out of them.
(i) History of Konkani literature from its probable source to the present times, with emphasis on its major works, writers and movements.
(ii) Social and cultural background of the making of Konkani literature from time to time.

(iii) Indian and Western influences on Konkani literature, from the earliest to modern times.

(iv) Modern literary trends in the various genres and regions including a study of Konkani folklore.

PAPER-II

(Answers must be written in Konkani)

Textual Criticism of Konkani Literature

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

Section A : Prose

1. (a) Konkani Mansagangotri (excluding poetry) ed. by Prof : Olivinho Gomes.
(b) Old Konkani language and literature—the Portuguese Role

2. (a) Otmo Denvcharak—a novel by A. V. da Cruz.
(b) Vadoll ani Varem—a novel by Antonio Pereira.
(c) Devache Kurpen—a novel by V.J.P. Saldanha.

3. (a) Vajralikhani—Shenoy goem-bab-An anthology-ed. by Shantaram Varde Valavalikar.
(b) Konkani Lalit Niband—Essays-ed. by Shyam Verenkar.
(c) Teen Dasakam—An anthology-ed. by Chandrakant Keni.

Section B : Poetry

Section B : Poetry

1. (a) Evani Mori : Poetry by Eduardo Bruno de Souza.
(b) Abravanchem Yadhyan—by Luis Mascarenhas.

(b) Ratnahar I and II—collection of poems—ed. R. V. Pandit.

3. (a) Zayo Zuyo—poems- Manohar L. Sardessai.
(b) Kanadi Mati Konkani Kavi—Anthology of Poems—ed. Pratap Naik.

4. (a) Adrusheditcha Kalle—Poems by Pandurang Bhangui.
(b) Yaman—Poems by Madhav Borkar.

MAITHILI

PAPER I

HISTORY OF MAITHILI LANGUAGE AND ITS LITERATURE

(Answers must be written in Maithili)

PART A

History of Maithili Language

1. Place of Maithili in Indo-European Language family.

2. Origin and development of Maithili language. (Sanskrit, Prakrit, Avh, Maithili)

3. Periodic division of Maithili Language. (Beginning, Middle era, Modern era).

4. Maithili and its different dialects.

5. Relationship between Maithili and other Eastern languages (Bengali, Asamese, Oriya)


7. Pronouns and Verbs in Maithili Language.

PART B

History of Maithili Literature

1. Background of Maithili Literature (Religious, Economic, Social, Cultural).

2. Periodic division of Maithili literature.

3. Pre-Vidyapati Literature.

4. Vidyapati and his tradition.


6. Maithili Folk Literature (Folk Tales, Folk Drama, Folk Stories, Folk Songs).

7. Development of different literary forms in modern era:
   (a) Prabandh-kavya
   (b) Muktak-kavya
   (c) Novel
   (d) Short Story
   (e) Drama
   (f) Essay
   (g) Criticism
   (h) Memoirs
   (i) Translation


PAPER-II

(Answers must be written in Maithili)

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

PART A

Poetry

1. Vidyapati Geet-Shati—Publisher : Sahitya Akademi, New Delhi (Lyrics—1 to 50)

2. Govind Das Bhajanavali—Publisher : Maithili Acadamy, Patna (Lyrics—1 to 25)

3. Krishnajanam—Manbodh

4. Mithilabhasha Ramayana—Chanda Jha (only Sunder-Kand)

5. Rameshwar Charit Mithila Ramayan—Lal Das (only Bal-kand)

6. Keechak-Vadh—Manbodh

7. Datta-Vati—Surendra Jh ‘Suman’ (only 1st and 2nd Cantos).
8. Chitra-Yatri

PART-B
10. Varna Ratnakar—Jyotirishwar (only 2nd Kallol)
11. Khattar Kakak Tarang—Hari Mohan Jha
12. Lorik—Vijaya Manipadma
13. Prithvi Putra—Lalit
14. Bhaphait Chahak Jinagi—Sudhanshu ‘Shekhar’ Choudhary
15. Kriti Rajkamlak—Publisher: Maithili Academy, Patna

MALAYALAM

PAPER-I
(Answers must be written in Malayalam)

Section A

1—Early phase of Malayalam Language :
1.1 Various theories : Origin from proto Dravidian, Tamil, Sanskrit.
1.2 Relation between Tamil and Malayalam : Six nayas of A. R. Rajarajavarma.
1.3 Pattu School—Definition, Ramacharitam, later pattu works—Niranam works and Krishnagatha.

2—Linguistic features of :
2.2 Folklore—Southern and Northern ballads, Mappila songs.
2.3 Early Malayalam Prose—Bhashakautaliyam, Brahmandapuramam, Attaprakaram, Kramadipika and Nambiantamil.

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

Section B

LITERARY HISTORY

4—Ancient and Medieval Literature :
4.1 Pattu—Ramacharitam, Niranam Works and Krishnagatha.
4.2 Manipravalam—early and medieval manipravala works including attakkatha and champu.
4.3 Folk Literature.

5—Modern Literature—Poetry :
5.1 Venmanni poets and contemporaries.
5.2 The advent of Romanticism—Poetry of Kavitraya i.e., Asan, Ulloor and Vallathol.
5.3 Poetry after Kavitraya.
5.4 Modernism in Malayalam Poetry.

6—Modern Literature—Prose :
6.1 Drama.
6.2 Novel.
6.3 Short story.
6.4 Biography, travelogue, essay and criticism.

PAPER-II
(Answers must be written in Malayalam)

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

Section A

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

Unit 2
2.1 Kumaran Asan—Chintavisthayaya Sita.
2.2 Vailoppilli—Kutiyozhikkal.
2.3 G. Sankara Kurup—Perunthachan.
2.4 N. V. Krishna Variar—Tivandiyle pattu.

Unit 3
3.1 O. N. V.—Bhumikkoru Charamagitam.
3.2 Ayyappa Panicker—Kurukshetram.
3.3 Akkittam—Pandatha Messanthi.
3.4 Attur Ravivarma—Megharupan.

Section B

Unit 4
4.1 O. Chanthu Menon—Indulekha.
4.2 Thakazhy—Chemmin.
4.3 O. V. Vijayan—Khasakkinte Ithihasam.

Unit 5
5.1 M. T. Vasudevan Nair—Vanaprastham (Collection).
5.2 N. S. Madhavan—Higvitta (Collection).
5.3 C. J. Thomas—1128-il Crime 27.

Unit 6
6.1 Kuttikrishna Marar—Bharataparyatanam.
6.2 M. K. Sanu—Nakshatragalute Snehabhajanam.
6.3 V. T. Bhattathirippad—Kamirum Kinavum.
MANIPURI
PAPER-I
(Answers must be written in Manipuri)

Section A

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

Section B

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

PAPER-II
(Answers must be written in Manipuri)

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

Section A

Old and Medieval Manipuri Literature:
(a) Old Manipuri Literature:
1. O. Bhogeswar Singh (Ed.) : Numit Kappa
2. M. Gourachandra Singh (Ed.) : Thawanthaba Hiran
3. N. Khelchandra Singh (Ed.) : Naothingkhong Phambal Kaba
4. M. Chandra Singh (Ed.) : Panthoibi Khonggul
(b) Medieval Manipuri Literature:
1. M. Chandra Singh (Ed.) : Samsok Ngamba
2. R.K. SnaHAL Singh (Ed.) : Ramayana Adi Kanda
3. N. Khelchandra Singh (Ed.) : Dhananjoy Laibu Ningba
4. O. Bhogeswar Singh (Ed.) : Chandrakirti Jila Changba

Section B

Modern Manipuri Literature:
(a) Poetry and Epic:
(I) Poetry:
(a) Manipuri Sheireng (Pub) Manipuri Sahitya Parishad, 1998 (Ed.)
Kh. Chaoba Singh : Pi Thadoi, Lamgi Chekla Amada, Loktak
Dr. L. Kamal Singh : Nirjanata, Nirab Rajani
A. Minaketan Singh : Kamalda, Nonggumlalkkhoda.
L. Samarendra Singh : Ingagi Nong, Mamang Leikai Thambal Satle
E. Nilakanta Singh : Manipur, Lamangnaba
Shri Biren : Tangkholu Hui
Th. Ibopishak : Anouba Thunglaha Jiba.
(b) Kanchi Sheireng. (Pub) Manipur University 1998 (Ed.)
Dr. L. Kamal Singh : Biswa-Prem
Shri Biren : Chaphadraba Laigi Yen
Th. Ibopishak : Norok Patal Prithivi
(II) Epic:
1. A. Dorendrajit Singh : Kansa Bodha
2. H. Anganghal Singh : Kamba-Thoibi Sheireng
(San-Senba, Lei Langba, Shamu Khonggi Bichar)
(III) Drama:
1. S. Lalit Singh : Areppa Marup
2. G.C. Tongbra : Matric Pass
3. A. Samarendra : Judge Saheb ki Imung
(b) Novel, Short-story and Prose:
(I) Novel:
1. Dr. L. Kamal Singh : Madhabi
2. H. Anganghal Singh : Jahera
3. H. Guno Singh : Laman
4. Pacha Meetei : Imphal Amasung, Magi Ishing, Nungsitki Phibam
(II) Short-story:
(a) Kanchi Warimacha (Pub) Manipur University 1997(Ed.)
R.K. Shitaljit Singh : Kamala Kamala
M.K. Binodini : Eigi Thahoudraba Heitup Lalu
Kh. Prakash : Wanom Shareng
(b) Parishadki Khangatlaba Warimacha (Pub) Manipuri Sahitya Parishad 1994 (Ed.)
S. Nilbir Shastri : Loukhatpa
R.K. Elangba : Karinunggi
(c) Anouba Manipuri Warimacha (Pub) The Cultural Forum Manipur 1992 (Ed.)
N. Kunjamohon Singh : Ijat Tanba
E. Dinamani : Nongthak Khongnang

(III) Prose :
(a) Warenggi Saklon [Due Part] (Pub) The Cultural Forum Manipur 1992 (Ed.)
Kh. Chaoba Singh : Khamba-Thoibigi Wari Amasung Mahakavya
(b) Kanchi Wareng (Pub) Manipur University, 1998 (Ed.)
B. Manisana Shastri : Phajaba
Ch. Manihar Singh : Lai-Haraoba
(c) Apunba Wareng (Pub) Manipur University, 1986 (Ed.)
Ch. Pishak Singh : Samaj Amasung Sanskriti
M.K. Binodini : Thoibidu Warouhouida
Eric Newton : Kalagi Mahousa (translated by I.R. Babu)
(d) Manipuri Wareng (Pub) The Cultural Forum Manipur 1999 (Ed.)
S. Krishnamohan Singh : Lan

MARATHI

PAPER-I
(Answers must be written in Marathi)

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

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

PAPER-II
(Answer must be written in Marathi)

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

Section A
(Prose)
(1) ‘Smritisthala’
(2) Mahatma Jotiba Phule
‘Shetkaryacha Asud’
‘Sarvajanik Satyadharma’
(3) S.V. Ketkar
‘Brahmakanya’
(4) P.K. Atre
‘Sashtang Namaskar’
(5) Sharchchandra Muktiobodh
‘Jana Hey Volutu Jethe’
(6) Uddhav Shelke
‘Shilan’
(7) Baburao Bagul
‘Jevha Mi Jaat Chorli Hoti’
(8) Gouri Deshpande
‘Ekek Paan Galavaya’
(9) P.I. Sonkamble
‘Athavaninche Pakshi’

Section B
(Poetry)
(1) ‘Namadevanchi Abhangawani’
Ed: Inamdar, Relekar, Mirajkar Modern Book Depot, Pune
(2) ‘Painjan’
Ed : M.N. Adwant
Sahitya Prasar Kendra, Nagpur
NEPALI

PAPER-I

(Answers must be written in Nepali)

Section A

1. History of the origin and development of Nepali as one of the new Indo Aryan Languages.

2. Fundamentals of Nepali Grammar and phonology:
   (i) Nominal forms and categories:—
       Gender, Number, Case, Adjectives, Pronouns, A vyayas
   (ii) Verbal forms and categories:—
       Tense, Aspects, Voice, Roots and Fixes
   (iii) Nepali Swara and Vyanyajana;

3. Major Dialects of Nepali

4. Standardisation and Modernisation of Nepali with special reference to language movements (viz. Halanta Bahiskar, Jharrovad etc.)

5. Teaching of Nepali language in India—Its history and development with special reference to its socio-cultural aspects.

Section B

1. History of Nepali literature with special reference to its development in India.

2. Fundamental concepts and theories of Literature:
   Kavya/Sahitya, Kavya Prayojan, Literary genres, Shabda Shakti, Rasa, Alankara, Tragedy, Comedy, Aesthetics, Stylistics.

3. Major literary trends and movements—
   Swachchhandatavad, Yatharthavad, Asitwavad, Ayamik Movement Contemporary Nepali writings, Postmodernism.

4. Nepali folklores (the following folk-form only)—
   Sawai, Jhyaurey, Selo, Sangini, Lahari.

5. Balkrishna Sama — Prahlad.

6. Manbahadur Mukhia Andhyaroma Banchneharu (The following One-Act only—Andhyaroma Banchneharu ‘Suskera’)

PAPER-II

(Answers must be written in Nepali)

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

Section A

1. Santa Jnandil Das — Udaya Lahari

2. Lekhnath Poudyal — Tarun Tapasi
   (Vishrams III, V, VI, XII, XV, XVIII only)

3. Agam Sing Giri — Jaleko Pratibimba Royeko Pratidhwani (The following Poems only—Prasadwako Chichyahatsanga Byunjheko Ek Raat, Chhorolai, Jaleko Pratibimba : Royeko Pratidhwani, Hamro Akashman Pani Hunchha Ujyalo, Tihar).


5. Balkrishna Sama — Prahlad.

6. Manbahadur Mukhia Andhyaroma Banchneharu (The following One-Act only—Andhyaroma Banchneharu ‘Suskera’)

Section B

1. Indra Sundas — Sahara.

2. Lilbahadur Chhetri — Brahmaputra ko Chheuchhau

3. Rupnarayan Sinha — Katha Navaratna
   (The following stories only—Biteka Kura, Jimmewari Kasko, Dhnammatik Cinema—Swapna, Vidhwasta Jeevan).
4. Indrabahadur Rai — Vipana Katipaya (The following stories only—Raatbhari Huri Chalyo, Jayamaya Aphumatra Lekhapani Aipugi, Bhagi, Ghosh Babu, Chhutuayio).

5. Sanu Lama — Katha Sampaad (The following stories only—Swasni Manchhey, Khati Tarna Ekdin, Phurbale Gaun Chhadyo, Asinapo Manchhey).

6. Laxmi Prasad — Laxmi Nibandha Sangraha (The following essays only—Sri Ganeshaya Namha, Nepali Sahityako Itihasma Sarvashrestha Purus, Kalpana, Kala Ra Jeevan, Gadha Buddhiman ki Guru?)

7. Ramkrishna Sharma — Das Gorkha (The following essays only—Kavi, Samaj Ra Sahitya, Sahityama Sapekshata, Sahityik Ruchiko Praudhata, Nepali Sahityako Pragati).

ODIA PAPER-I
(Answers must be written in Odia)

Section A
History of Odia Language

(i) Origin and development of Odia Language—Influence of Austric, Dravidian, Perso—Arabic and English on Odia Language.

(ii) Phonetics and Phonemics: Vowels, Consonants Principles of changes in Odia sounds.

(iii) Morphology: Morphemes (free, bound compound and complex), derivational and inflectional affixes, case inflection, conjugation of verb.

(iv) Syntax: Kinds of sentences and their transformation, structure of sentences.

(v) Semantics—Different types of change in meaning. Euphemism.

(vi) Common errors in spellings, grammatical uses and construction of sentences.

(vii) Regional variations in Odia Language (Western, Southern and Northern Odia) and Dialects (Bhatri and Desia).

Section B
History of Odia Literature

(i) Historical backgrounds (social, cultural and political) of Odia Literature of different periods.

(ii) Ancient epics, ornate kavyas and padavalis.

(iii) Typical structural forms of Odia Literature (Koili, Chautisa, Poi, Chaupadi, Champu).

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

PAPER-II
(Answers must be written in Odia)

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

Section A
Poetry
(Ancient)

1. Sàralà Dâs—Shanti Parva from Mahâbhârata.


(Medieval)

3. Dinakrushna Dâs—Raskallola—(Chhãnda—16 & 34)

4. Upendra Bhanja—Lâvanyabati (Chhãndas—1 & 2).

(Modern)

5. Râdhânath Rây—Chandrabhâgã.


8. Ramâkânta Ratha—Saptama Ritu.

Section B
Drama:


Novel:


Short Story:


Essay:

15. Chittaranjan Dâs—Tranga O Tadit (First Five essays).

16. Chandra Sekhar Rath—Mun Satyadharmâ Kahuchhi (First five essays).
PUNJABI

PAPER-I

Answers must be written in Punjabi in Gurumukhi script

Section A

(a) Origin of Punjabi Language; different stages of development and recent development in Punjabi Language; characteristics of Punjabi phonology and the study of its tones; classification of vowels and consonants.

(b) Punjabi morphology; the number-gender system (animate and inanimate), prefixes, suffixes and different categories of post positions; Punjabi word formation; Tatsam, Tad Bhav, forms; Sentence structure, the notion of subject and object in Punjabi; Noun and verb phrases.

(c) Language and dialect: the notions of dialect and idiolect: major dialects of Punjabi: Pothohari, Majhi, Doabi, Malwai, Patiala; the validity of speech variation on the basis of social stratification, the distinctive features of various dialects with special reference to tones Language and script; origin and development of Gurumukhi; suitability of Gurumukhi for Punjabi.

(d) Classical background: Nath Jogi Sahit.

Medieval Literature: Gurmat, Suti, Kissa and Var: Janamsakhis.

Section B


Experimentalist (Jasbir Singh Ahluwalia, Ravinder 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).


Short Story (Sujan Singh, K. S. Virk, Prem Parkash, Waryam Sandhu).

(d) Socio-cultural: Sanskrit, Persian and Western.

Literary influences:


PAPER-II

Answers must be written in Punjabi in Gurumukhi script

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

Section A

(a) Sheikh Farid: The complete Bani as included in the Adi Granth.

(b) Guru Nanak: Japu Ji, Baramah, Asa di Var.

(c) Bulleh Shah: Kafian.

(d) Waris Shah: Heer.

Section B

(a) Shah Mohammad: Jangnama (Jang Singh te Firangian)

Dhani Ram Chatrik (Poet): Chandan Var

Sufi Khana

Nawan Jahan

(b) Nanak Singh: Chitta Lahu (Novelist)

Pavittar Papi

Ek Mian Do Talwaran

(c) Gurbaksh Singh (Essayist): Zindagi-di-Ras

Nawan Shivali

Mera Roosi Safarnama

Mera Pakistani Safarnama

(d) Balwant Gargi (Dramatist): Loha Kutt

Dhuni-di-Agg

Sultan Razia

Sant Singh Sekhon (Critic): Sahityarth

Parsidh Punjabi Kavi

Punjabi Kav Shiromani.

SANSKRIT

PAPER-I

There will be three questions as indicated in the Question Paper which must be answered in Sanskrit. The Remaining questions must be answered either in Sanskrit or in the medium of examination opted by the candidate.

Section A

1. Significant features of the grammar, with particular stress on Sanjna, Sandhi, Karaka, Samasa, Kartari and Karmani vacyas (voice usages) (to be answered in Sanskrit).
2. (a) Main characteristics of Vedic Sanskrit language  
   (b) Prominent 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 literary genres of:  
       Mahakavya  
       Rupaka (drama)  
       Katha  
       Akhyanayika  
       Campu  
       Khandakavya  
       Muktaka Kavya.  

Section B  
4. Essential of Indian Culture with stress on:  
   (a) Purusarthas  
   (b) Samskaras  
   (c) Varnasramavyavastha  
   (d) Arts and fine arts  
   (e) Technical Sciences.  
5. Trends of Indian Philosophy  
   (a) Mimansa  
   (b) Vedanta  
   (c) Nyaya  
   (d) Vaisesika  
   (e) Sankhya  
   (f) Yoga  
   (g) Bauddha  
   (h) Jaina  
   (i) Carvaka  
6. Short Essay (in Sanskrit)  
7. Unseen passage with the questions (to be answered in Sanskrit).  

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

Section A  
General study of the following groups:—  

<table>
<thead>
<tr>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
<th>Group 4</th>
</tr>
</thead>
</table>
| (a) Raghuvamsam—Kalidasa  
   (b) Kumarasambhavam—Kalidasa  
   (c) Kiratarjunyam—Bharavi  
   (d) Sisupalavadham—Magha  
   (e) Naisadhiyacaritam—Sriharsa  
   (f) Kadambari—Banabhatta  
   (g) Dasakumaracaritam—Dandin  
   (h) Sivarajyodayam—S.B. Varnekar  | (a) Isavasyopanisad  
   (b) Bhagavadgita  
   (c) Sundararakanda of Valmiki’s Ramayana  
   (d) Arthasastra of Kautilya  | (a) Svapanavasavadattam—Bhasa  
   (b) Abhijinanaasakuntalam—Kalidasa  
   (c) Mricechakatikam—Sudraka  
   (d) Mudraraksasam—Visakhadatta  
   (e) Uttararamacaritam—Bhavbhuvi  
   (f) Ratnavali—Sriharshavardhana  
   (g) Venisamharam—Bhattanarayana  | (a) Meghadutam—Kalidasa  
   (b) Nitisatakam—Bhartrhari  
   (c) Pancatantra—  
   (d) Rajatarangini—Kalhana  
   (e) Harsacaritam—Banabhatta  
   (f) Amurukasatakam—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 in the Medium opted by the candidate.  

<table>
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</table>
| (a) Raghuvamsam—Canto I, Verses 1 to 10  
   (b) Kumarasambhavam—Canto I, Verses 1 to 10  
   (c) Kiratarjuniyae—Canto I, Verses 1 to 10  | (a) Isavasyopanisad—Verses—1, 2, 4, 6, 7, 15 and 18  
   (b) Bhagavatgita II Chapter Verses 13 to 25  
   (c) Sundararakandam of Valmiki Canto 15, Verses 15 to 30 (Geeta Press Edition)  | | (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)  | (a) Svapanavasavadattam Act VI  
   (b) Abhijnanasakuntalam Act IV Verses 15 to 30 (M.R. Kale Edition)  
   (c) Uttararamacaritam Act I Verses 31 to 47 (M.R. Kale Edition).  |
SANTHALI

PAPER I
(Answers must be written in Santhali)

Section A

Part I—History of Santhali Language
1. Main Austric Language family, population and distribution.
2. Grammatical structure of Santhali Language.
3. Important character of Santhali Language: Phonology, Morphology, Syntax, Semantics, Translation, Lexicography.
4. Impact of other languages of Santhali.
5. Standardization of Santhali Language.

Part II—History of Santhali Literature
1. Literary trend of the following four periods of history of Santhali Literature.
   (a) Ancient Literature before 1854.
   (b) Missionary period Literature between 1855 to 1889 AD.
   (c) Medieval period: Literature between 1890 to 1946 AD.
   (d) Modern period: Literature from 1947 AD to till date.
2. Writing tradition in History of Santhali literature.

Section B

Literary forms—Main characteristics, history and development of following literary forms.

Part I
Folk Literature in Santhali—folk song, folk tale, phrase, idioms puzzles, and Kudum.

Part II
Modern literature in Santhali
1. Development of poetry and prominent poets.
   (i) Novels and prominent Novelists.
   (ii) Stories and prominent story writers.
   (iii) Drama and Prominent Dramatist.
   (iv) Criticism and prominent critics.
   (v) Essay, sketches, memoirs, travelogues and prominent writers.

Santhali writers

Part III
Cultural Heritage of Santhali tradition, customs, festival and rituals (birth, marriage and death).

PAPER II
(Answers must be written in Santhali)

Section A

This paper will require in-depth reading of the following texts and the questions will be designed to test the candidates’ critical ability.

Ancient Literature:
Prose
(a) Kherwal Bonso Dhorom Puthi—Mahi Ramdas Tudu “Rasika”.
(b) Mare Hapramko Reyak Katha—L.O. Scrafsrud.
(c) Jomsim Binti Lita—Mangal Chandra Turkulumang Soren.
(d) Marang Buru Binti—Kanailal Tudu.

Poetry
(a) Karam Sereng—Nunku Soren.
(b) Devi Dasain Sereng—Manindra Hansda.
(c) Horh Sereng—W.G. Archer.
(d) Baha Sereng—Balaram Tudu.
(e) Dong Sereng—Padmashri Bhagwat Murmu ‘Thakur’.
(f) Hor Sereng—Raghunath Murmu.
(g) Soros Sereng—Babulal Murmu “Adivasi”.
(h) More Sin More Ndia—Rup Chand Hansda.
(i) Judasi Madwa Latar—Tez Narayan Murmu.

Section B

Modern Literature
Part I—Poetry
(a) Onorhen Baha Dhalwak—Paul Jujhar Soren.
(b) Asar Binti—Narayan Soren “Toresutam”.
(c) Chand Mala—Gora Chand Tudu.
(d) Onto Baha Mala—Aditya Mitra “Santhali”.
(e) Tiryo Tetang—Hari Har Hansda.
(f) Sisirjon Rar—Thakur Prasad Murmu.

Part II—Novels
(a) Harmawak Ato—R.Karstiars (Translator—R.K. Kisku Rapaz).
(b) Manu Mati—Chandra Mohan Hansda.
(c) Ato Orak—Doman Hansdak.
(d) Ojoy Gada Dhiph re—Nathenial Murmu.
Part III—Stories
(a) Jiyon Gada—Rup Chand Hansa and Jadumani Beshra.
(b) Mayajaal—Doman Sahu ‘Samir’ and Padmashri Bhagwat Murmu ‘Thakur’.

Part IV—Drama
(a) Kherwar Bir—Pandit Raghunath Murmu.
(b) Juri Khatir—Dr. K.C. Tudu.
(c) Birsa Bir—Ravi Lal Tudu.

Part V—Biography
Santal Ko Ren Mayam Gohako—Dr. Biswanath Hansda.

SINDHI
PAPER I
Answers must be written in Sindhi
(Arabic or Devanagar Script)

Section A
1. (a) Origin and evolution of Sindhi language—views of different scholars.
(b) Significant linguistic features of Sindhi language, including those pertaining to its phonology, morphology and syntax.
(c) Major dialects of the Sindhi language.
(d) Sindhi vocabulary—stages of its growth, including those in the pre-partition and post-partition periods.
(e) Historical study of various Writing Systems (Scripts) of Sindhi.
(f) Changes in the structure of Sindhi language in India, after partition, due to influence of other languages and social conditions.

Section B
2. Sindhi literature through the ages in context of socio-cultural conditions in the respective periods:
(a) Early medieval literature upto 1350 A.D. including folk literature.
(b) Late medieval period from 1350 A.D. to 1850 A.D.
(c) Renaissance period from 1850 A.D. to 1947 A.D.
(d) Modern period from 1947 and onwards.
   (Literary genres in Modern Sindhi literature and experiments in poetry, drama, novel, short story, essay, literary criticism, biography, autobiography, memoirs and travelogues.)

PAPER II
Answer must be written in Sindhi
(Arabic or Devanagar Script)

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

Section A
References to context and critical appreciation of the texts included in this section.

PAPER I
Answers must be written in Tamil
(Arabic or Devanagari Script)

Section A
Part 1: History of Tamil Language
Major Indian Language Families—The place of Tamil among Indian Languages in general and Dravidian in particular—Enumeration and Distribution of Dravidian languages.

The language of Sangam Literature—The language of medieval Tamil : Pallava Period only—Historical study of
Nouns, Verbs, Adjectives, Adverbs—Tense markers and case markers in Tamil.

Borrowing of words from other languages into Tamil—Regional and social dialects—difference between literary and spoken Tamil.

**Part 2: History of Tamil Literature**

Tolkappiyam—Sangam Literature—The division of Akam and Puram—The secular characteristics of Sangam Literature—The development of Ethical literature—Silappadikaram and Manimekalai.

**Part 3: Devotional Literature (Alwars and Nayanamars)**

The bridal mysticism in Alwar hymns—Minor literary forms (Tutu, Ula, Parani, Kuravanji).

Social factors for the development of Modern Tamil Literature; Novel, Short Story and New Poetry—The impact of various political ideologies on modern writings.

**Section B**

**Part 1: Recent trends in Tamil Studies**

Approaches to criticism: Social, psychological, historical and moralistic—the use of criticism—the various techniques in literature; Ullurai, Iraichi, Thonnam (Myth) Otturuvagam (allegory), Angadam (Satire), Meyappadu, Padimam (image), Kurleyedu (Symbol), Irunmari (Ambiguity)—The concept of comparative literature—the principle of comparative literature.

**Part 2: Folk literature in Tamil**

Ballads, Songs, proverbs and riddles—Sociological study of Tamil folklore. Uses of translation—Translation of Tamil works into other languages—Development of journalism in Tamil.

**Part 3: Cultural Heritage of the Tamils**

Concept of Love and War—Concept of Aram—the ethical codes adopted by the ancient Tamils in their warfare—customs beliefs, rituals, modes of worship in the five Thinais.

The Cultural changes as revealed in post sangam literature—cultural fusion in the medieval period (Janism and Buddhism). The development of arts and architecture through the ages (Pallavas, later Cholas, and Nayaks). The impact of various political, social, religious and cultural movements on Tamil Society. The role of mass media in the cultural change of contemporary Tamil society.

**PAPER II**

**Answers must be written in Tamil**

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

**Section A**

**Part 1: Ancient Literature**

1. Kuruntokai (1—25 poems)
2. Purananuru (182—200 poems)

3. Tirukkural: Poruppad: Arasiyalum Amaiychiyalam (from Iraimatchi to Avaianjai).

**Part 2: Epic Literature**

1. Silappadikaram: Madurai Kandam only.

**Part 3: Devotional Literature**

1. Tiruvasagam: Neeththal Vinnappam
2. Tiruppavai: (Full Text).

**Section B**

**Modern Literature**

**Part 1: Poetry**

1. Bharathiar: Kannan Pattu
2. Bharathidasan: Kudumba Vilakkku

**Prose**

1. Mu. Varadharajan: Aramum Arasiyalum

**Part 2: Novel, Short Story and Drama**

1. Akilon: Chittairappavai
2. Jayakanthan: Gurupeedam
3. Cho: Yaurkum Vettamullai

**Part 3: Folk Literature**


**TELUGU**

**PAPER I**

**Answer must be written in Telugu**

**Section A : Language**

1. Place of Telugu among Dravidian languages and its antiquity—Etymological History of Telugu, Tenugu and Andhra.
2. Major linguistic changes in phonological, morphological, grammatical and syntactical levels, from Proto-Dravidian to old Telugu and from old Telugu to Modern Telugu.
3. Evolution of spoken Telugu when compared to classical Telugu—Formal and functional view of Telugu language.
4. Influence of other languages and its impact on Telugu.
5. Modernization of Telugu language:
   (a) Linguistic and literary movements and their role in modernization of Telugu.
   (b) Role of media in modernization of Telugu (Newspapers, Radio, TV etc.)
(c) Problems of terminology and mechanisms in coining new terms in Telugu in various discourses including scientific and technical.

6. Dialects of Telugu—Regional and social variations and problems of Standardization.

7. Syntax—Major divisions of Telugu sentences—simple, complex and compound sentences—Noun and verb predications—Processes of nominalization and relativization—Direct and indirect reporting-conversion processes.

8. Translation—Problems of translation, cultural, social and idiomatic—Methods of translation—Approaches to translation—Literary and other kinds of translation—Various uses of translation.

**Section B : Literature**

1. Literature in Pre-Nannaya Period—Marga and Desi poetry.
2. Nannaya Period—Historical and literary background of Andhra Mahabharata.
4. Tikkana and his place in Telugu literature.
5. Errana and his literary works—Nachana Somana and his new approach to poetry.
6. Srinatha and Potana—Their works and contribution.
9. Southern school of Telugu literature-raghunatha Nayaka, chemakura vankatakavi and women poets-Literary forms like yakshagana, prose and padakavita.
12. Digambarakavulu, feminist and dalit Literature.
13. Main divisions of folk literature—Performing folk arts.

**PAPER II**

**Answer must be written in Telugu**

This paper will require first hand reading of the prescribed texts and will be designed to test the candidate’s critical ability, which will be in relation to the following approaches :


(ii) Sociological, Historical, Ideological, Psychological approaches.

**Section A**

2. Tikkana-Sri Krishna Rayabaramu (Udyoga parva-3rd Canto verses 1—144).
3. Srinath-Guna Nidhi Katha (Kasikhandam, 4th Canto, verses 76—133).
4. Pingali Surana-sugatri Salinulakatha (Kalapurnodayamu 4 Canto verses, 60—142).
5. Molla-Ramayanamu (Balakanda including avatarika).

**Section B**

10. Sri Sri-Maha prastanam.

**URDU**

**PAPER I**

**Answer must be written in Urdu**

**Section A**

Development of Urdu Language

(a) Development of Indo-Aryan

(i) Old Indo-Aryan

(ii) Middle Indo-Aryan

(iii) New Indo-Aryan.

(b) Western Hindi and its dialects Brij Bhasha Khadi Bol, Haryanavi, Kannauji, Bundeli—Theories about the origin of Urdu language.

(c) Dakhani Urdu—origin and development, its significant linguistic features.

(d) Social and Cultural roots of Urdu language— and its distinctive features.

Script, Phonology, Morphology, Vocabulary.

**Section B**

(a) Genres and their development :

(i) Poetry: Ghazal, Masnavi, Qasida, Marsia, Rubai Jadid Nazm.

(ii) Prose : Novel, Short Story, Dastan, Drama, Inshaiya, Khutoot, Biography.

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

Answer must be written in Urdu

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

Section A
1. Mir Amman Bagho-Babar
2. Ghalib Intikhab-e-Khutoot-e-Ghalib
4. Prem Chand Godan
5. Rajendra Singh Bedi Apne Dukh Mujhe Dedo
6. Abul Kalam Azad Ghubar-e-Khatir

Section B
1. Mir Intikhab-e-Kalam-e-Mir (Ed. Abdul Haq.)
2. Mir Hasan Sahrul Bayan
3. Ghalib Diwan-e-Ghalib
4. Iqbal Bal-e-Jibrail
5. Firaq Gul-e-Naghma
6. Faiz Dast-e-Saba
7. Akhtruliman Bint-e-Lamhat

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 Management Thoughts; Managerial Functions—Planning, Organizing, Controlling; Decision-making; Role of Manager, Managerial skills; Entrepreneurship; Management of innovation; Managing in a global environment, Flexible Systems Management; Social responsibility and managerial ethics; Process and customer orientation; Managerial processes on direct and indirect value chain.

2. Organisational Behaviour and Design:

Conceptual model of organization behaviour; The individual processes—personality, values and attitude, perception, motivation, learning and reinforcement, work stress and stress management; The dynamics of Organization behaviour—power and politics, conflict and negotiation, leadership process and styles, communication; The Organizational Processes—decision-making, job design; Classical, Neoclassical and Contingency approaches to organizational design; Organizational theory and design—Organizational culture, managing cultural diversity, learning Organization; Organizational change and development; Knowledge Based Enterprise—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 resource planning; Job analysis; Job evaluation, Recruitment and selection; Training and development; Promotion and transfer; Performance management; Compensation management and benefits; Employee morale and productivity; Management of Organizational climate and Industrial relations; Human resources accounting and audit; Human resource information system; International human resource management.

4. Accounting for Managers:

Financial accounting—concept, importance and scope, generally accepted accounting principles, preparation of financial statements with special reference to analysis of a balance sheet and measurement of business income, inventory valuation and depreciation, financial statement analysis, fund flow analysis, the statement of cash flows; Management accounting concept, need, impartiality and scope; Cost accounting—records and processes, cost ledger and control accounts, reconciliation and integration between 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 customer satisfaction, Value and retention; Services
and non-profit marketing; Ethics in marketing; Consumer protection; Internet marketing; Retail management; Customer relationship management; Concept of holistic marketing.

PAPER II

1. Quantitative Techniques in Decision-making:

Descriptive statistics—tabular, graphical and numerical methods, introduction to probability, discrete and continuous probability distributions, inferential statistics—sampling distributions, central limit theorem, hypothesis testing for differences between means and proportions, inference about population variances, Chi-square and ANOVA, simple correlation and regression, time series and forecasting, decision theory, index numbers; Linear programming—problem formulation, simplex method and graphical solution, sensitivity analysis.

2. Production and Operations Management:

Fundamentals of operations management; Organizing for production; Aggregate production planning, capacity planning, plant design; process planning, plant size and scale of operations, Management of facilities; Line balancing; Equipment replacement and maintenance; Production control; Supply, chain management—vendor evaluation and audit; Quality management; Statistical process control, Six Sigma; Flexibility and agility in manufacturing systems; World class manufacturing; Project management concepts, R&D management, Management of service operations; Role and importance of materials management, value analysis, make or buy decision; Inventory control, MRP; Waste management.

3. Management Information System:

Conceptual foundations of information systems; Information theory; Information resource management; Types of information systems; Systems Development—Overview of Systems and Design; System Development management life-cycle, Designing online and distributed environments; Implementation and control of project; Trends in information technology; Managing data resources—Organising data. DSS and RDBMS; Enterprise Resource Planning (ERP), Expert systems, e-Business architecture, e-Governance; Information systems planning, 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 policy 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 implementation; 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 alliances, Mergers and Acquisitions; Strategy and corporate evolution in the Indian context.

6. International Business:

International Business Environment: Changing composition of trade in goods and services; India’s Foreign Trade: Policy and trends; Financing of International trade; Regional Economic Cooperation; FTAs; Internationalisation of service firms; International production; Operation Management in International companies; International Taxation; Global competitiveness and technological developments; Global E-Business; Designing global organisational structure and control; Multicultural management; Global business strategy; Global marketing strategies; Export Management; Export-Import procedures; Joint Ventures; Foreign Investment: Foreign direct investment and foreign portfolio investment; Cross-border Mergers and Acquisitions; Foreign Exchange Risk Exposure Management; World Financial Markets and International Banking; External Debt Management; Country Risk Analysis.

MATHEMATICS

PAPER I

(1) Linear Algebra:

Vector spaces over R and C, linear dependence and independence, subspaces, bases, dimensions, Linear transformations, rank and nullity, matrix of a linear transformation. Algebra of Matrices; Row and column reduction, Echelon form, congruence’s and similarity; Rank of a matrix; Inverse of a matrix; Solution of system of linear equations; Eigenvalues and eigenvectors, characteristic polynomial, Cayley-Hamilton theorem, Symmetric, skew-symmetric, Hermitian, skew-Hermitian, orthogonal and unitary matrices and their eigenvalues.

(2) Calculus:

Real numbers, functions of a real variable, limits, continuity, differentiability, mean-value theorem, Taylor’s theorem with remainders, indeterminate forms, maxima and minima, asymptotes; Curve tracing; Functions of two or three variables; Limits, continuity, partial derivatives, maxima and minima, Lagrange’s method of multipliers, Jacobian.
Riemann’s definition of definite integrals; Indefinite integrals; Infinite and improper 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 linear 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, projectiles; Constrained motion; Work and energy, conservation of energy; Kepler’s laws, orbits under central forces.
Equilibrium of a system of particles; Work and potential energy, friction, Common catenary; Principle of virtual work; Stability of equilibrium, equilibrium of forces in three dimensions.

(6) Vector Analysis:
Scalar and vector fields, differentiation of vector field of a scalar variable; Gradient, divergence and curl in cartesian and cylindrical coordinates; Higher order derivatives; Vector identities and vector equation.
Application to geometry: Curves in space, curvature and torsion; Serret-Furenet’s formulae.
Gauss and Stokes’ theorems, Green’s identities.

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

(2) Real Analysis:
Real number system as an ordered field with least upper bound property; Sequences, limit of a sequence, Cauchy sequence, completeness of real line; Series and its convergence, absolute and conditional convergence of series of real and complex terms, rearrangement of series. Continuity and uniform continuity of functions, properties of continuous functions on compact sets.
Riemann integral, improper integrals; Fundamental theorems of integral calculus.
Uniform convergence, continuity, differentiability and integrability for sequences and series of functions; Partial derivatives of functions of several (two or three) variables, maxima and minima.

(3) Complex Analysis:
Analytic function, Cauchy-Riemann equations, Cauchy’s theorem, Cauchy’s integral formula, power series, representation of an analytic function, Taylor’s series; Singularities; Laurent’s series; Cauchy’s residue theorem; Contour integration.

(4) Linear Programming:
Linear programming problems, basic solution, basic feasible solution and optimal solution; Graphical method and simplex method of solutions; Duality.
Transportation and assignment problems.

(5) Partial Differential Equations:
Family of surfaces in three dimensions and formulation of partial differential equations; Solution of quasilinear partial differential equations of the first order, Cauchy’s method of characteristics; Linear partial differential equations of the second order with constant coefficients, canonical form; Equation of a vibrating string, heat equation, Laplace equation and their solutions.

(6) Numerical Analysis and Computer Programming:
Numerical methods: Solution of algebraic and transcendental equations of one variable by bisection, Regula-Falsi and Newton-Raphson methods, solution of system of linear equations by Gaussian Elimination and Gauss-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.

Computer Programming: Binary system; Arithmetic and logical operations on numbers; Octal and Hexadecimal Systems; Conversion to and from decimal Systems; Algebra of binary numbers.
Elements of computer systems and concept of memory; Basic logic gates and truth tables, Boolean algebra, normal forms.

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

Algorithms and flow charts for solving numerical analysis problems.

(7) Mechanics and Fluid Dynamics:

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

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

MECHANICAL ENGINEERING

PAPER I

1. Mechanics:

1.1 Mechanics of Rigid Bodies:

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

1.2 Mechanics of Deformable Bodies:

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

2. Engineering Materials:

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

3. Theory of Machines:

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

4. Manufacturing Science:

4.1 Manufacturing Process:

Machine tool engineering - 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 gauges; comparators; inspection of length; position; profile and surface finish.

4.2 Manufacturing Management:

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

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

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

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

PAPER II

1. Thermodynamics, Gas Dynamics Turbine:

1.1 Basic concept of First-law and Second law of Thermodynamics; concept of entropy and reversibility; availability and unavailability and irreversibility.

1.2 Classification and properties of fluids; incompressible and compressible fluids flows; effect of Mach number and compressibility; continuity momentum and energy equations; normal and oblique shocks; one dimensional isentropic flow; flow or fluids in duct with frictions that transfer.

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

2. Heat Transfer:

2.1 Conduction heat transfer—general conduction equation-Laplace, Poisson and Fourier equations; Fourier law of conduction; one dimensional steady state heat conduction applied to simple wall, solid and hollow cylinder and spheres.

2.2 Convection heat transfer—Newton's law of convection; free and forces convection; heat transfer during laminar and turbulent flow of an incompressible fluid over a
flat plate; concepts of Nusselt number, hydrodynamic and thermal boundary layer their thickness; Prandtl number; analogy between heat and momentum transfer—Reynolds, Colburn, Prandtl analogies; heat transfer during laminar and turbulent flow through horizontal tubes; free convection from horizontal and vertical plates.

2.3 Black body radiation—basic radiation laws such as Stefan-Boltzman, Planck distribution, Wein’s displacement etc.

2.4 Basic heat exchanger analysis; classification of heat exchangers.

3. Engines:

3.1 Classification, thermodynamic 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 factor; reheating and regeneration, methods of governing; back pressure and pass out turbines.

4.4 Steam power plants—combined cycle power generation; heat recovery steam generators (HRSG) fired and unfired, co-generation plants.

5. Refrigeration and Air-conditioning:

5.1 Vapour compression refrigeration cycle—cycle on p-H & T-s diagrams; ecofriendly refrigerants—R 134a, 123; Systems like evaporators, condensers, compressor, expansion devices. Simple vapour absorption systems.

5.2 Psychrometry—properties; processes; charts; sensible heating and cooling; humidification and dehumidification effective temperature; air-conditioning load calculation; simple duct design.
bronchogenic carcinoma, carcinoma breast, oral cancer, cancer cervix, leukemia, Etiology, pathogenesis and histopathology of—cirrhosis liver, glomerulonephritis, tuberculosis, acute osteomyelitis.

5. Microbiology:
   Humoral and cell mediated immunity.
   Diseases caused by and laboratory diagnosis of —
   * Meningococcus, Salmonella
   * Shigella, Herpes, Dengue, Polio
   * HIV/AIDS, Malaria, E. Histolytica, Giardia
   * Candida, Cryptococcus, Aspergillus.

6. Pharmacology:
   Mechanism of action and side effects of the following drugs:
   * Antipyretics and analgesics, Antibiotics,
   * Antimalaria, Antikala-azar, Antidiabetics,
   * Antihypertensive, Antidiuretics, General and cardiac vasodilators, Antiviral, Antiparasitic, Antifungal, Immunosuppressants,
   * Anticancer.

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

PAPER-II

1. General Medicine
   Etiology, clinical features, diagnosis and principles of management (including prevention) of—Typhoid, Rabies, AIDS, Dengue, Kala-azar, Japanese Encephalitis.
   Etiology, clinical features, diagnosis and principles of management of:
   Ischaemic heart disease, pulmonary embolism.
   Bronchial asthma.
   Pleural effusion, tuberculosis, Malabsorption syndromes; acid peptic diseases, Viral hepatitis and cirrhosis of liver.
   Glomerulonephritis and pyelonephritis, renal failure, nephrotic syndrome, renovascular hypertension, complications of diabetes mellitus, coagulation disorders, leukaemia, Hypo and hyper thyrodism, meningitis and encephalitis.
   Imaging in medical problems, ultrasound, echocardiogram, CT scan, MRI.
   Anxiety and Depressive Psychosis and schizophrenia and ECT.

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

3. Dermatology

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 postpartum hemorrhage, resuscitation of the newborn, Management of abnormal life and difficult labour. Management of small for date or premature newborn.
   Diagnosis and management of anemia. Preeclampsia and Toxaemias of pregnancy, Management of Postmenopausal Syndrome.
   Intra-uterine devices, pills, tubectomy and vasectomy.
   Medical termination of pregnancy including legal aspects.
   Cancer cervix.
   Leucorrhoea, pelvic pain; infertility, dysfunctional uterine bleeding (DUB), amenorrhoea, Fibroid and prolapse of uterus.

6. Community Medicine (Preventive and Social Medicine)
   Principles, methods approach and measurements of Epidemiology.
   Nutrition, nutritional diseases/ disorders and Nutrition Programmes.
   Health information Collection, Analysis and Presentation.
Objectives, components and critical analysis of National programmes for control/eradication of:

- Malaria, Kala-azar, Filaria and Tuberculosis,
- HIV/AIDS, STDs and Dengue.

Critical appraisal of Health care delivery system.

Health management and administration; Techniques, Tools, Programme Implementation and Evaluation.

Objectives, Components, Goals and Status of Reproductive and Child Health, National Rural Health Mission and Millennium Development Goals.

Management of hospital and industrial waste.

**PHILOSOPHY**

**PAPER-I**

**History and Problems of Philosophy**

1. Plato and Aristotle: Ideas; Substance; Form and Matter; Causation; Actuality and Potentiality.
2. Rationalism (Descartes, Spinoza, Leibniz): Cartesian Method and Certain Knowledge; Substance; God; Mind-Body Dualism; Determinism and Freedom.
3. Empiricism (Locke, Berkeley, Hume): Theory of Knowledge; Substance and Qualities; Self and God; Scepticism.
4. Kant: Possibility of Synthetic a priori Judgments; Space and Time; Categories; Ideas of Reason; Antinomies; Critique of Proofs for the Existence of God.
5. Hegel: Dialectical Method; Absolute Idealism.
6. Moore, Russell and Early Wittgenstein: Defence of Commonsense; Refutation of Idealism; Logical Atomism; Logical Constructions; Incomplete Symbols; Picture Theory of Meaning; Saying and Showing.
7. Logical Positivism: Verification Theory of Meaning; Rejection of Metaphysics; Linguistic Theory of Necessary Propositions.
8. Later Wittgenstein: Meaning and Use; Language-games; Critique of Private Language.
11. Quine and Strawson: Critique of Empiricism; Theory of Basic Particulars and Persons.
12. Carvaka: Theory of Knowledge; Rejection of Transcendent Entities.
16. Samkhya; Prakrit; Purusa; Causation; Liberation.
17. Yoga; Citta; Cittavritti; Klesas; Samadhi; Kaivalya.
19. Schools of Vedanta: Brahman; Isvara; Atman; Jiva; Jagat; Maya; Avida; Adhysa; Moksa; Aprthaksiddhi; Pancaviddbheda.

**Socio-Political Philosophy**

2. Sovereignty: Austin, Bodin, Laski, Kautilya.
3. Individual and State: Rights; Duties and Accountability.
4. Forms of Government: Monarchy; Theocracy and Democracy.
5. Political Ideologies: Anarchism; Marxism and Socialism.
6. Humanism; Secularism; Multi-culturalism.
9. Gender Discrimination: Female Foeticide, Land and Property Rights; Empowerment.

**Philosophy of Religion**

1. Notions of God: Attributes; Relation to Man and the World. (Indian and Western).
2. Proofs for the Existence of God and their Critique (Indian and Western).
4. Soul: Immortality; Rebirth and Liberation.
5. Reason, Revelation and Faith.
7. Religion without God.
8. Religion and Morality.
PHYSICS

PAPER-I

1. (a) Mechanics of Particles:

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

(b) Mechanics of Rigid Bodies:

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

(c) Mechanics of Continuous Media:

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

(d) Special Relativity:

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

2. Waves and Optics:

(a) Waves:

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

(b) Geometrical Optics:

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

(c) Interference:

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

(d) Diffraction:

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

(e) Polarisation and Modern Optics:

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

3. Electricity and Magnetism:

(a) Electrostatics and Magnetostatics:

Laplace and Poisson equations in electrostatics and their applications; Energy of a system of charges, multipole expansion of scalar potential; Method of images and its applications. Potential and field due to a dipole, force and torque on a dipole in an external field; Dielectrics, 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; Isothermal, adiabatic, isobaric, isochoric processes and entropy changes; Otto and Diesel engines, Gibbs’ phase rule and chemical potential; Van der Waals equation of state of a real gas, critical constants; Maxwell-Boltzmann distribution of molecular velocities, transport phenomena, equipartition and virial theorems; Dulong- Petit, Einstein, and Debye’s theories of specific heat of solids; Maxwell relations and application; Clausius-Clapeyron equation. Adiabatic demagnetisation, Joule-Kelvin effect and liquefaction of gases.
1. Quantum Mechanics:

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

2. Atomic and Molecular Physics:

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

3. Nuclear and Particle Physics:

Basic nuclear properties-size, binding energy, angular momentum, parity, magnetic moment; Semi-empirical mass formula and applications. Mass parabolas; Ground state of 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 RELATIONS

PAPER-I

Political Theory and Indian Politics:

1. Political Theory: meaning and approaches.
2. Theories of state: Liberal, Neo-liberal, Marxist, Pluralist, post-colonial and Feminist.
4. Equality: Social, political and economic; relationship between equality and freedom; Affirmative action.
5. Rights: Meaning and theories; different kinds of rights; Concept of Human Rights.
6. Democracy: Classical and contemporary theories; different models of democracy—representative, participatory and deliberative.
8. Political Ideologies: Liberalism, Socialism, Marxism, Fascism, Gandhism and Feminism.

Indian Government and Politics

1. Indian Nationalism:

(a) Political Strategies of India’s Freedom Struggle: Constitutionalism to mass Satyagraha, Non-cooperation, Civil Disobedience; Militant and Revolutionary Movements, Peasant and Workers Movements.

(b) Perspectives on Indian National Movement: Liberal, Socialist and Marxist; Radical Humanist and Dalit.


4. (a) Principal Organs of the Union Government : Envisaged role and actual working of the Executive, Legislature and Supreme Court.

(b) Principal Organs of the State Government : Envisaged role and actual working of the Executive, Legislature and High Courts.

5. Grassroots Democracy : Panchayati Raj and Municipal Government; Significance of 73rd and 74th Amendments; Grassroot movements.


7. Federalism : Constitutional provisions; changing nature of centre-state relations; integrationist tendencies and regional aspirations; inter-state disputes.

8. Planning and Economic development : Nehruvian and Gandhian perspectives; Role of planning and public sector; Green Revolution, land reforms and agrarian relations; liberalization and economic reforms.

9. Caste, Religion and Ethnicity in Indian Politics.

10. Party System : National and regional political parties, ideological and social bases of parties; Patterns of coalition politics; Pressure groups, trends in electoral behaviour; changing socio-economic profile of Legislators.

11. Social Movement : Civil liberties and human rights movements; women’s movements; environmentalist movements.

PAPER-II

Comparative Politics and International Relations

Comparative Political Analysis and International Politics :

1. Comparative Politics : Nature and major approaches; Political economy and political sociology perspectives; Limitations of the comparative method.

2. State in Comparative Perspective : Characteristics and changing nature of the State in capitalist and socialist economies, and advanced industrial and developing societies.

3. Politics of Representation and Participation : Political parties, pressure groups and social movements in advanced industrial and developing societies.

4. Globalisation : Responses from developed and developing societies.

5. Approaches to the Study of International Relations : Idealist, Realist, Marxist, Functionalist and Systems theory.

6. Key Concepts in International Relations : National interest, security and power; Balance of power and deterrence; Transnational actors and collective security; World capitalist economy and globalisation.

7. Changing International Political Order :

(a) Rise of super powers; Strategic and ideological Bipolarity, arms race and cold war; Nuclear threat;

(b) Non-aligned Movement : Aims and achievements.

(c) Collapse of the Soviet Union; Unipolarity and American hegemony; Relevance of non-alignment in the contemporary world.

8. Evolution of the International Economic System : From Brettonwoods to WTO; Socialist economies and the CMEA (Council for Mutual Economic Assistance); Third World demand for new international economic order; Globalisation of the world economy.

9. United Nations : Envisaged role and actual record; Specialized UN agencies—aims and functioning; need for UN reforms.

10. Regionalisation of World Politics : EU, ASEAN, APEC, AARC, NAFTA.


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 Isreal; Vision of a new world order.

PSYCHOLOGY

PAPER-I

Foundations of Psychology

1. Introduction: Definition of Psychology; Historical antecedents of Psychology and trends in the 21st century; Psychology and scientific methods; Psychology in relation to other social sciences and natural sciences; Application of Psychology to societal problems.

2. Methods of Psychology: Types of research: Descriptive, evaluative, diagnostic and prognostic; Methods of Research: Survey, observation, case-study and experiments; Characteristics of experimental design and non-experimental designs; quasi-experimental designs; Focussed group discussions, brain storming, grounded theory approach.

3. Research methods: Major steps in psychological research (problem statement, hypothesis formulation, research design, sampling, tools of data collection, analysis and interpretation and report writing); Fundamental versus applied research; Methods of data collection (interview, observation, questionnaire and case study). Research Designs (Ex-post facto and experimental). Application of statistical techniques (t-test, two-way ANOVA, correlation and regression and factor analysis) item response theory.


5. Sensation, Attention and Perception: Sensation: concepts of threshold, absolute and difference thresholds, signal-detection and vigilance; Factors influencing attention including set and characteristics of stimulus; Definition and concept of perception, biological factors in perception; Perceptual organization-influence of past experiences, perceptual defence-factor influencing space and depth perception, size estimation and perceptual readiness; The plasticity of perception; Extrasensory perception; Culture and perception, Subliminal perception.


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, Guilford Vernon, Sternberg and J.P. Das; Emotional Intelligence, Social intelligence, measurement of intelligence and aptitudes, concept of IQ deviation IQ, constancy of IQ; Measurement of multiple intelligence; Fluid intelligence and crystallized intelligence.

11. Personality: Definition and concept of personality; Theories of personality (psychoanalytical, socio-cultural, interpersonal, developmental, humanistic, behavioural, trait and type approaches); Measurement of personality (projective tests, pencil-paper test); The Indian approach to personality; Training for personality development; Latest approaches like big 5 factor theory; The notion of self in different traditions.

12. Attitudes, Values and Interests: Definitions of attitudes, values and interests; Components of attitudes; Formation and maintenance of attitudes. Measurement of attitudes, values and interests. Theories of attitude changes, strategies for fostering values. Formation of stereotypes and prejudices; Changing other’s behaviour, Theories of attribution; Recent trends.

13. Language and Communication: Human language—Properties, structure and linguistic hierarchy, Language acquisition—predisposition, critical period hypothesis; Theories of Language development—Skinner and Chomsky; Process and types of communication—effective communication training.
14. Issues and Perspectives in Modern Contemporary Psychology: Computer application in the psychological laboratory and psychological testing; Artificial intelligence; Psychocybernetics; Study of consciousness—sleep—wake schedules; dreams, stimulus deprivation, meditation, hypnotic/drug induced states; Extrasensory perception; Intersensory perception; Simulation studies.

PAPER-II

Psychology: Issues and applications

1. Psychological Measurement of Individual Differences:
   The nature of individual differences. Characteristics and construction of standardized psychological tests. Types of psychological tests. Use, misuse and limitation of psychological tests. Ethical issues in the use of psychological tests.

2. Psychological well being and Mental Disorders:
   Concept of health—ill health positive health, well being casual factors in Mental disorders (Anxiety disorders, 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:

4. Work Psychology and Organisational Behaviour:
   Personnel selection and training. Use of Psychological tests in the industry. Training and human resource development. Theories of work motivation. Herzberg, Maslow, Adam Equity theory, Porter and Lawler, Vroom; Leadership and participatory management; Advertising and marketing; Stress and its management; Ergonomics; consumer psychology; Managerial effectiveness; Transformational leadership; Sensitivity training; Power and politics in organizations.

5. Application of Psychology to Educational Field:

6. Community Psychology:
   Definition and concept of Community Psychology. Use of small groups in social action. Arousing Community consciousness and action for handling social problems. Group decision making and leadership for social change. Effective strategies for social change.

7. Rehabilitation Psychology:
   Primary, secondary and tertiary prevention programmes—role of psychologists. Organising of services for rehabilitation of physically, mentally and socially challenged persons including old persons. Rehabilitation of persons suffering from substance abuse, juvenile delinquency, criminal behaviours. Rehabilitation of victims of violence. Rehabilitation of HIV/AIDS victims, the role of social agencies.

8. Application of Psychology to disadvantaged groups:
   The concepts of disadvantaged, deprivation social, physical, cultural and economic consequences of disadvantaged and deprived groups. Educating and motivating the disadvantaged towards development; Relative and prolonged deprivation.

9. Psychological problem of social integration:
   The concept of social integration. The problem of caste, class, religion and language conflicts and prejudice. Nature and manifestation of prejudice between the ingroup and outgroup. Casual factors of such conflicts and prejudices. Psychological strategies for handling the conflicts and prejudices. Measures to achieve social integration.

10. Application of Psychology in Information Technology and Mass Media:
   The present scenario of information technology and the mass media boom and the role of psychologists. Selection and training of Psychology professionals to work in the field of IT and mass media. Distance learning through IT and mass media. Entrepreneurship through e-commerce. Multilevel marketing. Impact of TV and fostering value through IT and mass media. Psychological consequences of recent developments in Information Technology.

11. Psychology and Economic development:

12. Application of Psychology to environment and related fields:
   Environmental Psychology effects of noise, pollution and crowding. Population Psychology: Psychological consequence of population explosion and high population density. Motivating for small family norms. Impact of rapid scientific and technological growth on degradation of environment.

13. Application of psychology in other fields:
   (a) Military Psychology
      Devising psychological tests for defence personnel for use in selection, Training, counseling; training psychologists to work, with defence personnel in promoting positive health; Human engineering in defence.
   (b) Sports Psychology
      Psychological interventions in improving performance of athletes and sports. Persons participating in Individual and Team Games.
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:


2. Administrative Thought:

Scientific Management and Scientific Management movement; Classical Theory; Weber’s bureaucratic model its critique and post-Weberian Developments; Dynamic Administration (Mary Parker Follett); Human Relations School (Elton Mayo and others); Functions of the Executive (C.I. Barnard); Simon’s decision-making theory; Participative Management (R. Likert, C. Argyris, D. McGregor.)

3. Administrative Behaviour:

Process and techniques of decision-making; Communication; Morale; Motivation Theories content, process and contemporary; Theories of Leadership: Traditional and Modern.

4. Organisations:

Theories systems, contingency; Structure and forms; Ministries and Departments, Corporations, Companies; Boards and Commissions; Ad hoc, and advisory bodies; Headquarters and Field relationships; Regulatory Authorities; Public-Private Partnerships.

5. Accountability and Control:

Concepts of accountability and control; Legislative, Executive and judicial control over administration; Citizen and Administration; Role of media, interest groups, voluntary organizations; Civil society; Citizen’s Charters; Right to Information; Social audit.

6. Administrative Law:

Meaning, scope and significance; Dicey on Administrative law; Delegated legislation; Administrative Tribunals.

7. Comparative Public Administration:

Historical and sociological factors affecting administrative systems; Administration and politics in different countries; Current status of Comparative Public Administration; Ecology and administration; Rigg’sian models and their critique.

8. Development Dynamics:

Concept of development; Changing profile of development administration; ‘Anti-development thesis’; Bureaucracy and development; Strong state versus the market debate; Impact of liberalisation on administration in developing countries; Women and development the self-help group movement.

9. Personnel Administration:

Importance of human resource development; Recruitment, training, career advancement, position classification, discipline, performance appraisal, promotion, pay and service conditions; employer-employee relations, grievance redressal mechanism; Code of conduct; Administrative ethics.

10. Public Policy:

Models of policy-making and their critique; Processes of conceptualisation, planning, implementation, monitoring, evaluation and review and their limitations; State theories and public policy formulation.

11. Techniques of Administrative Improvement:

Organisation and methods, Work study and work management; e-governance and information technology; Management aid tools like network analysis, MIS, PERT, CPM.

12. Financial Administration:

Monetary and fiscal policies: Public borrowings and public debt; Budgets types and forms; Budgetary process; Financial accountability; Accounts and audit.

PAPER-II

Indian Administration

1. Evolution of Indian Administration:

Kautilya Arthashastra; Mughal administration; Legacy of British rule in politics and administration; Indianization of Public services, revenue administration, district Administration, local self Government.

2. Philosophical and Constitutional framework of Government:

Salient features and value premises; Constitutionalism; Political culture; Bureaucracy and democracy; Bureaucracy and development.

3. Public Sector Undertakings:

Public sector in modern India; Forms of Public Sector Undertakings; Problems of autonomy, accountability and control; Impact of liberalization and privatization.

4. Union Government and Administration:

Executive, Parliament, Judiciary-structure, functions, work processes; Recent trends; Intra-governmental relations; Cabinet Secretariat; Prime Minister’s Office; Central Secretariat; Ministries and Departments; Boards; Commissions; Attached offices; Field organizations.
5. Plans and Priorities:
Machinery of planning; Role, composition and functions of the Planning Commission and the National Development Council; ‘Indicative’ planning; Process of plan formulation at Union and State levels; Constitutional Amendments (1992) and decentralized planning for economic development and social justice.

6. State Government and Administration:
Union-State administrative, legislative and financial relations; Role of the Finance Commission; Governor; Chief Minister; Council of Ministers; Chief Secretary; State Secretariat; Directorates.

7. District Administration since Independence:
Changing role of the Collector; Union-State-local relations; Imperatives of development management and law and order administration; District administration and democratic decentralization.

8. Civil Services:
Constitutional position; Structure, recruitment, training and capacity building; Good governance initiatives; Code of conduct and discipline; Staff associations; Political rights; Grievance redressal mechanism; Civil service neutrality; Civil service activism.

9. Financial Management:
Budget as a political instrument; Parliamentary control of public expenditure; Role of finance ministry in monetary and fiscal area; Accounting techniques; Audit; Role of Controller General of Accounts and Comptroller and Auditor General of India.

10. Administrative Reforms since Independence:
Major concerns; Important Committees and Commissions; Reforms in financial management and human resource development; Problems of implementation.

11. Rural Development:
Institutions and agencies since Independence; Rural development programmes: foci and strategies; Decentralization and Panchayati Raj; 73rd Constitutional amendment.

12. Urban Local Government:
Municipal governance: main features, structures, finance and problem areas; 74th Constitutional Amendment; Global-local debate; New localism; Development dynamics, politics and administration with special reference to city management.

13. Law and Order Administration:
British legacy; National Police Commission; Investigative agencies; Role of Central and State Agencies including 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.

SOCIOMETRY
PAPER—I
FUNDAMENTALS OF SOCIOLOGY

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

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

3. Research Methods and Analysis:
   (a) Qualitative and quantitative methods.
   (b) Techniques of data collection.
   (c) Variables, sampling, hypothesis, reliability and validity.

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

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

6. Works and Economic Life:
   (a) Social organization of work in different types of society - slave society, feudal society, industrial capitalist society.
(b) Formal and informal organization of work.
(c) Labour and society.

7. Politics and Society:
   (a) Sociological theories of power.
   (b) Power elite, bureaucracy, pressure groups and political parties.
   (c) Nation, state, citizenship, democracy, civil society, ideology.
   (d) Protest, agitation, social movements, collective action, revolution.

8. Religion and Society:
   (a) Sociological theories of religion.
   (b) Types of religious practices: animism, monism, pluralism, sects, cults.
   (c) Religion in modern society: religion and science, secularization, religious revivalism, fundamentalism.

9. Systems of Kinship:
   (a) Family, household, marriage.
   (b) Types and forms of family.
   (c) Lineage and descent.
   (d) Patriarchy and sexual division of labour.
   (e) Contemporary trends.

10. Social Change in Modern Society:
    (a) Sociological theories of social change.
    (b) Development and dependency.
    (c) Agents of social change.
    (d) Education and social change.
    (e) Science, technology and social change.

PAPER-II

INDIAN SOCIETY : STRUCTURE AND CHANGE

A. Introducing Indian Society:
   (i) Perspectives on the Study of Indian Society:
      (a) Indology (G.S. Ghure).
      (b) Structural functionalism (M. N. Srinivas).
      (c) Marxist sociology (A. R. Desai).
   (ii) Impact of colonial rule on Indian society:
      (a) Social background of Indian nationalism.
      (b) Modernization of Indian tradition.
      (c) Protests and movements during the colonial period.
      (d) Social reforms.

B. Social Structure:
   (i) Rural and Agrarian Social Structure:
      (a) The idea of Indian village and village studies.
      (b) Agrarian social structure—evolution of land tenure system, land reforms.
   (ii) Caste System:
      (b) Features of caste system.
      (c) Untouchability-forms and perspectives.
   (iii) Tribal Communities in India:
      (a) Definitional problems.
      (b) Geographical spread.
      (c) Colonial policies and tribes.
      (d) Issues of integration and autonomy.
   (iv) Social Classes in India:
      (a) Agrarian class structure.
      (b) Industrial class structure.
      (c) Middle classes in India.
   (v) Systems of Kinship in India:
      (a) Lineage and descent in India.
      (b) Types of kinship systems.
      (c) Family and marriage in India.
      (d) Household dimensions of the family.
      (e) Patriarchy, entitlements and sexual division of labour.
   (vi) Religion and Society:
      (a) Religious communities in India.
      (b) Problems of religious minorities.

C. Social Changes in India:
   (i) Visions of Social Change in India:
      (a) Idea of development planning and mixed economy.
      (b) Constitution, law and social change.
      (c) Education and social change.
   (ii) Rural and Agrarian Transformation in India:
      (a) Programmes of rural development, Community Development Programme, cooperatives, poverty alleviation schemes.
      (b) Green revolution and social change.
      (c) Changing modes of production in Indian agriculture.
      (d) Problems of rural labour, bondage, migration.
   (iii) Industrialization and Urbanisation in India:
      (a) Evolution of modern industry in India.
      (b) Growth of urban settlements in India.
      (c) Working class: structure, growth, class mobilization.
      (d) Informal sector, child labour.
      (e) Slums and deprivation in urban areas.
(iv) **Politics and Society:**
(a) Nation, democracy and citizenship.
(b) Political parties, pressure groups, social and political elite.
(c) Regionalism and decentralization of power.
(d) Secularization.

(v) **Social Movements in Modern India:**
(a) Peasants and farmers movements.
(b) Women’s movement.
(c) Backward classes & Dalit movements.
(d) Environmental movements.
(e) Ethnicity and Identity movements.

(vi) **Population Dynamics:**
(a) Population size, growth, composition and distribution.
(b) Components of population growth: birth, death, migration.
(c) Population Policy and family planning.
(d) Emerging issues: ageing, sex ratios, child and infant mortality, reproductive health.

(vii) **Challenges of Social Transformation:**
(a) Crisis of development: displacement, environmental problems and sustainability.
(b) Poverty, deprivation and inequalities.
(c) Violence against women.
(d) Caste conflicts.
(e) Ethnic conflicts, communalism, religious revivalism.
(f) Illiteracy and disparities in education.

**STATISTICS**

**PAPER—I**

1. **Probability:**

Sample space and events, probability measure and probability space, random variable as a measurable function, distribution function of a random variable, discrete and continuous-type random variable, probability mass function, probability density function, vector-valued random variable, marginal and conditional distributions, stochastic independence of events and of random variables, expectation and moments of a random variable, conditional expectation, convergence of a sequence of random variable in distribution, in probability, in 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 function, characteristic function, inversion theorem, Linderberg and Levy forms of central limit theorem, standard discrete and continuous probability distributions.

2. **Statistical Inference:**


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

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

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

3. **Linear Inference and Multivariate Analysis:**

Linear statistical models, theory of least squares and analysis of variance, Gauss-Markoff theory, normal equations, least squares estimates and their precision, test of significance and interval estimates based on least squares theory in oneway, two-way and three-way classified data, regression analysis, linear regression, curvilinear regression and orthogonal polynomials, multiple regression, multiple and partial correlations, estimation of variance and covariance components, multivariate normal distribution, Mahalanobis’s $D^2$ and Hotelling’s $T^2$ statistics and their applications and properties, discriminant analysis, canonical correlations, principal component analysis.

4. **Sampling Theory and Design of Experiments:**

An outline of fixed-population and super-population approaches, distinctive features of finite population sampling, probability sampling designs, simple random sampling with and without replacement, stratified random sampling, systematic sampling and its efficacy, cluster sampling, 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 observation per cell), CRD, RBD, LSD and their analyses, incomplete block designs, concepts of orthogonality and balance, BIBD, missing plot technique, factorial experiments and $2^k$ and $3^k$, 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, 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-Romim tables.

Concept of reliability, failure rate and reliability functions, reliability of series and parallel systems and other simple configurations, renewal density and renewal function. Failure models: exponential, Weibull, normal, lognormal. Problems in life testing, censored and truncated experiments for exponential models.

2. Optimization Techniques:

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

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

Homogeneous discrete-time Markov chains, transition probability matrix, classification of states and ergodic theorems, homogeneous continuous-time Markov chains, Poisson process, elements of queuing theory, M/M/1, M/M/K, G/M/1 and M/G/1 queues.

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

3. Quantitative Economics and Official Statistics:

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

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

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

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

4. Demography and Psychometry:

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

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

ZOLOGY

PAPER-I

1. Non-chordata and Chordata:

(a) Classification and relationship of various phyla up to subclasses: Acoelomate and Coelomate, Protostomes and Deuterostomes, Bilateria and Radiata; Status of Protista, Parazoa, Onychophora and Hemichordata; Symmetry.
2. Ecology:

(a) Biosphere: concept of biosphere; biomes, Biogeochemical cycles, Human induced changes in atmosphere including green house effect, ecological succession, biomes and ecotones, community ecology.

(b) Concept of ecosystem; structure and function of ecosystem, types of ecosystem, ecological succession, ecological adaptation.

(c) Population; characteristics, population dynamics, population stabilization.

(d) Biodiversity and diversity conservation of natural resources.

(e) Wildlife of India.

(f) Remote sensing for sustainable development.

(g) Environmental biodegradation; pollution and its impact on biosphere and its prevention.

3. Ethology:

(a) Behaviour: Sensory filtering, responsiveness, sign stimuli, learning, and memory, instinct, habituation, conditioning, imprinting.

(b) Role of hormones in drive; role of pheromones in alarm spreading; crypsis, predator detection, predator tactics, social hierarchies in primates, social organization in insects.

(c) Orientation, navigation, homing; biological rhythms: biological clock, tidal, seasonal and circadian rhythms.

(d) Methods of studying animal behaviour including sexual conflict, selfishness, kinship and altruism.

4. Economic Zoology:

(a) Apiculture, sericulture, lac culture, carp culture, pearl culture, prawn culture, vermiculture.

(b) Major infectious and communicable diseases (malaria, filaria, tuberculosis, cholera and AIDS) their vectors, pathogens and prevention.

(c) Cattle and livestock diseases, their pathogen (helminths) and vectors (ticks, mites, Tabanus, Stomoxys).

(d) Pests of sugar cane (Pyrrilla perpusiella), oil seed (Achaeajanata) and rice (Sitophilus oryzae).

(e) Transgenic animals.

(f) Medical biotechnology, human genetic disease and genetic counselling, gene therapy.

(g) Forensic biotechnology.

5. Biostatistics: Designing of experiments; null hypothesis; correlation, regression, distribution and measure of central tendency, chi square, student-test, F-test (one-way & two-way F-test).
6. Instrumentation methods:
(a) Spectrophotometer, phase contrast and fluorescence microscopy, radioactive tracer, ultra centriuge, gel electrophoresis, PCR, ELISA, FISH and chromosome painting.
(b) Electron microscopy (TEM, SEM).

PAPER II

1. Cell Biology:
(a) Structure and function of cell and its organelles (nucleus, plasma membrane, mitochondria, Golgi bodies, endoplasmic reticulum, ribosomes and lysosomes), cell division (mitosis and meiosis), mitotic spindle and mitotic apparatus, chromosome movement chromosome type ploytene and lambrush, organization of chromatin, heterochromatin. Cell cycle regulation.
(b) Nucleic acid topology, DNA motif, DNA replication, transcription, RNA processing, translation, protein foldings and transport.

2. Genetics:
(a) Modern concept of gene, split gene, genetic regulation, genetic code.
(b) Sex chromosomes and their evolution, sex determination in Drosophila and man.
(c) Mendel’s laws of inheritance, recombination, linkage, multiple alleles, genetics of blood groups, pedigree analysis, hereditary diseases in man.
(d) Mutations and mutagenesis.
(e) Recombinant DNA technology, plasmid, cosmid, artificial chromosomes as vectors, 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 AFLP and application of RFLP in DNA finger-printing, ribozyme technologies, human genome project, genomics and proteomics.

3. Evolution:
(a) Theories of origin of life.
(b) Theories of evolution; Natural selection, role of 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 and biodiversity.

5. Biochemistry:
(a) Structure and role of carbohydrates, fats, fatty acids, cholesterol, proteins and amino-acids, nucleic acids. Bioenergetics.
(b) Glycolysis and Krebs cycle, oxidation and reduction, oxidative phosphorylation; energy conservation and release, ATP, cycl cyclic AMP-its structure and role.
(c) Hormone classification (steroid and peptide hormones), biosynthesis and functions.
(d) Enzymes: types and mechanisms of action.
(e) Vitamins and co-enzymes.
(f) Immunoglobulin and immunity.

6. Physiology (with special reference to mammals):
(a) Composition and constituents of blood; blood groups and Rh factor in man; factors and mechanism of coagulation; iron metabolism, acid-base balance, thermo regulation, anticoagulants.
(b) Haemoglobin: Composition, types and role in transport of oxygen and carbon dioxide.
(c) Digestion and absorption: Role of salivary glands, liver, pancreas and intestinal glands.
(d) Excretion: nephron and regulation of urine formation; osmo-regulation and excretory product.
(e) Muscles: Types, mechanism of contraction of skeletal muscles, effects of exercise on muscles.
(f) Neuron: nerve impulse—its conduction and synaptic transmission; neurotransmitters.
(g) Vision, hearing and olfaction in man.
(h) Physiology of reproduction puberty and menopause in human.

7. Developmental Biology:
(a) Gametogenesis; spermatogenesis, composition of semen, in vitro and in vivo capitation of mammalian sperm, Oogenesis, totipotency; fertilization, morphogenesis and morphogen; blastogenesis, establishment of body axes formation, fate map, gestulation in frog and chick; genes in development in chick homeotic genes, development of eye and heart, placenta in mammals.
(b) Cell lineage, cell to cell interaction, Genetic and induced teratogenesis, role of thyroxine in control of metamorphosis in amphibia, paedogenesis and 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.
Appendix-II

Instructions to the Candidates for filling online applications

Candidates are required to apply Online using the website www.upscon-line.nic.in.

Salient features of the system of Online Application Form are given hereunder:

- Detailed instructions for filling up online applications are available on the above mentioned website.
- Candidates will be required to complete the Online Application Form containing two stages viz. Part-I and Part-II as per the instructions available in the above mentioned site through drop down menus.
- The candidates are required to pay a fee of Rs.100/- Rupees One Hundred only) [excepting SC/ST/ Female/Persons with Benchmark Disability candidates who are exempted from payment of fee] either by depositing the money in any branch of State Bank of India by cash, or by using net banking facility of State Bank of India or by using any Visa/Master/RuPay Credit/Debit Card.
- Before start filling up of Online Application, a candidate must have his/her photograph and signature duly scanned in the jpg format in such a manner that each file should not exceed 40 KB and must not be less than 3 KB in size for the photograph and 1 KB for the signature.
- The Online applications (Part I and II) can be filled from 7th February, 2018 to 6th March, 2018 till 18:00 Hrs.
- Applicants should avoid submitting multiple applications. However, if due to any unavoidable circumstances, any applicant submits multiple applications then he/she must ensure that the applications with higher RID is complete in all respects.
- In case of multiple applications, the applications with higher RID shall be entertained by the Commission and fee paid against one RID shall not be adjusted against any other RID.
- The applicants must ensure that while filling their Application Form, they are providing their valid and active E-Mail IDs as the Commission may use electronic mode of communication while contacting them at different stages of examination process.
- The applicants are advised to check their emails at regular intervals and ensure that the email addresses ending with @ nic.in are directed to their inbox folder and not to the SPAM folder or any other folder.
- **Candidates are strongly advised to apply online well in time without waiting for the last date for submission of Online Applications.**
APPENDIX-III

Special Instructions to Candidates for objective type tests

1. Articles permitted inside Examination Hall
   Clip board or hard board (on which nothing is written), a good quality black ball pen for making responses on the Answer Sheet. Answer Sheet and sheets for rough work will be supplied by the Invigilator.

2. Articles not permitted inside Examination Hall
   Do not bring into the Examination Hall any article other than those specified above, e.g., books, notes, loose sheets, electronics or any other type of calculators, mathematical and drawing instruments. Log Tables, stencils of maps, slide rules, Test Booklets and rough sheets pertaining to earlier session(s), etc.

3. THERE WILL BE PENALTY (NEGATIVE MARKING) FOR WRONG ANSWERS MARKED BY A CANDIDATE IN THE OBJECTIVE TYPE QUESTION PAPERS.

(i) There are four alternatives to the answer for every question. For each question for which a wrong answer has been given by the candidate, one-fourth (0.25) 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 happens 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. Unfair means strictly prohibited
   No candidate shall copy from the papers of any other candidate nor permit his papers to be copied nor give nor attempt to give nor obtain nor attempt to obtain irregular assistance of any description.

5. Conduct in Examination Hall
   No candidate should misbehave in any manner or create disorderly scenes in the Examination Hall or harass the staff employed by the Commission for the conduct of the examination. Any such misconduct will be severely penalized.

6. Answer Sheet particulars
   (i) Write in black ball pen your Centre and subject followed by test booklet series (in bracket), subject code and roll number at the appropriate space provided on the answer sheet at the top. Also encode your booklet series (A, B, C or D, as the case may be), subject code and roll number in the circles provided for the purpose in the answer sheet. The guidelines for writing the above particulars and for encoding the above particulars are given in Annexure. In case the booklet series is not printed on the test booklet or answer sheet is unnumbered, please report immediately to the Invigilator and get the test booklet/answer sheet replaced.
   (ii) All corrections and changes in writing the roll number must be initialed by the candidates as well as by the Invigilator and countersigned by the Supervisor.
   (iii) Immediately after commencement of the examination please check that the test booklet supplied to you does not have any unprinted or torn or missing pages or items etc. If so, get it replaced by a complete test booklet of the same series and subject.

7. Do not write your name or any other thing on the specific items of information asked for, on the answer sheet/test booklet/ sheet for rough work.

8. Do not fold or mutilate or damage or put any extraneous marking in the Answer Sheet. Do not write anything on the reverse of the answer sheet.

9. Since the answer sheets will be evaluated on computerised machines, candidates should exercise due care in handling and filling up the answer sheets. They should use black ball pen only to darken the circles.

For writing in boxes also, they should use black ball pen. Since the entries made by the candidates by darkening the circles will be taken into account while evaluating the answer sheets on computerised machines, they should make these entries very carefully and accurately.

10. Method of marking answers
   In case of "OBJECTIVE TYPE" of examination, you do not write the answers. For each question (hereinafter referred to as "Item") several suggested answers (hereinafter referred to as "Responses") are given. You have to choose one response to each item.

The question paper will be in the Form of TEST BOOKLET. The booklet will contain bearing numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10. Each item, Responses marked (a), (b), (c), (d) will be given. Your task will be to choose the correct response. If you think there is more than one correct response, then choose what you consider the best response. In any case, for each item you are to select only one response. If you select more than one response, your response will be considered wrong.

In the Answer Sheet, Serial Nos. from 1 to 160 are printed. Against each numbers, there are circles marked (a), (b), (c) and (d). After you have read each item in the Test booklet and decided which one of the given responses is the correct one, you have to mark your response by completely blackening with black ball pen to indicate your response. For example, if the correct answer to item 1 is (b), then the circle containing the letter (b) is to be completely blackened with black ball pen as shown below.

Example: (a) (c) (d)

11. Entries in Scannable Attendance List
   Candidates are required to fill in the relevant particulars with black ball pen only against their columns in the Scannable Attendance List, as given below:
   i) Blacken the circle [P] under the column [Present/Absent]
   ii) Blacken the relevant circle for Test Booklet Series
   iii) Write Test Booklet Serial No.
   iv) Write the Answer Sheet Serial No. and also blacken the corresponding circles below.
   v) Append signature in the relevant column

12. Please read and obey by the instructions on the cover of Test booklet. If any candidate indulges in disorderly or improper conduct, he will render himself liable for disciplinary action and/or imposition of a penalty as the Commission may deem fit.

ANNEXURE

How to fill in the Answer Sheet of objective type tests in the Examination Hall
Please follow these instructions very carefully. You may note that since the answer sheets are to be evaluated on machines, any violation of these instructions may result in reduction of your score for which you would yourself be responsible.

Before you mark your responses on the Answer Sheet, you will have to fill in various particulars in it.

As soon as the candidate receives the Answer Sheet, he should check that it is numbered at the bottom. If it is found un-numbered he should at once get it replaced by a numbered one.

You will see from the Answer Sheet that you will have to fill in the top line, which reads thus:

<table>
<thead>
<tr>
<th>Centre</th>
<th>Subject Code</th>
<th>Roll Number</th>
</tr>
</thead>
</table>

If you are, say, appearing for the examination in Delhi Centre for the General Ability Test Papers and your Roll No. is 0812709, and your test booklet series is 'A' you should fill in thus, using black ball pen

<table>
<thead>
<tr>
<th>Centre Delhi</th>
<th>Subject Code</th>
<th>Roll Number</th>
</tr>
</thead>
</table>

For Mathematics * subject paper of 'A' Test Booklet Series you have to encode the subject code, which is 0. Do it thus:

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Roll Number</th>
</tr>
</thead>
</table>

All that is required is to blacken completely the circle marked 'A' below the Booklet Series and below the subject code blacken completely the Circles for "0" (in the first vertical column) and "1" (in the second vertical column). You should enter the roll No. 0812769. Do it thus similarly:

Important: Please ensure that you have carefully encoded your subject, Test Booklet series and Roll Number.

This is just illustrative and may not be relevant to your Examination.

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