

**ANDHRA PRADESH PUBLIC SERVICE COMMISSION: HYDERABAD**

**NOTIFICATION NO. 08/2010**

**SPECIAL RECRUITMENT FOR SC,ST BACKLOG VACANCIES  
(LIMITED RECRUITMENT-2010)**

**Date of Notification: 25/06/2010**

**Para-1:**

Applications are invited On-line through the proforma Application to be made available on WEBSITE ([www.apspsc.gov.in](http://www.apspsc.gov.in)) from 27/08/2010 to 18/09/2010 (**Note: 15/09/2010 last date for payment of processing fees**) for recruitment to the various posts meant for SC, ST Candidates.

The commission has dispensed with the sale of applications through HPO's / Sales Counter of Commission's office. The desirous eligible Candidates may apply ON-LINE by satisfying themselves with the terms and conditions of this recruitment. The details are as follows:-

PC. No.	Name of the Post	Zone/ M.Z	Community	Age as on 01/07/2008	Scale of Pay Rs. (Pre-Revised)
01	Dental Asst. Surgeon in A.P. IMS	SL	ST(W)-1	18-44	11755-26300
02	Inspector of Boilers in A.P. Boiler Service	SL	SC(W)-1	18-44	10845-25600
03	Child Development Project Officer in WD&CW Dept.,	MZ-I	SC(W)-1	18-44	9285-21550
04	Lecturer in Govt., Polytechnic Colleges in Sugar Tech.	IV	SC(W) -1L	18-45	10,845-22,955
05	Civil Assistant Surgeon in Insurance Medical Service.	I	ST(W) -1L	18-44	11755-26300
		III	ST(W) -1L		
		IV	SC(W) -1L		
		VI	SC(W) -1L		
06	Assistant Electrical Inspectors in A.P. Electrical Inspectorate Services	SL	ST(W)-1 SC(W)-1 SC(G)-1	18-44	10845- 26600
07	Assistant Director of Mines in A.P. Mining Service	SL	SC(W)-1	18-44	10285-24200
08	Technical Assistants in Geophysics in Ground Water Sub – Service	Z-IV	SC/ST- 2L ST/SC- 1L	18-44	9285-21550
09	Assistant Engineer in Ground Water Dept.,	IV	SC(W)-1L	18-44	8815-20300
		VI	ST(W)-1L		
10	Prohibition & Excise Sub Inspector in A.P. Prohibition & Excise Sub-Service	I	ST(G) -2L SC(W) -2L	18-40	6675-15500
		V	ST(W) -1L		
11	Sr. Stenographers in A.P. Sect., Law Dept.,	SL	SC/ST(W)-1	18-44	6675-15500
12	Executive Officer Grade-III in A.P. Endowments Sub-Service	KST	ST(W)-1L	18-44	4825-10845
		KRMN	SC(W)-1L		
		WG	ST(W)-1L		
13	Junior Stenographer in Industrial Tribunal – Hyd.	SL	SC(W)-1	18-44	4825-10845
14	Junior Stenographers (English / Telugu) in HODs	SL	ST(G)-2	18-44	4825-10845
15	Typists in Heads of Dept., (Group-IV)	SL	ST(W)- 5	18-44	4825-10845
			ST(G) -1		
			SC(G) -1		
16	Junior Assistants in Engg. Labs & in Engineer in. Chief Panchayat Raj	SL	ST(W)-1 SC(W)-1	18-44	4825-10845

**NOTE:**

1. THE APPLICANTS ARE REQUIRED TO GO THROUGH THE USER GUIDE AND DECIDE THEMSELVES AS TO THEIR ELIGIBILITY FOR THIS RECRUITMENT CAREFULLY BEFORE APPLYING AND ENTER THE PARTICULARS COMPLETELY ONLINE. ALL CANDIDATES HAVE TO PAY RS. 25/- (RUPEES TWENTY FIVE ONLY) TOWARDS APPLICATION PROCESSING FEE.
2. APPLICANT MUST COMPULSORILY FILL-UP ALL RELEVANT COLUMNS OF APPLICATION AND SUBMIT APPLICATION THROUGH WEBSITE ONLY. THE PARTICULARS MADE AVAILABLE IN THE WEBSITE SHALL BE PROCESSED THROUGH COMPUTER AND THE ELIGIBILITY DECIDED IN TERMS OF NOTIFICATION AND CONFIRMED ACCORDINGLY.
3. THE APPLICATIONS RECEIVED ONLINE IN THE PRESCRIBED PROFORMA AVAILABLE IN THE WEBSITE AND WITHIN THE TIME SHALL ONLY BE CONSIDERED AND THE COMMISSION WILL NOT BE HELD RESPONSIBLE FOR ANY KIND OF DISCREPANCY.

4. APPLICANTS MUST COMPULSORILY UPLOAD HIS/HER OWN SCANNED PHOTO AND SIGNATURE THROUGH J.P.G FORMAT.
5. ALL THE ESSENTIAL CERTIFICATES ISSUED BY THE COMPETENT AUTHORITY SHALL COMPULSORILY BE KEPT WITH THE APPLICANTS TO PRODUCE AS AND WHEN REQUIRED, ON THE DAY OF VERIFICATION DATE ITSELF FOR VERIFICATION. IF CANDIDATES FAIL TO PRODUCE THE SAME, THE CANDIDATURE IS REJECTED / DISQUALIFIED WITHOUT ANY FURTHER CORRESPONDENCE.
6. THE APPLICANTS SHOULD NOT FURNISH ANY PARTICULARS THAT ARE FALSE, TAMPERED, FABRICATED OR SUPPRESS ANY MATERIAL INFORMATION WHILE MAKING AN APPLICATION THROUGH WEBSITE.
7. **IMPORTANT:-** HAND WRITTEN/TYPED/PHOTOSTAT COPIES/PRINTED APPLICATION FORM WILL NOT BE ENTERTAINED.

N.B:- 1) The Applicants are advised to pay the processing fee and submit their applications ON-LINE well in advance of the last dates i.e., **15/09/2010 for submission of Applications.**  
2) On **18/09/2010** on-line submission closes by 5.00 P.M.

**IMPORTANT NOTE:** Distribution of vacancies among roster points is subject to variation and confirmation from the Unit Officer/ Appointing authority.

### **NOTE ON IMPORTANT LEGAL PROVISIONS GOVERNING THE RECRUITMENT PROCESS:**

1. **Vacancies:** The recruitment will be made to the vacancies notified only. There shall be no waiting list as per G.O.Ms.No. 81 General Administration (Ser.A) Department, Dated 22/02/1997 and Rule 6 of APPSC Rules of procedure. The vacancies are only approximate, subject to variation and confirmation by the Unit Officer, till such time as decided by the Commission and in any case, no cognisance will be taken by Commission of any vacancies arising or reported after the completion of the selection and recruitment process or the last date as decided by the Commission as far as this Notification is concerned, and these will be further dealt with as per G.O. & Rule cited above.
2. The Recruitment will be processed as per this Notification and also as per the Rules and Instructions issued by the Government and also as decided by the Commission from time to time in terms of respective Special Rules/Adhoc Rules governing the Recruitment and G.O. Ms. No. 183, HM&FM(Q1) dt. 04/05/1996, G.O. Ms. No. 128, I.E&T.E(Lab.IV) Dept., dt. 23/06/1988 read with G.O. Ms. No. 135, Energy (CCB) Dept., dt. 04/12/2002, G.O. Ms. No. 5, WD.CW&DW(Estt.) dt. 01/02/2001, G.O. Ms. No. 178, HE(T.E.I-2) Dept., dt. 09/12/2005, G.O. Ms. No. 200, E.F.E.S&T., dt. 07/08/1990, G.O. Ms. No. 59, Industries and Commerce (Mines.I) dt. 10/03/1998, G.O. Ms. No. 385, I&C (M-I) Dept., dt. 07/05/1979, G.O. Ms. No. 357, I&CAD(CAD.SER.I) Dept., dt. 04/12/1992, G.O. Ms. No. 950, Revenue (Excise-I) Dept., dt. 28/11/1998, G.O. Ms. No. 455, GA(Ser.A) Dept., dt. 31/12/1997, G.O. Ms. No. 261, GA(Ser.B) Dept., dt. 04/07/1998, G.O. Ms. No. 262, Revenue (Endowments-I) Dept., dt. 20/05/2002, APMS Rules 1998 issued in G.O. Ms. No. 261 GA(Ser.B) Dept., dt. 14/07/1998 departmental respective Special Rules and other related G.Os, Rules etc. applicable in this regard.
3. **Caste & Community:** Community Certificate issued by the competent authority in terms of G.O.Ms No. 58, SW (J) Dept., dt: 12/5/97 should be submitted at appropriate time. As per General Rules for State and Subordinate Service Rules, Rule 2 (28) Explanation:- No person who professes a religion different from Hinduism shall be deemed a member of scheduled caste.
4. The Scheme of local reservation, wherever applicable has been indicated in the table at Para-1. The candidates may refer the same for applying the local posts including the definition of local cadres Para-7 of this Recruitment Notification.
5. Reservation and eligibility in terms of General Rule 22 & 22 (A) of A.P. State and Subordinate Service Rules are applicable subject to respective Special/ Adhoc Rules (Except Pc. No. 02 & 10).
6. **Rules:** All are informed that the various conditions and criterion prescribed herein are governed by the General Rules of A.P. State and Subordinate Service Rules, 1996 read with the relevant Special Rules applicable to any particular service in the departments. Any guidelines or clarification is based on the said Rules, and, in case of any necessity, any matter will be processed as per the relevant General and Special Rules cited as in force.
7. The Commission is empowered under the provisions of Article 315 and 320 of the Constitution of India read with relevant laws, rules, regulations and executive instructions and all other enabling legal provisions in this regard to conduct examination for appointment to the posts notified herein, duly following the principle of order of merit as per Rule 3(vi) of the APPSC Rules of Procedure read with relevant statutory provisions and ensuring that the whole recruitment and selection process is carried out with utmost regard to maintain secrecy and confidentiality so as to ensure that the principle of merit is scrupulously followed. A candidate shall be disqualified for appointment, if he himself or through relations or friends or any others has canvassed or endeavored to enlist for his candidature, extraneous support, whether from official or non-official sources for appointment to this service.
8. The Commission is also empowered to invoke the penal provisions of the A.P. Public Examinations (Prevention of Malpractices) and unfair means Act 25/97 and for matters connected therewith or incidental thereto in respect of this Notification.
9. The Reservation to Women will apply as per General Rules and Special Rules.
10. The persons already in Government Service/ Autonomous bodies/ Government aided institutions etc., whether in permanent or temporary capacity or as work charged employees are however required to inform in writing, their Head of Office/ Department, that they have applied for this recruitment.

11. The persons already in Government Service/ Autonomous bodies/ Government aided institutions etc., whether in permanent or temporary capacity or as work charged employees are however required to inform in writing, their Head of Office/ Department, that they have applied for this recruitment.

**Para-2: EDUCATIONAL AND OTHER QUALIFICATIONS:**

Applicants must possess the educational and other qualifications from a recognized University as detailed below or equivalent thereto, subject to various specifications in the relevant service rules as on the date of notification. (i.e., 25/06/2010).

PC. No.	Educational Qualification
01	B.D.S. Degree or an equivalent qualification as recognized by the Dental Council of India.
02	Candidates must possess a Bachelors Degree in Mechanical Engineering or its equivalent and Boiler Operation Engineer proficiency Certificate where class is not mentioned or First Class Boiler operation Engineer Proficiency Certificate where class is mentioned, issued by the Board of Examiners under the Andhra Pradesh Boiler Operation Engineer Rules or by the authority of other States, competent to issue such certificate. (As prescribed under Rule 5 of A.P. Boiler Service Rules issued vide G.O. Ms. No.128, dt. 23/06/1988 of Labour Employment & Technical Education (Lab IV) Dept., and as amended in G.O. Ms. No. 135, dt. 04/12/2002, of Energy (CCB) Dept.,)
03	Bachelor's Degree in Home Science or Social Work or Sociology of a recognized University.
04	A Degree in Sugar Technology (B.E./ B.Tech.) with not less than 55% of marks. If candidates with prescribed qualifications are not available, candidates with degree in " Chemical Engineering" (B.E./ B.Tech./ A.M.I.E.(A & B) with not less than 55% of marks with Sugar Technology as an elective subject in the final year will be considered.
05	(a) M.B.B.S. Degree or an equivalent qualification as entered in the schedule to the Indian Medical Council Act, 1956 as subsequently amended. (b) Must be a permanent Registered Medical Practitioner with in the meaning of the Law for the time being existing in the state.
06	Must possess Bachelors Degree in Electrical Engineering. <b>Experience:</b> 3 Years practical experience in Electrical Engineering of which not less than one year shall be in the field of Electrical and Mechanical Workshop or Generation or Transmission or Distribution of Electricity or in the administration of I.E. Act, 1910 and the rules made there under in a position of responsibility. N.B:- Experience Certificate should be from an Electrical Contractor [License Grade-A/Grade-B Form HA/HB] issued by the Electrical Licensing Board to the company where he/she has worked.
07	Must possess a Degree in Mining Engineering from any University of India established or incorporated by or under a Central Act or Provincial Act or a State Act or an Institution recognized by the University Grants Commission; or a Diploma in Mining Engineering from the Indian School of Mines, Dhanbad or an equivalent Diploma from any other recognized Institute.
08	M.Sc or M.Sc. (Tech.) or M.Tech. or its equivalent in Geophysics from a University recognized by U.G.C.
09	Diploma in Civil Engineering or any other equivalent Qualification.
10	A Bachelor's Degree from any recognized University in India established or incorporated by or under Central Act, Provincial Act, a State Act or an Institution recognized by the U.G.C. or an equivalent qualification. Note:- I) <u>Physical Requirements</u>  i) FOR MEN: i) Must not be less than 165 Cms. in height. ii) Must not be less than 81 Cms. round the Chest on full expiration with a minimum expansion of 5 Cms.  Provided if ST candidates with above measurements are not available, it may be relaxed the requisite height and it shall not be less than 160 Cms. Provided the members of A.P.M.S; Drivers and Attenders working in Prohibition & Excise Department shall possess a minimum height of 163 Cms., if otherwise eligible. ii) FOR WOMEN: i) Must not be less than 152.5 Cms. in height. ii) Must not weigh less than 45.5 Kgs.  <u>VISUAL STANDARDS: (For both Men &amp; Women)</u>  (a)(i) Right Eye      Near Vision    0.5 (Snellen) Distant      6/6. (ii) Left Eye      Near Vision    0.5 (Snellen) Distant      6/6. (b) Each eye must have a full field of vision. (c) Colour blindness, squint or any morbid condition of the eyes or lids of either eye, knock knees, pigeon chest, flat foot, varicose veins, hammer-toes, fractured limbs or decayed teeth shall be deemed to be disqualification.

11	Bachelor's Degree of a University; and a) Pass in Typewriting Higher English and Shorthand Higher (English), and b) Pass in Typewriting Lower Telugu and Shorthand Lower (Telugu).
12	Must possess a Bachelor's Degree from a University. Note: Candidates shall profess Hindu Religion as per sub section (4) of Section 29 of the A.P.C. & H.R.I. and Endowments Act 30/87.
13	(i) Must have passed Intermediate Examination or its equivalent Examination. (ii) Must have passed the Government Technical Examination in Typewriting by the Higher Grade.in (English) (iii) The Government Technical Examination in Shorthand by the Higher Grade (English). If however persons who have passed the examinations on Typewriting or Shorthand by the Higher Grade in English are not available those who have passed the examination by the Lower Grade (English) may be appointed.
14	(i) Must have passed Intermediate Examination or its equivalent Examination. (ii) Must have passed the Government Technical Examination in Typewriting by the Higher Grade in the relevant language; and (iii) The Government Technical Examination in Shorthand by the Higher Grade in the relevant language. If however persons who have passed the examinations on Typewriting or Shorthand by the Higher Grade are not available those who have passed the examination by the Lower Grade may be appointed. Note: In the case of Telugu Typist the pass in the Typewriting exam shall be on the Typewriter with Government Standard Key Board.
15	(i) Must have passed Intermediate Examination or its equivalent Examination. (ii) Must have passed the Government Technical Examination in Typewriting by the Higher Grade in Telugu on a Government standard Key Board. (iii) Provided that if persons with the qualification prescribed in item (ii) above are not available candidates who have passed the above examination in Typewriting by Lower Grade may if otherwise qualified be appointed. (iv) Provided further that candidates who possess Typewriting qualification in English by Lower Grade besides the qualifications mentioned in items (ii) and (iii) above shall be given preference for appointment by direct recruitment. Note(1): If sufficient number of candidates with Telugu Typewriting qualifications are not available for appointment by direct recruitment as Typists candidates with English Typewriting qualification may be appointed subject to the condition that he/she should acquire the Telugu Typewriting qualification within the period of probation on pain of postponement of Increment without Cumulative effect. Note(2): In the case of Telugu Typist the pass in the Typewriting Exam shall be on the Typewriter with Government Standard Key Board.
16	A Bachelors Degree of recognized University.

**Para-3: AGE:-** The candidates should fulfill the minimum and maximum age criteria as indicated in Para-1 as on 01/07/2008.

**NOTE:** The upper age limit prescribed above is relaxable in the following cases:

S. No	Category of candidates	Relaxation of age permissible
1	2	3
1.	Retrenched temporary employees in the State Census Department with a minimum service of 6 months.	3 Years
2.	A.P. State Government Employees (Employees of APSEB, APSRTC, Corporations, Municipalities etc. are not eligible).	5 Years based on the length of regular service.(ceiling for 5 Years)
3.	Ex-Service men	3 Years & length of service rendered in the armed forces.
4.	N.C.C. (who have worked as instructor in N.C.C.)	3 Years & length of service rendered in the N.C.C.

**Para-4: FEE:** All candidates are exempted from payment of Fee. The SC/ST Candidates belonging to other states are not entitled to apply as it is a backlog Recruitment.

**Para-5: PROCEDURE OF SELECTION:**

(1) THE SELECTION OF CANDIDATES FOR APPOINTMENT TO THE POSTS WILL BE MADE IN TWO SUCCESSIVE STAGES VIZ.,

- (i) Written Examination (Objective Type) for eligible candidates.
- (ii) Oral Test in the shape of Interview only for those who qualify for it as per rules.

(2) FINAL SELECTION FOR THESE POSTS WILL BE BASED ON MERIT AFTER THE WRITTEN AND ORAL TEST (INTERVIEW) MARKS ARE PUT TOGETHER. FROM AMONGST

THOSE CANDIDATES WHO QUALIFIED & ATTENDED THE ORAL TEST (INTERVIEW) AS PER RULES.

(3) The candidate will be selected and allotted as per order of zonal preference for allotment of candidates against NL/L vacancies. Mere claim of preference for any zone for allotment against NL/L vacancy does not confer a right to selection for that zone in particular or any zone in general. It is hereby clarified that the said preferences are only indicative for being considered to the extent possible but not binding or limiting the Commission's powers enjoyed under the Article 315 and 320 of the Constitution of India.

(4) The appearance in all the papers at the Written Examination is compulsory. And also for appearance for Oral Test in the shape of Interview in case called upon if qualified for the same as per rules is compulsory. Absence in any of the above will automatically render his candidature as disqualified.

(5) Candidates have to produce Original documents and other particulars **on the day of verification date itself** for verification as and when required and called for. If **candidate fails to produce the certificates if any one, and** the particulars furnished in the Application do not tally with the Original documents produced by the candidate, the candidature will be rejected/**disqualified without any further correspondence**. As candidature for the recruitment is processed through Computer/Electronic devices based on the particulars furnished in the Application Form, the candidate is advised to fill in all the relevant particulars carefully.

(6) Reservation to Local candidates is applicable in terms of (i) orders issued by the Government in A.P. Public Employment (Organization of Local Cadres and Regulation of Direct Recruitment) Order 1975, i.e. Presidential Order, (ii) G.O.Ms.No. 674, General Administration (SPF-A) Department, Dated 28/10/1975, (iii) G.O.Ms.No.124, General Administration (SPF-A) Department, Dated 07/03/2002 and (iv) Departmental Special/Adhoc Rules.

(7) Minimum qualifying marks for admission to interview or selection shall be 30% for SCs & STs. However the Commission can relax the minimum qualifying marks, if the Commission is of the opinion that SC/ST candidates are not likely come up for interview.

(8) After Written Examination, eligible candidates are called for interview at the ratio of 1:2 with reference to the number of confirmed vacancies duly following the rules in force.

(9) The following notified category of posts do not have interview part. The selection may be based on the written marks / performance.

- i) Pc. No. 11: Sr. Stenographers in A.P. Sect., Law Dept.,
- ii) Pc. No. 13: Junior Stenographer in Industrial Tribunal – Hyd.
- iii) Pc. No. 14: Junior Stenographers (English / Telugu) in HODs
- iv) Pc. No. 15: Typists in Heads of Dept., (Group-IV)
- v) Pc. No. 16: Junior Assistants in Engg. Labs & in Engineer in. Chief Panchayat Raj

**Para-6: SCHEME OF EXAMINATION:** The Scheme and Syllabus for the Written Examination (Post-wise) has been shown in Annexure-I. The Written Examination will be "Objective Type". The appearance in all the papers in the Written Examination is compulsory for considering for Oral Test (Interview) and also for interview only for those candidates qualified as per rules, otherwise the candidature shall be liable for invalidation.

**Para-7: RESERVATION TO LOCAL CANDIDATES:**

**For Post Code No. 4,5,8,9&10:** Reservation to the Local candidates is applicable as provided in the Rules and as amended from time to time as in force on the date of Notification.

**DEFINITION OF LOCAL CANDIDATE:**

(A) (i) "LOCAL CANDIDATE" means a candidate for direct recruitment to any post in relation to that Local areas where he/she has studied in Educational Institution(s) for not less than four consecutive academic years prior to and including the year in which he/she appeared for S.S.C or its equivalent examination. If however, he/she has not studied in any educational institution during the above four years period, it is enough if he/she has resided in that area which is claimed as his/her local area during the above said period.

(ii) In case the candidate does not fall within the scope of the above it will be considered if he/she has studied for a period of not less than seven years prior to and inclusive of the year in which he/she has studied for the maximum period out of the said period of seven years AND where the period of his/her study in two or more local areas are equal such local area where he/she has studied last (in such local area) will be taken for determining the local candidature. Similarly, if he/she has not studied during the above said period in any Educational Institution(s) the place of residence during the above period will be taken into consideration and local candidature determined with reference to the maximum period of residence or in the case of equal period where he/she has resided last.

(iii) If the claim for local candidature is based on study, the candidate is required to produce a certificate from the Educational Institution(s) where he/she has studied during the said 4/7-year period. If, however, it is based on residence, a certificate should be submitted as and when asked to do so (See relevant enclosure) obtained from an officer of the Revenue Department not below the rank of a Mandal Revenue Officer in independent charge of a Mandal.

(iv) If however, a candidate has resided in more than one Mandal during the relevant four/seven years period but within the same District or Zone as the case may be separate certificates from the Mandal Revenue Officers exercising jurisdiction have to be obtained in respect of different areas.

**NOTE:** (A) Single certificate, whether of study or residence would suffice for enabling the candidate to apply as a "**LOCAL CANDIDATE**".

(B) RESIDENCE CERTIFICATE WILL NOT BE ACCEPTED, IF A CANDIDATE HAS STUDIED IN ANY EDUCATIONAL INSTITUTION UPTO S.S.C. OR EQUIVALENT EXAMINATION, SUCH CANDIDATES HAVE TO PRODUCE STUDY CERTIFICATES INVARIABLY. THE CANDIDATES, WHO ACQUIRED DEGREE FROM OPEN UNIVERSITIES WITHOUT STUDYING SSC/ MATRICULATION OR EQUIVALENT IN EDUCATIONAL INSTITUTIONS, HAVE TO SUBMIT RESIDENCE CERTIFICATE ONLY. (SEE THE RELEVANT ENCLOSURE)

(C) Each of the following Zones comprises the Districts mentioned against each Zone.

**Zones:**

1. Srikakulam, Visakhapatnam and Vizianagaram. (SKM, VSP, VZM)
2. East Godavari, West Godavari and Krishna. (EG, WG, KST)
3. Guntur, Prakasam and Nellore. (GNT, PKM, NLR)
4. Chittoor, Kadapa, Anantapur and Kurnool. (CTR, KDP, ATP, KNL)
5. Adilabad, Karimnagar, Warangal and Khammam. (ADB, KRMN, WGL, KMM)
6. Ranga Reddy, Nizamabad, Mahaboobnagar, Medak and Nalgonda. Excluding the area under City of Hyderabad. (RRD, NZB, MBNR, MDK, NLG, HYD)

**City Cadre:** City of Hyderabad consists of Hyderabad Division, Secunderabad Division of Municipal Corporation of Hyderabad, Secunderabad Contonment area, O.U.Campus, Fatehnagar, Bowenpally, Macha Bolarum, Malkajgiri, Uppal Khalsa, Alwal, Balanagar, Moosapet, Kukatpally Panchayat Areas and Zamistanpur and Lallaguda villages. (HYD)

Preference 7 means – City Cadre (city of Hyderabad)

**For Post Code No. 1,2,6,7,11 and 13 to 16:** Reservation for local candidates is not applicable, as the post is State Cadre.

**For Post Code No. 03:** The posts are organized into two Multi-zones as detailed below:

**Multi Zone- I (Zone – I to III):** Srikakulam(SKM), Visakhapatnam(VSP), Vizianagaram(VZM), East Godavari(EG), West Godavari(WG), Krishna(KST), Guntur(GNT), Prakasham(PKM), Nellore(NLR), Chittoor(CTR).

**Multi Zone- II (Zone – IV to VI):** Cuddapah(CDP), Ananthapur(ATP) and Kurnool(KNL), Adilabad(ADB), Karimnagar(KRMN), Warangal(WGL), Khammam(KMM), Nizamabad(NZB), Mahaboobnagar(MBNR), Medak(MDK), Nalgonda(NLG), Rangareddy(RRD) and Hyderabad(HYD).

**For Post Code No. 12:** Local: In terms of para-6 of the G.O. A.P.Public Employment (Organisation of Local Cadre Regulation of Direct Recruitment) order 1975, (G.O.Ms.No. 674, G.A.(SPF.A) Department, dated 28/10/1975 G.O.Ms.No. 8, G.A(SPF-A) Department, dated 8/1/02 Read with G.O.Ms.No. 124, General Administration (SPF-A) Department dated 7/3/2002 and other SPF provisions 80% are to be filled by local candidates and 20% of posts are open to all for which Local and Non-local has to be considered on the basis of Combined Merit List, as the each Revenue District is the unit of appointment.

**PARA-8: HOW TO APPLY:**

**A) HOW TO UPLOAD THE APPLICATION FORM:**

i) The Applicants have to read the User Guide for Online Submission of Applications and then proceed further.

I Step: The Candidate has to logon to the WEBSITE ([www.apspsc.gov.in](http://www.apspsc.gov.in)) and enter his/her Basic Personal Details like Name, Father's Name, Date of Birth, and Community.

II Step: Immediately on entering the above details the Applicant will get (downloadable)- Challan Form to pay the Fee at AP Online centers /State Bank of India.

III Step: The Applicant should pay the prescribed Fee in any one of the A.P. Online centers / State Bank of India and obtain Fee paid challan with Journal Number in the first instance.

IV Step: **On the next working day** after payment of Fee the Applicant should again visit WEBSITE and enter the Journal Number to get and fill the format of Application and should submit ON-LINE.

V Step: Affix your recent Colour Passport Size Photograph on a White Paper and then sign below the photograph with Black Pen. Scan the above Photo and Signature and Upload in the appropriate space provided (JPG Format) in Application Form.

VI Step: The applicants have to invariably fill all the relevant columns in the Application and should submit ON-LINE .

ii) **Hand written/ Typed/ Photostat copies/ outside printed Application Form will not be accepted and liable for rejection.**

- iii) Only applicants willing to serve anywhere in the Andhra Pradesh should apply.
- iv) For any problems related to Online submission and downloading of Hall-Tickets please contact 040-23557455 (Call Time: 9.30 A.M to 1.00 P.M & 1.30 P.M to 5.30 P.M) or mail to [appschelpdesk@gmail.com](mailto:appschelpdesk@gmail.com).

**NOTE:**

1. The Commission is not responsible, for any discrepancy in submitting through Online. The applicants are therefore, advised to strictly follow the instructions and User guide in their own interest.
2. The particulars furnished by the applicant in the Application Form will be taken as final, and data entry processed, based on these particulars only by Computer. Candidates should, therefore, be very careful in Uploading / Submitting the Application Form Online.
3. INCOMPLETE/INCORRECT APPLICATION FORM WILL BE SUMMARILY REJECTED. THE INFORMATION IF ANY FURNISHED BY THE CANDIDATE SUBSEQUENTLY WILL NOT BE ENTERTAINED BY THE COMMISSION UNDER ANY CIRCUMSTANCES. APPLICANTS SHOULD BE CAREFUL IN FILLING-UP THE APPLICATION FORM AND SUBMISSION. IF ANY LAPSE IS DETECTED DURING THE SCRUTINY, THE CANDIDATURE WILL BE REJECTED EVEN THOUGH HE/SHE COMES THROUGH THE FINAL STAGE OF RECRUITMENT PROCESS OR EVEN AT A LATER STAGE.
4. Before Uploading/Submission Application Form, the Candidates should carefully ensure his/her eligibility for this examination. NO RELEVANT COLUMN OF THE APPLICATION FORM SHOULD BE LEFT BLANK, OTHERWISE APPLICATION FORM WILL NOT BE ACCEPTED.
5. The candidates should carefully decide about the choice for CENTRE for the examination, which is taken as final. If any candidate appears at a centre/ Examination venue other than one allotted by the Commission, the answer sheets of such candidates shall not be valued and liable for invalidation.
6. The Commission reserves the right to create centre(s) for examination and also to call the Candidates for the test at any other centre.

**PARA-9: CENTRES FOR THE WRITTEN EXAMINATION:**

1. The Written Examination will be held at HYDERABAD only.
2. DATES FOR WRITTEN EXAMINATION WILL BE ANNOUNCED LATER THROUGH NEWS PAPERS AND CANDIDATES ARE REQUESTED TO REMAIN ALERT IN THIS REGARD.

**PARA-10: INSTRUCTIONS TO CANDIDATES:**

- 1) The candidates must note that his/her admission to the examination is strictly provisional. The mere fact that an Admission has been issued to him/her does not imply that his/her candidature has been finally cleared by the Commission or that the entries made by the candidate in his/her application have been accepted by the Commission as true and correct. Candidates are required to upload his / her photo with signature in the prescribed format of Application form. Failure to produce the same photograph, if required, at the time of interview/ verification, may lead to disqualification. Hence the candidates are advised not to change their appearance till the recruitment process is complete.
- 2) The candidates should go through the instructions given on the cover page of test booklet and carefully write his/her Register Number, Centre etc., in the Answer Sheet, which will be provided to him/her in the examination hall.
- 3) Since the answer sheets are to be scanned (valued) with Optical Mark Scanner system, the candidates have to USE H.B. PENCIL ONLY FOR MARKING THE ANSWERS. The candidates should bring H.B. pencil, Eraser, Ball pen, and smooth writing pad to fill up relevant columns on the Answer Sheet. The candidate must ensure encoding the Subject, Register No., etc., on the O.M.R. Answer sheet correctly, failing which the Answer sheet will be rejected and will not be valued.
- 4) The candidates should satisfy the Invigilator of his identity with reference to the signature and photographs.
- 5) The candidates should take their seats 20 minutes before the commencement of the examination and are not to be allowed after 10 minutes of the scheduled time. They should not leave the examination hall till expiry of fulltime. The candidates are allowed to use the calculators in the examination hall (not programmable calculators). Loaning and interchanging of articles among the candidates is not permitted in the examination hall. Cell phones and Pagers are not allowed in the examination hall.
- 6) The candidates are expected to behave in orderly and disciplined manner while writing the examination. If any candidate takes away Answer Sheet, the candidature will be rejected and in case of impersonation/ disorder/ rowdy behavior during Written Examination, necessary F.I.R. for this incident will be lodged with concerned Police Station, apart from disqualifying appointment in future.

Merit is the only criteria that decides the selections. Candidates trying to use unfair means shall be disqualified from the selection. No correspondence whatsoever will be entertained from the candidates. The candidature and conditions specified here are subject to latest rules / orders come into force during the process of recruitment.

- 7) The Commission would be analyzing the responses of a candidate with other appeared candidates to detect patterns of similarity. If it is suspected that the responses have been shared and the scores obtained are not genuine/ valid, the Commission reserves the right to cancel his/ her candidature and to invalidate the Answer Sheet.
- 8) If the candidate noticed any discrepancy printed on Hall ticket as to community, date of birth etc., they may immediately bring to the notice of Commission's officials/Chief Superintendent in the exam centre and necessary corrections be made in the Nominal Roll for being verified by the Commission's Office.

**PARA-11:DEBARMENT:**

- a) Candidates should make sure of their eligibility to the post applied for and that the declaration made by them in the format of application regarding their eligibility is correct in all respects. Any candidate furnishing in-correct information or making false declaration regarding his/her eligibility at any stage or suppressing any information is liable TO BE DEBARRED FROM APPEARING FOR ANY OF THE EXAMINATIONS CONDUCTED BY THE COMMISSION, and summarily rejection of their candidature for this recruitment.
- b) The Penal Provisions of Act 25/97 published in the A.P. Gazette No. 35, Part-IV.B Extraordinary dated: 21/08/1997 shall be invoked if malpractice and unfair means are noticed at any stage of the Recruitment.
- c) The Commission is vested with the constitutional duty of conducting recruitment and selection as per rules duly maintaining utmost secrecy and confidentiality in this process and any attempt by anyone causing or likely to cause breach of this constitutional duty in such manner or by such action as to violate or likely to violate the fair practices followed and ensured by the Commission will be sufficient cause for rendering such questionable means as ground for debarment and penal consequences as per law and rules as per decision of the Commission.
- d) Any candidate is or has been found impersonating or procuring impersonation by any person or resorting to any other irregular or improper means in connection with his / her candidature for selection or obtaining support of candidature by any means, such a candidate may in addition to rendering himself/ herself liable to criminal prosecution, will be liable to be debarred permanently from any exam or selection held by the Service Commission's in the country.
- e) **MEMORANDUM OF MARKS:** Memorandum of Marks is issued on payment of Rs.25/- (Rupees twenty five only) through crossed Indian Postal Order only drawn in favour of the Secretary, A.P. Public Service Commission, Hyderabad. Request for Memorandum of Marks from candidates, will be entertained within two months from the date of publication of the selections. Such a request must necessarily be accompanied by a Xerox copy of the Hall-ticket. Request for revaluation or recounting will not be under taken under any circumstances. Invalid, disqualified, ineligible candidates will not be issued any Memorandum of Marks and fees paid by such candidates, if any, will be forfeited to Government account, without any correspondence in this regard.

If any candidate fails to mark the Booklet Series, Roll Number etc., in the OMR Answer Sheet, the Commission reserves the right to invalidate such Answer Sheets as Answer Sheets are valued by Optical Mark Scanner. In case of rejection/ invalidation due to omission on the part of the candidate, the decision of the Commission is final and such request for Memorandum of Marks in such cases will be intimated accordingly. No request for reconsideration of such rejected/invalidated cases will be entertained under any circumstances whatsoever.

**PARA-12: COMMISSION'S DECISION TO BE FINAL:**

The decision of the Commission in all aspects and all respects pertaining to the application and its acceptance or rejection as the case may be, conduct of examination and at all consequent stages culminating in the selection or otherwise of any candidate shall be final in all respects and binding on all concerned, under the powers vested with it under Article 315 and 320 of the Constitution of India. Commission also reserves its right to alter and modify regarding time and conditions laid down in the notification for conducting the various stages up to selection, duly intimating details thereof to all concerned, as warranted by any unforeseen circumstances arising during the course of this process, or as deemed necessary by the Commission at any stage.

**Note: On 18/09/2010 on-line submission closes by 5.00 P.M.**

**HYDERABAD,  
DATE: 27/08/2010**

**Sd/- M.G. GOPAL, IAS.,  
SECRETARY**



**Annexure – I****NOTIFICATION NO. 08/2010****SCHEME AND SYLLABUS FOR RECRUITMENT TO THE POST OF SPECIAL RECRUITMENT FOR SC,ST  
BACKLOG VACANCIES  
(LIMITED RECRUITMENT- 2010)****FOR POST CODE NO. 01:- Dental Assistant Surgeons in A.P. Insurance Medical Services.****SCHEME**

<b>Part-A</b> (Written Examination (Objective type))				
Paper-1	General Studies & Mental Ability (Degree standard)	150 Marks	150 Questions	150 Minutes
Paper-2	Dental Surgery – I (BDS standard)	150 Marks	150 Questions	150 Minutes
Paper-3	Dental Surgery – II (BDS standard)	150 Marks	150 Questions	150 Minutes
<b>Part-B</b> Oral Test (Interview)		50 Marks		
<b>Total</b>		500 Marks		

**SYLLABUS****Paper-1: GENERAL STUDIES & MENTAL ABILITY**

1. General Science – Contemporary developments in Science and Technology and their implications including matters of every day observation and experience, as may be expected of a well-educated person who has not made a special study of any scientific discipline.
2. Current events of national and international importance.
3. History of India – emphasis will be on broad general understanding of the subject in its social, economic, cultural and political aspects with a focus on AP Indian National Movement.
4. World Geography and Geography of India with a focus on AP.
5. Indian polity and Economy – including the country's political system- rural development – Planning and economic reforms in India.
6. Mental ability – reasoning and inferences.

**Paper-2: DENTAL SURGERY-I****APPLIED GENERAL HUMAN ANATOMY - HEAD AND NECK, ORAL ANATOMY AND ORAL HISTOLOGY**

1. Osteology: General knowledge of the human skeleton - Detailed knowledge of the bones of the head and neck - articulation - muscle attachment - ossification.
2. Soft Parts: Muscles of head and neck - Muscles of expression - Mastication - Deglutition.
3. Joints: Temporomandibular Joint.
4. Circulatory system: Circulatory system - Lymphatic drainage of the head and neck.
5. Embryology: Development of Face, tongue, lips, jaws, palate, salivary glands, Temporomandibular joint and tooth.

**DENTAL ANATOMY:** Macroscopic Anatomy of permanent and deciduous dentition. Age changes in teeth and surrounding structures - Occlusion.

**ORAL HISTOLOGY:** Macroscopic and Microscopic appearance of Enamel, Dentin, Cementum, Pulp, Periodontal Ligament and Alveolar Bone.

**APPLIED GENERAL HUMAN PHYSIOLOGY AND ORAL PHYSIOLOGY:**

1. Blood: Structure - composition - function and blood coagulation.
2. Respiration: Mechanism of respiration - chemical changes in blood and air - interchanges of gases.
3. Alimentary system: Physiology of mastication - salivary, Gastric and Intestinal degestion - Role of Liver, Pancreas and Galbladder.
4. Nutrition: Chemistry of food, their digestion, absorption and asimilation
5. Endocrines: Thyroid, Para thyrod, Adrenals, Pituitary and Gonads.

**ORAL PHYSIOLOGY:**

1. Saliva: Secretion, composition and functions.
2. Calcium Metabolism: Calcium metabolism - relating to oral structures.
3. Teeth: Development of teeth, Eruption, resorption and shedding.
4. Vitamins: Vitamins and minerals - influence on oral structures.

**ORAL PATHOLOGY:**

1. Inflammation - Mechanism - Varieties and results.
2. Healing of Jaw fractures and complications.
3. Healing of the Socket following extraction.
4. Repair following Root fracture.
5. Healing and repair of Periodontium after Root Canal Therapy.
6. Developmental abnormalities of Teeth.
7. Acquired changes of the Teeth.
8. Dental Caries.
9. Regressive changes in tooth structure.
10. Inflammation of the pulp.
11. Acute and Chronic conditions of the Periodontium
12. Common Tumors and Cysts of the Oral Cavity.
13. Neuralgias - Trigeminal - Glossopharyngeal neuralgias.

**ORAL MICROBIOLOGY:**

1. Sterilization and Disinfection
2. Infection and Immunity.
3. Pathogenic Microorganisms of oral cavity - Culture Media and methods.
4. Relationship of oral Sepsis and Focal infection to general and systemic diseases.

**APPLIED BIO-CHEMISTRY RELATING TO DENTAL SURGERY:**

1. Principles and Clinical applications, Structure and Properties of: Amino acids, Peptides, Proteins, Enzymes and Co-enzymes.
2. Metabolism of: Minerals, Carbohydrates, Fats, Proteins.

**APPLIED GENERAL AND DENTAL PHARMACOLOGY:****GENERAL PHARMACOLOGY:**

1. Chemotherapy - Sulfonamides and Antibiotics.
2. Drugs acting on Blood - Coagulants and Anti-coagulants - Haematemics.
3. Drugs Acting upon Central Nervous System - General Anaesthetics - Hypnotics, analgesics, Psychotropic drugs, epileptic and anti-epileptics, muscle relaxants, analeptics, Local Anaesthetics.
4. Sialogogues and Anti-sialogogues.

**DENTAL PHARMACOLOGY:**

Antiseptics - astringents - obtundents - mummyfying agents - bleaching agents - Styptics - Disclosing agents - Dentifrices and Mouth washes.

**DENTAL BIOMATERIALS:**

1. General and Physical properties of Gypsum products - Impression materials - Denture base resins - Restorative Resins and direct bonding cement materials.
2. Metals and Alloys: Structure, behaviour and physical properties - Dental Amalgam alloys - Gold foil - Dental casting gold alloy - Stainless Steel - Chrome Cobalt alloys - Titanium.
3. Dental Cements: Zinc cement - Copper cement - Zinc Oxide Eugenol cement - Silicate cement - Cavity Liners - Cavity Varnishes and Resin cements.

**Paper-3: DENTAL SURGERY-II****ORAL MEDICINE:**

1. Method of diagnosis including special investigations.
2. Acute infections of Oral and Para Oral structures.
3. Blood dyscrasias and their management.
4. Metabolic and Endocrine disturbances and their Oral manifestations.
5. Nutritional deficiencies - their significance in Dentistry.
6. Oral sepsis and its effects on General system.
7. Dysfunctions of Temporomandibular Joint.
8. Diseases of Salivary Glands.
9. Facial Pain.
10. Radiological Interpretation of abnormal dental and Jaw conditions.
11. Radiation treatment in oral and Facial conditions and their sequelae. Biological effects of Radiation.

**ORAL AND MAXILLO-FACIAL SURGERY:**

1. Techniques of infiltration and Nerve block Anaesthesia - Complications associated with local anaesthesia and management.
2. Short anaesthesia in Dental Office - Endotracheal anaesthesia - Intra venous anaesthesia and general anaesthetics in Dentistry.

3. Forceps Extractions - Surgical Extractions - Complications and their management.
4. Emergencies in Oral Surgery - their Management.
5. Inflammatory diseases of the Jaw Bones.
6. Benign Cystic lesions of the Jaws - their Management.
7. Trismus and Ankylosis - Its management.
8. Fractures of the Jaws - Treatment - Complications - its Management.
9. Odontogenic Tumors - its treatment.

#### PERIODONTICS:

1. Aetiology of Periodontal diseases.
2. Diagnosis and Prognosis of Periodontal diseases.
3. Treatment of all Gingival and Periodontal disturbances - Treatment planning - Phases rationale - Healing Mechanism.
4. Drugs in Periodontics.
5. Periodontal Splints.
6. Plaque Control.
7. Biological and Clinical aspects of Dental Implants.

#### CONSERVATIVE DENTISTRY:

1. Principles of Cavity preparation Design and - Control of Pain - Prevention of damage to hard and soft tissues during operative procedure.
2. Choice of filling materials.
3. Pulp and soft tissue protection.
4. Diagnostic Aids in Endodontics.
5. Treatment of Vital and Non-vital pulp.
6. Bleaching of Teeth.
7. Surgical treatment in Endodontics.

#### ORTHODONTICS:

1. Genetics applied to Orthodontics.
2. Malocclusions - Aetiology - Types and different classifications.
3. Preventive and Interceptive treatment of Malocclusion.
4. Appliances used in Orthodontic treatment.
5. Habit breaking appliances.
6. Tissue change in Orthodontic treatment.

#### PROSTHODONTICS:

1. Mouth examination and preparing patient for Complete Dentures.
2. Choice of Impression Materials.
3. Concept of Occlusion.
4. Articulators and Face Bow and other Gadgets.
5. Immediate Dentures.
6. Periodontal aspects of partial dentures.
7. Systemic methods of designing partial dentures.
8. Principles of preparation of Retainers for Fixed Partial Dentures.
9. Latest trends in Materials and Techniques in Fixed Prosthodontics.

#### PEDODONTICS:

1. Child Psychology and management of Child patient.
2. Clinical Pedodontics.
3. Teething and Developmental Anomalies.
4. Dental Caries in Children and prevention.
5. Restorative Dentistry.
6. Space maintainers.
7. Treatment of Traumatized teeth.
8. Stomatological condition in Children.
9. Mouth habits and management.

#### COMMUNITY DENTISTRY AND FORENSIC ODONTOLOGY:

1. Demographics - Population statistics in relation to Medical and Dental health - 2. Biostatistics - Statistical methods and tests - 3. Public health Dentist and Dentistry - 4. School Dental health Service - 5. Fluorides and Human body - 6. Oral Cancer - Prevention - individual and Community level -- 7. Legal procedures - Evidence, witness and expert witness - 8. Injuries - Recording and registering - 9. Dentist and Legal problems in the profession - consumer councils.

**FOR POST CODE NO. 02:- INSPECTOR OF BOILERS IN A.P.BOILER SERVICE.****SCHEME****Engineers Degree standard**

<b><u>PART-A WRITTEN (OBJECTIVE TYPE) EXAMINATION</u></b>			
Paper-1 : General Studies and Mental Ability	150 Marks	150 Qns	150 Minutes
Paper-2 : Mechanical Engineering	300 Marks	150 Qns	150 Minutes
<b><u>PART-B: INTERVIEW</u></b>	50 Marks		
<b>Total</b>	500 Marks		

**SYLLABUS****Paper-1 : GENERAL STUDIES AND MENTAL ABILITY**

1. General Science – Contemporary developments in Science and Technology and their implications including matters of every day observation and experience, as may be expected of a well-educated person who has not made a special study of any scientific discipline.
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3. History of India – emphasis will be on broad general understanding of the subject in its social, economic, cultural and political aspects with a focus on AP Indian National Movement.
4. World Geography and Geography of India with a focus on AP.
5. Indian polity and Economy – including the country's political system- rural development – Planning and economic reforms in India.
6. Mental ability – reasoning and inferences.

**PAPER-2 : MECHANICAL ENGINEERING****1. THERMODYNAMICS:**

Basic concepts, Open and closed systems. Heat and work, Zeroth, First and second law, application to flow and non-flow processes. Entropy, Availability, Irreversibility, T-S relations, Clapery on and real gas Equations. Properties of ideal gases and vapours. Air standard cycles, Two stage air compressor, CI and SI engines, Valve travel diagram, Pre ignition, Detonation and Diesel knock, Fuel injection, Carburetion, Super charging, Turbo prop and Rocket engines. Cooling, Emission and Control. Measurement of calorific value of fuels. Conventional and Nuclear fuels.

**2. HEAT TRANSFER:**

Modes of heat transfer. One-dimensional steady and unsteady conduction. Composite slab and equivalent resistance. Heat dissipation from extended surfaces. Heat exchangers, Over all heat transfer coefficient, Empirical correlations for heat transfer ;in laminar and turbulent flow, Heat transfer in free and forced convection. Thermal boundary layer over a flat plate. Fundamentals of diffusive and convective mass transfer. Black body and fundamental concepts of radiation. Shape factor, Network analysis.

**3. REFRIGERATION AND AIR CONDITIONING:**

Heat pump, Refrigeration cycles and systems, Refrigerants, Condensers, Expansion devices, Psychrometry, Charts and application to air conditioning, Sensible heating and cooling. Effective temperature, Comfort indices, Load calculations. Solar refrigeration, Duct design.

**4. STEAM GENERATORS AND TURBINES:**

Fire tube and water tube boilers. Binary vapour system. Flow of steam through nozzles and Diffusers. Dryness fraction, Condensation. Various types of turbines, Compounding, Velocity triangles, Partial admission, Reheat, Regeneration, Efficiency and Governance. Gas Turbines, Role of Mach number.

**5. THEORY OF MACHINES:**

Kinematic and DYNAMIC ANALYSIS OF PLANAR MECHANISMS CAMS Gears and Gear trains. Fly wheels, Governors, Balancing of rotating masses, Balancing of single and ;multi cylinder engines. Linear Vibrations of mechanical systems, Transmissibility and Vibration Isolation. Critical speeds. Two rotor and Three rotor systems. Automatic controls - Order and Type of system, 2<sup>nd</sup> order system and its characteristics. Frequency analysis. Stability, Routh-Hurwitz criterion, Nyquist criterion.

**6. MACHINE DESIGN:**

Theories of failure, Design of Cotter joint, Keys, Splines, Welded Joints, Threaded fasteners, Bolt of uniform strength, Screw Jack. Design of Bearings, Couplings, Clutches, BELT DRIVES and Spur gear system. Hydrodynamic and Antifriction bearings. Design of shafts for combined loads. Helical and Leaf Springs. Thin and Thick walled pressure vessels.

**7. ENGINEERING MATERIALS:**

Basic concepts of structure of solids. Crystalline Materials. Defects in Crystalline materials. Alloys and Binary Phase diagrams. Structure ;and properties of common Engineering Materials. Heat treatment of Steels. Plastics, Ceramics and Composite materials. Common applications of various materials.

**8. PRODUCTION ENGINEERING:**

Metal Forming: Basic principles of Forging, Drawing and Extrusion. High energy rate forming. Powder Metallurgy.  
Metal Casting: Die casting, Investment Casting, Shell molding, Centrifugal casting, Gating and Rising design, Melting furnaces.

Fabrication processes: Principles of Gas, Arc and Shielded Arc welding. Advanced welding processes. Weldability, Metallurgy of Welding.

Metal cutting: Turning, Methods of Screw production, Drilling, Boring, Milling, Gear Manufacturing, Production of Flat surfaces, Grinding and Finishing processes. Computer controlled manufacturing systems-CNC, DNC, FMS, Automation and Robotics.

Cutting Tool Materials, Tool geometry, Mechanism of Tool Wear, Tool Life and Machinability. Measurement of Cutting Forces. Economics of Machining. Unconventional Machining processes. Jigs and Fixtures. Fits and Tolerances. Measurement of Surface texture. Comparators Alignment Tests and Reconditioning of Machine Tools.

**9. INDUSTRIAL ENGINEERING:**

Production planning and Control: Forecasting, Moving Averages, Exponential Smoothing, Operations, Scheduling, Assembly line balancing. Product Development, Break-even analysis, Capacity Planning, PERT and CPM.

Control Operations: Inventory Control, ABC analysis, EOQ model, Material requirement Planning. Job Design, Job standards, Work Measurement, Quality Management, Quality Analysis and Control.

Operations Research: Linear Programming – Graphical and simplex methods. Transport and Assignment Models. Single server Queuing Model.

Value Engineering: Value analysis for Cost value.

**10. ELEMENTS OF COMPUTATION:**

Computer Organization, Flow charting, Features of Common Computer Languages – FORTRAN, d Base III, Lotus1-2-3,C and Elementary Programming.

**FOR POST CODE NO. 03:- CHILD DEVELOPMENT PROJECT OFFICER IN WD&CW DEPT.,**

<b>PART-A : Written (Objective type) Examination :</b>			
Paper – 1 : General Studies and Mental Ability	150 Questions	150 Mts.	150 Marks
Paper – 2 : Home Science OR Social Work OR Sociology	150 Questions	150 Mts.	300 Marks
<b>PART-B : Oral (Interview) Test</b>			50 Marks
<b>Total</b>			<b>500 Marks</b>

**PAPER – I : GENERAL STUDIES AND MENTAL ABILITY**

1. General Science – Contemporary developments in Science and Technology and their implications including matters of every day observation and experience, as may be expected of a well-educated person who has not made a special study of any scientific discipline.
2. Current events of national and international importance.
3. History of India – emphasis will be on broad general understanding of the subject in its social, economic, cultural and political aspects with a focus on AP Indian National Movement.
4. World Geography and Geography of India with a focus on AP.
5. Indian polity and Economy – including the country's political system- rural development – Planning and economic reforms in India.
6. Mental ability – reasoning and inferences.

**PAPER – II : HOME SCIENCE****Food Science and Nutrition :**

Basic Food Group which will provide nutrition, requirement for normal health; body building goods, energy food and protractive foods – Cereals – Millets – legumes, oil seeds, milk and milk products, flesh goods, egg, fish, vegetables, fruits – Nutritive value; selection, storage, Processing and cooking methods, their effect on nutritive value and palatability – evaluation of food quality – subjective methods of measuring quality of products – Products – preparation of score cards.

Food poisoning, food allergy – Biological function, food sources and deficiency signs of carbohydrates, fat, proteins, Vitamins and minerals – Nutritional inter-relationships.

Food and Nutrient requirement in human life cycle – Adulthood Pregnancy – lactation – infancy – pre – school age, school age, preadolescence and adolescence - nutritionally vulnerable groups – factors effect in nutrient requirements.

Principles of meal planning – Principle of diet in diseases. Therapeutic modification of normal diet during dietary deficiencies diseases – Anemia, PCM, Vit.A and other common diseases – Fever Diseases of gastro intestinal tract, obesity, Diabetes – Heart diseases and Renal diseases.

Assessment of nutritional status of communities and their interpretation – clinical Biochemical – Anthropometry – Biophysical and Diet surveys.

Child Development :

Factors affecting growth and development of child. Prenatal care preparation for Child Birth – premature baby – causes postnatal care breast feeding V.S. bottle feeding weaning – immunization, physical, intellectual and emotional development during infancy toddlerhood – childhood and adolescence developmental talks – physical and physiological needs of young children – Learning types and effects – importance of play – language growth – Habit formation.

Creches and Balwadies – Importance of pre-school education needs and characteristics of pre-school child – Needs of importance in the growth and development of children.

Population education, Child and family welfare services of State, National and International Agencies.

Agriculture productivity trends – Demand and supply of food-grain – Agriculture planning and Government Policy – Credit and Credit institutions in the Agricultural sector – Agricultural marketing – Storage losses – Rural reconstruction – Community development and Panchayats – their principles and organizations.

Principles and methods of Extension work – Individual group and mass media. Audio visual aids in extension work. Programme planning – Execution and evaluation in extension work. Developing leadership – Organisation of Women in villages.

The Five year Plan of Government of India – Principles of rural reconstruction – Problems of Indian Villages – Community development – National programmes for rural women and children ANP, IRDP, SNP Adult Literacy, ICDS – Family Welfare Programme – Social Welfare Boards, etc.

Problems involved in improving nutritional status of Community, Nutrition intervention programmes – International agency involved in alleviating malnutrition – UNESCO, UNICEF, WHO, FAO.

### SOCIAL WORK

1. Content, Scope and nature of Social Work. Definition of the terms Social Welfare, Social Service, Social Reform and Social Action.
2. A Historical review of Social work in India and abroad. The Philosophy of Social Work and its relationship to changing Indian Culture. Professional and ethical values of Social Work.
3. Methods of Social Work : Definition, Scope, Principles and Values of case work, Group work and Community Organisation.
4. Fields of Social Work : Government and voluntary efforts, difference between Government – Professional – Voluntary work in the various fields of Social Work practice such as :

Youth Welfare  
Labour Welfare  
Correctional Social Work  
Medical and Psychiatric Social Work  
Rural and Urban Community Development – Local Self Government  
Panchayat Raj

5. Family and Child Welfare : Importance of Family and Child Welfare, Status, Problems of Women in India and Special Legislation relating to :

Marriage, Dowry, Inheritance and maintenance of Women, Problems of working Women, Women in need of special care.

6. State Women's Welfare Department : Organisation, functions and programmes.

7. Family Welfare Planning : Trends in demography and its impact on the nation.

Demographic characteristics of Child Population, emerging Philosophy of Child Welfare and emphasised in the Children's character of Rights, Indian Constitution and other legislative Provision.

Importance of the Family in the development of the personality of the Child, Child rearing practices in India. Children in need of special care, the disabled, the deserted and disturbed in the role of professional help and services available.

Child Welfare in the Five Year Plans, Child Welfare Schemes by the State.

Philosophy and Objectives – Organisational structure and functions – a review.

Needs of Children and organizing programmes to improve health, nutrition, recreational and educational needs – Problems and needs to handle them.

Role of Voluntary agencies and their contribution, Social Welfare Administration, Semi-Government agencies and Central Social Welfare Board, State Social Welfare Board – their structure and functions.

**SOCIOLOGY :-**

1. Nature of Society, Holism and Atomism, the animal and human society – Language and human society.
2. Nature and scope of sociology – Methods of Sociology and Social Science – Sociology and Philosophy.
3. The natural order and the human society, individual and society; theories of society; social contract theory; organisamic theory and group mind theory. Sociology and Ecology.
4. The Social System – Status and Role, Social stratification and bases, Forms of stratification – Social differentiation.
5. Social interaction and social processes. Basis of social interaction. Interests and Motivation – Forms of social processes, associative and dissociative – Accommodation and Adjustment, Assimilation and Cooperation – Competition and Conflict.
6. Socialisation – Theories of Socialisation – Agencies of Socialisation – Social learning and imitation, rewards and punishment.
7. Nature and scope of special control means and agencies of social control – Social control and changing social situation.
8. Poverty and unemployment, social and moral hygiene, Prostitution and Alcoholism.
9. The concept of family – Joint family and its type – Advantages and disadvantages, breakdown of joint family : causes and trends. Status of woman-child marriage, widow marriage, divorce, dowry, Sati and social seclusion – law of inheritance.
10. Basic Social Institution – marriage, family at kinship Economic Institutions and division of a Labour.

**FOR POST CODE NO. 04:- LECTURER IN GOVT., POLYTECHNIC COLLEGES IN SUGAR TECH.**

<b><u>PART-A:</u>      Written (Objective Type) Examination:</b>				
<b>Paper-1</b>	General Studies and Mental Ability	150 Marks.	150 Qns.	150 Minutes
<b>Paper-2</b>	Sugar Technology	300 Marks.	150 Qns.	150 Minutes
<b><u>PART-B:</u></b>	<b>ORAL TEST</b> (Interview)	50 Marks		
<b>TOTAL</b>		500 Marks		

**SYLLABUS****PAPER-1 : GENERAL STUDIES AND MENTAL ABILITY**

1. General Science – Contemporary developments in Science and Technology and their implications including matters of every day observation and experience, as may be expected of a well-educated person who has not made a special study of any scientific discipline.
2. Current events of national and international importance.
3. History of India – emphasis will be on broad general understanding of the subject in its social, economic, cultural and political aspects with a focus on AP Indian National Movement.
4. World Geography and Geography of India with a focus on AP.
5. Indian polity and Economy – including the country's political system- rural development – Planning and economic reforms in India.
6. Mental ability – reasoning and inferences.

**PAPER-2 : SUGAR TECHNOLOGY**

**1. SUGAR MANUFACTURING PROCESS:** Juice extraction - Clarification, evaporation - Pan boiling, Crystallization - Centrifugation, drying and grading - Chemicals used in sugar industry.

**2. SUGAR - TECHNOLOGY:**

- i. MILLING CONTROL: Mill Extraction - Reduced mill extraction, Analysis of mill performance - Calibration of vessels.
- ii. BOILING HOUSE CONTROL: Boiling house extraction-Reduced boiling house extraction, balances-importance of Chemical control.
- iii. BY PRODUCTS OF SUGAR INDUSTRY: Bagasse-Molasses-Filter cake.
- iv. WASTE WATER TREATMENT: Primary treatment of wastewater, sugar mill wastes-Breweries, wineries and distillery wastes.

**3. SUGAR-ENGINEERING:** Cane unloading equipment-Cane carrier and preparatory devices-Mills-Boilers-Clarification equipments-Evaporators - Pans and condensers – Crystallisers – Centrifugal - Driers and graders- Packing and storing, Spray pan-Storage vessel.

**4. INSTRUMENTATION AND PROCESS CONTROL:** Elements of instrumentation-Principles and operation of instruments used for measuring process variables such as temperature, pressure and vacuum, liquid level, density, viscosity, composition-process instrumentation-process control.

**5. CHEMICAL PROCESS PRINCIPLES:** Process engineering -Laws of conservation of mass and energy, gas laws, vapour pressure, humidity and saturation. Material and energy balances.

**THERMO PHYSICS:** Heat capacities of gases and gas mixtures, enthalpy changes during phase transfers.

**THERMO CHEMISTRY:** Heats of formation, combustion and reaction.

**THERMO DYNAMICS:** First and second law, ideal gas law, equations of state, phase equilibrium-simple concepts and equations for vapour- Liquid equilibria-Equilibrium constants-Temperature and pressure effects and conversion.

**6. CHEMISTRY AND SUGAR CANE AGRICULTURE:** Chemistry of aliphatic and aromatic compounds-Solutions-Chemical kinetics-Colloids and emulsions. Composition of cane and cane juice-Principle of polarimetry. Sugar cane cultivation-Sugar cane pests and diseases- Nutrition of sugar cane.

**7. FLUID MECHANICS:** Fluid statics, Newtonian and non-newtonian fluids, macroscopic energy balance, continuity equation, Bernoulli's equation, Dimensional analysis, flow through pipe line systems, flow meters, pumps and compressors. Flow through packed and fluidized beds.

**8. HEAT TRANSFER:** Modes of heat transfer- one-dimensional heat conduction through planes, cylindrical and spherical walls, Resistance concepts, critical insulation thickness. Heat transfer to fluids without phase change- Forced convection in laminar and turbulent flows, Natural convection, agitated vessels. Heat transfer to fluids with phase change-Boiling, condensation and evaporation. Types of heat exchangers and evaporators and their design. Fundamentals of radiation heat transfer.

**9. MECHANICAL UNIT OPERATIONS:** Size reduction and size separation. Free and hindered settling. Filtration, mixing and agitation. Conveying and storage of solids.

**10. MASS TRANSFER OPERATIONS:** Fick's laws, mass transfer coefficients, Film, Penetration and surface renewal theories. Reynold's and Colburn analogies, Continuous and stage-wise contacting and stage efficiencies principles, design and operation of equipment's for distillation, absorption and leaching.

**FOR POST CODE NO. 05:- CIVIL ASSISTANT SURGEON IN INSURANCE MEDICAL SERVICE.**

**SCHEME:**

<b>a) WRITTEN EXAMINATION (Objective type)</b>				
1	GENERAL STUDIES AND MENTAL ABILITY	150 Marks	150 Questions	150 Minutes
2	SUBJECT: (Medical Science & General Medicine)	300 Marks	150 Questions	150 Minutes
<b>b) INTERVIEW (Oral Test)</b>		50 Marks		

**SYLLABUS**

**1 - GENERAL STUDIES AND MENTAL ABILITY**

1. General Science – Contemporary developments in Science and Technology and their implications including matters of every day observation and experience, as may be expected of a well-educated person who has not made a special study of any scientific discipline.
2. Current events of national and international importance.
3. History of India – emphasis will be on broad general understanding of the subject in its social, economic, cultural and political aspects with a focus on AP Indian National Movement.
4. World Geography and Geography of India with a focus on AP.
5. Indian polity and Economy – including the country's political system- rural development – Planning and economic reforms in India.
6. Mental ability – reasoning and inferences.

**2 - Subject: (MEDICAL SCIENCE & GENERAL MEDICINE)**

**HUMAN ANATOMY:** Gross and microscopic anatomy and movements of shoulder hip and knee joints – Gross and microscopic anatomy and blood supply of lungs, heart, kidneys, liver, testis and uterus – Gross anatomy of pelvis, perineum and inguinal region, Cross sectional anatomy of the body at mid-thoracic, upper abdominal, mid-abdominal and pelvic regions. Major steps in the development of lung, heart, kidney, urinary bladder, uterus, ovary, testis and their common congenital abnormalities – Placenta and placental barrier – Neural pathways for cutaneous



semasations and vision cranial nerves iii, iv,v, vi, vii, x; distribution and clinical significance - Anatomy of the automatic control of gastrointestinal respiratory and reproductive systems.

**HUMAN PHYSIOLOGY:** Nerve and muscle excitation, conduction and transmission of impulse; mechanism ;of contraction; neuromuscular transmission - Synaptic transmission, reflexes, control of equilibrium posture and muscle tone. Descending pathways; functions of cerebellum, basal ganglia, reticular formation, hypothalamus limbic system and cerebral cortex – Physiology of sleep and consciousness: E.E.G. – Higher functions of the brain – Vision and hearing – Mechanism of action of hormones; formation, secretion, transport, metabolism, functions and regulation of secretion of pancreas and pituitary glands – Menstrual cycle; lactation, pregnancy – Development regulation and fate of blood cells – Cardiac excitation; spread ;of cardiac impulse, E.C.G. cardiac output, blood pressure, Regulation of Cardiovascular functions – Mechanics of respiration and regulation of respiration – Digestion and absorption of food, regulation of secretion and motility of gastrointestinal tract – Glomerular and tubular functions of kidney – Blood groups, Rh grouping, blood transfusion, and Blood volume.

**BIOCHEMISTRY:** PH and PK Hendrson – Hasselbalch equation – Properties and regulation of enzyme activity; role of high energy phosphates in bioenergetics – Sources, daily requirements, action and toxicity of vitamins – Metabolism of Lipids, carbohydrates, proteins; disorders of their metabolism – Chemical nature, structure, synthesis and functions of nucleic acids and proteins – distribution and regulation of body water and minerals including trace elements – Acid base balance – Clinical importance of enzymes. **PATHOLOGY:** Reaction of cell and tissue of injury; inflammation and repair, disturbances of growth and cancer; genetic diseases – Pathogenesis and histo-pathology of; rheumatic and ischaemic heart disease – bronchogenic carcinoma, carcinoma breast, oral cancer, cancer colon – Etiology, pathogenesis and histopathology of: Peptic ulcer – Cirrhosis liver – Glomerulonephritis – Lobar pneumonia –Acute osteomyelitis – Hepatitis – acute pancreatitis – FINE needle aspiration cytology(FNAC) – **MICROBIOLOGY:** Growth of micro-organisms; sterilization and disinfection bacterial genetics; virus-cell interactions – Immunological principles; acquired immunity; immunity in infections caused by viruses – Diseases caused by and laboratory diagnosis of staphylococcus Enterococcus; Salmonella; Shigella; Edcherichia; Pseudomonas, Vibrio; Adenoviruses; Herpes viruses (including Rubella); Fungi Protozoa; Helminths – AIDS – diagnostic procedure – **PHARMACOLOGY:** Drug receptor interaction, mechanism of drug action – Mechanism of action, dosage, metabolism and side effects of the – Pilocarpine, Terbutaline, Metoprolol, Diazepam, Acetylsalicylic Acid Ibuprofen, Furosemide, Metronidazole, Chloroquin, - Mechanism of action, dosage and toxicity of the antibiotics: Ampicillin, Cephalexin, Doxycycline, Chloramphenicol, Rifampin, Cefotaxime – Indications, dosage, side-effects and contraindications of the following anti-cancer drugs:- Methotrexate, vincristin, Tamoxifen – Classification, route of administration, mechanism of action and side effects of the :- General anaesthetics, Hypnotics, Analgesics – Forensic Medicine and Toxicology: Forensic examination of injuries and wounds – Physical and chemical examination of blood and seminal stains – Details of forensic examination for establishing identification of persons, pregnancy, abortion rape and virginity.

**GENERAL MEDICINES:-** 1. Disorders of CNS: Meningitis Encephalitis, Cerebrovascular diseases epilepsy, Neoplasms - 2. Disorders of CVS - Rheumatic, Ischaemic and congenital heart diseases, Hypertension \_ 3. Respiratory diseases – Acute and Chronic infections, bronchial asthma, Neoplasms, Industrial diseases – 4. Excretory systems – Acute glomerulo Nephritis, Nephrotic syndrome, chronic pyelonephritis and renal failure – 5. Gastro-Intestinal disorders – Acid Peptic diseases, Malabsorption syndromes, viral hepatitis, Cirrhosis of liver pancreatitis - 6. Hematological diseases – Anemias, Coagulation failures, Leukemias, Lymphomas, Hodgkins disease – 7. Metabolic disorders – Diabetes, Thyroid disorders, parathyroid diseases – 8. Miscellaneous – Skin disorders – Allergies, Drug reactions, parasitic infestations, Psychiatric disorders: Schizophrenia and depression – 9. Community Medicine – Malaria, Filaria and various national Health programmes – Leprosy, T.B., S.T.D. including AIDS – Parasitic infestations – Hook worm, round worm, Guinea worm, Amoebiasis – 10. Nutritional disorders – Normal nutrition, and deficiency diseases in India.

**GENERAL SURGERY:** 1. Cervical lymphnodes, parotid tumour and oral cancers – 2. Peripheral arterial diseases – varicose veins, Filariasis – 3. Dysfunctions of Thyroid, Parathyroid adrenal tumors and the surgical aspects – 4. Abscess breast and cancer breast – 5. Acute and Chronic Appendicitis including peptic ulcer, T.B. of bowel intestinal obstructions – 6. Renal mass, retention of Urine Benign Prostatic Hypertrophy – 7. Spleno-Megaly, Chronic Cholecystitis portal Hypertension liver abscess peritonitis, Cancer head of Panchreas – 8. Direct and indirect Inguinal Hernias and their complications – 9. Fracture of Femur, Spine Poly trauma and their management.

**OBSTETRIC AND GYNECOLOGY + FAMILY PLANNING:** 1. Diagnosis of Pregnancy, Antenatal Screening for high-risk pregnancy, Feto-placental development – 2. Labour management, complications of 3<sup>rd</sup> stage, post partum hemorrhage, Inversion, Resuscitation of the new born and premature baby – 3. Diagnosis and management of Pregnancy – induced – hypertension Eclampsia, anemias – 4. Principles of contraceptive methods – Intrauterine Device oral pills, Tubectomy and Vasectomy. Medical termination of pregnancy including its legal aspects and complications – 5. Etiology, Clinical features, diagnosis and mass screening of cancer cervix leucorrhoea, Infertility, Abnormal Uterine bleeding, Amenorrhoea – 6. Miscellaneous: Objectives, components of National Health and Family Welfare Programmes – Maternal and Child health – Family welfare – Nutrition – Immunisations – Population trends and its effect on health and Development.

**FOR POST CODE NO. 06:- ASSISTANT ELECTRICAL INSPECTORS IN A.P. ELECTRICAL INSPECTORATE SERVICES**

**SCHEME**

**Degree Standard:**

<b>Part-A: Written (Objective type) Examination</b>				
Paper-1	General Studies & Mental ability	150 Marks	150 Questions	150 Minutes
Paper-2	Subject (Electrical Engineering)	300 Marks	150 Questions	150 Minutes
<b>Part-B: Oral Test (Interview)</b>		50 Marks		

## SYLLABUS

### PAPER-1 GENERAL STUDIES & MENTAL ABILITY

1. General Science – Contemporary developments in Science and Technology and their implications including matters of every day observation and experience, as may be expected of a well-educated person who has not made a special study of any scientific discipline.
2. Current events of national and international importance.
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4. World Geography and Geography of India with a focus on AP.
5. Indian polity and Economy – including the country's political system- rural development – Planning and economic reforms in India.
6. Mental ability – reasoning and inferences

### PAPER-2 (CONCERNED SUBJECT) ELECTRICAL ENGINEERING

#### **I. ELECTRICAL CIRCUITS:**

Basic electrical laws, Analysis of DC networks, transient response of RLC networks excited by impulse, step, ramp and sinusoidal excitations. Transform methods, transfer functions, poles and zeros steady state AC networks, frequency domain analysis, resonance, coupled circuits, two port networks, three phase networks, power in a.c. networks, power measurement in 3-phase networks.

#### **II. E.M. THEORY:**

Electro static and electro magnetic fields, vector methods, Fields in dielectric, conducting and magnetic materials, Laplace and Poisson's equation. Time varying fields, Maxwell's equation, Poynting Theory, properties of transmission lines.

#### **III. ELECTRICAL MEASUREMENT AND INSTRUMENTS:**

Electrical standards, Error analysis, Measurement of current, voltage, power, energy, power factor, resistance, inductance capacitance frequency and loss angle. Indicating instruments, extension of range of instruments, DC and AC bridges. Electronic measuring instruments. Electronic multimeter, CRO, frequency counter, digital voltmeter, transducers, Thermocouples, Thermistor, LVDT, strain gauges, Piezo electric crystal, Measurement of non-electrical quantities like, pressure, velocity, temperature, flow rate, displacement acceleration and strain.

#### **IV. CONTROL SYSTEMS**

Open and closed loop control systems, Mathematical modelling, block diagram, signal flow graphs, time response and frequency response of linear systems, error constants and series Rootlocus technique, Bodeplot, polar plot, M-circles, N-circles, Nichol's charts, stability, Routh Hurwitz criteria. Nyquist stability criteria, compensators, design in frequency domain. Control system components. Servo motors, synchros, tacho generator, error detector. State variable approach, modelling, state transition matrix, transfer function, response.

#### **V. ELECTRONICS:**

Solid state devices and circuits. Small and large signal-amplifiers with and without feedback at audio and radio frequency, multistage amplifiers. Operational amplifiers and applications. Integrated circuits oscillators, RC, LC and crystal oscillators wave form generators, multi-vibrators – Digital circuits, Logic gates, Boolean algebra combinational and sequential circuits. A to D and D to A converters Micro processors (8085) instruction set, memories, interfacing programmable peripheral devices – Number system flow charts – expressions and statements in C – language – simple programs for engineering application.

#### **VI. D.C. ELECTRICAL MACHINES:**

Fundamentals of electro mechanical energy conversion, constructional features of D.C. Machines, emf equation types and characteristics of generators application, Torque in DC motor, types of DC motors, applications. Testing of D.C. motors, efficiency, and starting and speed control.

#### **VII. TRANSFORMERS:**

Construction – Principle of operation of 1-phase transformers – Vector diagram on No Load and – Load – Parallel operation – Regulation – efficiency – Equivalent circuit 3 phase transformer connections – Scott connection.

#### **VIII. INDUCTION MOTORS:**

Production of rotating magnetic field, production of torque types of motors equivalent circuits, Circle diagram, torque slip characteristics, starting and maximum torque, speed control, principle of single phase induction motors, Applications.

#### **IX. SYNCHRONOUS MACHINES:**

Generation of emf in 3 phase AC Generator, Armature reaction, regulation by Synchronous impedance and Ampere turn methods, parallel operation, transient and sub-transient reactances, theory of salient pole machines.

Synchronous Motor: Torque production, performance characteristics, methods of starting, V-Curves, synchronous condenser.

Special Machines: Stepper motor, Methods of operation, Amplidyne and metadyne-applications.

#### **X. ELECTRICAL POWER GENERATION:**

General layout – Types of power stations, economics of different types, base load and peak load stations, load factor and its effects, pumped storage schemes.

**XI. POWER TRANSMISSION:**

Calculation of line parameters, concepts of short, medium and long transmission lines, ABCD parameters, insulators, Corona, P.U. quantities, fault calculations, symmetrical components load flow analysis using Gauss Seidal, New-ton Raphson, methods, economic operation, stability, steady state and transient stability, equal area criterion, ALFC and AVR control for real time operation of interconnected systems.

**XII. POWER SYSTEM PROTECTION:**

Principles of arc quenching, circuit breaker classification, Recovery and restriking voltages, relaying principles over current, directional over current relays-generator and transformer protection using differential relays-line protection using distance relays Surgeo phenomena in transmission lines – Travelling wave theory, protection against surges.

**XIII. UTILISATION:**

Industrial Drives – Motors for various drives – Braking methods – Speed control of motors – Economics of rail traction – Mechanics of train movement – Estimation of power and energy requirements – Illumination – Laws Factory lighting – Street lighting – Induction and dielectric heating.

**FOR POST CODE NO. 07:- ASSISTANT DIRECTOR OF MINES IN A.P. MINING SERVICE**

**SCHEME**

<b><u>PART-A:</u></b> Written (Competitive) Examination (Objective Type)			
<b>Paper-I :</b> General Studies & Mental Ability	150 Marks	150 Questions	150 Minutes
<b>Paper-II:</b> Mining Engineering	300 Marks	150 Questions	150 Minutes
<b><u>PART-B:</u></b> Interview (Oral Test)	50 Marks		
<b><u>TOTAL</u></b>	500 Marks		

**SYLLABUS**

**PAPER – 1 :GENERAL STUDIES AND MENTAL ABILITY**

1. General Science – Contemporary developments in Science and Technology and their implications including matters of every day observation and experience, as may be expected of a well-educated person who has not made a special study of any scientific discipline.
2. Current events of national and international importance.
3. History of India – emphasis will be on broad general understanding of the subject in its social, economic, cultural and political aspects with a focus on AP Indian National Movement.
4. World Geography and Geography of India with a focus on AP.
5. Indian polity and Economy – including the country's political system- rural development – Planning and economic reforms in India.
6. Mental ability – reasoning and inferences.

**PAPER-2 : MINING ENGINEERING**

1. GEOLOGY: Structural Geology: Definition and scope. Recognition of faults, folds, joints, unconformities etc., Primary and induced structures, their importance in Mining, Bedding, Liniation, foliation, fracture, Cleat etc., field Geology; importance and scope of filed Geology, field techniques, geological mapping. Use of survey equipment.
2. Principles of Stratigraphy.
3. EXPLORATORY DRILLING: Principles, selection of site, lay outs, details of equipment, methods of drilling and their variation, interpretation of bore holo data.
4. EXPLOSIVES AND BLASTING: Classification, types and use of explosives storage and transport. Blasting techniques in UG and open cost mines.
5. SUPPORTS: Objectives, limitations of mine supports, Types of mine supports and systematic timbering.
6. OPENING AND CHOICE OF MINING METHODS: Opening, development of mineral deposits, classification of mining methods, merits, demerits and application. Bord and pillar mining. Long wall mining. Open cast mining and their variations. Design of suitable methodology of mining for specific conditions like thickness, depth, inclination, annual production etc.,
7. METAL MINING: Scope and limitations of U/G mining methods, Classification of U/G metal mining systems and their applications in different conditions.

8. **MINE SURVEYING:** Principles of surveying. Different methods and their importance. Chain surveying. Compass surveying, theodolite surveying, plane labling, levelling, triangulation, correlation. Astronomical terms and definitions. Mine plans and sections. Regulations pertaining to plans and sections.
9. **MINING MACHINERY:** Elements of transport system, classification and techno economic indecies. Rope haulage, locomotive haulage, conveyers, Aerial rope ways, trackless haulage, Winding. Drainage and pumping.
10. **MINE ENVIRONMENTAL ENGINEERING:** Mine air and environment. Natural and mechanical ventilation, Types, design variables, selection, installation and maintenance. Mine fires, explosions and inundations, Rescue and recovery.
11. **MINE LEGISLATION AND SAFETY:** Regulations pertaining to conservation's, exploitation of mineral deposits. Safety welfare and hygiene of mine workers.

**FOR POST CODE NO. 08:- TECHNICAL ASSISTANTS IN GEOPHYSICS IN GROUND WATER SUB – SERVICE**

**SCHEME**

(Degree standard)

<b>PART – A WRITTEN (Objective Type) EXAMINATION</b>				
PAPER-1	General Studies	150 Marks	150 Qns.	150 Minutes
PAPER-2	Geophysics	150 Marks	150 Qns.	150 Minutes
<b>PART – B - INTERVIEW:</b>		30 Marks		

**SYLLABUS**

**PAPER-I: GENERAL STUDIES**

General Science

Current Events of National and International Importance.

History of India and Indian National Movement. India and World Geography.

General Mental Ability.

Questions on General Science will cover General appreciation and understanding of science including matters of every day observation and experience, as may be expected of a well educated person who has not made a special study of any particular scientific discipline. In current events, knowledge of significant national and international events will be tested. In History of India, emphasis will be on broad general understanding of the subject in its social, economic and political aspects. Questions on Indian National Movement will relate to the nature and character of the nineteenth century resurgence, growth of Nationalism and attainment of independence. In geography emphasis will be on geography of India. Questions on geography of India will relate to physical, social and economic geography of the country, including the main features of the Indian agricultural and natural resources. On general mental ability, the candidates will be tested on reasoning and analytical abilities.

**PAPER-2: GEOPHYSICS**

**BASICS :** Occurrence of water in different forms, water cycle and water balance and factors contributing to the distortion of water balance.

**Geo-Hydrology:** Concepts of Geo-Hydrology and Hydro-Geology, Ground Water Aquifers – Definition of acquifer, aquiclude, aquited and aquifuge, concepts of confined, unconfined and leaky aquifers – Water bearing properties of aquifers – Storage properties – Definition of porosity, specific yield, specific retention factors influencing porosity of rocks – Determining porosity of rocks in field and in laboratory. Definition of permeability, transmissivity and storage coefficients – Ground Water Movement - Darcy's Law, distribution and concurrence of ground water. Dependency of ground water quality and yield on the recharge, Lithology and structural features. Ground water in hard rock, soft rock and coastal aquifers – Application of geological, geochemical and remote sensing methods in ground water exploration.

**PRINCIPLES OF GEOPHYSICAL PROSPECTING OF GROUND WATER:** Physical properties of rocks and ground water – Electrical resistivity, polarisability, dielectric permeability, thermal conductivity, density, magnetic susceptibility, elastic modulus and wave velocities in different media. Effect of porosity, mineral composition grain size, packing, temperature and pressure conditions water content, salinity etc., of the rocks and saturating fluids on the physical properties of rocks and Electrical resistivity method as employed in ground water problems. Various electrode configurations their applications and merits and demerits – VES and profiling methods – Interpretation – Tracing lateral and vertical boundaries of strata. Determining hydro geological properties of strata from electrical resistivity method – Principles and application of S.P., I.P. and E M methods in solving ground water problems especially in tracing the fracture and joint pattern of rocks.

Electromagnetic frequency sounding and applications – Seismic prospecting methods – Reflection and Refraction and Interpretation of seismic data in ground water problems – Gravity and magnetic methods – their role in ground water exploration, Geothermal methods – principle and application in solving ground water problems – Remote sensing and Airborne geophysical methods for assessing ground water potentialities on regional basis.

**GEOPHYSICAL WELL – LOGGING METHODS:** Consideration and specification for solving ground water problems. Principles and role of resistivity, S.P. Nuclear and thermal logging methods. Sonic, density and magnetic susceptibility logging for determining formation characters – Geophysical methods in estimating aquifer and reservoir conditions.

**APPLICATION OF GEOPHYSICAL METHODS FOR SOLVING HYDROGEOLOGICAL PROBLEMS IN :**

- (i) Soft Rock areas – Sedimentary and alluvial
- (ii) Hard Rock Areas – Granites, metamorphics etc
- (iii) Karst areas
- (iv) Coastal areas – Salt water intrusion in fresh water aquifers and their boundary determination
- (v) Prediction of hydraulic properties of granular aquifers
- (vi) Tracing buried river valleys
- (vii) Ground Water reservoir studies
- (viii) Studying valley fill areas.

**HYDRODYNAMIC INVESTIGATIONS OF AQUIFERS AND WELLS:** Hydro geological parameters of aquifers. Systematic pumping tests in steady and unsteady state conditions and methods of Theis and Jacob and Theis recovery method.

**FORMATION DRILLING AND WELL CONSTRUCTION:** Types of wells – Dug, Dug-cum-bore, shallow bore-wells, Tube Wells and Radial wells, Infiltration Galleries. Their advantages and disadvantages for discharging ground water, Methods of drilling and Percussion and Rotary – their advantages and disadvantages. Well construction-well design, well casing, Grouting and installation of well screens. Development of wells, surging, compressed air, high velocity setting, back washing, Over pumping, well efficiency and maintenance – causes of failure of wells and remedial measures pumps – shallow and deep well, hand pumps, vertical turbine pumps, submersible pumps, centrifugal pumps, jet pumps.

**ANALYTICAL STUDY OF GEO-HYDROLOGICAL DATA:** Flow nests – Graphical construction, analog simulation, numerical simulation, saturated and unsaturated flow nest and well hydrographs and their analysis. Ground water modeling scope and utility. Types of models – Physical, analog, digital and hybrid models. Advantages and disadvantages; determining norms for safe yield in a basin by various methods. Ground water investigation in environmental and eco-balance studies.

1. Concept of programming languages Computer operating system like MS Dos, MS Windows, Unix.
2. Interpretation of Geophysical data by using computer techniques.
3. Artificial recharge Methods, conservation.
4. Ground Water Management, Ground Water Budget.
5. Ground Water pollution, landfills, waste disposal, Mining, water logging, reclamation – case studies.
6. Geographic Information system related to Ground water.

**FOR POST CODE NO. 09:- ASSISTANT ENGINEER IN GROUND WATER DEPARTMENT**

**SCHEME**

<b><u>PART-A WRITTEN (OBJECTIVE TYPE) EXAMINATION</u></b>				
<b>PAPER-1</b>	General Studies and Mental Ability	150 Marks	150 Questions	150 Minutes
<b>PAPER-2</b>	Subject:- (Common) (Diploma Standard)	150 Marks	150 Questions	150 Minutes
<b><u>PART-B: ORAL TEST (INTERVIEW)</u></b>		30 Marks		

**SYLLABUS**

**PAPER-1 GENERAL STUDIES AND MENTAL ABILITY**

General Science

Current Events of National and International Importance.

History of India and Indian National Movement. India and World Geography.

General Mental Ability.

Questions on General Science will cover General appreciation and understanding of science including matters of every day observation and experience, as may be expected of a well educated person who has not made a special study of any particular scientific discipline. In current events, knowledge of significant national and international events will be tested. In History of India, emphasis will be on broad general understanding of the subject in its social, economic and political aspects. Questions on Indian National Movement will relate to the nature and character of the nineteenth century resurgence, growth of Nationalism and attainment of independence. In geography emphasis will be on geography of India. Questions on geography of India will relate to physical, social and economic geography of the country, including the main features of the Indian agricultural and natural resources. On general mental ability, the candidates will be tested on reasoning and analytical abilities.

**PAPER-2: (COMMON FOR ALL BRANCHES)**

**SOLID MECHANICS:**

Forces: Different types of forces, gravitational, frictional, axial, tensile or compressive. Law of Parallelogram and triangle of forces, polygon of forces, problems.

Friction: Statical friction, limiting friction, simple problems.  
Centre of gravity and moment of inertia. Simple plane figures.

Simple machines, law of machine, Mechanical advantage, velocity ratio and efficiency, wheel and axle, pulleys and simple screw jack-problems

Simple Stresses and strains: Different types of stresses and strains, stress-strain diagram for ductile materials. Factor of safety, ultimate strength and working strength, elastic constants, poisson ratio. Deformations, volume changes. Relations between elastic constants. Hooke's Law. Compound rods, temperature stresses, strain energy, proof resilience, impact loading.

Riveted and welded joints, different modes of failures, efficiency of joints, thin cylindrical shells, longitudinal and circumferential stresses and volume changes.

Shear force and bending moment diagrams for simply supported, over hanging and cantilever beams. Relation between intensity of loading, shear force and bending moment. Economical length of overhanging beams.

Theory of simple bending: Assumptions, basic flexure formula, bending stresses, modulus of section, moment of resistance. Circular bending. Distribution of shear stress in common structural sections.

Deflection in cantilever and simply supported beams under simple loading-propped cantilever beams subjected to simple loading, determination of reaction. SF and BM diagrams.

Torsion: Assumptions, basic formula of torsion, power transmission by shafts of uniform circular sections close-coiled springs, strain-energy in simple beams and shafts, sudden and impact loading. Principal stresses and principal planes. Mohr's circle of stress.

Thin cylinders under internal pressure stresses and volume changes.

Columns and struts: Direct and bending stresses, core of section. Short and long columns under axial loading-various end-conditions. Euler and Rankine formulae, Slenderness ratio, simple built-up columns.

Simple plane and pin-jointed trusses: Stresses by method of joints and method of sections.

**FLUID MECHANICS:**

Introduction: Scope of hydraulics in Engineering. Definition and properties of fluid.

Fluid pressure and its measurement: Atmospheric pressure, Gauge pressure and absolute pressure. Piezometer, Manometer-U-tube, Inverted U-tube, and differential manometers.

Pressure on plane surface immersed in liquid-Horizontal, vertical and inclined plane surface.

Flow of fluids: Type of flow-uniform flow, non-uniform flow, streamline flow, Turbulant flow, steady flow and unsteady flow, Energies in fluid motion-Datum head, pressure head and velocity head. Total energy of fluid in motion - Bernoulli's theorem. Practical application of Bernoulli's theorem - pitot tube venturimeter - Orificemeter - problems.

Flow through orifices and Mouth Pieces: Definition of orifice, types of orifices, Vena contracta, coefficient of velocity, coefficient of contraction, coefficient of discharge. Submerged and partially submerged orifices. Flow through orifices under variable heads - Time of emptying a rectangular tank through orifices. Mouth pieces - different types of problems.

Notches and Weirs: Definition of notch, types of notches - Rectangular notch, Triangular notch and trapezoidal notch. Discharge over a rectangular, triangular and a trapezoidal notches.

Flow through pipes: Major and minor losses - Loss of head at entrance, loss of head due to sudden enlargement, due to sudden contraction, loss of head at exit of the pipe. Frictional loss in pipe-Chezy formula and Daycy's formula.

Hydraulic gradient and total energy line. Discharge through parallel pipes and branched pipes connected to a reservoir. Flow through syphon pipe.

Hydraulic transmission of power-flow through nozzle at the end of a pipe line-diameter of nozzle for Max H.P. available. Water hammer and its effect. Laminar and turbulent flow in pipes-Critical velocity and Reynold number.

Measurements: Measurement of velocity - Current meter surface floats and weighted rods. Determination of discharge from velocity readings.

Impact of jets: Formulae for the force of jet on a fixed vertical flat plate, fixed inclined flat plates, moving flat plates, series of flat plates fixed on the rim of a wheel. Force of jet striking at the centre and at the top of a fixed curved blade and moving curved blade, velocity triangles. Work done, power and efficiency in the above cases. Simple problems. Water turbines: Introduction to water turbines. Use of water turbines in Hydroelectric power stations line sketch showing layout of hydro-electric power plant with head race, dam, sluice gate, pen stock turbine, generator and tail race. Classification of turbines - impulse and reaction turbines brief sub-classification of axial, radial and tangential

flow type. Pelton wheel, Francis turbine and Kaplan turbine, Governing of waster turbines. Simple problems on power and efficiency.

Centrifugal pump: Installation, mountings and other accessories. Priming of centrifugal pump. Efficiency, cavitation. Simple problems on work, power and efficiency.

**FOR POST CODE NO. 10:- PROHIBITION & EXCISE SUB INSPECTOR IN A.P. PROHIBITION & EXCISE SUB-SERVICE**

**SCHEME OF EXAMINATION**

Subject	Duration (Minutes)	Maximum Marks	Minimum qualifying marks		
			SC/ST/PH	B.Cs	Others
1	2	3	4	5	6
<b><u>Paper-I:</u></b> GENERAL STUDIES and Mental Ability	150	150			
<b><u>Paper-II:</u></b> <b>Section-1:</b> Social and Cultural History of Andhra Pradesh (the History of various Social and Cultural movements in Andhra Pradesh) <b>Section-2:</b> General overview of the Indian Constitution.	150	150			
<b><u>Paper-III:</u></b> <b>Section-1:</b> Planning in India and Indian Economy; <b>Section-2:</b> Contemporary problems and Developments in Rural Society with special reference to Andhra Pradesh	150	150			
<b>TOTAL:</b>		<b>450</b>	135	157.5	180
<b>INTERVIEW</b>		50			
<b>GRAND TOTAL (for Executive posts):</b>		<b>500</b>	150	175	200

**SYLLABUS**

**PAPER-I**  
**GENERAL STUDIES AND MENTAL ABILITY**

General Science

Current Events of National and International Importance.

History of India and Indian National Movement. India and World Geography.

General Mental Ability.

Questions on General Science will cover General appreciation and understanding of science including matters of every day observation and experience, as may be expected of a well educated person who has not made a special study of any particular scientific discipline. In current events, knowledge of significant national and international events will be tested. In History of India, emphasis will be on broad general understanding of the subject in its social, economic and political aspects. Questions on Indian National Movement will relate to the nature and character of the nineteenth century resurgence, growth of Nationalism and attainment of independence. In geography emphasis will be on geography of India. Questions on geography of India will relate to physical, social and economic geography of the country, including the main features of the Indian agricultural and natural resources. On general mental ability, the candidates will be tested on reasoning and analytical abilities.

**PAPER-II**

**SECTION-1: SOCIAL AND CULTURAL HISTORY OF ANDHRA PRADESH**

1. The Satavahanas and their contribution – social structure – Ikshvakus and their cultural contribution; Buddhism and Jainism; The Eastern Chalukyas of Vengi – their socio-cultural contribution – growth of Telugu language & Literature.
2. Socio- Cultural and Religious conditions in Andhra Desha between first and fifteenth centuries of the Christian Era.
3. Establishment of British Rule – 1857 Revolt and its impact on Andhra and Hyderabad Socio-cultural awakening ; Adi-Andhra/Dalit and Justice/self – respect movements; Growth of Nationalist Movement in Andhra between 1885 and 1947 – Role of socialists – communists – anti-zamindari-kisan movements.
4. Asafjahi Dynasty – socio-cultural awakening in Telangana -Adi-Hindu Movement – Nizam Rashtra Janasangham – Andhra Mahasabha – Andhra Saaraswata Parishat – Hyderabad State Congress and Vandemataram Movement.
5. Growth of Leftist / Communist Movement and Telangana People's Armed Struggle – Ittehadul-Muslimeen – Razakars-anti-Nizam Struggles and end of Nizam's Rule. Integration of Hyderabad State into Indian Union – Formation of Andhra Pradesh – Important historical events after 1956.

**SECTION-2: GENERAL OVERVIEW OF THE INDIAN CONSTITUTION**

- 1) Salient features of the Indian Constitution – Preamble, Fundamental Duties, Fundamental Rights, Directive Principles of State Policy and their relationship.
- 2) Distinctive features of Indian Federation - Distribution of Legislative Powers between the Union and the State; Relative roles of Legislature, Executive and Judiciary.
- 3) Community development experiment – 3 tier model of Panchayat Raj – 73<sup>rd</sup> and 74<sup>th</sup> amendments and their implementation.
- 4) Welfare Mechanism in India: Provisions for Scheduled Castes, Tribes and Minorities; Reservations for SC, ST and Backward Classes; Prevention of SC and ST Atrocities Act; National and State SC and ST Commission; Women's Commission; National and States Minorities Commission and Human Rights Commission.
- 5) Unicameral and Bicameral Legislatures – Functions and crises of accountability, decline of legislature.

**PAPER-III**

**Section-1: PLANNING IN INDIA & INDIAN ECONOMY**

- 1) Planning in Indian Economy – Socio-economic objectives and outlays of 5 year plans – Major controversies of planning in India – Alternative strategies – Goals and achievements – shortfall of different plans – Planning in the market – Major reforms/policy changes effect from 1991.
- 2) Broad fiscal, monetary, industrial trade and agricultural policies, objectives, rationale, constraints and effects.
- 3) Geographic size – Endowment of natural resources, population; size composition quality and growth trends – occupational distribution – effect of British rule with reference to drain theory and Laissez faire Policy.
- 4) Money banking and public finances – concept of money and measures of money supply velocity of money banks and credit creation, determination of price level – inflation, its causes and remedies , finance budget – taxes and non-tax revenue.
- 5) Meaning and measurements of growth- growth distribution and welfare, characteristics of under development, stages of development, sources of growth capital – human capital, population, productivity, trade and aid, growth strategies – types of average measures – dispersion-correlation-index numbers ; types, uses and limitations.

**Section-2: CONTEMPORARY PROBLEMS AND DEVELOPMENTS IN RURAL SOCIETY WITH SPECIAL REFERENCE TO ANDHRA PRADESH**

1. National Income & Main sectors of Economy, GDP (Gross Domestic Product), Per capita income and HDI (Human Development Index) as measures of development. Relative contribution of agriculture to income and employment in the recent four decades of AP.
2. Five year plans of AP – Outlays, Finance in public sector plan and resource allocation pattern in the recent five year plan.
3. Need for and aims of land reforms in AP – Structure of land holdings in AP. Forest, sown and irrigated area in AP. Cropping pattern. Sources of Agricultural finance in AP –Agricultural subsidies.
4. Growth and structure of Industries in Andhra Pradesh , factories, small and tiny sectors, their comparison , growth , weaknesses and problems- Institutional and non-institutional – growth and structure of cooperatives in Andhra Pradesh – Share of cooperatives in total credits – adequacy and problems.
5. Structure of Agricultural outputs – administered prices including support and procurement prices – Public Distribution System in AP ; Service sector of AP – importance, composition and growth with special reference to transport and communication, tourism and information and biotechnology.

**FOR POST CODE NO. 11:- SENIOR STENOGRAPHERS IN A.P. SECRETARIAT LAW DEPARTMENT.**

**SCHEME**

PART-A) WRITTEN EXAMINATION (Conventional Type)	
PAPER-1	Shorthand English 120 words per minute Dictation for 7 minutes 150 Marks (45 Minutes for transcription)
OR	Shorthand Telugu 60 words per minute Dictation for 7 minutes 150 Marks (45 Minutes for transcription)

- N.B:
- 1) Selection would be based on the number of marks obtained by the candidates
  - 2) Candidates will be required to transcribe their shorthand notes on typewriters. For this purpose they will be required to bring their own **Typewriters**



**FOR POST CODE NO. 12:- EXECUTIVE OFFICER GRADE-III IN A.P. ENDOWMENTS SUB-SERVICE****a: Written (OBJECTIVE TYPE) Examination**

Sl. No.	Subject	No. of Questions	Duration (Minutes)	Maximum Marks	Minimum qualifying Marks		
					SCs, STs & PH	B.Cs	Others
1	Paper-I: General Studies and Mental Ability	150	150	150	90	105	120
2	Paper-II: Optional Subject (One paper)	150	150	150			
<b>b: Oral Test (Interview)</b>				30			
<b>Total Marks:</b>				330			

**NOTE:** The candidates have to choose ONE subject from the following for Paper-II Optional Subject:

Code No.	Subject Name	Code No.	Subject Name
01	English Literature	15	Sociology
02	Hindi Literature	16	Agriculture
03	Telugu Literature	17	Animal Husbandry & Veterinary Science
04	Urdu Literature	18	Botany
05	Anthropology	19	Chemistry
06	Commerce	20	Geology
07	Economics	21	Mathematics
08	Geography	22	Physics
09	History	23	Statistics
10	Law	24	Zoology
11	Philosophy	25	Civil Engineering
12	Political Science	26	Electrical Engineering
13	Psychology	27	Electronics & Communication Engineering
14	Public Administration	28	Mechanical Engineering

**SYLLABUS****GENERAL STUDIES AND MENTAL ABILITY**

General Science

Current events of National and International importance.

History of India and Indian National movement. India and World Geography.

Indian Polity and Economy.

General mental Ability.

Questions on General Science will cover General appreciation and understanding of science including matters of everyday observation and experience, as may be expected of a well educated person who has not made a special study of any particular scientific discipline. In current events, knowledge of significant national and international events will be tested. In History of India, emphasis will be on broad general understanding of the subject in its social, economic and political aspects. Questions on the Indian National Movement will relate to the nature and character of the nineteenth century resurgence, growth of nationalism and attainment of Independence. In Geography, emphasis will be on Geography of India. Questions on the Geography of India will relate to physical, social and economic geography of the country, including the main features of Indian agricultural and natural resources. Questions on Indian Polity and Economy will test knowledge of the country's political system and Constitution of India, Panchayat Raj, Social Systems and economic developments in India. On general mental ability, the candidates will be tested on reasoning and analytical abilities.

**OPTIONAL SUBJECTS FOR PAPER-II****01. ENGLISH LITERATURE****PART – 'A'****UNIT 1.1:****SHAKESPEARE:**

A Midsummer Night's Dream

Measure for Measure

Hamlet

The Tempest

**UNIT 1.2:****SHAKESPEARE'S CONTEMPORARIES:**

The Play of Everyman

Christopher Marlow: Doctor Faustus

Ben Jonson: The Alchemist

John Webster: The Duchess of Malfi

Edmund Spenser: The Faerie Queene, Book 1

**UNIT II.1: SEVENTEENTH-CENTURY LITERATURE:**

John Milton:	Paradise Lost, Books 1,4 and 9 Milton's English Sonnets
John Donne:	The Sonnets "The Flea"; "Canonization"; "Valediction Forbidding Mourning"
John Dryden:	All for Love

**UNIT II.2: RESTORATION LITERATURE:**

William Congreve:	The Way of the World
John Bunyan:	The Pilgrim's Progress

**UNIT III.1: THE EIGHTEENTH-CENTURY NOVEL:**

Daniel Defoe:	Moll Flanders; Robinson Crusoe
Jonathan Swift:	Gulliver's Travels
Henry Fielding:	Joseph Andrews
Oliver Goldsmith:	The Vicar of Wakefield
Horace Walpole:	The Castle of Otranto

**UNIT III.2 EIGHTEENTH-CENTURY POETRY:**

Alexander Pope:	The Rape of the Lock
Samuel Johnson:	"London"
Oliver Goldsmith:	The Deserted Village
William Blake:	From Songs of Innocence, "Introduction", "Lamb", "Nurse's Song", "Holy Thursday" and from Songs of Experience: "Tyger", "Nurse's Song", "Holy Thursday", "Poison Tree".

**UNIT III.3 EIGHTEENTH-CENTURY DRAMA:**

Henry Fielding:	Tom Thumb
John Gay:	The Beggar's Opera
R.B.Sheridan:	The Rivals

**UNIT IV.1 ROMANTIC POETRY:**

William Wordsworth:	"Michael", "Tintern Abbey", The Immortality Ode
S.T. Coleridge:	Rime of the Ancient Mariner, "Christabel", "Dejection, an Ode"
P.B.Shelly:	"Ode to the West Wind"
John Keats	"The Grecian Urn" and "The Nightingale"

**UNIT IV.2: THE ROMANTIC NOVEL:**

Sir Walter Scott:	Ivanhoe
Jane Austen:	Pride and Prejudice; Persuasion
James Hogg:	Confessions

**UNIT IV.3: ROMANTIC PROSE:**

The Major Essays of Charles Lamb and William Hazlitt;  
De Quincey's "On knocking at the Gate in Macbeth",  
The Preface to The Lyrical Ballads (1800)

**PART-B****UNIT V.1: THE VICTORIAN NOVEL:**

Charlotte Bronte:	Jane Eyre
Emily Bronte:	Wuthering Heights
Charles Dickens:	Oliver Twist
Thomas Hardy:	Jude the Obscure
Joseph Conrad:	Heart of Darkness
R.L. Stevenson:	Treasure Island

**UNIT V.2: VICTORIAN POETRY:**

Tennyson:	"Mariana", "The Lady of Shalott", "Ulysess", "Crossing the Bar",
Robert Browning:	"My last Duchess", "Soliloquy of a Spanish Cloister", "Love among the Ruins"
Matthew Arnold:	"Forsaken Merman", "Dover Beach", "The Buried Life"
Thomas Hardy:	"She Hears the Storm", "The Ruined Maid", "Convergence of the Twain"

	G.M. Hopkins:	"The Windhover", "Pied Beauty", "God's Grandeur"
<b>UNIT VI.1</b>	<b>THE MODERN NOVEL:</b>	
	James Joyce:	Portrait of an Artist as a Young Man
	Virginia Woolf:	To the Lighthouse
	Graham Greene:	The Power and the Glory
	William Golding:	Lord of the Flies
<b>UNIT VI.2</b>	<b>MODERN POETRY:</b>	
	W.B. Yeats:	"Easter 1916", "Byzantium", "Lake Isle of Innisfree"
	T.S. Eliot	The Waste Land
	W.H. Auden	"W.B. Yeats", "The Unknown Citizen"
	Ted Hughes:	Poems from Crow
<b>UNIT VI.3</b>	<b>MODERN DRAMA:</b>	
	G.B. Shaw:	St. Joan
	John Osborne:	Look Back in Anger
	Samuel Beckett:	Waiting for Godot
	Harold Pinter:	Birthday Party
<b>UNIT VII</b>	<b>CRITICAL TEXTS:</b>	
	Sir Philip Sidney's <i>Apology</i> ; John Dryden's <i>Defence</i> ; Alexander Pope's <i>Essay on Man</i> and <i>Essay on Criticism</i> ; Jonathan Swift's "A Modest Proposal"; Samuel Johnson's Preface to Shakespeare, and the Lives of Milton and Gray; Matthew Arnold's <i>Culture and Anarchy</i> , The 1853 Preface, "Wordsworth"; T.S. Eliot's "Tradition and the Individual Talent"	
<b>UNIT VIII</b>	<b>FORMS OF LITERATURE:</b>	
	<u>Epic</u> - Paradise Lost	
	<u>Sonnet</u> - Shakespeare's, John Donne's, Keats's Sonnets;	
	<u>Elegy</u> - Milton's "Lycidas", Gray "Elegy in a Country Churchyard", W.H. Auden's "In Memory of W.B. Yeats";	
	<u>Ode</u> - Odes of Pope, Wordsworth and Keats;	
	<u>Dramatic Monologue</u> -Tennyson's "Ulysses", Robert Browning's "My Last Duchess";	
	<u>Novel</u> -all the novels in Units I to VII above;	
	<u>The Short Story</u> ;	
	<u>The Essay</u> .	

## 02. HINDI LITERATURE

### Unit I: General Study of life, works, the personality of the following writers of Hindi Literature:

- (a) Kabirdas, Tulsidas, Surdas, Biharilal, Meerabai
- (b) Premchand, Phaneeswarnath Renu
- (c) Jaishankar Prasad, Sumitranandan Pant, Suryakant Tripathi Nirala, Dhumil, Muktibodh

### Unit II: Trends and tendencies in the History of Hindi literature

- (a) Veeragathakal, Siddha sahitya, Nath sahitya
- (b) Bhaktikal : Nirguna & Saguna Bhakti Sahitya
- (c) Ritikal
- (d) Adhunik kal: Bharatendu yug, Dwivedhi yug, Chayavadi yug, Nayee Dharaayen

### Unit III: Development of modern Genre

- (a) Natak
- (b) Upanyas
- (c) Kahanii
- (d) Nibhandh

### Unit IV : History of Hindi Language

- (a) Dialects of Hindi : Khadiboli, Brajbhasha and Avadhi
- (b) Development of Khadiboli
- (c) Hindi-Urdu-Hindusthaani
- (d) National Independence movement and Hindi
- (e) Constitution, National Language and directions in the constitution for development

### Unit V : Modern Hindi grammar:

- (a) Hindi sounds
- (b) Hindi Lipi
- (c) Hindi vocabulary (Nouns and Gender)
- (d) General grammar rules
- (e) Sandhi in Hindi
- (f) Samaasa in Hindi

**Unit VI : Alankara, Chanda and Rasa:**

- (a) **Alankaras:** Upama, Utprekshaa, Yamak, Shlesh, Anuprasa, Ruupak, Sandeha, Vakrokti, Arthaantaranyasa, Lokokti (definitions & identification)
- (b) **Rasa:** Srigara, Veera, Shanta and their Staayee
- (c) **Chand :** Doha, Sorataa, Kavita, Rola, Chowpayee (rules & identification)

**Unit VII: Criticism (Alochanaa):**

The trends and contributions of the following critics of Hindi

- (a) Ramachendra Shukla
- (b) Nagendra
- (c) Ravilas Shama
- (d) Namvar Singh

**Unit VIII: Indian Poetics**

General study of the following Sanskrit Sampradayas

- (a) Rasa Sampradaya
- (b) Alankar Sampradaya
- (c) Dwani Sampradaya only

**Unit IX : Identifications Forms of Hindi**

Under this Unit the works of the important writers are mentioned and the candidates are required to identify the form of the work as Natak, Upanyas, Ekanki, Kavya etc.

**Unit X Functional aspects of Hindi**

General knowledge of the **vocabulary and terms** used in Hindi in offices. Under this Unit generally used **English Words** in offices and office correspondence are given and the Hindi equivalents are to be identified.

**03. TELUGU LITERATURE**

**Unit I:** Age of Ithihasasas and Puranas - Major poets and their works - Aesthetic approach of different poets and historical background.

Nannaya, Tikkana, Errana, Nannechoda, Palkuriki Somanna, Marana, Kethana, Manchana, Nachana, Somana, Ramayana Poets.

**Unit II:** Age of Kavyas and Katha Kavyas: Major poets during the period and their works Poetic qualities of the poets: Srinatha, Pothanna, Vallabhamatya, Pillalamarri Pina Veerabhadrana, Nandimallaya and Ghanta Singana, Koravi Goparaju, Anantamatya, Annamayya etc.

**Unit III:** Age of Prabandhas: Evolution of Prabandhas - Works and poetic talents of the poets during the period. Srikrishnadevaraya, Ashtadiggaja poets and other major poets.

**Unit IV:** Telugu literature of Southern School: Literary genres like Prabandha, Dvipada, Yakshagana, Geya, Kirthana, Prose works and major poets and writers of these works.

**Unit V:** Telugu language and literature during nineteenth century, Evolution of Telugu prose contribution of Telugu and Western scholars to Telugu language and literature.

**Unit VI:** Modern period: Major literary movements and trends in Telugu literature – Reformation, Rationalism, Romanticism – Progressive, Revolutionary, Feminist and Dalit movements – Major writers.

**Unit VII:** Evolution of literary genres in modern period: Poetry, Novel, Short story, Biography, Auto-biography, Essay etc. – Major writers.

**Unit VIII:** Poetics and literary criticism: Rasa, Dwani, Alankara, Rithi, Vakrokti, Auchitya – Major trends in Literary criticism and major writers.

**Unit IX:** Grammar and Alankaras – Major Sanskrit and Telugu Sandhis applicable to Classical and Modern Telugu. The Alankaras (Artha and Sabda): Upama, Rupaka, Utpreksha, Ananvaya, Dipaka, Parinama, Upameyopama, Sandeha, Bhramantimat, Smruti, Arthantaranyasa, Drustanta – Anuprasa, Yamaka.

**Unit X:** Structure of Modern Telugu: Classification of the vocabulary – Plural formation, cases, verbs, major divisions of Telugu sentences – simple, complex, compound sentences.

**04. URDU LITERATURE****I. History of Urdu Language:**

- a. Hind Aariya, Zabano Ke Advar
- b. Magribi Hindi Aur Uskey Boliyan
- c. Khdi Boli – Urdu Aur Hindi Ka Rishta

**II. Important Writers of Deccani Literature:**

- 1. Mohd. Quli Qutub Shah
- 2. Gawasi

- 3 Mula Asadullah Wajhi
4. Nusrati
5. Walli

III. General study of life works, the personalities of the following writers of Urdu Literature:

- a. Sir Syed Ahmad Khan, Moulana Altaf Hussain Halli, Munshi Premchand, Dr. Syed Mohiuddin Qadri, Zor.
- b. Mir Taqi Mir, Ghalib, Iqbal, Josh

**IV. Important School of thought of Urdu Literature:**

- a. DABISTAN-E- DELHI
- b. DABISTAN-E-LUCKNOW

**V. Literary Trends of Urdu Literature**

1. Aligarh Tahreek
2. Progressive movement

**VI. Important Urdu Genres and Writers:**

- a. Ghazal – Qhasida, Mathnavi, Marsia
- b. Mirtaqi Mir, Ghalib
- c. Sauda, Zaoq
- d. Mir Anees, Mirza Dabeer
- e. Mir Hasan, Daya Shankar, Naseem

**VII Development of Modern Urdu Genre:**

- a. Novel
- b. Short Story
- c. Drama
- d. Auto Bio-graphy
- e. Essay etc. Major Writer

**VIII Criticism:**

The trends and contributions of following critic of Urdu

- a. Altaf Hussain HALLI
- b.. Abdul Rahman Bijnori
- c. Ahtesham Hussain
- d. Aal-e-Ahmad Suroor

IX Literary contribution of Fort William College.

X. National Independence Movement and URDU.

**05. ANTHROPOLOGY**

1 Meaning and scope of Anthropology, Branches of Anthropology – Social – Cultural Anthropology, Physical Biological anthropology, Linguistic anthropology, Archaeological anthropology, Contribution of these branches to the 'holistic' study of Man. Anthropology's relation with other social sciences, humanities and natural sciences.

2 Physical anthropology: Meaning and scope. Relationship of Physical anthropology with other branches of anthropology and also Biological sciences, Anatomy, Physiology, Human Biology and Genetics.

3 Theories of organic evolution – Lamarckism, Darwinism, Synthetic theory of Evolution.

4 Human Genetics. Mendel's Laws of inheritance and their application to Man Branches and scope of Human Genetics.

5 Man's place in the Animal Kingdom. Order primates – General characteristics, the Great Apes – Gibbon. Orangutan. Gorilla and Chimpanzee and Man.

6 Fossil evidence of human evolution. Australopithecus africanus, Homo erectus – Pithecanthropuserectus, Sinanthropus Pekinensis. Neanderthal Man, Rhodesian Man. Homo Sapiens, Cro-magnon, Chancelade, Grimaldi, Characteristics of Homo Sapiens.

7 Concept of race: Criteria for racial classification. Major races of the world. Racial classification of Indian population – Riskey's classification, Guha's classification.

8 Archaeological anthropology: Origin, aims and scope. Its relations with other branches of anthropology.

9 Pleistocene environment. Glacial and inter glacial, Pluvial and inter pluvial. Archaeological data and cultural reconstructions; Methods of dating. Relative and absolute dating their relevance.

10 Paleolithic cultures. Lower, Middle and Upper Paleolithic cultures – their tool technology, typology and cultural traits and associated human fossils.

**Mesolithic Cultures: Salient features.**

11 Neolithic Cultures – emergence and characteristic features in India. Megaliths, definition; Megalithic cultures and their salient features.

12 Sites of Paleolithic, Mesolithic and Neolithic cultures in India and their features. Megalithic cultures and their salient features in India.

13 Concept of culture in anthropology – definition and characteristics. Concepts of society, Association, Community, institution, comparison of society – culture civilization.

14 Family Definition and its universality; Family of Orientation and Procreation, Family typology – Nuclear, Extended and Joint; Features and significance of Hindu Joint Family, Changing family system in India.

15 Marriage. Definition. Marriage and Family; Marriage rules – Endogamy, Exogamy. Incest; Preferential Marriages, Marriage payments: Ways of acquiring a mate in tribal societies. Forms of marriage - :Monogamy, Polygamy, Polygyny and Polyandry. Levirate and Sororate; Rules of Post marital residence – patrilocal, matrilocal, neolocal.

16 Kinship. Definition and significance of kinship in simple societies; primary, secondary and tertiary relatives; kinship terms – terms of reference and terms of address classificatory and descriptive kinship terms; Analysis of kinship terminology kinship usages.

Rules of Descent – Patrilineal, matrilineal and double; Rules of inheritance and succession. Structure and functions of descent groups in tribal societies – Clan, Phratry, Moiety, Dual organisation.

17 Tribe – Definition. Tribes in India and their geographical distribution; characteristic features of tribal societies in India. Features of food gathering, pastoral and food producing societies, shifting cultivation. Concept of property and types of property in tribal societies – Primitive communism, Exchange – Balter, ceremonial exchange, reciprocity and redistribution. Market, Money and trade. Impact of urbanization and industrialization on tribal societies.

18 Nature of political organisation in tribal societies, Social control, Law and justice. Role of oaths and ordeals in tribal societies. Panchayati Raj in tribal societies.

19 Indian society – Characteristic features – Racial, ethnic, religious and linguistic elements in Indian population – Unity and diversity in Indian society. Indian village, its features and Jaimani system; concept of caste and dominant caste. Concepts of Sanskritisation. Westernisation, great and Little Traditions.

20 Constitutional provisions and safeguards for Scheduled Tribes in India. Tribal development programmes. Role of NGOs in tribal development.

21 Emergence and development of anthropology in India. Applied Anthropology – Meaning, Scope, Development anthropology; Role of anthropology in tribal welfare administration; Role and relevance of anthropology in agricultural development; Health and Family Welfare in India and education.

## 06. COMMERCE

### PART-I:

**Accounting and Auditing:** Nature, Scope and Objectives of Accounting-Accounting as an Information System Users of Accounting Information.

Generally Accepted Principles of Accounting-The Accounting Equation-Accrual Concept-other concepts and conventions, Distinction between capital and revenue expenditure. Accounting Standards and their application-Accounting standards relating to fixed assets, depreciation, inventory, recognition of revenue

Final Accounts of Sole Proprietors, Partnership Firms and Limited Companies-Statutory Provisions-Reserves, Provisions and Funds. Final Accounts of not-for profit organisation. Accounting problems related to admission and retirement of a partner and dissolution of a firm.

Accounting for Shares and Debentures Accounting Treatment of Convertible debentures.

Analysis and Interpretation of Financial Statements Ratio analysis and interpretation. Ratios relation to short term liquidity, long term solvency and profitability-Importance of the rate of return on investment (ROI) in evaluating the overall performance of a business entity-Cash-flow Statement and Statement of Source and Application of Funds-Societal obligations of Accounting.

**Auditing:** Nature, objectives and basic principles of auditing.- Techniques of auditing-physical verification, examination of documents and vouching, direct confirmation, analytical review.

Planning an audit, audit programmes, working papers, audit process.

Evaluation of internal controls.

Test checking and sampling.

Broad outlines of company audit.

Audit of non-corporate enterprises.

Internal and management audit.

### PART-II:

**Business Organisation:** Distinctive features of different forms of business organisation.

#### **SOLE PROPRIETOR**

Partnerships-characteristics, Registration, Partnership deed, Rights and duties, Retirement, Dissolution.

Joint Stock Company-Concept, characteristics, types.

Cooperative and State ownership forms of organizations.

Types of securities and methods of their issue.

Economic functions of the capital market, stock exchanges, Mutual Funds. Control and regulation of capital market.

Business combination; control of Monopolies. Problems of modernisation of industrial enterprises. Social responsibility of business. Foreign Trade-Procedure and financing of import and export trade. Incentives for export promotion. Financing of foreign trade.

Insurance-Principles and practice of Life, Fire, Marine and General Insurance.

**MANAGEMENT**

Management functions-Planning-strategies, Organising-levels of authority Staffing, Line function and staff function, Leadership, Communication, Motivation, Directing-Principles, Strategies.

Coordination-Concept, types, methods.

Control-principles, performance standards, corrective action. Salary and wage administration-job evaluation.

Organisation Structure-Centralization and decentralization-Delegation of authority-span of control-Management by Objectives and management by Exception.

Management of change; Crisis Management. Office Management-scope and principles, systems and routines; handling of records-modern aids of Office management; office equipment and machines; Automation and Personal computers.

Impact of Organisation and Methods (O&M)

**Company Law:** Joint stock companies-incorporation; documents and formalities-Doctrine of indoor management and constructive notice.

Duties and powers of the board of directors of a company.

**Accounts and audit of companies:** Company Secretary-role and functions-qualifications for appointment.

**07. ECONOMICS****PART-I****General Economics:**

1. **Micro- Economics:** (a) Production, Agents of Production; Costs and Supply; Isoquants, (b) Consumption and Demand; Elasticity concept, (c) Market Structure and concepts of equilibrium; (d) Determination of prices; (e) Components and Theories of Distribution, (f) Elementary concepts of Welfare economics: Pareto-optimality-Private and social products consumers surplus.

2. **Macro- Economics:** (a) National Income concepts; (b) Determinants of National income employment (c) Determinants of consumption, savings and investment, (d) Rate of Interest and its determination, (e) Interest and Profit.

3. **Money, Banking and Public Finance:** (a) Concepts of Money and measures of money supply; velocity of money, (b) Banks and credit creation; Banks and portfolio management, (c) Central Bank and control over money supply, (d) Determination of the price level, (e) Inflation, its causes and remedies, (f) Public, Finance-Budgets-Taxes and non-tax revenues-Types of Budget deficits.

**4. International Economics:**

(1) Theories of International Trade-comparative costs – Hecksher-Ohlin-Gains from Trade-Terms of Trade.

(2) Free Trade and Protection

(3) Balance of payments accounts and adjustment

(4) Exchange rate under the exchange markets

(5) Evolution of the International Monetary System and World Trading order-Gold Standard-the Brettonwoods system.

IMF and the World Bank and their associates.

**Floating rates-GATT and WTO:**

5. **Growth and Development:** (1) Meaning and measurement of growth; Growth, distribution and Welfare; (2) Characteristics of under-development; (3) Stages of Development; (4) Sources of growth-capital, Human capital, population, productivity, Trade and aid, non-economic factors; growth Strategies, (5) Planning in a mixed economy-Indicative planning-Planning and growth.

6. **Economic Statistics:** Types of averages-measures of dispersion-correlation-Index numbers; types, uses and limitations.

**PART-II****Indian Economics:**

1. Main features; Geographic size-Endowment of natural resources, Population; size composition quality and growth trend-Occupational distribution-Effects of British Rule with reference to Drain theory and Laissez Faire policy.

2. Major problems, their dimensions, nature and broad causes; Mass poverty-Unemployment and its types-Economics effects of population pressure-Inequality and types thereof-Low productivity and low per capita income, Rural-urban disparities-Foreign Trade and payments imbalances. Balance of Payments and External Debt-Inflation and parallel economy and its effects-Fiscal deficit.

3. Growth in income and employment since Independence-Rate, Pattern, Sectoral trends-Distributional Changes-Regional disparities.

4. Economic Planning in India: Major controversies on planning in India-Alternative strategies-goals and achievements, shortfalls of different plans-planning and the Market

5. Broad Fiscal, monetary, industrial trade and agricultural policies-objectives, rationale, constraints and effects.

**08. GEOGRAPHY****Section – A****PHYSICAL GEOGRAPHY**

i) **Geomorphology:** Origin of the earth; Geological Time Scale; Interior of the earth; Types and characteristics of rocks; Folding and Faulting; Volcanoes; Earth quakes; Weathering; Landforms caused by fluvial, Aeolian and glacial actions.

ii) **Climatology:** Structure and composition of atmosphere; Temperature; Pressure belts and Wind systems; Clouds and rainfall types; Cyclones and anti-cyclones; Major climatic types.

iii) **Oceanography:** Ocean relief; Temperature; Salinity; Ocean deposits; Ocean currents, El Nino and La Nino; Waves and tides.

iv) **Biogeography:** Origin and types of soils; Major biomes of the world; Ecosystem and food chain; Environmental degradation and conservation.

### **Section – B**

#### **HUMAN GEOGRAPHY**

i) **Man and Environment Relationship:** Growth and development of Human Geography; Concepts of Determinism and Possibilism.

ii) **Population:** Races of mankind and tribes; growth and distribution of world population; migration; population problems of developed and developing countries.

iii) **Economic Activities:** Food gathering and hunting; Pastoral herding; fishing and forestry; Types of agriculture-shifting, subsistence, commercial and plantation; Mining, power; Manufacturing – locational factors of textile, iron and steel, sugar and fertilizer industries; Tertiary activities-trade, transport, communication and services.

iv) **Settlements:** Origin, types and patterns of rural settlements; Processes of urbanisation; morphology and functional classification of towns; million-cities and mega-cities.

### **Section – C**

#### **GEOGRAPHY OF THE WORLD**

i) Major Natural Regions: Characteristics, economic base and human adaptation.

ii) Regional Geography of Developed Countries: Canada, U.S.A., Western Europe, Russia, Japan, Australia and New Zealand.

iii) Regional Geography of Developing Countries: S.E. Asia, S.W. Asia, China, Southern Africa and Brazil.

iv) Regional Geography of South Asia.

### **Section – D**

#### **GEOGRAPHY OF INDIA**

i) **Physical Setting:** Landforms, drainage, climate, soils and natural vegetation.

ii) **Economic Base:** Minerals & energy resources, aquatic resources, forest resources; irrigation, agriculture and industries; trade and commerce.

iii) **Population:** Growth, distribution and density; demographic characteristics.

iv) Environmental problems, developmental issues and regional planning.

### **Section – E**

#### **GEOGRAPHICAL THOUGHT**

i) **Ancient Period:** Contributions of Indians, Greeks, Romans and Arabs.

ii) **Pre-Modern Period:** Contribution of Verenius, Kant, Humboldt and Ritter.

iii) **Modern Period:** Dichotomy of determinism and possibilism; contributions of Ratzel, Semple, Huntington and La Blache.

iv) **Recent Period:** Quantitative Revolution; Radicalism, Behaviouralism and Humanism.

### **Section – F**

#### **TECHNIQUES OF GEOGRAPHICAL ANALYSIS**

i) **Maps:** Scale and types, uses.

ii) **Diagrams:** Types and uses.

iii) **Projections:** Types, characteristics and uses.

iv) **Remote sensing and geographical information system (GIS):** Aerial photographs and imagery, GIS.

## **09. HISTORY**

### **Section – A**

1. Prehistoric cultures in India.
2. Indus Civilization. Origins. The Mature Phase: extent, society, economy and culture. Contacts with other cultures. Problems of decline.
3. Geographical distribution and characteristics of pastoral and farming communities outside the Indus region, from the Neolithic to early iron phases.
4. Vedic society. The Vedic texts; change from Rigvedic to later Vedic phases. Religion; Upanishadic thought. Political and social organization; evolution of monarchy and varna system.
5. State formation and urbanization, from the mahajanapadas to the Nandas. Jainism and Buddhism. Factors for the spread of Buddhism.
6. The Mauryan Empire. Chandragupta; Megasthenes. Ashoka and his inscriptions; his dhamma, administration, culture and art. The Arthashastra.
7. Post-Mauryan India, BC 200 – AD 300. Society: Evolution of jatis. The Satavahanas and state formation in Peninsula. Sangam texts and society. Indo-Greeks, Sakas Parthians, Kushanas; Kanishka. Contacts with the outside world. Religion: Saivism, Bhagavatism, Hinayana and Mahayana Buddhism; Jainism; Culture and art.
8. The Guptas and their successors (to c. 750 AD). Changes in political organization of empire. Economy and society. Literature and science. Arts.

### **Section - B**

9. Early Medieval India. Major dynasties; the Chola Empire. Agrarian and political structures. The Rajaputras. Extent of social mobility. Position of women. The arabs in Sind and the Ghaznavides.
10. Cultural trends, 750-1200, Religious conditions: importance of temples and monastic institutions; Sankaracharya; Islam; Sufism. Literature and Science. Alberuni's "India". Art and architecture.



- 11-12. Thirteenth and fourteenth Centuries: Ghorian invasions causes and consequences. Delhi Sultanate under the "Slave" Rulers. Alauddin Khilji: Conquests; administrative, agrarian and economic measures. Muhammad Tughluq's innovations. Firoz Tughluq and the decline of the Delhi Sultanate. Growth of commerce and urbanization. Mystic movements in Hinduism and Islam. Literature. Architecture, Technological changes.
13. The fifteenth and early 16<sup>th</sup> Century: major Provincial dynasties; Vijayanagara Empire. The Lodis, First phase of the Mughal Empire: Babur, Humayun. The Sur empire and administration. The Portuguese. Monotheistic movements: Kabir; Guru Nanak and Sikhism; Bhakti, Growth of regional literatures. Art and Culture.
- 14-15. The Mughal Empire: 1556-1707. Akbar: conquests, administrative measures, **jagir** and **mansab** systems; policy of **sulh-i-kul**. Jahangir, Shahjahan and Aurangzeb: expansion in the Deccan; religious policies. Shivaji, Culture: Persian and regional literatures. Religious thought: Abul Fazi; Maharashtra dharma. Painting. Architecture. Economy: conditions of peasants and artisans, growth in trade; commerce with Europe. Social stratification and status of women.
16. Decline of Mughal Empire, 1707-61. Causes behind decline. Maratha power under the Peshwas. Regional states. The Afghans. Major elements of composite culture. Sawai Jai Singh, astronomer. Rise of Urdu language.

### Section – C

17. British expansion: The Carnatic Wars, Conquest of Bengal. Mysore and its resistance to British expansion: The three Anglo-Maratha Wars. Early structure of British raj: Regulating and Pitt's India Acts.
18. Economic impact of the British Raj: Drain of Wealth (Tribute); land revenue settlements (zamindari, ryotwari, mahalwari); De-industrialisation; Railways and commercialization of agriculture; Growth of landless labour.
19. Cultural encounter and social changes: Introduction of western education and modern ideas. Indian Renaissance, social and religious reform movements; growth of Indian middle class; The press and its impact: rise of modern literature in Indian languages. Social reforms measures before 1857.
20. Resistance to British rule: early uprisings; The 1857 Revolt-causes, nature, course and consequences.
21. Indian Freedom struggle-the first phase: Growth of national consciousness; Formation of Associations; Establishment of the Indian national Congress and its Moderate phase;-Economic Nationalism; Swadeshi Movement; The growth of "Extremism" and the 1907 split in Congress; The Act of 1909-the policy of Divide and Rule; Congress-League Pact of 1916.
22. Gandhi and his thought; Gandhian techniques of mass mobilization-Khilafat and Non-Cooperation Movement, Civil Disobedience and Quit India Movement; Other strands in the National Movement-Revolutionaries, the Left, Subhas Chandra Bose and the Indian National Army.
23. Separatist Trends in Indian Nationalist Politics-the Muslim League and the Hindu Mahasabha; The post-1945 developments; Partition and Independence.
24. India independent to 1964. A parliamentary, secular, democratic republic the 1950 Constitution. Jawaharlal Nehru's vision of a developed, socialist society. Planning and state-controlled industrialization. Agrarian reforms. Foreign policy of Non-alignment. Border conflict with China, and Chinese aggression.

## 10. LAW

### I. Jurisprudence

1. Nature and concept of law.
2. School of Jurisprudence: Analytical, Historical; Philosophical, Sociological & Natural.
3. Administration of Justice: Theories of punishment.
4. Sources of Law: Custom, Precedent and Legislation.
5. A few basic Legal concepts:
  - (i) Rights and Duties
  - (ii) Legal Personality
  - (iii) Ownership and Possession

### II. Constitutional Law of India

1. Salient features of the Indian Constitution.
2. Preamble.
3. Fundamental Rights. Directive Principles and Fundamental Duties
4. Constitutional position and powers of President and Governors
5. Supreme Court and High Courts: Jurisdiction, powers, appointment and transfer of Judges
6. Union Public Service Commission and State Public Service Commissions: Powers and functions
7. Distribution of Legislative and Administrative Powers between the Union and the States
8. Emergency Provisions
9. Amendment of the Constitution

### III. International Law:

1. Nature and definition of International Law
2. Sources: treaty, Custom, General Principles of Law recognized by civilized nations and subsidiary means of determination of law
3. State Recognition and State succession
4. The United Nations, its objective, purpose and principal organs; Constitution, role and jurisdiction of International Court of Justice
5. Protection of Human Rights:
  - (i) Provisions in the UN Charter
  - (ii) Universal declaration of Human Rights, 1948
  - (iii) International Covenant of civil and Political Rights, 1966
  - (iv) International covenant on Economic, Social and Cultural Rights, 1966

### IV. Torts:

1. Nature and Definition of Tort.
2. Liability based on fault and strict liability
3. Vicarious Liability including State Liability
4. Joint Tortfeasors

5. Negligence
6. Defamation
7. Conspiracy
8. Nuisance
9. False imprisonment
10. Malicious Prosecution

#### **V. Criminal Law:**

1. General Principles of criminal liability: Mens rea and actus reus
2. Preparation and criminal attempts
3. General Exceptions
4. Joint and constructive liability
5. Abetment
6. Criminal Conspiracy
7. Sedition
8. Murder and culpable homicide
9. Theft, extortion, robbery and decoity
10. Misappropriation and Criminal Breach of Trust

#### **VI. Law of Contract:**

1. Definition of contract
2. Basic elements of contract: Offer acceptance, consideration, contractual capacity
3. Factors vitiating consent
4. Void, Voidable, illegal and unenforceable agreements
5. Wagering agreements
6. Contingent contracts
7. Performance of contracts
8. Dissolution of contractual obligations: frustration of contracts
9. Quasi-contracts
10. Remedies for breach of contract

### **11. PHILOSOPHY**

#### **SECTION-A:**

##### **PROBLEMS OF PHILOSOPHY:**

1. Substance and Attributes: Aristotle, Descartes, Locke, Berkeley's criticism, Nyaya-Vaisesika, Buddhist criticism of Pudgala.
2. God, Soul and the World: Thomas Aquinas, St. Augustine, Spinoza, Descartes, Nyaya-Vaisesika, Sankara, Ramanuja.
3. Universals: Realism and Nominalism (Plato, Aristotle, Berkeley's criticism of abstract ideas, Nyaya-Vaisesika, Buddhism).
4. Bases of knowledge: Pramanavada in Carvaka, Nyaya-Vaisesika, Buddhism, Advaita Vedanta.
5. Truth and Error: Correspondence theory, Coherence theory, Pragmatic theory; Khyativada (Anyathakhyati, Akhyati, Anivacaniyakhyati)
6. Matter and Mind: Descartes, Spinoza, Leibnitz, Berkeley.

#### **SECTION-B:**

##### **Logic:**

1. Truth and Validity
2. Classification of sentences: Traditional and Modern
3. Syllogism: Figures and Moods; Rules of Syllogism (General and special) validation by Venn Diagrammes; Formal Fallacies
4. Sentential Calculus: Symbolisation; Truth-Functions and their interdefinability, Truth tables; Formal proof.

#### **SECTION-C:**

##### **Ethics:**

1. Statement of fact and statement of value
2. Right and Good; Teleology and Deontology
3. Psychological Hedonism
4. Utilitarianism (Bentham; J.S. Mill)
5. Kantian Ethics
6. Problem of the freedom of will
7. Moral judgements: Descriptivism, Prescriptivism, Emotivism
8. Niskamakarma: Sthitaprajna
9. Jaina Ethics
10. Four Noble Truths and Eight fold path in Buddhism
11. Gandhian Ethics: Satya, Ahimsa, Ends and Means.

### **12. POLITICAL SCIENCE**

#### **SECTION – A**

1. **Political Science** : Nature & scope of the discipline, relationship with allied disciplines like History, Economics, Philosophy, Sociology, Psychology.
2. **Meaning of Politics** : Approaches to the study of Politics.
3. **Key Concepts** : State, Society, Sovereignty, Power, Citizenship, Nation, Global order and Imperialism.

4. **Political Ideas** : Rights, Liberty, Equality, Justice, Rule of Law. Civil Society Swaraj, Revolution, Democratic Participation.
5. **Democracy** : Meaning and Theories of Democracy, Electoral system, Forms of Representation & Participation, Political accountability.
6. **Political Ideologies** : Liberalism, Neoliberalism, Marxism, Socialism, Fascism, Gandhism.
7. **Party System and Political Process** : Theories of Party System, National and regional parties, Political Parties in the Third World. Patterns of coalition politics, interest and pressure groups.
8. **Forms of Government** : Parliamentary and Presidential. Federal & Unitary Models of decentralisation.
9. **Bureaucracy Concept** : Theories, Weber and critiques of Bureaucracy.
10. **Theories of Development** : Meaning and various approaches. Concept and Theories of underdevelopment Debates in the Third World.
11. **Social Movements** : Meaning, Theories & Forms, Role of Environmental Feminist Peasant & workers movements, Role of Non-Government Organisation.
12. Nationalism and Internationalism :
13. **Major theories of International relations** : Realist Marxist, Systems & Decision making & Game theory. State & the Global Order : Neo-Liberalism, globalisation, structural adjustment, regional economic integration, Nature and Impact of globalisation.

## SECTION – B

### INDIAN GOVERNMENT AND POLITICS

1. **Approaches to the study of Governments** : Comparative historical, legal institutional, political economy and political sociology, approaches.
2. **Classification of Political Systems** : Democratic and Authoritarian, characteristics of Political systems in the third world.
3. **Typologies of Constitutions; Basic features of these constitutions & governments** : Including U.K., USA., France, Germany, China and South Africa.
4. **Constitutional development** : In India during British Rule-A historical perspective.
5. **Constituent Assembly** : Philosophical and socio-economic dimensions. Salient features of the Indian Constitution.
6. **Nature of Indian Federalism** : Centre-state relations, legislative, administrative, financial and political; politics of regional move and National Integration.
7. **Fundamental Rights** : Constitutional provisions and political dynamics. Judicial interpretations and socio political realities; Fundamental Duties.
8. **The Union Executive** : President, Prime Minister and the Council of Ministers, Constitutional provisions & framework and political trends.
9. **Parliament** : Powers and functions of the Lok Sabha & Rajya Sabha; Parliamentary Committees; Functioning of the Parliamentary system in India.
10. **The Judiciary** : The Supreme Court, Judicial Review Judicial Activism, Public Interest Litigation; Judicial Reforms.
11. **The State Executive** : Governor, Chief Minister and the Council of Ministers; Constitutional Provisions and Political trends.
12. **Indian Party System** : Evolution and Contemporary trends; Coalition government at the Centre and States, pressure groups in Indian Politics.
13. **The interaction of Government & Scientific & Technology business** : Previous and now their inter relationship and changing roles in Society, Elites, Role of Pressure groups class and voluntary associations in society.
14. **Local Government & Politics** : Panchayati Raj and Municipal Government, structure power & functions. Political realities, significance of 73rd and 74th Amendments, role of women in Panchayats.
15. **Bureaucracy and Development** : Post-colonial India; its changing role in the context of liberalization bureaucratic Accountability.
16. **Challenges to Indian Democracy** :
  - a) munalism Regionalism violence, 'criminalisation' and corruption.
  - b) ional disparities, environmental degradation, illiteracy, Mass Poverty, Population, growth, caste oppressions and socio economic in equalities among backward classes.

### 13. PSYCHOLOGY

1. **Introduction to Psychology** : Concept and definition of psychology – Nature and Scope – Branches of psychology – Application of psychology to society and social problems.
2. **Methods in Psychology** : Characteristics of psychological studies, Observation, Survey method, Clinical and case study method. Experimental method. Application of the method.
3. **Quantitative Analysis** : Measures of central tendency and dispersion. Correlation. Levels of measurement. Reliability and validity. Application in test construction.
4. **Physiological Psychology** : Structure of neuron, nerve impulses, synapse and neurotransmitters. Central and peripheral nervous system-structure and neural control of behaviour. Hemispheric specialization. Endocrine system and hormonal control of behaviour. Application of hemispheric knowledge to diagnostic purposes.
5. **Development of human behaviour**: Individual Differences; Heredity and environment;. Life span development. Role of early experience and mastering developmental tasks. Sensitive or critical periods of development in human life cycle and its application.
6. **Perception**: Preceptual process. Perceptual organisation. Perceptual of form, colour, depth and time. Perceptual readiness and constancy. Role of motivation, social and cultural factors in Perception. Application of knowledge of Perception to skill development (e.g. for certain jobs like that of driving, airline pilots etc.)
7. **Learning**: Classical conditioning and operant conditioning. Modeling and observational learning. Transfer of training. Learning and motivation. Application of the above to the improvement of academic performance in education.

8. **Memory:** Physiological basis of memory. Memory and forgetting. Measurement of memory (Recall, Recognition, Relearning). Short term and long term memory. Theories of forgetting (Decay and interference theories and Repressive forgetting) Application of Mnemonic devices etc., to improving memory.
9. **Cognition and Language:** Concept of formation. Nature and development of thinking. Language and thought and acquisition of language. Problem solving. Creative thinking and its applications.
10. **Intelligence and Aptitude:** Definition and concept. Theories and models of Intelligence. Measurement of intelligence and aptitude. Exceptional intelligence. Mental retardation. Concepts of multiple, emotional and artificial intelligence and their applications.
11. **Motivation and Emotion:** Definition and concept. of instinct, needs, drives and motives. Theories of motivation and their application (drive reduction theory, Maslow's motivational hierarchy). Social motivation; Achievement, power, affiliation motives and influence of early experiences. Physiological basis of emotion. Theories of emotion (James-Lange and Cannon-Brad theories, cognitive physiological theory).
12. **Personality:** Concepts and Definition of personality. Study of personality (Trait, type and eclectic approaches) Development of personality (Freud, Erikson, Biological and socio-cultural determinants). Measurement of Personality (Projective tests, pencil-paper tests). Application of personality profiles in fitting a person to a job.
13. **Adjustment and Stress:** Concept and definition. Factors affecting adjustment (frustration and conflict). Sources of stress and reactions to stress. Coping with stress. Application of stress management techniques.
14. **Social Behaviour:** Socio-cultural factors and behaviour. Development of attitudes, stereo-types and prejudice, Measurement of Attitudes (Thurstone, Likert attitude scale and Bogardus Social Distance scale). Strategies for reducing prejudice and changing attitude. Person perception, implicit personality theory and integrating impressions. Application of person perception to impression management.
15. **Application of Psychology:** Health and mental health (yoga, meditation and relaxation therapies). Education (programmed learning; self instructional learning and learning styles). Community (self help through group cohesiveness and leadership). Industry (Assessment centre approach in selection, recruitment and training). Environment (man-nature interaction, personal space concept, pollution reduction information technology (Application to commercial, educational and health areas).

#### 14. PUBLIC ADMINISTRATION

1. **Introduction:** Meaning, scope and significance. Evolution and status of the discipline. Comparative Public Administration and Development Administration. Public and Private Administration. State versus market debate. New public Administration. New Public Management perspective.
2. **Basic concepts and principles:** Organisation, hierarchy, Unity of command, Span of control, Authority and Responsibility, Co-ordination, Centralization and Decentralization, Delegation, Supervision, Line and Staff.
3. **Theories of Administration:** Scientific Management (Tylor and the Scientific Management Movement), Classical Theory (Fayol, Urwick, Gulick and others) Bureaucratic theory (Weber and his critics). Ideas of Mary Parker Follett and C I Barnard; Human Relations School (Elton Mayo and others). Behavioral approach, Systems approach.
4. **Administrative Behaviour:** Decision making with special reference to H Simon, communication and control, leadership theories. Theories of motivation (Maslow and Herzberg)
5. **Accountability and Control:** The concepts of Accountability and control; Legislative, executive and judicial control. Citizen and Administration; Role of civil society, people's participation and right to information.
6. **Administrative Systems:** Comparative Administrative features of USA, Great Britain, and Japan.
7. **Personnel Administration:** Role of Civil Service in developing societies; position classification, Recruitment, Training, Promotion, Pay and Service conditions. Relations with the Political Executive; Administrative Ethics.
8. **Financial Administration:** Budget; Concepts and forms. Formulation and execution of budget, deficit financing public debt, Accounts and Audit.
9. **Union Government and Administration in India. British legacy:** Constitutional context of Indian Administration; The President, Prime Minister and the Council of Ministers; Central Secretariat; Cabinet Secretariat, Prime Minister's Office, Planning Commission; Finance Commission; Election Commission; Comptroller and Auditor-General of India. Public enterprises; Patterns, role performance and impact of liberalization.
10. **Civil Services in India:** Recruitment to All India and Central Services. Union Public Service Commission; Training of Civil Servants. Generalists and Specialists. Minister-Civil Servant relationship.
11. **State and District Administration:** Governor, Chief Minister, Secretariat, Chief Secretary, Directorates, District Collector; changing role.
12. **Local Government:** Panchayati Raj and Urban local Government; Main features, structures, finances and problem areas. 73<sup>rd</sup> and 74<sup>th</sup> Constitutional Amendments.

#### 15. SOCIOLOGY

##### **Unit-I: Basic Concepts:**

Society, community, association, institution. Culture-culture change, diffusion, Cultural-tag, Cultural relativism, ethnocentrism, acculturation

Social Groups-primary, secondary and reference groups.

Social structure, social system, social action.

Status and role, role conflict, role set.

Norms and values-conformity and deviance

Law and customs.

Socio-cultural processes: socialisation, assimilation, integration, cooperation, competition, conflict, accommodation, social distance, relative deprivation.

##### **Unit-II: Marriage, Family and Kinship.**

Marriage: types and norms, marriage as contract and as a sacrament.

Family: types, functions and changes.

Kinships: terms and usages, rules of residence, descent, inheritance.

##### **Unit-III: Social Stratification:**

Forms and functions; Caste and Class. Jajmani system, purity and pollution, dominant caste, sanaskritisation.

**Unit-IV: Types of Society:**

Tribal, agrarian, industrial and post-industrial.

**Unit-V: Economy and Society:**

Man, nature and social production, economic systems of simple and complex societies, non-economic determinants of economic behaviour, market (free) economy and controlled (planned) economy.

**Unit-VI: Industrial and Urban Society:**

Rural-Urban Continuum, urban growth and urbanisation-town, city and metropolis; basic features of industrial society; impact of automation on society; industrialisation and environment.

**Unit-VII: Social Demography:**

Population size, growth, composition and distribution in India; components of population growth-births, deaths and migration; causes and consequences of population growth; population and social development; population policy.

**Unit-VIII: Political Processes:**

Power, authority and legitimacy; political socialisation; political modernisation, pressure groups; caste and politics.

**Unit-IX: Weaker Section and Minorities:**

Social justice-equal opportunity and special opportunity; protective discrimination; constitutional safeguards.

**Unit-X: Social change:**

Theories of change; factors of change; science, technology and change. Social movements- Peasant Movement, Women's Movement, Back-ward Caste Movement, Dalit Movement.

**16. AGRICULTURE**

Agriculture, its importance in National economy. Factors determining agro-ecological zones and geographic distribution of crop plants. Importance of crop plants, cultural practices for cereal, pulses, oilseed, fibre, sugar, tuber and fodder crops and scientific basis for these crop-rotations, multiple and relay cropping, intercropping and mixed cropping.

Soil as medium of plant growth and its composition, mineral and organic constituents of the soil and their role in crop production; chemical, physical and microbiological properties of soils. Essential plant nutrients (macro and micro) their functions, occurrence, cycling in soils. Principles of soil fertility and its evaluation for judicious fertilizer use. Organic manures and bio-fertilizers, inorganic fertilizers, integrated nutrient management.

Principles of plant physiology with reference to plant nutrition, absorption, translocation and metabolism of nutrients.

Diagnosis of nutrient deficiencies and their amelioration photosynthesis and respiration, growth and development, auxins and hormones in plant growth.

Cell and cell organelles. Cell division. Reproductive cycle, Principles of genetics, gene-interaction, sex determination, linkage and re-combination, mutation, extra chromosomal inheritance, polyploidy. Origin and domestication of crop plants. Genetic resources-conservation and utilization. Floralbiology in relation to selfing and crossing.

Genetic basis of plant breeding pureline selection, mass selection, male sterility and incompatibility and their use in plant breeding. Pedigree selection, back-cross method of selection. Heterosis and its exploitation. Development of hybrids, composites and synthetic, important varieties, hybrids, composites and synthetic of major crops. Seeds and seed production techniques.

Important fruit and vegetable crops of India, method of propagation-Sexual and asexual. Package and practices and their scientific basis. Crop rotation, intercropping, companion crops, role of fruits and vegetables in human nutrition, post-harvest handling and processing of fruits and vegetables. Landscaping and ornamental horticulture, commercial floriculture. Medicinal and aromatic plants. Serious pests and diseases affecting major crops. Principles of control of crop pests and diseases, integrated management. Proper use and maintenance of plant protection equipment.

Principles of economics as applied to agriculture. Farm planning and optimum resource-use efficiency and maximizing income and employment. Farm systems and their spatial distribution, their significant roles in regional economic development.

**17. ANIMAL HUSBANDRY AND VETERINARY SCIENCE****ANIMAL HUSBANDRY**

**1. General:** Role of Livestock in Indian Economy and human health. Mixed farming. Agroclimatic zones and livestock distribution. Socioeconomic aspects of livestock enterprise with special reference to women.

**2. Genetics and Breeding:** Principle of genetics, chemical nature of DNA and RNA and their models and functions. Recombinant DNA technology, transgenic animals, multiple ovulation and embryo-transfer. Cytogenetics, immunogenetics and biochemical polymorphic and their application in animal improvement. Gene actions. Systems and strategies for improvement. Geneaction. Systems and strategies for improvement of livestock for milk, meat, wool production and drought and poultry for eggs and meat. Breeding of animals for disease resistance. Breeds of livestock, poultry and rabbits.

**3. Nutrition:** Role of nutrition in animal health and production. Classification of feeds, Proximate composition of feeds, feeding standards, computation of rations. Ruminant nutrition. Concepts of total digestible nutrients and starch equivalent systems. Significance of energy determinations. Conservation of feeds and fodder and utilization of agro by-products. Feed supplements and additives. Nutrition deficiencies and their management.

**4. Management:** Systems of housing and management of livestock poultry and rabbits. Farm record. Economics of livestock, poultry and rabbit farming. Clean milk production. Veterinary hygiene with reference to water, air and habitation. Sources of water and standards of potable water. Purification of water. Air changes and thermal comfort. Drainage systems and effluent disposal Biogas.

**5. Animal Production:** (a) Artificial insemination, fertility and sterility. Reproductive physiology, semen characteristics and preservation. Sterility its causes and remedies. (b) Meat eggs and wool production. Methods of slaughter of meat animals, meat inspection, judgment, carcass characteristics, adulteration and its detection processing and preservation; Meat products, quality control and nutritive value, By-products. Physiology of egg production, nutritive value, grading of eggs preservation and marketing. Types of wool, grading and marketing.

**6. Veterinary Science:** (i) Major contagious diseases affecting cattle, buffaloes, horses, sheep and goats, pigs, poultry, rabbits and pet animals-Etiology, symptoms, pathogenicity, diagnosis, treatment and control of major bacterial, viral, rickettsial and parasitic infections. (ii) Description, symptoms, diagnosis and treatment of the following:

- a) Production diseases of milk animals, pig and poultry.
- b) Deficiency diseases of domestic livestock and birds
- c) Poisonings due to infected/contaminated foods and feeds, chemicals and drugs.

**7. Principles of immunization and vaccination:** Different types of immunity, antigens and antibodies. Methods of immunization. Break-down of immunity, Vaccines and their use in animals. Zoonoses, Foodborne infections and intoxications, occupation hazards.

8. (a) Poisons used for killing animals euthanasia.
- (b) Drugs used for increasing production/performance efficiency and their adverse effects.
- (c) Drugs used to tranquilize wild animals as well as animals in captivity.
- (d) Quarantine measures in India and abroad. Act, Rules and Regulations.

**9. Dairy Science:** Physicochemical and nutritional properties of milk.

Quality assessment of milk and milk products, Common tests and legal standards. Cleaning and sanitation of dairy equipment. Milk collections, chilling, transportation processing, packaging, storage and distribution. Manufacture of market milk, cream butter, cheese, ice-cream, condensed and dried milk, by products and Indian Milk products. Unit operations in dairy plant.

Role of micro organism in quality of milk and products physiology of milk secretion.

## 18. BOTANY

**1. Cell Biology:** Structure and function of cell wall(extracellular matrix or ECM), cell membrane and cell organelles, Nucleus, nucleolus, nuclear pore complex (NPC), chromosome and nucleosome, Mitosis, meiosis, molecular control involving check-points in cell division cycle. Differentiation, cellular senescence.

**2. Genetics, Molecular Biology and Biotechnology:** Laws of inheritance. Concept of gene and allelomorph. Linkage crossing over and gene mapping. Structural and numerical changes in chromosomes and gene mutations. Sex determination and differentiation. Structure and synthesis of nucleic acids and proteins. Genetic code. Regulation of gene expression. Genetic engineering and crop improvement. Protoplast, cell, tissue and organ cultures. Somatic hybridization. Biofertilizers and biopesticides. Biotechnology in agri-horticulture, medicine and industry.

**3. Tissue Systems:** Origin, development, structure and function of primary and secondary tissue.

**4. Plant Diversity and Systematics:** Structure and function of plant forms from evolutionary aspects (viruses to Angiosperms including fossils). Principles of nomenclature, classification and identification of plants. Modern approaches in plant Taxonomy. Recent classification of living organism into three groups (bacteria, archaea and eukarya).

**5. Plant Physiology:** Water relations. Mineral nutrition. Photosynthesis. Respiration. Nitrogen metabolism. Enzymes and coenzymes. Dynamics of growth, growth movements, growth substances, photomorphogenesis. Secondary metabolites. Isotopes in biological studies. Physiology of flowering.

**6. Methods of Reproduction and Seed Biology:** Vegetative, asexual and sexual methods of reproduction. Pollination and fertilization. Sexual incompatibility. Development, structure, dormancy and germination of seed.

**7. Plant Pathology:** Diseases of rice, wheat, sugarcane, potato, mustard, groundnut and cotton crops. Factors affecting infection (host factors, pathogen factors, biotic factors like rhizosphere and phyllosphere organisms). Chemical, biological and genetic methods of disease control (including transgenic plants).

**8. Plant and Environment:** Biotic and abiotic components. Ecological adaptation. Types of vegetational zones and forests of India. Deforestation, afforestation, social forestry and plant introduction. Soil erosion, wasteland, reclamation. Environmental pollution and its control (including phytoremediation). Bio-indicators. Global warming.

**9. Biodiversity, plant Genetic Resources:** Methods of conservation of plant genetic resources and its importance. Convention of Biological Diversity (CBD). Endangered, threatened and endemic taxa. Role of cell/tissue culture in propagation and enrichment of genetic diversity. Plants as sources of food, fodder, forage, fibres, oils, drugs, wood and timber, paper, rubber, beverages, spices, essential oils and resins, gums, dyes, insecticides, pesticides and ornamentation. Biomass as a source of energy.

**10. Origin of Life and Evolution:** Basic concept of origin of earth and origin of life. Theories of organic evolution, molecular basis of evolution.

## 19. CHEMISTRY

### SECTION-A: (INORGANIC CHEMISTRY):

**1.1 Atomic structure:** Schrodinger wave equation, significance of  $n$  and  $l$  quantum numbers and their significance, radial and angular probability, shapes of orbitals, relative energies of atomic orbitals as a function of atomic number. Electronic configurations of elements; Aufbau principle, Hund's multiplicity rule, Pauli exclusion principle.

**1.2 Chemical periodicity:** Periodic classification of elements, salient characteristics of s,p,d and f block elements. Periodic trends of atomic radii, ionic radii, ionization potential, electron affinity and electro-negativity in the periodic table.

**1.3 Chemical bonding:** Types of bonding, overlap of atomic orbitals, sigma and pi-bonds, hydrogen and metallic bonds. Shapes of molecules bond order, bond length, V.S.E.P.R. theory and bond angles. The concept of hybridization and shapes of molecules and ions.

**1.4 Oxidation states and oxidation number:** Oxidation and reduction, oxidation numbers, common redox reactions, ionic equations. Balancing of equations for oxidation and reduction reactions.

**1.5 Acids and bases:** Bronsted and Lewis theories of acids and bases. Hard and soft acids and bases. HSAB principle, relative strengths of acids and bases and the effect of substituents and solvents on their strength.

#### **1.6 Chemistry of elements:**

- i) **Hydrogen:** Its unique position in the periodic table, isotopes, ortho and para hydrogen, industrial production, heavy water.
- ii) **Chemistry of 's' and 'p' block elements:** Electronic configuration, general characteristics properties, inert pair effect, allotropy and catenation. Special emphasis on solutions of alkali and alkaline earth metals in liquid ammonia. Preparation, properties and structures of boric acid, borates, boron nitrides, borohydride (diborane), carboranes, oxides and oxyacids of nitrogen, phosphorous, sulphur and chlorine; interhalogen compounds, polyhalide ions, pseudohalogens, fluorocarbons and basic properties of halogens. Chemical reactivity of noble gases, preparation, structure and bonding of noble gas compounds.
- iii) **Chemistry of 'd' block elements:** Transition metals including lanthanides, general characteristic properties, oxidation states, magnetic behaviour, colour. First row transition metals and general properties of their compounds (oxides, halides and sulphides); lanthanide contraction.

**1.7 Extraction of metals:** Principles of extraction of metals as illustrated by sodium, magnesium, aluminum, iron, nickel, copper, silver and gold.

**1.8 Nuclear Chemistry:** Nuclear reactions; mass defect and binding energy, nuclear fission and fusion. Nuclear reactors; radioisotopes and their applications.

**1.9 Coordination compounds:** Nomenclature, isomerism and theories of coordination compounds and their role in nature and medicine.

**1.10 Pollution and its control:** Air pollution, types of air pollution, control of air and water pollution, radioactive pollution.

### SECTION-B: (ORGANIC CHEMISTRY):

**2.1 Bonding and shapes of organic molecules:** Electronegativity, electron displacements-inductive, mesomeric and hyperconjugative effects; bond polarity and bond polarizability, dipole moments of organic molecules; hydrogen bond; effects of solvent and structure on dissociation constants of acids and bases; bond formation, fission of covalent bonds; homolysis and heterolysis; reaction intermediates-carbocations, carbanions, free radicals and carbenes; generation geometry and stability; nucleophiles and electrophiles.

**2.2 Chemistry of aliphatic compounds:** Nomenclature alkanes-synthesis, reactions (free radical halogenation) – reactivity and selectivity, sulphonation-detergents; cycloalkanes-Baeyers' strain theory; alkanes and alkynes-synthesis, electrohilic addition; reactions, Markownikov's rule, peroxide effects, 1-3-dipolar addition; nucleophilic addition to electron-deficient alkenes; polymerization; relative acidity; synthesis and reactions of alkyl halides, alkanols, alkanals, alkanones, alkanonic acids, esters, amides, nitriles, amines, acid anhydrides,  $\alpha$ -unsaturated ketones, ethers and nitro compounds.

**2.3 Stereochemistry of carbon compounds:** Elements of symmetry, chiral and achiral compounds. Fischer projection formulae; optical isomerism of lactic and tartaric acids, enantiomerism and diastereo-isomerism; configuration (relative and absolute); conformations of alkanes upto four carbons, cyclohexane and dimethylcyclohexanes their potential energy D,L and R,S notations of compounds containing chiral centers; projection formulae-Fischer, Newman and sawhorse of compounds containing two adjacent chiral centers; meso and dl-isomers, erythro and threo isomers; racemization and resolution; examples of homotopic, enantiotopic and diasteretopic atoms and groups in organic compounds, geometrical isomers; E and Z notations. Stereo-chemistry of SN1, SN2,E1 and E2 reactions.

**2.4 Organometallic compounds:** Preparation and synthetic uses of Grignard reagents, alkyl lithium compounds.

**2.5 Active methylene compounds:** Diethyl malonate, ethyl acetoacetate. ethyl cyanoacetate-applications in organic synthesis; tautomerism (keto-enol).

**2.6 Chemistry of aromatic compounds:** Aromaticity; Huckel's rule; electrophilic aromatic substitution-nitration, sulphonation, halogenation (nuclear and side chain), Friedel-Crafts alkylation and acylation, substituents effect; chemistry and reactivity of aromatic halides, phenols, nitro, diazo, dia-zonium and sulphonic acid derivatives, benzyne reactions.

**2.7 Chemistry of biomolecules:** (i) **Carbohydrates:** Classification, reactions, structure of glucose, D,L-configuration, osazone formation; fructose and sucrose; step-up step-down of aldoses and ketoses; and their interconversion, (ii) **Amino acids:** Essential amino acids; zwitterions, isoelectric point, polypeptides; proteins; methods of synthesis of amino acids. (iii) Elementary idea of oils, fats, soaps and detergents.

2.8 Basic principles and applications of UV, visible, IR and NMR spectroscopy of simple organic molecules.

### **SECTION-C: (PHYSICAL CHEMISTRY):**

**3.1 Gaseous state:** Deviation of real gases from the equation of state for an ideal gas, Vander Waals and Virial equation of state, critical phenomena, principle of corresponding states, equation for reduced state. Liquification of gases, distribution of molecular speed, collisions between molecules in a gas; mean free path, specific heat of gases.

#### **3.2 Thermodynamics:**

- (i) **First Law and its applications:** Thermodynamic systems, states and processes work, heat and internal energy, zeroth law of thermodynamics, various types of work done on a system in reversible and irreversible processes. Calorimetry and thermo-chemistry, enthalpy and enthalpy changes in various physical and chemical processes, Joule-Thomson effect, inversion temperature. Heat capacities and temperature dependence of enthalpy and energy changes.
- (ii) **Second Law and its applications:** Spontaneity of a process, entropy and entropy changes in various processes, free energy functions, criteria for equilibrium, relation between equilibrium constant and thermodynamic quantities.

**3.3 Phase rule and its applications:** Equilibrium between liquid, solid and vapours of a pure substance, Clausius-Clapeyron equation and its applications. Number of components, phases and degrees of freedom; phase rule and its applications; simple systems with one (water and sulphur) and two components (lead-silver, salt hydrates). Distribution law, its modifications, limitations and applications.

**3.4 Solutions:** Solubility and its temperature dependence, partially miscible liquids, upper and lower critical solution temperatures, vapour pressures of liquids over their mixtures, Raoult's and Henry's law, fractional and steam distillations.

**3.5 Colligative Properties:** Dilute solutions and colligative properties, determination of molecular weights, using colligative properties.

**3.6 Electro-chemistry:** Ions in solutions, ionic equilibria, dissociation constants of acids and bases, hydrolysis, pH and buffers, theory of indicators and acid-base titrations. Conductivity of ionic solutions, its variation with concentration, Ostwald's dilution law, Kohlrausch law and its application. Transport number and its determination. Faraday's laws of electrolysis, galvanic cells and measurements of their e.m.f., cell reactions, standard cell, standard reduction potential Nernst equation, relation between thermodynamic quantities and cell e.m.f., fuel cells, potentiometric titrations.

**3.7 Chemical kinetics:** Rate of chemical reaction and its dependence on concentrations of the reactants, rate constant and order of reaction and their experimental determination; differential and integral rate equations for first and second order reaction, half-life periods; temperature dependence of rate constant and Arrhenius parameters; elementary ideas regarding collision and transition state theory.

**3.8 Photochemistry:** Absorption of light, laws of photochemistry, quantum yield, the excited state and its decay by radiative, non-radiative and chemical pathways; simple photochemical reactions.

**3.9 Catalysis:** Homogeneous and heterogeneous catalysis and their characteristics, mechanism of heterogeneous catalysis; enzyme catalysed reactions (Michaelis-Menten mechanism)

**3.10 Colloids:** The colloidal state, preparation and purification of colloids and their characteristics properties; lyophilic and lyophobic colloids and coagulation; protection of colloids; gels, emulsions, surfactants and micelles.

## **20. GEOLOGY**

### **Part – I**

- a. **General Geology:** Solar System. The Earth: its origin, age and internal constitution. Volcanoes-types, distribution geological effects and products. Earth-quakes-intensity, magnitude, distribution, causes and effects. Elementary ideas about isostasy, geosynclines, mountain building, continental drift, sea floor spreading and plate tectonics.
- b. **Geomorphology:** Basic concepts. External and internal processes. Rock weathering. Cycle of erosion. Fluvial landforms and drainage patterns. Landforms of Aeolian, marine, glacial and 'Karst' landscapes. Elements of Remote Sensing.
- c. **Structural and field Geology:** Primary and secondary structures. Dip and strike of beds. Unconformities. Study of folds, joints, faults, foliation and lineations. Overthrusts and nappe structures. Stages of rock deformation. Construction of block diagrams, Stereographic and equal-area nets. Solutions of simple problems by stereographic net. Topographic maps and their interpretation. Use of clinometer compass in the field Measurements of bed, foliation, folds joints, faults and lineations in the field. Principles of geological mapping. Effects of topography on outcrops. Drawing of sections.



**Part – II**

- a. **Crystallography:** Elements of crystal structure. Laws of crystallography, Symmetry elements of normal classes of seven crystal systems. Properties and interaction of light and crystalline matter. Petrological microscope and accessories. Construction and use of Nicole prism. Pleochroism, double refraction, extinction angle, birefringence and twinning in crystals, Isotropic, uniaxial and biaxial minerals.
- b. **Mineralogy:** Physical, chemical and optical properties of the following common rock forming minerals: quartz, feldspar, mica, pyroxene, amphibole, olivine, garnet, chlorite, carbonates, aluminosilicates. Structure of silicates and crystal chemistry of minerals. Gemstones.
- c. **Economic Geology:** Ore, ore mineral and gangue. Classification of ore deposits. Important processes of their formation. Occurrence, origin and distribution in India of the ores of aluminium, chromium, copper, gold, lead, zinc, iron, manganese and radioactive elements. Deposits of minerals use as abrasives, refractories and in ceramics, deposits of coal and petroleum. Elements of prospective of mineral deposits.

**Part – III**

- a. **Igneous Petrology:** Origin of magma and formation of igneous rocks. Bowen's reaction principle. Crystallisation of binary systems. Classification of igneous rocks. Textures and structures of igneous rocks. Composition, origin and mode of occurrence of granite, syenite diorite, mafic and ultramafic groups, anorthosites and alkaline rocks.
- b. **Sedimentary Petrology:** Sedimentary process and products. Classification of sedimentary rocks. Sedimentary structures. Residual deposits – their mode of formation, characteristics and types, Clastic deposits – their classification, mineral composition and texture. Elementary ideas about the origin and characteristics of quartz arenites, arkoses and greywackes. Siliceous and calcareous deposits of chemical and organic origin.
- c. **Metamorphic Petrology:** Types and factors of metamorphism. Zones, grades and facies of metamorphism. Regional and contact metamorphism. Textures and structures of metamorphic rocks. Metamorphism of argillaceous, arenaceous, calcareous and basic rocks. Metasomatism.

**Part – IV**

- a) **Paleontology:** Habits and habitats of animals. Fossils and fossilization. Modes of preservation. Application of fossils, Study of morphology and geological history of Foraminiferida, Brachipoda, Bivalvia, Gastropoda, Cephalopoda, Trilobita, Echinoidea and Anthozoa. Mammals of Siwalik Group. A brief study of Gondwana flora.
- b) **Stratigraphy and Geology of India:** Fundamental laws of stratigraphy. Stratigraphic classification lithostratigraphic, biostratigraphic and chronostratigraphic. Geological time scale. Physiographic divisions and outline of stratigraphy of India. Brief study of Dharwar, Vindhyan and Gondwana Supergroups and Siwalik Group with reference to their major subdivisions, lithology, fossils, aerial distribution and economic importance.

**21. MATHEMATICS**

1. **Algebra:** Elements of Set Theory; Algebra of Real and Complex numbers including Demovire's between Coefficients and Roots, symmetric functions of roots; Elements of Group Theory; Sub-Group, Cyclic groups, Permutation, Groups and their elementary properties. Rings, Integral Domains and Fields and their elementary properties.
2. **Vector Spaces and Matrices:** Vector Space, Linear Dependence and Independence. Sub-spaces. Basis and Dimensions, Finite Dimensional Vector Spaces. Linear Transformation of a Finite dimensional vector Space, Matrix Representation. Singular and Nonsingular Transformations. Rank and nullity. **Matrices:** Addition, Multiplication, Determinants of a Matrix, Properties of Determinants of order  $n$ , Inverse of a Matrix, Cramer's rule.
3. **Geometry and Vectors:** Analytic Geometry of straight lines and conics in Cartesian and Polar coordinates; Three Dimensional geometry for planes, straight lines, sphere, cone and cylinder. Addition, Subtraction and Products of Vectors and Simple applications to Geometry.
4. **Calculus:** Functions, Sequences, Series, Limits, Continuity, Derivatives. Application of Derivatives: Rates of change, Tangents, Normals, Maxima, Minima, Rolle's Theorem, Mean value Theorems of Lagrange and Cauchy, Asymptotes, Curvature. Methods of finding indefinite integrals, Definite Integrals, Fundamental Theorem of integrals Calculus. Application of definite integrals to area, Length of a plane curve, Volume and Surfaces of revolution.
5. **Ordinary Differential Equations:** Order and Degree of a Differential Equation, First order differential Equations, Singular solution, Geometrical interpretation, Second order equations with constant coefficients.
6. **Mechanics:** Concepts of particles-Lamina; Rigid body; Displacement; force, Mass; Weight; Motion, Velocity; Speed; Acceleration; Parallelogram of forces; Parallelogram of velocity, acceleration; resultant; equilibrium of coplanar forces; Moments; Couples; Friction; Centre of mass, Gravity; Laws of motion; Motion of a particle in a straight line; simple Harmonic motion; Motion under conservative forces; Motion under gravity; Projectile; Escape velocity; Motion of artificial satellites.
7. **Elements of Computer Programming:** Binary system, Octal and Hexadecimal systems. Conversion to and from Decimal systems. Codes, Bits, Bytes and Words. Memory of a computer, Arithmetic and Logical operations on numbers. Precision. AND, OR, XOR, NOT and Shift/Rotate operators, Algorithms and Flow charts.

**22. PHYSICS**

1. **Mechanics and Waves:** Dimensional analysis. Newton's laws of motion and applications, variable mass systems, projectiles. Rotational dynamics-kinetic energy, angular momentum, theorems of moment of inertia and calculations in simple cases. Conservative forces, frictional forces. Gravitational potential and intensity due to spherical objects. Central forces, Kepler's problem, escape velocity and artificial satellites (including GPS). Streamline motion, viscosity, Poiseuille's equation. Applications of Bernoulli's equation and Stokes' law. Special relativity and Lorentz transformation-length contraction, time dilation, mass-energy relation. Simple harmonic motion, Lissajous figures. Damped oscillation, forced oscillation and resonance. Beats, Phase and group velocities. Stationary waves, vibration of strings and air columns, longitudinal waves in solids. Doppler effect. Ultrasonics and applications.
2. **Geometrical and Physical Optics:** Laws of reflection and refraction from Fermat's principle. Matrix method in paraxial optics- thin lens formula, nodal planes, system of two thin lenses. Chromatic and spherical aberrations. Simple optical instruments- magnifier, eyepieces, telescopes and microscopes.

Huygen's principle-reflection and refraction of waves. Interference of light – Young's experiment, Newton's rings, interference by thin films, Michelson interferometer. Fraunhofer diffraction-single slit, double slit, diffraction grating, resolving power. Fresnel diffraction- half-period zones and zone plate. Production and detection of linearly, circularly and elliptically polarized light. Double refraction, quarter-waves plates and half-wave plates. Polarizing sheets. Optical activity and applications. Raman & Rayleigh scattering and applications. Elements of fibre optics-attenuation; pulse dispersion in step index and parabolic index fibres; material dispersion. Lasers, characteristics of laser light-spatial and temporal coherence. Focusing of laser beams and applications.

**3. Heat and Thermodynamics:** Thermal equilibrium and temperature. The zeroth law of thermodynamics. Heat and the first law of thermodynamics. Efficiency of Carnot engines. Entropy and the second law of thermodynamics. Kinetic theory and the equation of state of an ideal gas. Mean free path, distribution of molecular speeds and energies. Transport phenomena. Andrew's experiments-van der Waals equation and applications. Joule-Kelvin effect and applications. Brownian motion. Thermodynamic potentials-Maxwell relations. Phase transitions. Kirchhoff's laws. Black-body radiation – Stefan-Boltzmann law, spectral radiance, Wien displacement law, application to the cosmic microwave background radiation, Planck radiation law.

**4. Electricity and Magnetism:** Electric charge, Coulomb's law, electric field, Gauss' law. Electric potential, van de Graaff accelerator. Capacitors, dielectrics and polarization. Ohm's law, Kirchhoff's first and second rules, resistors in series and parallel, applications to two-loop circuits. Magnetic field-Gauss' law for magnetism, atomic and nuclear magnetism, magnetic susceptibility, classification of magnetic materials. Circulating charges, cyclotron, synchrotron. Hall effect. Biot-Savart law, Ampere's law, Faraday's law of induction – Lenz's law. Inductance. Alternating current circuits – RC, LR, single-loop LRC circuits, impedance, resonance, power in AC circuits. Displacement current, Maxwell's equations (MKS Units), electromagnetic waves, energy transport and Poynting vector.

**5. Atomic and Nuclear Physics:** Photoelectric effect, Einstein's photon theory. Bohr's theory of hydrogen atom. Stern Gerlach experiment, quantisation of angular momentum, electron spin. Pauli exclusion principle and applications. Zeeman effect. X-ray spectrum, Bragg's law, Bohr's theory of the Moseley plot. Compton effect, Compton wavelength. Wave nature of matter, de Broglie wavelength, wave-particle duality. Heisenberg's uncertainty relationships. Schrodinger's equation-eigenvalues and eigenfunctions of (i) particle in a box, (ii) simple harmonic oscillator and (iii) hydrogen atom. Potential step and barrier penetration. Natural and artificial radioactivity. Binding energy of nuclei, nuclear fission and fusion. Classification of elementary particles and their interactions.

**6. Electronics.:** Diodes in half-waves and full-wave rectification, qualitative ideas of semiconductors p type and n type semiconductors, junction diode, Zener diode, transistors, binary numbers, Logic gates and truth tables, Elements of microprocessors and computers.

## 23. STATISTICS

**Probability:** Random experiment, sample space, event, algebra of events, probability on a discrete sample space, basic theorems of probability and simple examples based theorem, conditional, probability of an event, independent events, Bayes's theorem and its application, discrete and continuous random variables and their distributions, expectation, moments, moment generating function, joint distribution of two or more random variables, marginal and conditional distributions, independence of random variables, covariance, correlation, coefficient, distribution of a function of random variables. Bernoulli, binomial, geometric, negative binomial, hypergeometric, poisson, multinomial, uniform, beta, exponential, gamma, cauchy, normal, longnormal and bivariate normal distributions, real-life situations where these distributions provide appropriate models, Chebyshev's inequality, weak law of large numbers and central limit theorem for independent and identically distributed random variables with finite variance and their simple applications.

**Statistical Methods:** Concept of a statistical population and a sample, types of data, presentation and summarization of data, measures of central tendency, dispersion, skewness and kurtosis, measures of association and contingency, correlation, rank correlation, intraclass correlation, correlation ratio, simple and multiple linear regression, multiple and partial correlations (involving three variables only), curve-fitting and principle of least squares, concepts of random sample, parameter and statistic, Z,  $\chi^2$ , t and F statistics and their properties and applications, distributions of sample range and median (for continuous distributions only), censored sampling (concept and illustrations).

**Statistical Inference:** Unbiasedness, consistency, efficiency, sufficiency, completeness, minimum variance unbiased estimation, Rao-Blackwell theorem, Lehmann-Scheffe theorem, Cramer-Rao inequality and minimum variance bound estimator, moments maximum likelihood, least squares and minimum chi-square methods of estimation, properties of maximum likelihood and other estimators, idea of a random interval, confidence intervals for the parameters of standard distributions, shortest confidence intervals, large-sample confidence intervals. Simple and composite hypotheses, two kinds of errors, level of significance, size and power of a test, desirable properties of a good test, most powerful test, Neyman-Pearson lemma and its use in simple example, uniformly most powerful test, likelihood ratio test and its properties and applications.

Chi-square test, sign test, Wald-Wolfowitz runs test, run test for randomness, median test, Wilcoxon test and Wilcoxon-Mann-Whitney test.

Wal's sequential probability ratio test, OC and ASN functions, application to binomial and normal distributions.

Loss function, risk function, mini-max and Bayes rules.

**Sampling Theory and Design of Experiments:** Complete enumeration vs. sampling, need for sampling, basic concepts in sampling, designing large-scale sample surveys, sampling and non-sampling errors, simple random sampling, properties of a good estimator, estimation of sample size, stratified random sampling, systematic sampling cluster sampling, ratio and regression methods of estimation under simple and stratified random sampling, double sampling for ratio and regression methods of estimation, two-stage sampling with equal-size first-stage units.

Analysis of variance with equal number of observations per cell in one, two and three-way classifications, analysis of covariance in one and two-way classifications, completely randomized design, randomized block design, latin square design, missing plot technique,  $2^n$  factorial design, total and partial confounding,  $3^2$  factorial experiments, split-plot design and balanced incomplete block design.

## 24. ZOOLOGY

### 1. Cell structure and function:

- a) Prokaryote and eukaryote
- b) Structure of animal cell, structure and functions of cell organelles.
- c) Cell cycle-mitosis, meiosis.
- d) Structure and contents of nucleus including nuclear membrane, structure of chromosome and gene, chemistry of genetic components.
- e) Mendel's laws of inheritance, linkage and genetic recombination; cytoplasmic inheritance.
- f) Function of gene: replication, transcription and translation; mutations (spontaneous and artificial); Recombinant DNA; principle and application
- g) Sex determination in Drosophila and man; sex linkage in man

### 2 Systematics:

- a) Classification of non-chordates (upto sub-classes) and chordates (up to orders) giving general features and evolutionary relationship of the following phyla: Protozoa, Porifera, Coelenterata, Platyhelminthes, Nematelminthes, Annelida, Arthropoda, Mollusca, Echinodermata, Minor Phyla (Bryozoa, Phoronida and Chaetognatha) and Hemichordata.
- b) Structure reproduction and life history of the following types: Amoeba, Monocystis, Plasmodium, Paramecium, Sycon, Hydra, Obelia, Fasciola, Taenia, Ascaris, Neanthes, Pheretima, Hirudina, Palaemon, Buthus, Periplaneta, Lamellidens, Pila, Asterias and Balanoglossus.
- c) Classification of chordates (up to orders), giving general features and evolutionary relationship of the following: Protochordata; Agnatha; Gnathostomata-Pisces, Amphibia, Reptilia, Aves and Mammalia.
- d) Comparative functional anatomy of the following based on type animals (Scoliodon, Rana, Calotes, Columba and Oryctolagus): integument and its derivatives, endoskeleton, digestive system, respiratory system, circulator system including heart and aortic arches, urinogenital system; brain and sense organs (eye and ear); endocrine glands and other hormone producing structures, (Pituitary, thyroid, parathyroid, adrenal, pancreas, gonads) their function.

### 3. Vertebrate Physiology and Biochemistry:

- a) Chemical composition of protoplasm; nature and function of enzymes; vitamins, their sources and role; colloids and hydrogen ion concentration; biological oxidation, electron transport and role of ATP, enegetics, glycolysis, citric acid cycle; vertebrate hormones; their type, sources and function; pheromones and their role.
- b) Neuron and nerve impulse-conduction and transmission across synapses; nenurotransmitters and their role, including acetyl cholinesterase activity.
- c) Homeostasis; osmoregulation; active transport and ion pump.
- d) Composition of carbohydrates, fats, lipids and proteins; steroids.

### 4. Embryology:

- a) Gametogenesis, fertilization, cleavage; gastrulation in frog and chick
- b) Metamorphosis in frog and retrogressive metamorphosis in ascidian; extra-emhryonic membranes in chick and mammal; placentation in mammals; Bio-genetic law.

### 5. Evolution:

- a) Origin of life; principles, theories and evidences of evolution; species concept.
- b) Zoogeographical realms, insular fauna; geological eras.
- c) Evolution of man; evolutionary status of man.

### 6. Ecology, Wildlife and Ethology:

- a) Abiotic and biotic factors; concept of ecosystem, food chain and energy flow; adaptation of aquatic, terrestrial and aerial fauna; intra-and inter-specific animal relationships; environmental pollution; Types, sources, causes, control and prevention.
- b) Wildlife of India; endangered species of India; sancturaries and national parks of India.
- c) Biological rhythms.

### 7. Economic Zoology:

- a) Beneficial and harmful kinsects including insect vectors of human diseases.
- b) Industrial fish, prawn and molluscs of India.
- c) Non-poisonous and poisonous snakes of India
- d) Venomous animals-centipede, wasp, honey bee
- e) Diseases caused by aberrant chromosomes/genes in man; genetic counselling; DNA as a tool for forensic investigation.

## 25. CIVIL ENGINEERING

### PART-A

**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 and Varignon's theorem, free body diagram, conditions of equilibrium, Principle of virtual work, equivalent force system.

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

Static Friction Inclined plane and bearings.

Kinematics and Kinetics: Kinematics in Cartesian and polar co-ordinates, motion under uniform and non-uniform acceleration, motion under gravity. Kinetics of particle: Momentum and Energy principles, D'Alembert's Principle, Collision of elastic bodies, rotation of rigid bodies, simple harmonic motion.

**2. Strength of Materials:** Simple Stress and Strain, Elastic constants, axially loaded compression members, Shear force and bending moment, theory of simple bending moment, Shear Stress distribution across cross sections, Beams of uniform strength, Leaf spring, Strain Energy in direct stress, bending and shear.

**Deflection of beams:** Macaulay's method, Mohr's moment area method, Conjugate beam method, unit load method. Torsion of Shafts, Transmission of power, close coiled helical springs, Elastic stability of columns: Euler's, Rankine's and Secant formulae. Principal Stresses and Strains in two dimension, Mohr's Circle. Theories of Elastic failure, Thin and Thick cylinders: Stresses due to internal and external pressures-Lame's equation.

**3. Structural Analysis:** Analysis of pin jointed plane trusses, deflection in trusses. Three hinged and two hinged arches, rib shortening, temperature effects, influence lines in arches. Analysis of propped cantilevers, fixed beams, continuous beams and rigid frames. Slope deflection, moment distribution, Kani's method and Matrix method: Force and Displacement methods. Rolling loads and influence lines for determinate beams and pin jointed trusses.

## PART-B

**Geotechnical Engineering:** Types of soil, field identification and classification, phase relationships, consistency limits, particle size distribution, classification of soil, structure and clay mineralogy.

Capillary water and structural water, effective stress and pore water pressure, Darcy's Law, factors affecting permeability, determination of permeability, permeability of stratified soil deposits.

Seepage pressure, quick sand condition, compressibility and consolidation, Terzaghi's theory of one dimensional consolidation, consolidation test. Compaction of soil, optimum moisture content, Proctor Density.

Subsurface exploration, methods of boring, sampling, types of sampler, field tests.

Shear strength of soils, Mohr-Coulomb failure theory, shear tests Earth pressure at rest, active and passive pressures, Rankine's theory, Coulomb's wedge theory, earth pressure on retaining wall.

Bearing capacity, Terzaghi and other important theories, net and gross bearing pressure, immediate and consolidation settlement.

Load carrying capacity of pile groups.

Stability of slope-conventional method of slices, stability numbers.

**Transportation Engineering:** Highway alignment, choice of layout and capacity of highways, location survey, geometric design of highways-various elements, curves, grade separation and segregation of traffic, inter-section design, highway materials and testing subgrade and pavement components, type of pavements, road drainage, elements of airport engineering.

Railway engineering-elements of permanent track-rails, sleepers, ballast and rail fastenings, tractive resistance, elements of geometric design-gradients and grade compensation on curves, cant transition curves and vertical curves, stresses in railway tracks, points and crossing, signaling and inter-locking, maintenance of railway track. Culverts and small bridges.

## PART-C

**Fluid Mechanics:** fluid properties, fluid statics, forces on plane and curved surfaces, stability of floating and submerged bodies.

**Kinematics:** Velocity, streamlines, continuity equation, accelerations irrotational and rotational flow, velocity potential and stream functions, flownet, separation.

**Dynamics:** Euler's equation along streamline, control volume equation, continuity, momentum, energy and moment of momentum equation from control volume equation, applications to pipe flow, moving vanes, moment of momentum, Dimensional analysis.

Boundary layer on a flat plate, drag and lift on bodies. Laminar and Turbulent Flows. Laminar and turbulent flow through pipes, friction factor variation, pipe networks, water hammer and surge tanks.

**Open Channel Flow:** Energy and momentum correction factors, uniform and non-uniform flows, specific energy and specific force, critical depth, Friction factors and roughness co-efficients, flow in transitions, free overfall, weirs, hydraulic jump, surges, gradually varied flow equations, surface profiles, moving hydraulic jump.

## PART-D

### Environmental Engineering:

**Water Supply:** Estimation of surface and subsurface water resources, predicting demand for water, impurities of water and their significance, physical, chemical and bacteriological analysis, water borne diseases, standards for potable water.

**Intake of water:** Pumping and gravity schemes, water treatment; principles of coagulation, flocculation and sedimentation; slow-, rapid-, pressure-, filters; chlorination, softening, removal of taste, odour and salinity.

Water storage and distribution: storage and balancing reservoir types, location and capacity. Distribution systems: layout, hydraulics of pipe lines, pipe fittings, valves including check and pressure reducing valves, meters, analysis of distribution systems, leak detection, maintenance of distribution systems, pumping stations and their operations.

**Sewerage systems:** Domestic and industrial wastes, storm sewage-separate and combined systems, flow through sewers, design of sewers, sewer appurtenances, manholes, inlets, junctions, siphon. Plumbing in Public buildings.

**Sewerage characterization:** BOD, COD, solids, dissolved oxygen, nitrogen and TOC. Standards of disposal in normal water course and on land.

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

**Construction Management:** Elements and principles of Activity on Arrow (AOA) and Activity on Node (AON) networks and work breakdown structure. Interfaces. Ladder networks. Activity time. Time computations and works. ATC and PTC trade-off. Work study and sampling. Scheduling principles-material schedules. ABC and EOQ analysis of inventory. Budgeting with bar-charts. Working capital. PERT, probability of completion.

Elements of Engineering Economics, methods of appraisal, present worth, annual cost, benefit-cost, incremental analysis. Economy of scale and size. Choosing between alternatives including levels of investments. Project profitability.

## 26. ELECTRICAL ENGINEERING

**Electrical Circuits – Theory and Applications:** 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 and applications; coupled circuits and applications; balanced 3-phase circuits. Two port networks, driving point and transfer functions; poles and zeros of network functions.

**Signals & Systems:** Representation of continuous-time and discrete-time signals & systems; LTI systems; convolution; impulse response; time-domain analysis of LTI systems based on convolution and differential/difference equations. Fourier transform, Laplace transform, Z-transform, Transfer function. Sampling and recovery of signals.

**Control Systems:** Elements of control systems; block-diagram representations; open-loop & closed-loop systems; principles and applications of feed-back. LTI systems: time domain and transform domain analysis. Stability: Routh Hurwitz criterion, root-loci, Nyquist's criterion. Bode-plots, Design of lead-lag compensators; Proportional, PI, PID controllers.

**E.M. Theory:** Electro-static and magneto-static fields; Maxwell's equations; e.m. waves and wave equations; wave propagation and antennas; transmission lines; micro-wave resonators, cavities and wave guides.

**Electrical Engineering Materials:** Electrical/electronic behaviour of materials: conductivity; free-electrons and band-theory; intrinsic and extrinsic semi-conductor, p-n junction; solar cells, super-conductivity. Dielectric behaviour of materials: polarization phenomena; piezo-electric phenomena. Magnetic materials: behaviour and application.

**Analog Electronics:** Diode circuits: rectifiers filters, clipping and clamping, zener diode and voltage regulation, Bipolar and field effect transistors (BJT, JFET and MOSFET): Characteristics, biasing and small signal equivalent circuits. Basic amplifier circuits; differential amplifier circuits. Amplifiers: analysis, frequency response. Principles of feedback; OPAMP circuits; filters; oscillators.

**Digital Electronics:** Boolean algebra; minimisation of Boolean function; logic gates, digital IC families (DTL, TTL, ECL, MOS, CMOS). Combination circuits: arithmetic circuits, code converters, multiplexers and decoder's. Sequential circuits: latches and flip-flops, counters and shift-registers. Comparators, timers, multi-vibrators. Sample and hold circuits; ADCs and DACs. Semiconductor memories.

**Communication Systems:** Fourier analysis of signals: amplitude, phase and power spectrum, auto-correlation and cross-correlation and their Fourier transforms. Analog modulation systems: amplitude and angle modulation and demodulation systems, spectral analysis; super heterodyne receivers. Pulse code modulation (PCM), differential PCM, delta modulation. Digital modulation schemes : amplitude, phase and frequency shift keying schemes (ASK,PSK,FSK). Multiplexing: time-division, frequency-division. Additive Gaussian noise; characterization using correlation, probability density function, power spectral density, Signal-to-noise ratio calculations for AM and FM. Elements of digital communication systems; source coding, channel coding; digital modulation & demodulation. Elements of information theory, channel capacity. Elements of satellite and mobile communication; principles of television engineering; radar engineering and radio aids to navigation.

**Computers and Microprocessors:** Computer organization; number representation and arithmetic, functional organization machine instructions, addressing modes, ALU hardware and micro programmed control, memory organization. Elements of microprocessors; 8-bit microprocessors-architecture, instruction set, assembly level programming, memory, I/O interfacing, micro controllers and applications.

**Measurement and Instrumentation:** Error analysis; measurement of current voltage, power, energy, power-factor, resistance, inductance, capacitance and frequency; bridge measurements. Electronic measuring instruments; multimeter, CRO, digital volt meter, frequency counter, Q-meter, spectrum analyser, distortion-meter. Transducers; thermocouple, thermistor, LVDT, strain-gauges, piezo-electric crystal. Use of transducers in measurement of non-electrical quantities. Data-acquisition systems.

**Energy Conversion:** Single-phase transformer; equivalent circuit, phasor-diagram, tests, regulation and efficiency; three-phase transformer; auto transformer. Principles of energy conversion-d.c. generators and motors: Performers characteristics, starting and speed control armature reaction and commutation; three-phase induction motor; performance characteristics, starting and speed control. Single-phase induction motor. Synchronous generators; performance characteristics, regulation, parallel operation. Synchronous motors; starting characteristics, applications; synchronous condenser, FHP motors, permanent magnet and stepper motors, brushless d.c. motors, single-phase motors.

**Power Systems:** Electric power generation; thermal, hydro, nuclear. Transmission line parameters; steady-state performance of overhead transmission lines and cables. Distribution systems; insulators, bundle conductors, corona and radio interference effects; per-unit quantities; bus admittance and impedance matrices; load flow; voltage control and power factor correction. Economic operation. Principles of over current, differential and distance protection; solid state relays, circuit breakers, concept of system stability, HVDC transmission.

**Power Electronics and Electric Drives:** Semiconductor power devices; diode, transistor, thyristor, triac, GTO and MOSFET, static characteristics, principles of operation; triggering circuits; phase controlled rectifiers; bridge converters-fully controlled and half controlled; principles of thyristor chopper and inverter. Basic concept of speed control of DC and AC motor drives.

**Elements of IC Fabrication Technology:** Overview of IC Technology. Unit steps used in IC fabrication; wafer cleaning, photo-lithography, wet and dry etching, oxidation, diffusion, ion-implantation, CVD and LPCVD techniques for deposition of poly-silicon, silicon, silicon-nitride and silicon dioxide; metallisation and passivation.

## 27. ELECTRONICS AND COMMUNICATION ENGINEERING

**Solid State Physics:** Quantum theory of free electrons, classical wave equation, Schrodinger's wave equation, Fermi distribution function, Band theory of solids, Electron in a periodic field of a crystal (Kronig-Penny model), Diffusion, Drift Mechanism, Continuity equation, Hall effect. Basic Principles of Super Conductivity.

**Electronic Devices and Circuits** PN junction diode, Zener diode, Tunnel diode, Gunn diode, P-I-N diode, BJT, FET, PNPN Devices, Operational Amplifier. Biasing and bias stability, small signal and HF equivalent circuits. Rectifier circuits. Amplifiers: Single-and multistage, differential, Operational, feedback and power amplifiers. Analysis of amplifiers, frequency response of amplifiers, simple operational amplifier circuits, sinusoidal oscillators.

**Networks:** Network definitions, Network topology, Mesh and Node circuit analysis, Steady state sinusoidal analysis, Network theorems, Response of RL, RC and RLC networks to various types of excitation, series and parallel resonance, Two port networks, Laplace transforms.

**Communication systems:** Fourier analysis of signals – amplitude, phase and power spectrum, Fourier Transforms. Autocorrelation and cross-correlation functions, signal transmission through linear time invariant systems. Analog and Digital Modulation Schemes: AM, DSB, SSB, VSB, FM, PM, PAM, PWM, PPM, PCM, DM, ASK, FSK, PSK – Signal generation and demodulation – spectral analysis. (S/N) calculations at the destination. Transmitters and receivers: Radio, TV, Radar and Satellite. Satellite Orbits, Subsystems of a Satellite, G/T of an earth station, Multiple Access Techniques, Basics of optical fiber communication system.

**Electromagnetics:** Gradient, divergence, curl. Gauss and Stokes theorems. Electrostatics, Magnetostatics, Boundary conditions. Maxwell's equations, Wave equation and its solutions, Poynting Vector, Propagation of Electromagnetic waves through various media, reflection, refraction. Phase and group velocity. Transmission lines: Transmission line parameters, transmission line theory, Line at Radio frequencies, Impedance matching. Wave Guides: Modes in Rectangular and Circular Wave guides, attenuation, Wave impedance. Antennas: Retarded Vector potential. LF, MF, HF, VHF, UHF, SHF antennas. Propagation: Ground, Sky and space wave propagation.

**Digital Electronics:** Clipping, Clamping circuits. Boolean algebra, Minimisation of Boolean functions, logic gates, digital IC families, arithmetic circuits, code converters, multiplexers and decoders. Latches and flip-flops, counters and shift registers, comparators, timers, ADC and DACs. Microprocessor (8085) architecture, programming, memory and I/O interfacing.

**Control Systems:** Open loop and closed loop (feedback) systems, LTI systems-transfer function, impulse response, poles, zeros – their significance, stability analysis, Root loci, Routh-Hurwitz criterion, Bode and Nyquist plots.

**Electronic Instrumentation:** Types of errors, Power supplies, CRO, Special purpose CROs, DVM, DMM, digital frequency meters, function generators, standard AM/FM signal generators, pattern generators, Transducers.

## 28. MECHANICAL ENGINEERING

**STATICS:** Simple applications of equilibrium equations.

**DYNAMICS:** Simple applications of equations of motion, work, energy and power.

**THEORY OF MACHINES:** Simple examples of kinematic chains and their inversions.

Different types of gears, bearings, governors, flywheels and their functions.

Static and dynamic balancing of rigid rotors.

Simple vibration analysis of bars and shafts.

Linear automatic control systems.

**MECHANICS OF SOLIDS:** Stress, strain and Hooke's Law. Shear and bending moments in beams. Simple bending and torsion of beams, springs and thin walled cylinders. Elementary concepts of elastic stability, mechanical properties and material testing.

**MANUFACTURING SCIENCE:** Mechanics of metal cutting, tool life, economics of machining, cutting tool materials. Basic types of machine tool and their processes. Automatic machine tools, transfer lines. Metal forming processes and machines-shearing, drawing, spinning, rolling, forging, extrusion. Types of casting and welding methods. Power metallurgy and processing of plastics.

**MANUFACTURING MANAGEMENT:** Methods and time study, motion economy and work space design, operation and flow process charts. Cost estimation, break-even analysis. Location and layout of plants, material handling. Capital budgeting, job shop and mass production, scheduling, dispatching, Routing, Inventory.

**THERMODYNAMICS:** Basic concepts, definitions and laws heat, work and temperature, Zeroth law, temperature scales, behaviour of pure substances, equations of state, first law and its corollaries, second law and its corollaries. Analysis of air standard power cycles, Carnot, Otto, Diesel, Brayton cycles. Vapour power cycles, Rankine reheat and regenerative cycles, Refrigeration cycles-Bell Coleman, Vapour absorption and Vapour compression cycle analysis, open and closed cycle gas turbine with inter-cooling, reheating.

**ENERGY CONVERSION:** Flow of steam through nozzles, critical pressure ratio, shock formation and its effect. Steam generators, mountings and accessories. Impulse and reaction turbines elements and layout of thermal power plants. Hydraulic turbines and pumps, specific speed, layout of hydraulic power plants.

Introduction to nuclear reactors and power plants, handling of nuclear waste.

**REFRIGERATION AND AIR CONDITIONING:** Refrigeration equipment and operation and maintenance, refrigerants, principles of air conditioning, psychrometric chart, comfort zones, humidification and dehumidification.

**FLUID MECHANICS:** Hydrostatics, continuity equation, Bernoulli's theorem, flow through pipes, discharge measurement, laminar and turbulent flow, boundary layer concept.

**FOR POST CODE NO. 13:- JUNIOR STENOGRAPHER IN INDUSTRIAL TRIBUNAL****SCHEME**

<i>Paper</i>	<i>Subject</i>	<i>No.of Questions</i>	<i>Maximum Marks</i>	<i>Duration</i>
1	GENERAL STUDIES	150	150	150 Minutes
2	SECRETARIAL ABILITIES	150	150	150 Minutes

**SYLLABUS****PAPER-I: General Studies.**

Syllabus formulated by the Board of Secondary School Certificate, A.P., as prescribed for 10<sup>th</sup> Class in History, Geography, Civics, Economics, Physics, Chemistry, Botany, Zoology and Current Affairs.

**PAPER-II: - Secretarial Abilities: -**

- 1) Mental Ability (Verbal and non-verbal)
- 2) Logical Reasoning
- 3) Comprehension
- 4) Re-arrangement of sentences with a view to improving analysis of a passage
- 5) Numerical and Arithmetical abilities.

**FOR POST CODE NO. 14:- JUNIOR STENOGRAPHERS (ENGLISH / TELUGU) IN HODS****SCHEME**

<i>Paper</i>	<i>Subject</i>	<i>No.of Questions</i>	<i>Maximum Marks</i>	<i>Duration</i>
1	GENERAL STUDIES	150	150	150 Minutes
2	SECRETARIAL ABILITIES	150	150	150 Minutes

**SYLLABUS****PAPER-I: General Studies.**

Syllabus formulated by the Board of Secondary School Certificate, A.P., as prescribed for 10<sup>th</sup> Class in History, Geography, Civics, Economics, Physics, Chemistry, Botany, Zoology and Current Affairs.

**PAPER-II: - Secretarial Abilities: -**

- 1) Mental Ability (Verbal and non-verbal)
- 2) Logical Reasoning
- 3) Comprehension
- 4) Re-arrangement of sentences with a view to improving analysis of a passage
- 5) Numerical and Arithmetical abilities.

**FOR POST CODE NO. 15:- TYPISTS IN HEADS OF DEPARTMENT. (GROUP-IV)****SCHEME**

<i>Paper</i>	<i>Subject</i>	<i>No.of Questions</i>	<i>Maximum Marks</i>	<i>Duration</i>
1	GENERAL STUDIES	150	150	150 Minutes
2	SECRETARIAL ABILITIES	150	150	150 Minutes

**SYLLABUS****PAPER-I: General Studies.**

Syllabus formulated by the Board of Secondary School Certificate, A.P., as prescribed for 10<sup>th</sup> Class in History, Geography, Civics, Economics, Physics, Chemistry, Botany, Zoology and Current Affairs.

**PAPER-II: - Secretarial Abilities: -**

- 1) Mental Ability (Verbal and non-verbal)
- 2) Logical Reasoning
- 3) Comprehension
- 4) Re-arrangement of sentences with a view to improving analysis of a passage
- 5) Numerical and Arithmetical abilities.

**FOR POST CODE NO. 16:- Junior Assistants in Engineering Labs and in Engineer in Chief Panchayat Raj**(WRITTEN EXAMINATION - OBJECTIVE TYPE)  
(BACHELOR'S DEGREE STANDARD)**SCHEME OF EXAMINATION**

Subject	Duration (Minutes)	Maximum Marks	Minimum qualifying marks		
			SC/ST/ PH	B.Cs	Others
1	2	3	4	5	6
<b>Paper-I:</b> GENERAL STUDIES AND MENTAL ABILITY	150	150			
<b>Paper-II:</b> <b>Section-1:</b> Social and Cultural History of Andhra Pradesh (the History of various Social and Cultural movements in Andhra Pradesh) <b>Section-2:</b> General overview of the Indian Constitution.	150	150			
<b>Paper-III:</b> <b>Section-1:</b> Planning in India and Indian Economy; <b>Section-2:</b> Contemporary problems and Developments in Rural Society with special reference to Andhra Pradesh	150	150			
<b>TOTAL:</b>		<b>450</b>	135	157.5	180
<b>INTERVIEW</b>		50			
<b>GRAND TOTAL (for Executive posts):</b>		<b>500</b>	150	175	200

**Other Important Points:**

1. The candidates who apply for posts identified as of Executive nature will be called for an Interview at the ratio of 1:2 with reference to the number of vacancies duly following the special representation as laid down in General Rule-22 and 22-A of A.P. State and Subordinate Service Rules including Local reservations, and also with due regard to the special/technical qualifications if any. The selections to these posts will be based on the total marks obtained by the candidates at the Written examination and Oral Test taken together subject to the rule of reservation and local reservation etc.
2. The candidates belonging to SCs/STs/BCs/PHs may be called for Interview by relaxing the minimum qualifying marks at the discretion of the Commission, if the Commission is of the opinion that sufficient number of candidates from these communities are not likely to come up for Interview.
3. For the posts which are identified as non-executive posts, the selection will be made on the basis of written marks only.
4. There will no waiting list, if candidates are not available, such vacancies will be carried forward as per rules.
5. Candidates must appear for all the three papers in written examination and Oral Test, if qualified for the same. Absent in any of the above will be liable for disqualification.

**SYLLABUS****PAPER-I**  
**GENERAL STUDIES AND MENTAL ABILITY**

General Science  
Current Events of National and International Importance.  
History of India and Indian National Movement. India and World Geography.  
General Mental Ability.

Questions on General Science will cover General appreciation and understanding of science including matters of every day observation and experience, as may be expected of a well educated person who has not made a special study of any particular scientific discipline. In current events, knowledge of significant national and international events will be tested. In History of India, emphasis will be on broad general understanding of the subject in its social, economic and political aspects. Questions on Indian National Movement will relate to the nature and character of the nineteenth century resurgence, growth of Nationalism and attainment of independence. In geography emphasis will be on geography of India. Questions on geography of India will relate to physical, social and economic geography of the country, including the main features of the Indian agricultural and natural resources. On general mental ability, the candidates will be tested on reasoning and analytical abilities.

**PAPER-II****SECTION-1: SOCIAL AND CULTURAL HISTORY OF ANDHRA PRADESH**

1. The Satavahanas and their contribution – social structure – Ikshvakus and their cultural contribution; Buddhism and Jainism; The Eastern Chalukyas of Vengi – their socio-cultural contribution – growth of Telugu language & Literature.



2. Socio- Cultural and Religious conditions in Andhra Desha between first and fifteenth centuries of the Christian Era.
3. Establishment of British Rule – 1857 Revolt and its impact on Andhra and Hyderabad Socio-cultural awakening ; Adi-Andhra/Dalit and Justice/self – respect movements; Growth of Nationalist Movement in Andhra between 1885 and 1947 – Role of socialists – communists – anti-zamindari-kisan movements.
4. Asafjahi Dynasty – socio-cultural awakening in Telangana -Adi-Hindu Movement – Nizam Rashtra Janasangham – Andhra Mahasabha – Andhra Saaraswata Parishat – Hyderabad State Congress and Vandemataram Movement.
5. Growth of Leftist / Communist Movement and Telangana People’s Armed Struggle – Ittehadul-Muslimeen – Razakars-anti-Nizam Struggles and end of Nizam’s Rule. Integration of Hyderabad State into Indian Union – Formation of Andhra Pradesh – Important historical events after 1956.

## **SECTION-2: GENERAL OVERVIEW OF THE INDIAN CONSTITUTION**

- 6) Salient features of the Indian Constitution – Preamble, Fundamental Duties, Fundamental Rights, Directive Principles of State Policy and their relationship.
- 7) Distinctive features of Indian Federation - Distribution of Legislative Powers between the Union and the State; Relative roles of Legislature, Executive and Judiciary.
- 8) Community development experiment – 3 tier model of Panchayat Raj – 73<sup>rd</sup> and 74<sup>th</sup> amendments and their implementation.
- 9) Welfare Mechanism in India: Provisions for Scheduled Castes, Tribes and Minorities; Reservations for SC, ST and Backward Classes; Prevention of SC and ST Atrocities Act; National and State SC and ST Commission; Women’s Commission; National and States Minorities Commission and Human Rights Commission.
- 10) Unicameral and Bicameral Legislatures – Functions and crises of accountability, decline of legislature.

## **PAPER-III**

### **Section-1: PLANNING IN INDIA & INDIAN ECONOMY**

- 1) Planning in Indian Economy – Socio-economic objectives and outlays of 5 year plans – Major controversies of planning in India – Alternative strategies – Goals and achievements – shortfall of different plans – Planning in the market – Major reforms/policy changes effect from 1991.
- 2) Broad fiscal, monetary, industrial trade and agricultural policies, objectives, rationale, constraints and effects.
- 3) Geographic size – Endowment of natural resources, population; size composition quality and growth trends – occupational distribution – effect of British rule with reference to drain theory and Laissez faire Policy.
- 4) Money banking and public finances – concept of money and measures of money supply velocity of money banks and credit creation, determination of price level – inflation, its causes and remedies , finance budget – taxes and non-tax revenue.
- 5) Meaning and measurements of growth- growth distribution and welfare, characteristics of under development, stages of development, sources of growth capital – human capital, population, productivity, trade and aid, growth strategies – types of average measures – dispersion-correlation-index numbers ; types, uses and limitations.

### **Section-2: CONTEMPORARY PROBLEMS AND DEVELOPMENTS IN RURAL SOCIETY WITH SPECIAL REFERENCE TO ANDHRA PRADESH**

- 1) National Income & Main sectors of Economy, GDP (Gross Domestic Product), Per capita income and HDI (Human Development Index) as measures of development. Relative contribution of agriculture to income and employment in the recent four decades of AP.
- 2) Five year plans of AP – Outlays, Finance in public sector plan and resource allocation pattern in the recent five year plan.
- 3) Need for and aims of land reforms in AP – Structure of land holdings in AP. Forest, sown and irrigated area in AP. Cropping pattern. Sources of Agricultural finance in AP –Agricultural subsidies.
- 4) Growth and structure of Industries in Andhra Pradesh , factories, small and tiny sectors, their comparison , growth , weaknesses and problems- Institutional and non-institutional – growth and structure of cooperatives in Andhra Pradesh – Share of cooperatives in total credits – adequacy and problems.
- 5) Structure of Agricultural outputs – administered prices including support and procurement prices – Public Distribution System in AP ; Service sector of AP – importance, composition and growth with special reference to transport and communication, tourism and information and biotechnology.

**Annexure – II****LIST OF SCHEDULED CASTES****(Definition 28 of General Rule - 2)****SCHEDULE - I**

(Substituted with effect from 27-07-1977 through G.O.Ms.No. 838, G.A.(Services-D) Department, dated 15/12/1977)

- 1 Adi Andhra
- 2 Adi Dravida
- 3 Anamuk
- 4 Aray Mala
- 5 Arundhatiya
- 6 Arwa Mala
- 7 Bariki
- 8 Bavuri
- 9 Beda Jangam, Budga Jangam (In Districts of Hyderabad, Rangareddy, Mahaboobnagar, Adilabad, Nizamabad, Medak, Karimnagar, Warangal, Khammam and Nalgonda)\*
- 10 Bindla
- 11 Byagara, Byagari\*
- 12 Chachati
- 13 Chalavadi
- 14 Chamar, Mochi, Muchi, Chamar-Ravidas, Chamar-Rohidas\*
- 15 Chambhar
- 16 Chandala
- 17 Dakkal, Dokkalwar
- 18 Dandasi
- 19 Dhor
- 20 Dom, Dombara, Paidi, Pano
- 21 Ellamalwar, Yellammalawandlu
- 22 Ghasi, Haddi, Relli, Chachandi
- 23 Godagali, Godagula(in the Districts of Srikakulam, Vizianagaram & Vishakapatnam) \*
- 24 Godari
- 25 Gosangi
- 26 Holey
- 27 Holey Dasari
- 28 Jaggali
- 29 Jambuwulu
- 30 Kolupulvandlu, Pambada, Pambanda, Pambala \*
- 31 Madasi Kuruva, Madari Kuruva
- 32 Madiga
- 33 Madiga Dasu, Mashteen
- 34 Mahar
- 35 Mala, Mala Ayawaru \*
- 36 Mala Dasari
- 37 Mala Dasu
- 38 Mala Hannai
- 39 Mala Jangam
- 40 Mala Masti
- 41 Mala Sale, Netkani
- 42 Mala Sanyasi
- 43 Mang
- 44 Mang Garodi
- 45 Manne
- 46 Mashti
- 47 Matangi
- 48 Mahter
- 49 Mitha Ayyalvar

- |    |   |
|----|---|
| 50 | Mundala   |
| 51 | Paky, Moti, Thoti   |
| 52 | (Omitted)*  |
| 53 | Pamidi  |
| 54 | Panchama, Pariah  |
| 55 | Relli   |
| 56 | Samagara  |
| 57 | Samban  |
| 58 | Sapru   |
| 59 | Sindhollu, Chindollu  |
| 60 | Yatala (Srikakulam Dist. Only) Memo No. 8183/CV-1/2006-10 SW (CV-I) Dept., Dt. 31/03/2008               |
| 61 | Valluvan * (Chittoor and Nellore Dist. Only) Memo No. 8183/CV-1/2006-10 SW (CV-I) Dept., Dt. 31/03/2008 |

\* As per the Constitution (Scheduled Caste) orders (Second Amendment) Act 2002, Act No. 61 of 2002

### LIST OF SCHEDULED TRIBES

1. Andh, Sadhu Andh \*
2. Bagata
3. Bhil
4. Chanchu (Chenchwar omitted) \*
5. Gadabas, Boda Gadaba, Gutob Gadaba, Kallayi Gadaba, Parangi Gadaba, Kathera Gadaba, Kapu Gadaba \*
6. Gond, Naikpod, Rajgond, Koitur \*
7. Goudu (in the Agency tracts)
8. Hill Reddis
9. Jatapus
10. Kammara
11. Kattunayakan
12. Kolam, Kolawar \*
13. Konda Dhoras, Kubi \*
14. Konda Kapus
15. Konda Reddis
16. Kondhs, Kodi, Kodhu, Desaya Kondhs, Dongria Kondhs, Kuttiya Konds, Tikiria Khondhs, Yenity Khondhs, Kuvinga \*
17. Kotia, Benthoriya, Bartika, Dulia, Holva, Sanrona, Sidhopaiko (Dhulia, Paiko, Putiya- omitted \*)
18. Koya, Doli Koya, Gutta Koya, Kammara Koya, Musara Koya, Oddi Koya, Pattidi Koya, Rajah, Rasha Koya, Lingadhari Koya (Ordinary), Kottu Koya, Bhine Koya, Raj Koya (Goud-omitted \*)
19. Kulia
20. Malis (excluding Adilabad, Hyderabad, Karimnagar, Khammam, Mahabubnagar, Medak, Nalgonda, Nizamabad and Warangal District)
21. Manna Dhora
22. Mukha Dhora, Nooka Dhora
23. Nayaks (in the Agency tracts)
24. Pardhan
25. Porja, Parangi Perja
26. Reddi Dhoras
27. Rona, Rena
28. Savaras, Kapu Savaras, Maliya Savaras, Khutto Savaras
29. Sugalis, Lambadis, Banjara \*
30. Thoti (in Adilabad, Hyderabad, Karimnagar, Khammam, Mahabubnagar, Medak, Nalgonda, Nizamabad and Warangal Districts)
31. Valmiki (in the Scheduled Areas of Vishakapatnam, Srikakulam, Vizianagaram, East Godavari and West Godavari Districts \*)
32. Yenadis, Chella Yenadi, Kappala Yenadi, Manchi Yenadi, Reddi Yenadi \*
33. Yerukulas, Koracha, Dabba Yerukula, Kunchapuri Yerukula, Uppu Yerukula \*
34. Nakkala Kurivikaran
35. Dhulia, Paiko, Putiya (in the districts of Vishakapatnam, Vizianagaram \*)

\* As for the Scheduled Castes and Scheduled Tribes Orders (Amendment) Act 2002, Act No. 10 of 2003  
N.B.:1.The above list is for information and subject to confirmation with reference to G.O.Ms.No. 58, SW(J) Department, dated 12/05/1997 and time to time orders.

2. On account of any reason whatsoever in case of any doubt/ dispute arising in the matter of community status (SC/ST/BC/OC) of any candidate, subject to satisfaction with regard to relevant rules and regulations in force the decision of the Commission shall be final in all such cases.

**FORM FOR COMMUNITY, NATIVITY AND DATE OF BIRTH CERTIFICATE**

Serial No.

S.C.

Seal of the

District Code:

S.T

Issuing

Mandal Code :

B.C

Office

Village Code :

Certificate No:

**COMMUNITY, NATIVITY AND DATE OF BIRTH CERTIFICATE**

(1) This is to certify that Sri/Smt./Kum. \_\_\_\_\_  
 Son/Daughter of Sri \_\_\_\_\_ of Village/Town \_\_\_\_\_ Mandal  
 \_\_\_\_\_ District \_\_\_\_\_ of the State of Andhra Pradesh belongs to \_\_\_\_\_  
 Community which is recognised as (\*) S.C./S.T./B.C. sub-group \_\_\_\_\_

The Constitution (Scheduled Castes) Order, 1950  
 The Constitution (Schedule Tribes) Order, 1950

G.O.Ms.No:1793, Education, dated:25.9.1970 as amended from time to time (BCs.) / S.Cs., S.Ts. list (modification) Order, 1956 S.Cs. and S.Ts. (Amendment) Act, 1976.

(2) It is certified that Sri/Smt./Kum. \_\_\_\_\_ is a native of \_\_\_\_\_  
 Village/Town \_\_\_\_\_ Mandal \_\_\_\_\_ District of Andhra Pradesh.

(3) It is certified that the place of birth of Sri/Smt./Kum. \_\_\_\_\_ is  
 \_\_\_\_\_ Village/Town \_\_\_\_\_ Mandal \_\_\_\_\_ District of Andhra Pradesh.

(4) It is certified that the date of birth of Sri/Smt./Kum. \_\_\_\_\_ is  
 \_\_\_\_\_ Day \_\_\_\_\_ Month \_\_\_\_\_ Year \_\_\_\_\_ (in words) \_\_\_\_\_ as per the declaration  
 given by his/her father/mother/guardian and as entered in the school records where he/she studied.

Signature:

Date:

Name in Capital Letters:

Designation:

*(seal)*

Explanatory Note:- While mentioning the community, the Competent Authority must mention the sub-caste (in case of Scheduled Castes) and sub-tribe or sub-group (in case of Scheduled Tribes) as listed out in the S.Cs. and S.Ts. (Amendment) Act, 1976.

**SCHOOL STUDY CERTIFICATE**

NOTE: Should be obtained from the Head of Educational Institution(s).

1. Name of the Candidate :

2. Father's Name :

3. Date of Birth & Age :

<b>Class</b>	<b>Name and Place of School</b>	<b>District</b>	<b>Duration of Study giving month and year</b>
IV			
V			
VI			
VII			
VIII			
IX			
X or SSC.			

STATION:  
DATE:

Signature of the Head of the  
Educational Institute(s)