ANDHRA PRADESH PUBLIC SERVICE COMMISSION :: VIJAYAWADA
NOTIFICATION NO. 38/2026, DATED: 19/11/2026

DIRECT RECRUITMENT TO THE POST OF ASSISTANT DIRECTOR IN A.P. STATE FORENSIC SCIENCE SERVICE
(FORENSIC ENGINEERING / PHYSICS / CHEMISTRY / BIOLOGY)

(General Recruitment)

PARA – 1:

1.1. Applications are invited through online from eligible candidates for Recruitment to the Post of Assistant Director in A.P. State Forensic Science Service (Forensic Engineering / Physics / Chemistry /Biology). The applicants shall apply online through Commission's Website https://psc.ap.gov.in **from 19.11.2026 to 13.12.2026 up to 11:59 P.M.**

1.2. All desirous and eligible candidates shall apply online after satisfying themselves as per the terms and conditions of this Recruitment Notification. The details of vacancies are as follows;

STATE WIDE POST

P.C. No.	Name of the post/ Service & Subject	No.of vacancies Subject wise	Total No.of vacancies	Age as on 01.07.2026 (Min-Max)	Scale of pay
01	Assistant Director in A.P. State Forensic Science Service, **Forensic Engineering**	01	08 (01 C.F)	18-44	57,100 – 1,47,760
02	Assistant Director in A.P. State Forensic Science Service, **Physics**	02			
03	Assistant Director in A.P. State Forensic Science Service, **Chemistry**	02			
04	Assistant Director in A.P. State Forensic Science Service, **Biology**	03			

Note: The breakup of vacancies may be seen at Annexure-I

1.3. Any application sent through any mode other than the prescribed online mode will not be entertained under any circumstances. Submission of application form by the candidate is construed as he/she read the notification and shall abide by the terms and conditions laid down there under.

1.4. The applicants who desires to apply to this post shall login to the Commission's Website, with his/her registered OTPR ID/number. In case, the candidate is applying for the first time to the posts notified by APPSC, he/she shall register his/her bio-data particulars through One Time Profile Registration (OTPR) on the Commission's Website viz., https://psc.ap.gov.in Once applicant registers his/her particulars, an user ID is generated and be sent to his/her registered mobile number and email ID.

Note: **i. One Time Profile Registration (OTPR) is not considered as an application for any post under any circumstances.**
ii. The applicants are advised to retain their mobile number and e-mail ID registered in OTPR for receiving OTP/SMS for further communication.

1.5. The selection to the post shall be on the basis of Written Examination. The examination will be conducted by the Commission in online Computer based Recruitment Test (CBRT) mode. The date of Examination will be intimated later.

1.6. The candidate is required to visit the Commission's website regularly to keep himself/herself updated until completion of the recruitment process. The Commission's website information is final for all correspondence.

1.7. A General Mock Test facility is available to the applicants on the Commission's website to acquaint themselves with the computer-based recruitment test. Applicant can visit the website and practice the answering pattern under MOCK TEST option available on main page of website *https://psc.ap.gov.in*.

1.8. HALL TICKETS for the written Examination will be hosted on Commission's website. Instructions would be given through the website regarding downloading of Hall Tickets.

PARA-2: Eligibility:

1. He /She is of sound health, active habits and free from any bodily defect or infirmity rendering him / her unfit for such service;
2. His/Her character and antecedents are such as to qualify him/her for such service;
3. He/She possesses the academic and other qualifications prescribed for the post; and
4. He/She is a citizen of India.

Provided that no candidate other than a citizen of India may be appointed except with the previous sanction of the State Government and except in accordance with such conditions and restrictions as they may be laid down. Such sanction shall not be accorded unless the State Government are satisfied that sufficient number of citizens of India, who are qualified and suitable are not available.

PARA-3: EDUCATIONAL QUALIFICATIONS:

Applicants must possess the prescribed academic qualification from the recognized University as on the date of this Detailed Notification. The date of this notification shall be the crucial date for calculating the experience including the practical experience.

Pc. No.	Name of the Post	Educational Qualifications
01	Assistant Director in A.P. State Forensic Science Service, **Forensic Engineering**	Must possess B.E. in Mechanical or Structural Engineering of its equivalent.
02	Assistant Director in A.P. State Forensic Science Service, **Physics**	Must possess M.Sc. Degree in First Class or Second Class in Physics or its equivalent.
03	Assistant Director in A.P. State Forensic Science Service, **Chemistry**	Must possess M.Sc. Degree in First Class or Second Class in Chemistry or its equivalent qualification or B.Sc. Degree with A.I.C by examination in Forensic Science.

04	Assistant Director in A.P. State Forensic Science Service, **Biology**	Must possess M.Sc. Degree in 1st or 2nd Class in either Botany/ Ecology/ Microbiology/ Biochemistry or its equivalent or a Degree in Medicine with a Bachelor's Degree in Science (Chemistry, Botany, Zoology, Physics).

Note I:

1. Exceptionally good eye-sight (Colour blindness will be a disqualification); and
2. Practical Experience in a Forensic Science or Chemical or Analytical or Police Laboratory for at least 5 years.

Note II:

If the applicant possesses an equivalent qualification, other than the prescribed Qualification, in the Commission's notification, applicant should produce a copy of the Government Orders to the Commission in advance within 10 days of last date for submitting applications. Failing which their application will be rejected and the decision of the concerned department (U.O) shall be final in this regard.

PARA-4 RESERVATIONS:

4.1 There will be Vertical Reservations in direct recruitment in respect of Scheduled Tribes, Scheduled Castes, Backward Classes and Economically Weaker Sections; and Horizontal Reservations in respect of Women, and Meritorious Sports Persons (MSP) as per Rule 22, 22(A) and 22(B) of A.P. State and Subordinate Service Rules, 1996 as amended from time to time read with G.O.Ms.No.77, G.A. (Ser-D) Dept., Dt: 02.08.2023, G.O.Ms. No.03, G.A. (Ser-D) Dept., Dt: 17.01.2024. G.O.Ms.No.46, GA (Ser-D) Dept., Dt: 19.04.2025. G.O.Ms.No.56.GA(Ser-D) Dept., Dt:15.05.2026 read with G.O.Ms.No.25,YAT&C (Sports & Youth Services) Department, Dated: 15.05.2026.

4.2. There shall be Reservation to Women horizontally to an extent of 33 1/3% in terms of Rule 22, 22 (A) and 22 (B) of A.P. State and Subordinate Service Rules, 1996 as amended vide G.O. Ms. No. 77, GA(Ser-D)Dept.,Dt:02.08.2023, G.O.Ms.No.03,G.A.(Ser-D) Dept., Dt:17.01.2024, G.O.Ms.No.46, GAD, Dt:19.04.2025.

4.3. There shall be Reservation to Meritorious Sports Persons to an extent of 3% in terms of Rule 22, 22 (A) and 22 (B) of A.P. State and Subordinate Service Rules, 1996 as amended vide G.O.Ms.No.56.GA(Ser-D) Dept.,Dt:15.05.2026 read with G.O.Ms.No.25,YAT&C (Sports & Youth Services) Department, Dated: 15.05.2026.

4.4. No reservation shall be made for Persons with Benchmark Disability (PBD) for this post as per the Service Rules in G.O.Ms.No. 318, Home (Police-E) Department, Dt. 21/08/1996.

4.5. Reservation to BC-E group will be subject to the adjudication of the litigation before the Hon'ble Courts including final orders in Civil Appeal No: 2628-2637 of 2010 in SLP(C). No. 7388-7397 of 2010, dated: 25/03/2010 and orders from the Government.

4.6. The candidates belonging to Backward classes (BC's) applying for this Notification must produce Non Creamy layer certificate in terms of G.O. Ms. No.3, Backward Classes Welfare (C-2) Department, Dated 04.04.2006 read with G.O. Ms. No.26, Backward Classes Welfare(C) Department, Dated 09.12.2013 regarding their exclusion from the Creamy Layer from the competent authority (Tahsildar) and issued on or after 01.04.2026 (after the completion of FY 2025-2026) and must produce the same at appropriate time of verification. In case of failure to produce the same on the day of verification, he/she would not be entitled for the benefit of Reservation.

4.7. Economically Weaker Sections means the persons who are not covered under existing scheme of reservations for the SCs, STs and Socially and Educationally Backward Classes and whose gross annual family income is below Rs.8.00 lakh. Only such persons are identified as Economically Weaker Sections for the benefit of reservations. The applicants/candidates who claim the EWS Reservation must possess the

EWS certificate based on the income for FY 2025-2026 as issued by the competent Revenue Authority in the rank of Tahsildar in digital format only on / after 01.04.2026 (after the completion of FY 2025-2026) and must invariably produce the same at the time of certificate verification as per G.O.Ms.No:73, GA (SER-D) Dept,Dt:04-08-2021.

4.8. The Rule of Local Reservation is not applicable, as the Post is State Cadre.

4.9. Candidates seeking reservation/relaxation benefits available for SC((Gr-I/II/III)/ST/BC/EWS must ensure that they are entitled to such reservation/relaxation as per eligibility prescribed in this Notification. They should also be in possession of all the requisite certificates in the prescribed format in support of their claim as stipulated in the Notification for such benefits. (The Certificates issued in the name of applicant along with Father/Mother/legal Guardian's (if parents are no longer alive) name only are acceptable).

PARA- 5 AGE:

5.1. Minimum 18 years & Maximum 44 years as on 01/07/2026,

5.2. Age Relaxation is applicable to the categories as detailed below**:**

S. No.	Category of candidates	Relaxation of age permissible
1	SC, ST, BCs and EWS	5 Years
2	Ex-Servicemen	Shall be allowed to deduct from his age a period of 3 years in addition to the length of service rendered by him in the armed forces/ NCC.
3	N.C.C. (who have worked as Instructor in N.C.C.)	
4	Regular A.P. State Government Employees (Employees of Corporations, Municipalities etc. are not eligible).	Allowed to deduct from his age the length of regular Service under State Government up to a maximum of five years for the purposes of the maximum age limit.
5	Retrenched temporary employees in the State Census Department with a minimum service of 6 months.	3 Years

EXPLANATION:

Provided that the persons referred to at Sl.Nos.2 & 3 above shall, after making the deductions referred to in sub-Rule 12 (c) (i) & (ii) of A.P. State and Subordinate Service Rules not exceed the Maximum age limit prescribed for the post.

The age relaxation is applicable for those who have been released from Armed Forces other than by way of dismissal or discharge on account of misconduct or inefficiency.

PARA - 6 HOW TO APPLY:

STEP-I: The applicant desires to apply for the post shall login into the Commission's Website with his/her registered OTPR number. Candidate applying for the first time for any notification has to first fill the OTPR application carefully to obtain OTPR ID. While filling the OTPR, the candidate has to ensure that the particulars are filled correctly. The Commission bears no responsibility for the mistakes, if any, made by the candidates. If candidates choose to modify, they may do so by clicking the modify OTPR make the modification, save them and proceed to STEP-II.

STEP-II: The Applicant has to Login in the Commission's website with the User Name (OTPR ID) and the Password set by Candidate. After Login, the Applicant has to click on the "Online Application Submission" present in the bottom right corner of the Commission's website. The applicant now has to click on the Fill Application button against the notification number that he / she wants to apply.

STEP-III: After checking all the data and ensuring that the data is correct the applicant has to fill application specific data such as Local/Non-Local status, White card details etc., which are also used to calculate the Fee. Hence if any details are to be changed, applicant should use the modify OTPR link, modify the details, save it and again click on online application submission.

Once all the data such as Qualification details, Post preferences, examination centre, etc filled carefully and submit the Application form with Save or Save & Submit options. If candidate click on save button, the application details will be only saved. The applicant has to click on the Save & Submit button, then only payment link will be generated.

NOTE: 1. By click on "Save" button, the application details given by you will be partially saved at our end. However, your application will not be submitted until you click on "Save & Submit" button.

2. By click on "Save & Submit" button you will be directed to the payment gateway and on successful payment of fee, your application will be finally submitted.

3. Saving the application alone will not be sufficient. The application will be considered complete only when the candidate clicks the Save & Submit button and successfully completes the submission process. Applications that are not submitted accordingly will be treated as incomplete, and the commission shall not be responsible for such application.

4. Applicant shall note that the data displayed from OTPR at the time of submitting the application will be considered for the purpose of this notification only. Any changes made by the applicant in OTPR data at a later date shall not be considered for this Recruitment Notification.

PAYMENT PROCESS: The applicant has to check the basic details for calculation of the fee and age relaxation will be pre-populated from the OTPR data. The applicant has to verify all the details that are displayed. Once the payment form is submitted, the respective details (used for Calculation of fee and age relaxation) will not be altered in any stage of application processing. On successful submission, the payment reference ID is generated and SMS (alert) will be sent to the registered Mobile Number of the candidate. The candidate can download the filled application pdf for ready reference / correspondence.

STEP-IV: In any case, if the payment process is failed, then the applicant should start the fresh payment process as mentioned in STEP-II.

STEP-V: Once the application is submitted successfully, corrections in the application will be enabled after the last date of the submission of application and will be allowed up to 7 days only from the last date of applications. After this no changes in application form i.e., change of community/Reservation Category or any other will not be entertained under any circumstances at later stages. The corrections can be made in the application form itself. By making a payment of Rs.100 for each correction in said stipulated time. **Fields which affect the Name, fee and age relaxations are not enabled for corrections.**

NOTE:

A. The Commission is not responsible, for any omissions made by the applicant in bio-data particulars while submitting the application form online. The applicants are therefore, advised to strictly follow the instructions given in the user guide before submitting the application.

B. All the candidates are requested to submit their application with correct data. It is noticed that some of the candidates are requesting for change in the data, after submission of the application. It is informed that such requests shall be allowed on payment of Rs.100/- (Rupees Hundred Only) for each correction. However, changes are not allowed for Name, Fee and age relaxation. No manual application for corrections shall be entertained.

C. The particulars furnished by the applicant in the application form will be taken as final. Candidates should, therefore, be very careful in uploading

/ submitting the application form online.

D. 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 to the final stage of recruitment process or even at a later stage and also liable for punishment as per Para 14.1 of this notification.

Before uploading / Submission of Application Form, the applicants should carefully ensure his / her eligibility for this recruitment. No relevant column of the application form should be left blank; otherwise, application form will not be accepted.

PARA -7: FEE:

7.1. Applicant must pay Rs. 250/- (Rupees two hundred and fifty only) towards application processing fee and Rs 120/- (Rupees One Hundred and Twenty only) towards examination fee.

7.2. However, the following categories of candidates are exempted from payment of examination fee Rs.120/- only.

i) SC, ST, BC & Ex-Servicemen.

ii) Families having Household Supply White Card issued by Civil Supplies Department, A.P. Government (Residents of Andhra Pradesh).

iii) Un-employed youth as per G.O.Ms.No.439, G.A (Ser-A) Dept., dated: 18/10/1996 should submit declaration at an appropriate time to the Commission.

iv) Applicants belonging to the categories mentioned above (except Ex-Servicemen) hailing from other States are not entitled for exemption from payment of fee and not entitled for claiming any kind of reservation.

v) Applicants belonging to other States shall pay the prescribed fee of Rs.120/- (Rupees One hundred and twenty only), along with processing fee of Rs. 250/- (Rupees Two Hundred and Fifty only). Otherwise, such applications will not be considered and no correspondence on this will be entertained.

7.3 **MODE OF PAYMENT OF FEE:**

i) The Fee mentioned in the above paragraph is to be paid online using payment gateway using Net Banking/ Credit card / Debit Card**.** The list of Banks providing service for the purpose of online remittance of fee will be available on the website.

ii) The fee once remitted shall not be refunded or adjusted under any circumstances. If any candidate fails to pay the examination fee (in non-exempt cases) and application processing fee his/her application will be rejected.

iii)IPOs / Demand Drafts are not accepted.

PARA-8: SCHEME OF EXAMINATION:

8.1. Scheme & Syllabus for the written examination including the Computer Proficiency Test (CPT) is appended at Annexure-II.

8.2. Scheme is prescribed as per Annexure-VII of G.O.Ms.No.201, Finance (HR-I Plg. & Policy) Department, Dt: 21.12.2017 and G.O.Ms.No.26, G.A. (Ser-B) Dept., Dt: 24.02.2023 for CPT.

8.3. As per G.O. Ms. No.235, Finance (HR-I, Plg & Policy) Dept., Dt. 06/12/2016, for each wrong answer will be penalized with 1/3rd of the marks prescribed for the question.

8.4. The Commission will normalize the scores of candidates for the Computer Based Tests, if conducted in multi-sessions to take into account any variation in the question papers across different sessions and the results will be announced on percentile basis after normalization. The Commission holds the prerogative to decide on normalization as described in Annexure-V as may be required and the decision of the Commission is final.

8.5. After completion of the Written Examination, the candidates who have provisionally shortlisted for further process of selection in the ratio prescribed by the Commission have to qualify the Computer Proficiency Test (CPT) and would be eligible for selection/appointment to the vacancies/posts notified as per Rule 14A of APS&SS, Rules,1996 read with G.O.Ms.No.28 G.A(Ser.A) Dept., Dated:12.03.2024.

PARA-9: CENTERS FOR WRITTEN EXAMINATION:

9.1. The Computer Based Recruitment Test will be held in the following 04 centers;
(i) Visakhapatnam (ii) Vijayawada (iii) Tirupati (iv) Ananthapuramu

9.2 The applicant may choose the Test center with three preferences. However, the Commission reserves the right to create any Centre(s) or allot the applicant to any Centre of examination depending on the availability of the resources like centers / systems or any other means.

PARA –10: RESOLUTION OF DISPUTES RELATED TO QUESTION PAPER, ANSWER KEY AND OTHER MATTERS:

10.1. The Commission would publish initial answer key(s) for the question paper(s) on its website after conduct of the examination. If the candidates have any objections with regard to the initial key / questions they shall have to file the objections within three days after publication of the initial key in the prescribed proforma available in the website. Any objection filed after expiry of specified time would not be entertained.

10.2. The objections received if any on initial key, would be examined by referring it to three subject experts and finalize the key as per the decision of the Commission. And the key so finalized shall be final and no further objections shall be taken in to account.

10.3. The candidate shall pay Rs.100/- per objection raised by him/her against question/ initial answer key within the stipulated time &procedure as above. In case of genuine objections, which are sustained in the final analysis, the amount will be reimbursed to the candidate.

10.4. The question paper for General Studies & Mental Ability is set in English and translated in to Telugu language. English version will be considered as the authentic version for valuation purpose. The Subject question papers will be in English medium only.

10.5. With regard to situation where there is deletion of questions, if any, from any paper, scaling (proportionate increase) would be done for that particular part of the paper to the maximum marks prescribed for the paper and the marks would be rounded off to 2 decimals to determine the merit of the candidate.

10.6. **ANSWER KEY:** Answer key would be published on the Commission's website.

PARA-11: NOTE ON IMPORTANT LEGAL PROVISIONS GOVERNING THE RECRUITMENT PROCESS:

11.1. **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, G.O.Ms.No.544, General Administration (Ser.A) Department, Dated: 04.12.1998 and Rule 6 of APPSC Rules of procedure. In any case, no cognizance 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. As per G.O.Ms. No:139 Finance HR (I) Planning Policy Dept., dt: 28/07/2016 Rule 7 of APPSC Rules of procedure regarding relinquished vacancies has been deleted.

11.2. The Recruitment will be processed as per this notification and as per the Rules and Instructions issued by the Government and also as decided by the Commission in terms of respective Special Rules/Adhoc Rules governing the Recruitment and G.O.Ms.No. 318, Home (Police-E) Department, Dt. 21/08/1996 and Special Rules/Adhoc Rules governing the Recruitment and other related G.O.s, Rules, etc., applicable in this regard.

11.3. **Rules:** All are informed that the various conditions and criteria prescribed herein are governed by the A.P. State and Subordinate Service Rules, 1996 read with the relevant Special Rules applicable to any particular service in the department. 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 as in force.

11.4. The Commission is empowered under the provisions of Article 315 to 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 secrecy and confidentiality so as to ensure that the principle of merit is scrupulously followed.

11.5 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, to their Head of Office/Department that they have applied for this recruitment Notification.

11.6. A candidate shall be disqualified for appointment, if he/himself/she/herself or through relations or friends or any others has canvassed or endeavored to enlist for his/her candidature, extraneous support, whether from official or non-official sources for appointment to this service.

11.7. The Degrees obtained through Open Universities / Distance Education mode must have recognition by the Distance Education Council, Government of India. Unless such Degrees have been recognized by the D.E.C. they will not be accepted for purpose of Educational Qualification. The onus, in case of doubt, of Proof of recognition by the D.E.C. that their Degrees / Universities have been recognized, rests with the candidate. Candidates may also refer to G.O.R.T.No.143, Higher Education (EC) Dept., Dated: 11.07.2018 and the Supreme Court judgment dated: 03.11.2017 in this connection. However, B.Tech/B.E courses obtained under Distance Mode recognized/ approved by the AICTE are only eligible.

PARA- 12: ANNEXURES:

The applicants shall go through the Annexures before filling the application form.

Annexure –I:	Break up of vacancies
Annexure-II:	Scheme & Syllabus
Annexure- III:	Instructions to candidates
Annexure-IV:	List of SC/ST/BC's
Annexure-V:	Procedure for Normalization

PARA-13: PROCEDURE OF SELECTION:

13.1 Appearance in all the papers of examination is compulsory. Absence in any of the papers will automatically render the disqualification of the candidature.

13.2 The selection to this Recruitment shall be post/post code wise based on the merit in the Written Examination in the concerned subject , subject to condition he/she qualifies the Computer Proficiency Test (CPT).

13.3. The candidates have to secure minimum qualifying marks to be short listed for selection against respective vacancies. The minimum qualifying marks on aggregate for the vacancies notified under different categories are as follows as per G.O.Ms.No.103, G.A. (Ser.A) Dept., dt.03.02.1967 and amendments as in force on date of this notification.

1. OC & EWS	:40%
2. Backward Class	:35%
3. SCs, STs	:30%

N.B.: Mere securing of minimum qualifying marks does not confer any right to the candidate for being considered to the selection.

13.4. During the selection process, the Open competition vacancies shall be considered as per merit on open competition irrespective of Caste/community/ Gender and as the case may be. In respect of social reservations viz., Scheduled Castes, Scheduled Tribes, Backward Classes and Economically Weaker Sections the vertical reservation will be applicable and the number of appointments reserved for that category shall in no way be affected during the period the reservation for that category is in force. However, the candidates who got selection under Horizontal Reservation shall be adjusted against their respective social category only.

Note: The candidates belonging to SC, ST, BC, EWS and who avail upper age limit relaxation will also be considered for Open Competition (OC) Vacancies.

13.5. In the event of Schedule Caste & Schedule Tribe, candidates not coming up for selection with the existing minimum marks prescribed for selection in the competitive examination conducted by the APPSC their selection shall be considered on the basis of rank with reference to their performance in the written examination irrespective of the marks secured, as per G.O.Ms.No.631, G.A. (Ser.A) Dept., dt.05.09.1977.

13.6. Where the candidates get equal number of marks in the main examination if two or more candidates get equal total number of marks, those candidates shall be bracketed. Candidates within the same bracket shall then be ranked 1, 2, 3 etc., according to age i.e., oldest being considered for admission. In case there is tie in age, the person who possesses educational qualification at earlier date would be considered. However, where the preferential educational qualification is prescribed, the educational qualification will take priority over the age while ranking the candidates with equal marks classified (i), (ii), (iii) according to age i.e., oldest being considered.

13.7. The appointment of selected candidates will be subject to their being found medically fit in the appropriate medical classification, and if he/she is of sound health, active habits and free from any bodily defect or infirmity.

13.8. Memorandum of Marks: After publication of final selection list, the marks list (total marks) of the successful candidates will be displayed on the Commission's website. However, the marks of all the candidates who have attended the written Examination will be available in their individual logins. Requests for Memorandum of Marks will not be entertained until the recruitment process is finalized. Rejected, Invalid, Disqualified, ineligible candidates will not be issued any Memorandum of Marks.

PARA-14: DEBARMENT:

14.1. Applicants 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 applicant furnishing in-correct information or making false declaration regarding his/her eligibility at any stage or suppressing any information is liable TO BE DEBARRED UPTO FIVE YEARS FROM APPEARING FOR ANY OF THE EXAMINATIONS CONDUCTED BY THE COMMISSION, and summarily rejection of their candidature for this recruitment.

14.2. 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. Further candidates shall be liable for penalty as per G.O.Ms.No.385, G.A. (Ser. A) Dept., Dt.18/10/2016. The Chief Superintendent of the examination centre is authorized to take decision in case of malpractice or usage of unfair means or creation of disturbance or use of physical force by any candidate and report the matter to the competent authority as well as register a police case.

14.3. 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.

14.4. Any candidate 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, be liable to be debarred permanently from any exam or selection held by the Service Commissions in the Country.

14.5. **ELECTRONIC GADGETS BANNED:**

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

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

PARA-15: 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 to 320 of the Constitution of India. Commission also reserves its right to alter and modify the terms and conditions including vacancies laid down in the notification for conducting the various stages up to selection or withdraw the notification at any time 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.

Place: Vijayawada **Sd/-**

Date:19/11/2026. **Secretary (FAC)**

ANNEXURE – I

NOTIFICATION NO.38/2026

BREAK UP OF VACANCIES FOR THE POST OF ASSISTANT DIRECTOR IN A.P STATE FORENSIC SCIENCE SERVICE (FORENSIC ENGINEERING / PHYSICS / CHEMISTRY / BIOLOGY)

	OC	BC-A	BC-B	SC(Gr-II)	ST	TOTAL
STATE WIDE POST	04	01 (CF)	01	01	01	08

NOTE - 01:
The above total 08 vacancies will be filled in the following manner:

P.C.No.01 - Assistant Director in **Forensic Engineering** – **01 vacancy**
P.C.No.02 - Assistant Director in **Physics – 02 vacancies**
P.C.No.03 - Assistant Director in **Chemistry – 02 vacancies**
P.C.No.04 - Assistant Director in **Biology – 03 vacancies**

NOTE – 02: As per the Indent and in accordance with G.O. Ms. No. 77, GA (Ser-D) Dept., Dt: 02.08.2023 and G.O.Ms. No. 03, G.A. (Ser-D) Dept., Dt: 17.01.2024, **One (01) vacancy** will be filled by Women under Horizontal Reservation in any of the specified Post Codes (P.C. No. 01 to 04). Since the said vacancy is shown under Horizontal Reservation, all eligible candidates irrespective of Community/Gender may apply.

ANNEXURE - II

SCHEME AND SYLLABUS TO THE POST OF ASSISTANT DIRECTOR IN A.P. STATE FORENSIC SCIENCE SERVICE
(FORENSIC ENGINEERING / PHYSICS / CHEMISTRY / BIOLOGY)

(As per Annexure VII of G.O.Ms.No.201, Finance (HR.I, Plg & Policy) Dept; Dated.21.12.2017)

SCHEME OF THE EXAMINATION:

FOR THE POST OF ASSISTANT DIRECTOR IN A.P. STATE FORENSIC SCIENCE SERVICE (FORENSIC ENGINEERING):

Written (Objective type) Examination (Degree Standard)			
Paper – I: General Studies and Mental Ability	150 Questions	150 Minutes	150 Marks
Paper – II: Mechanical Engineering or Structural Engineering	150 Questions	150 Minutes	300 Marks
Total	**300**		**450**

FOR THE POST OF ASSISTANT DIRECTOR IN A.P. STATE FORENSIC SCIENCE SERVICE (PHYSICS):

Written (Objective type) Examination (Degree Standard)			
Paper – I: General Studies and Mental Ability	150 Questions	150 Minutes	150 Marks
Paper – II: Physics	150 Questions	150 Minutes	300 Marks
Total	**300**		**450**

FOR THE POST OF ASSISTANT DIRECTOR IN A.P. STATE FORENSIC SCIENCE SERVICE (CHEMISTRY):

Written (Objective type) Examination (Degree Standard)			
Paper – I: General Studies and Mental Ability	150 Questions	150 Minutes	150 Marks
Paper – II: Chemistry or Forensic Science	150 Questions	150 Minutes	300 Marks
Total	**300**		**450**

FOR THE POST OF ASSISTANT DIRECTOR IN A.P. STATE FORENSIC SCIENCE SERVICE (BIOLOGY):

Written (Objective type) Examination (Degree Standard)			
Paper – I: General Studies and Mental Ability	150 Questions	150 Minutes	150 Marks
Paper – II: Botany or Ecology or Microbiology or Biochemistry or Medicine	150 Questions	150 Minutes	300 Marks
Total	**300**		**450**

NEGATIVE MARKS: As per G.O.Ms. No.235, Finance (HR-I, Plg & Policy) Dept., Dt.06/12/2016, for each wrong answer will be penalized with 1/3rd of the marks prescribed for the question.

Syllabus
Paper-I

GENERAL STUDIES AND MENTAL ABILITY (Common for all Posts)

1. Major Current Events and Issues pertaining to International, National and State of Andhra Pradesh.
2. General Science and its applications to the day-to-day life Contemporary developments in Science & Technology and Information Technology.
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 and Indian National Movement.
4. Geography of India with focus on Andhra Pradesh.
5. Indian polity and Governance: constitutional issues, public policy, reforms and e-Governance initiatives.
6. Indian Economy and planning
7. Sustainable Development and Environmental Protection
8. Disaster management: vulnerability profile, prevention and mitigation strategies, Application of Remote Sensing and GIS in the assessment of Disaster
9. Logical reasoning, analytical ability and logical interpretation.
10. Data Analysis: Tabulation of data Visual representation of data Basic Data analysis (Summary Statistics such as mean, median, mode and variance) and Interpretation.

SYLLABUS FOR THE POST OF ASSISTANT DIRECTOR, FORENSIC ENGINEERING:

PAPER–II

There are **two alternative subjects** for Assistant Director, Forensic Engineering:

A. Mechanical Engineering

B. Structural Engineering

The candidate shall answer Paper–II in the subject corresponding to the qualification possessed, as follows:

- B.E. in Mechanical Engineering or its equivalent qualification – Mechanical Engineering syllabus;
- B.E. in Structural Engineering or its equivalent qualification – Structural Engineering syllabus.

The subject-wise syllabi are detailed below:

A. 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, Overall 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, 2nd order system and its characteristics. Frequency analysis. Stability, RouthHurwitz 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.

B. STRUCTURAL ENGINEERING:

a) Strength of Materials: Simple Stresses and Strains, Elastic Constants, Shear Force and bending moment diagrams for beams, Compund stresses – Principal Planes and Principal stresses - Mohr's circle method, Theory of bending, Distribution of shear stresses, Deflections – Macaulay method of double integration, Theory of torsion, thin and thick cylinders, Shear centre, Unsymmetrical bending.

b) Theory of Structures: Direct and bending stresses, Columns & Struts, Strain energy method, Moving loads and influence lines, Arches, Suspension bridges – static and kinematic indeterminacy, Analysis of Continuous beams and portal frames - Moment distribution method, Slope deflection method and Kani's method, Coloumn analogy method and Matrix methods.

c) Concrete Structures: Materials and stresses, Stress blocks, Limit state and working stress methods of design of Beams, Slabs, Columns and Footings. Retaining walls, Water tanks, Slab and T-Beam bridges, Design for Shear and Torsion, Yield line theory.

d) Steel Structures: Riveted and Welded joints and connections, Simple and compound columns, Column bases, Roof trusses, Plate and Gantry girders, Plate girder and Lattice girder railway bridges, Bearings. Plastic analysis and design of beams and frames.

e) Prestressed concrete: Basic concepts, Material losses, System of Prestressing, Analysis and design of beams.

SYLLABUS FOR THE POST OF ASSISTANT DIRECTOR, PHYSICS:

PAPER–II

A consolidated syllabus is proposed for all the equivalent disciplines prescribed under the qualifications for the post of Assistant Director (Physics), as detailed below:

PHYSICS

✧ **Mathematical Methods of Physics**

Dimensional analysis. Vector algebra and vector calculus. Linear algebra, matrices, Cayley-Hamilton Theorem. Eigenvalues and eigenvectors. Linear ordinary differential equations of first & second order. Special functions (Hermite, Bessel, Laguerre and Legendre functions). Fourier series, Fourier and Laplace transforms. Elements of complex analysis, analytic functions; Taylor & Laurent series; poles, residues and evaluation of integrals. Elementary probability theory, random variables, binomial, Poisson and normal distributions. Central limit theorem.

Data interpretation and analysis. Precision and accuracy. Error analysis, propagation of errors. Least squares fitting, Linear and non-linear curve fitting and Chi-Square Test.

Green's function. Partial differential equations (Laplace, wave and heat equations in two and three dimensions). Elements of computational techniques: root of functions, interpolation, extrapolation, integration by trapezoid and Simpson's rule. Solution of first order differential equation using Runge-Kutta method. Finite difference methods. Tensors. Introductory group theory.

✧ **Classical Mechanics**

Newton's laws. Dynamical systems, three space dynamics, stability analysis. Central force motions. Two body Collisions – scattering in laboratory and Centre of mass frames. Rigid body dynamics-moment of inertia tensor. Non-inertial frames and pseudoforces. Variational principle. Generalized coordinates. Lagrangian and Hamiltonian formalism and equations of motion. Conservation laws and cyclic coordinates. Periodic motion: small oscillations, normal

modes. Special theory of relativity-Lorentz transformations, relativistic kinematics and mass-energy equivalence.

Poisson brackets and canonical transformations. Symmetry, invariance and Noether's theorem. Hamilton-Jacobi theory.

✧ **Electromagnetic Theory**

Maxwell's equation: Gauss's law and its applications, Laplace and Poisson equations, boundary value problems. Magnetostatics: Biot-Savart law, Ampere's theorem. Electromagnetic induction, Maxwell's equations in free space isotropic media; boundary conditions on the fields at interfaces. Scalar and vector potentials, gauge invariance. Electromagnetic waves in free space. Dielectrics and conductors. Reflection and refraction, polarization, Fresnel's law, interference, coherence, and diffraction. Dynamics of charged particles in static and uniform electromagnetic fields. Charged particles in inhomogeneous fields.

Dispersion relations in plasma. Lorentz invariance of Maxwell's equation. Transmission lines and wave guides. Radiation- from moving charges and dipoles and retarded potentials.

✧ **Quantum Mechanics**

Wave-particle duality. Schrödinger equation (time-dependent and time-independent). Eigenvalue problems (particle in a box, harmonic oscillator, etc.). Tunneling through a barrier. Wave-function in coordinate and momentum representations. Commutators and Heisenberg uncertainty principle. Dirac notation for state vectors. Motion in a central potential: orbital angular momentum, angular momentum algebra, spin, addition of angular momenta; Hydrogen atom. Stern-Gerlach experiment. Time-independent perturbation theory and applications. Variational method. Time dependent perturbation theory and Fermi's golden rule, selection rules.

Identical particles, Pauli exclusion principle, spin-statistics connection.

Spin-orbit coupling, fine structure. WKB approximation. Elementary theory of scattering: phase shifts, partial waves, Born approximation. Relativistic quantum mechanics: Klein-Gordon and Dirac equations. Semi-classical theory of radiation.

✧ **Thermodynamics and Statistical Physics**

Laws of thermodynamics and their significance. Thermodynamic potentials, Maxwell relations, chemical potential, phase equilibria. Phase space, micro-and macro-states. Micro-canonical, canonical and grand-canonical ensembles and partition functions. Free energy and its connection with thermodynamic quantities. Classical and quantum statistics. Bose and Fermi gases. Principle of detailed balance. Blackbody radiation and Planck's distribution law.

First- and second-order phase transitions. Diamagnetism, paramagnetism, and ferromagnetism. Ising model. Bose-Einstein condensation. Diffusion equation. Random walk and Brownian motion. Introduction to nonequilibrium processes.

✧ **Electronics**

Semiconductors devices (diodes, junctions, transistors, field effect devices, homo- and hetero-junction devices), device structure, device characteristics, frequency dependence and applications. Opto-electronic devices (solar cells, photo-detectors, LEDs). Operational amplifiers and their applications. Digital techniques and applications (Logic circuits, registers, counters and comparators). A/D and D/A converters. Microprocessor microcontroller basics. Fundamentals of communication electronics, modulation techniques.

✧ **Atomic & Molecular Physics**

Quantum states of an electron in an atom. Electron spin. Spectrum of helium and alkali atom. Relativistic corrections for energy levels of hydrogen atom, hyperfine structure and isotopic shift, width of spectrum lines, LS & JJ couplings. Zeeman, Paschen-Bach & Stark effects. Electron spin resonance. Nuclear magnetic resonance, chemical shift. Franck-Condon principle. Electronic, rotational, vibrational and Raman spectra of diatomic molecules, selection rules. Lasers: spontaneous and stimulated emission, Einstein A & B coefficients.

Optical pumping, population inversion, rate equation. Modes of resonators and coherence length.

✧ **Condensed Matter Physics**

Bravais lattices. Reciprocal lattice. Diffraction and the structure factor. Bonding of solids. Elastic properties, phonons, lattice specific heat. Free electron theory and electronic specific heat. Response and relaxation phenomena. Drude model of electrical and thermal conductivity. Hall effect and thermoelectric power. Electron motion in a periodic potential, band theory of solids: metals, insulators and semiconductors. Superconductivity: type-I and type-II superconductors. Josephson junctions. Superfluidity. Defects and dislocations. Ordered phases of matter: translational and orientational order, kinds of liquid crystalline order. Quasi crystals.

Electron spin resonance, Nuclear magnetic resonance, chemical shift and applications. X-ray diffraction technique, scanning electron microscopy and transmission electron microscopy.

✧ **Nuclear and Particle Physics**

Basic nuclear properties; size, shape and charge distribution, spin and parity. Binding energy, semi-empirical mass formula, liquid drop model. Nature of the nuclear force, form of nucleon-nucleon potential, charge-independence and charge-symmetry of nuclear forces. Deuteron problem. Evidence of shell structure, single-particle shell model, its validity and limitations. Elementary ideas of alpha, beta and gamma decays and their selection rules. Fission and fusion. Nuclear reactions, reaction mechanism, compound nuclei and direct reactions.

Classification of fundamental forces. Elementary particles and their quantum numbers (charge, spin, parity, isospin, strangeness, etc.). Quark model, baryons and mesons. C, P, and T invariance. Application of symmetry arguments to particle reactions. Parity non-conservation in weak interaction. Relativistic kinematics.

SYLLABUS FOR THE POST OF ASSISTANT DIRECTOR, CHEMISTRY: PAPER-II

There are **two alternative subjects** for Assistant Director, Chemistry:

A. CHEMISTRY

B. FORENSIC SCIENCE

The candidate shall answer Paper–II in the subject corresponding to the qualification possessed, as follows:

- M.Sc. Degree in 1st or 2nd Class in Chemistry or its equivalent qualification – Chemistry syllabus;
- M.Sc. Degree with A.I.C. by examination in Forensic Science – Forensic Science syllabus.

The subject-wise syllabi are detailed below:

A. CHEMISTRY:

Inorganic Chemistry: -

1. **Atomic structure & Chemical Bonding** – Quantum theory Schrodinger – wave equation – Hydrogen atom, Hydrogen molecule – Elements on valence bond – molecular orbital theories.
2. **Determination of molecular structure** – X – ray and electron diffraction methods.
3. **Periodic classification** (Classical and modern) periodic functions of elements – atomic volume – atomic radious electronegativity-oxidation states – lattice energy and their applications.
4. **Chemistry of d-block elements** – Physical and chemical characteristics of the transition elements – Characteristics related to electronic arrangements oxidation states – colow

magnetic properties – Complex formation – interstitial L-S couping – Hund's rule. A General study of the first transition series.

5. **Chemistry of F-block elements** – Lanthanons and Actinons – electronic configurations – oxidation's states – Separation of Lanthanons and Actinons.
6. **Chemistry of complex compounds:** Jourgenson and werner's views – effective atomic number – valence bond theory – Introductory treatment of crystal field theory applied to complexes with co-ordination number 6.
7. **Isomerism in complexes:** Geometrical and optical isomerism of four and six co-ordinated complexes. Pearson's theory of hard and soft acids and bases.
8. **Study of the following elements and their modern Chemistry** Be, Ti, Zr, Hf, V, Mo, W, U, and Th.
9. **Alloys:** Interimettalic compounds.

Physical Chemistry:

10. **Radio activity:** Elementary account of nuclear structure natural and artificial radio activity – characterization of relations – decay chains-half-life-decay constant and average life. Radio-active series, atomic transmutation – atomic fission and fusion reactions and their applications – nuclear isomers and their separations.
11. **Kinetic theory of gases:** Equations of state – critical constants – States of aggregation – liquid states – viscosity – physical properties an chemical constitution – collision theory of derivation of the collision – number from Kinetic theory of gases.
12. **Chemical Kinetics:** order and molecularity of reaction first order and second order reactions – law of mass action – influence of temperature and pressure – thermo-dynamic derivation of Law of mass action – unimolecular reactions Lindemann's theory.
13. **Thermodynamics:** First law of thermodynamics and its applications to ideal gases, energy and enthalpy changes in gases, heat capacities of gases and their inter-relation.

    Isothermal and adiabatic processes – Kirchoff's equation and its applications – Vant Hoff's isotherm isochore equilibria in heterogeneous system. Second Flaw of thermodynamics (Joules and Joule Thomson experiments). Entropy change in an isolated system for reversible and irreversible processes – Variation on entropy of a system with temperature and pressure.

Organic Chemistry:

14. **Heterocyclic compounds and chemistry of neutral products** – Importance of heterocyclic compounds – classification based on the nature of heterocetom, size of the ring and II excessive and II deficient nature of the ring.

    A general and comparative study of Furan pyrole and thiophene Ring transformations. General comparison with benzenoid compounds, pyridine, quinotine, Isoquinoline and acrdine-fII deficient nature of heterocylic rings – case of nucleophilic substitution.
15. **Methods of synthesis, reactivity and properties of the following polynuclear aromatic compounds:** anthracene, Benzanthracene, Phenontherene Chryeneand picene.
16. **Benzopyrones:** Couamarins and Chromones.
17. **Alkaloids:** General occurrence, reactions and degradations. Chemical and Physico-Chemical methods for the elucidation of structures-synthesis and structural elucidation of the following alakaloids – atropine – cocaine - quinene – Narcotine – papaverine.
18. **Organic reaction mechanism:** Structure and reactivity of organic molecules – Factors affecting Electron density in a band-inductive, induct rometric, mesomeric, (reasonance) and electrometric effects, hyperconjugation – Dipole moments-acedic and basic strength of organic Compounds.

    Modern concepts of organic reaction mechanisms – Addition, substitution and elimination reactions – simple examples and their mechanism. The intermediate

carboniumion formation and its participation in organic reactions. Addition C-C, system-pinocol-pincolene rearrange rearrangements. Automatic substitution – Formation and hydrolysis of esters.

19. **Some name reactions:** Wurtz-Friedel-Crafts, Fries Gatter-mann – Perin – Beckmann's rearrangements and Grignard reactions.
20. **Carbohydrates:** General reactions of monosaccha rides – configurational studies on glucose, fructose, sucrose, Recent advances in the Chemistry of cellulose and starch.
21. **Proteins** – Introduction to proteins – their classification – Nomenclature and distribution in nature simple, amino acids – Isolation and their synthesis.
22. **General Ideas regarding the chemistry of vitamins & Harmones** nicotine, B-Carotene and Vitamin C.
23. **Alicyclic compounds:** Synthesis and reactions Bayers strain theory – Factors affecting stability of conformation – terpenes – citral – gerniol – limonenene – terpinol – pinene and camphor.
24. **Stereo Chemistry:** Opticnal and geometrtic isomerism configuration of saturated molecues – DL and RS configuration of optically active compound-racemic – mixtures – racemisation and resolution.
25. **Molecular spectra:** NMR, Chemical shift – Spin – Spincoupling – ESR of simple radicals – Rotational Spectra, diatomic molecules, linear triatomic molecules, isotopic substitution – Vibrational and Raman Spectra.

Physical Chemistry:

26. **Electro-Chemistry:** Equivalent conductance and its measurement. The independent migration of jons – kholraush's Law. Transport number and their determination. Ionic mobilities. Equivalent conductance of weak and strong electrolytes. Inter-ionic attraction theory treated quantitatively-Debye-huckle-onsager equation. Determination of solubilities from conductance measurements -–Conductometric titration's.

    Ionic product of water and its determination from conductance and EMF methods – theories of acids and bases – Hydrogen ion concentration and its measurements from E.M.F. measurements using Hydrogen quin – hydroen and glass electrodes – Buffer solutions – Henderson's equation potentiometric titration's – Determinations of equilibrium constant and solubilities from E.M.F. measurements – Gibbs – Helmbholtz equation and its application to chemical cells.
27. **Photo – Chemistry:** Laws on absorption of light – Gretius – Draper Laws – Einstiens Law in Chain reactions – Hydrogen chlorine reactions – absorption – Laws of absorption.
28. **Surface Chemistry and catalysis** – Absorption isotherms, surface area determination, heterogeneous catalysis, acid-base and enzyme cotolysis.

B. FORENSIC SCIENCE

✧ **Introduction to forensic science:**

Definition of forensic science – History of forensic science – Organization of forensic science laboratories and other allied institutions – Duties of forensic scientists – Physical evidence and Loccard's exchange principle – Classification of physical evidence – Role of forensic science in crime investigation – Crime scene – Crime scene management – Searching of crime scene for physical evidence – Collection, preservation, packing and forwarding of physical evidence to forensic science laboratory – Chain of custody – Reconstruction of scene of crime.

✧ **Basic wet analytical chemistry:**

Nature and scope of analytical chemistry – Classification of analytical methods – Macro, semi-micro, micro and ultra micro analytical methods – Conventional and instrumental methods of analysis – Comparative, absolute, qualitative and quantitative methods of analysis.

Theoretical principles of analytical chemistry – Law of mass action and its application – Le Chatlier and Braun principle – van't Hoff reaction isotherm –

Dissociation theory – Electrolytes and non electrolytes – Classification of acids, bases and salts according to their degree of dissociation – Dissociation of acids, bases and salts – Dissociation constants – Common ion effect – Solubility product – Conditions for precipitation – Order of precipitation – Factors affecting precipitation – Diverse ion effect – Ionization of water – pH value – pOH value, Relation between pOH: pH scale – pH scale - Salt hydrolysis – Degree of hydrolysis and hydrolysis constant – Buffer solutions - Buffer action - Calculation of pH of a buffer solution – preparation of buffer solutions – Completeness of a chemical reaction – Complex compounds – Oxidation reduction reactions – Oxidation reduction potentials.

Organic reagents in detection of inorganic ions – Oxidizing and reducing agents in organic chemistry – Inorganic and organic spot tests – Micro chemical tests – Physical tests – Qualitative inorganic analysis – Group separations for cations and anions – Interfering radicals - Elemental analysis of organic compounds – Functional group analysis – Schemes of identification of unknown solids, liquids and gases (inorganic and organic) – Confirmation tests and their importance – Sensitivity and limit of detection – Alternative methods of analysis – Physical separation methods – Distillation – Extraction – Precipitation – Crystallization – Chromatographic methods.

✧ **Volumetric / Titrimetric methods of analysis:**

Volumetric / Titrimetric methods of analysis – General principle – Equivalence point and end point – Fundamental requirement of a titrimetric method – Standard solution – Detection of end point – Indirect titrations – Types of reactions – Calculations in titrimetry – Aqueous acid-base titrimetry – Acids and bases –Preparation of standard solutions – Primary standards – Indicators – Theory of indicators – Strong acid- strong base; weak acid-strong base; weak base-strong acid and weak acid-weak base titrations – Acid-base titrimetry in nonaqueous solvents – Redox titrimetry – Oxidation and reduction – Oxidant and reductant – Iodimetry and iodometry – Permanganometry – Dichromatometry – Precipitation methods – Argentometry – Complexometry – EDTA methods – Instrumental methods and automated volumetric analysis.

✧ **Gravimetric methods of analysis:**

Gravimetric methods of analysis – Basic Digestion of precipitates – Washing of precipitates – Drying and ignition of precipitates – Thermal decomposition of precipitates – Organic precipitants - Extraction methods in gravimetry – Determination of chloride, suphate, iron, calcium and nickel as examples principles – Factors affecting gravimetric analysis – Requirements of quantitative separation – The process of precipitation – Saturated and supersaturated solution – Nucleation – Crystal growth – Conditions of precipitation – Completeness of precipitation – factors influencing solubility – Purity of a precipitate – Adsorption of ions on precipitates – Co precipitation – Occlusion and post precipitation.

✧ **Instrumental methods of analysis:**

Unit Measurements, signals and data – Introduction – Signal to noise ratio – Sensitivity and detection limit, sources of noise – Evaluation and measurement – Accuracy and instrument calibration.

✧ **Atomic Spectrometry** - Spectrometric methods – General properties of Electromagnetic Radiation – Wave and quantum mechanical properties of radiation – Optical Atomic Spectra – Principles, instrumentation, techniques and forensic applications of: Atomic Absorption Spectrometry – Atomic Emission Spectrometry – Atomic Mass Spectrometry.

✧ **Molecular Spectroscopy** – Introduction to UV-Visible Molecular Absorption Spectrometry – Measurement of Transmittance and Absorbance – Beer's Law – Instrumentation of UV- Visible Molecular Absorption Spectrometry – Molar Absorptivities

– Absorbing Species – Application to Qualitative Analysis – Quantitative Analysis – Photometric Titrations –Molecular Luminescence Spectrometry – Theory of Fluorescence and Phosphorescence – Instrumentation for Fluorescence and Phosphorescence Measurements – Applications of Photoluminescence methods – Chemiluminescence - Infrared Spectrometry – Theory – Infrared Sources and Transducers – Instrumentation – Dispersive and FT instruments -Techniques and Applications –IR Micro spectrometry – Forensic Applications of IR Spectrometric methods.

- **Nuclear Magnetic Resonance Spectrometry** – Principles, Instrumentation, Techniques and Forensic Applications.

- **Chromatographic Techniques** – Introduction – History of Chromatography - Theoretical principles of Chromatography – Classification of Chromatographic Methods – Adsorption and Partition Chromatography - Principles, instrumentation, techniques and applications of Thin Layer and High Performance Thin Layer Chromatography, Method Development in Planar Chromatography - Gas Chromatography – Instrumentation – Detectors - Adsorption, Partition, Gas Solid, Gas Liquid, Isothermal, Linear Temperature Programming, Chiral, Pyrolysis and Derivatization Chromatography - Columns and Stationary Phases – Column Efficiency –Method Development - Forensic Applications of Gas Chromatography - High Performance Liquid Chromatography – Instrumentation Detectors – Columns and Stationary Phases - Isocratic, Gradient, Adsorption, Partition, Ion and Derivatization Chromatography – Method Development – Applications of Liquid Chromatography- Super Critical Fluid Chromatography – Properties of Super Critical Fluids – Instrumentation – Columns – Detectors – Applications - Capillary electrophoresis – Principles – Instrumentation – Techniques and Applications.

- **Molecular Mass Spectrometry** – Molecular Mass Spectra – Ion Sources – Mass Spectrometers – Qualitative and Quantitative Applications of Molecular Mass Spectrometry – Interpretation of Mass Spectra Hyphenated techniques – Principle, instrumentation, techniques and applications of GC-FTIR, GC-MS, LC-MS, MS-MS.

- **Thermal Methods:** Principles, Instrumentation, Techniques and Applications of: Thermogravimetric Methods – Differential Thermal Analysis – Differential Scanning Calorimetry.

- **Radiochemical Methods:**

Radioactive Isotopes - Principles, Instrumentation, Techniques and Application of Neutron Activation Analysis and Isotope Dilution Methods.

- **Electrochemical Techniques:**

Introduction – Principles, instrumentation, techniques and applications of Potentiometry, Ion-selective electrodes, Coulometry and Polarography.

- **Forensic Chemistry:**

Forensic Chemistry - Introduction - Types of cases / exhibits - Preliminary screening - presumptive tests (colour and spot tests) - Examinations procedures involving standard methods and instrumental techniques.

Qualitative and quantitative forensic analysis of inorganic and organic material - Chemical fertilizers (N,P,K) _ Insecticides (Endosulfan, Malathion, Carbaryl) - Metallurgical analysis (Fe, Cu, Zn, Au, Ag) – Natural products (tobacco, tea, sugars, rubber) – Industrial chemicals - Sulphuric, Nitric and Hydrochloric acids, Sodium, Potassium hydroxide, Ammonium nitrate, Potassium chlorate, Organic solvents like Methanol, Ethanol, Acetone, Chloroform and Ether Organic chemicals like Acetanilide, P- Aminophenol, Nitrobenzene etc. with reference to forensic work.

- **Examination of petroleum products** - Distillation and fractionation - various fractions and their commercial uses - Standard method of analysis of petroleum products – Analysis if petroleum products for adulteration and arson residues.

- **Chemistry of fire** - Investigation and evaluation of fires – Causes of fire - Analysis of arson residues by conventional and instrumental methods.

- **Analysis of trace evidence** - Cosmetics, Dyes, Trap related evidence materials, Paints, Pigments, Fibres, Oils fats, Greases, Industrial dusts, Chemicals and Plant materials.

- **Analysis of beverages:** Composition and analysis of alcoholic and non-alcoholic beverages, country made liquor, illicit liquor and medicinal preparations containing alcohol – Common adulterants and toxic substances in alcoholic beverages.

- **Analysis of Narcotic Drugs and Psychotropic Substances** - Introduction - classification of NDPS / drugs of abuse – Drug abuse - Drugs of abuse in sports - Designers drugs - Forensic examination of NDPS – Clandestine laboratories – Drug profiling.

  The study of NDPS should be exemplified by Opiates, Cannabis, Cocaine, Amphetamines, Benzodiazepines, Disubstituted Quinazolones, Barbiturates and LSD, Psylocybin, Mescaline and MDMA.

  Drugs and Cosmetic Act, Excise Act, NDPS Act.

- **Explosives and Explosion residues:**

  Explosives and Explosion residues – composition, Classification, and characteristics of explosives, pyrotechnics, IEDs - Explosion process and effects - Approach to scene of explosion - post-blast explosion residue collection - Reconstruction of sequence of events - Evaluation and assessment of scene of explosion - Systematic analysis of explosives and explosion residues in the laboratory using chemical and instrumental techniques (exemplified by country bomb compositions, Picric acid, Gun powder, Ammonium nitrate, NG, NC, TNT, PETN, TETRYL, RDX and HMX) - Synthesis of above organic explosives – Profiling and tagging of explosives- Interpretation of results, Explosives Act and Explosive Substances Act.

- **Forensic toxicology:**

  Toxicology- Introduction- History- Scope- Areas of Toxicology- Role of forensic toxicologist- Poisons-Classification of poisons- Types of poisoning- Sample collection and preservation of toxicological exhibits in fatal and survival cases- Storage of samples- Signs and symptoms of poisoning-Toxicological investigation/examination of poisoned death- Interpretation of toxicological data-Courtroom testimony in toxicological cases. Case Histories.

  Pharmacokinetics - Methods of transportation of toxicant- Absorption- Distribution- Storage of toxicants- Redistribution - Metabolism-Oxidation – Reduction – Hydrolysis – Conjugation - Excretion-Other routes of elimination- Toxicokinetics- one and two compartmental model – Toxicodynamics-Spectrum of undesired (toxic) effects- Interaction of chemicals- Tolerance- Dose response relationship-Developmental and reproductive toxicity-Mutagenicity- Toxicity testing.

  Introduction- Extraction, Isolation and Clean-up procedures in toxicological analysis- Identification and quantitation of poisons by physical, chemical, chromatographic, spectrophotometric, electrophoretic, immunoassay- and other methods.

  (Metals, anions, volatile poisons, gases, drugs, pesticides and miscellaneous poisons such as plant poisons, radioactive materials, animal toxins). Field testing in toxicological work – Therapeutic drug monitoring – Analysis of drug abuse in sports – Emergency hospital toxicology.

- ✧ **Management of acute poisoning**- Introduction- Maintenance of vital functions- Measures to enhance elimination of poisons- Removal of unabsorbed poisons- Antidotes- Classification of antidotes-Mechanism of action of antidote (cyanide, methanol, arsenic, opiate, carbon monoxide, nitrite, acetaminophen and pesticides) Identifying route of administration of poison- Estimation of time and dose after administration of poison- Recovery and after care of patients- Poison Information/Control Centre. Case Histories.

SYLLABUS FOR THE POST OF ASSISTANT DIRECTOR, BIOLOGY:

PAPER–II

There shall be **five alternative subjects** for Paper–II of the Assistant Director (Biology), as follows:

A. BOTANY
B. ECOLOGY
C. MICROBIOLOGY
D. BIO-CHEMISTRY
E. MEDICINE

The candidate shall answer Paper–II in the subject corresponding to the qualification possessed, including its equivalent discipline, as follows:

- M.Sc. Degree in 1st or 2nd Class in Botany or its equivalent discipline – Botany syllabus;
- M.Sc. Degree in 1st or 2nd Class in Ecology or its equivalent discipline – Ecology syllabus;
- M.Sc. Degree in 1st or 2nd Class in Microbiology or its equivalent discipline – Microbiology syllabus;
- M.Sc. Degree in 1st or 2nd Class in Biochemistry or its equivalent discipline – Biochemistry syllabus;
- Degree in Medicine with a Bachelor's Degree in Science (Chemistry, Botany, Zoology, Physics) – Medicine syllabus.

The subject-wise syllabi are detailed below:

A. BOTANY

1) CELL AND MOLECULAR BIOLOGY OF PLANTS:

- ✧ **Cell Wall:** Structure and functions, biogenesis, growth.
- ✧ **Plasma membrane:** Structure, models and functions: Sites for ATPases, Ion carriers, Channels and pumps, Receptors.
- ✧ **Plasmodesmata:** Structure, Role in movement of molecules and macromolecules, Comparison with gap junctions.
- ✧ **Chloroplast:** Structure, genome organization, gene expression, RNA editing, nucleo-chloroplastic interactions.
- ✧ **Mithochondria:** Structure, genome organization, Biogenesis.
- ✧ **Plant Vacuoles:** Tonoplast membrane, ATPases, transporters, as storage organelle.
- ✧ **Nucleus:** Structure, nuclear pores, nucleosome organization, DNA structure: A, B and Z forms, replication, damage and repair, transcription, Plant promoters and transcription factors, splicing mRNA transport, nucleolus, rRNA biosynthesis.
- ✧ **Ribosomes:** Structure, site of protein synthesis, mechanism of translation, initiation, elongation and termination; structure and role of tRNA.
- ✧ **Protein sorting:** Targeting of proteins to organelles.

- ✧ **Cell shape and motility:** The cytoskeleton; organization and role of microtubules and microfilaments; motor movements; implications in flagellar and other movements.
- ✧ **Cell cycle and apoptosis:** Control mechanisms; role of cyclins and cyclin dependent kinases; retinoblastoma and E2F proteins; cytokinesis and cell plate formation; mechanisms of programmed cell death.
- ✧ **Other cellular organelles:** Structure and functions of microbodies, Golgi apparatus, lysosomes, endo plasmic reticulum.
- ✧ **Techniques in cell biology:** Immuno techniques; in situ hybridization, FISH, GISH; confocal microscopy.

2) CYTOLOGY, GENETICS AND CYTOGENETICS:

- ✧ **Chromatin organization:** Chromosome structure and Packaging of DNA, molecular organization of centromere and telomere; nucleolus and ribosomal RNA genes; euchromatin and heterochromatin; karyotype analysis; banding patterns; specialized types of chromosomes; polytene, lampbrush, B-chromosomes and sex chromosomes; molecular basis of chromosome pairing.
- ✧ **Structural and numerical alterations in chromosomes:** Duplication, deficiency, inversion and translocation; autopolyploids ; allopolyploids ; evolution of major crop plants.
- ✧ **Genetics of prokaryotes and eukaryotic organelles:** Genetic recombination in phage; genetic transformation, conjugation and transduction in bacteria; genetics of mitochondria and chloroplasts cytoplasmic male sterility.
- ✧ **Gene structure and expression:** Genetic fine structure; cis – trans test; Benzer's experiment; introns and their significance; RNA splicing; regulation of gene expression in prokaryotes and eukaryotes.
- ✧ **Genetic recombination and genetic mapping:** Recombination; independent assortment and crossing over; molecular mechanism of recombination; role of RecA and RecBCD enzymes; site-specific recombination; chromosome mapping, linkage groups, genetic markers, construction molecular maps.
- ✧ **Mutations:** Spontaneous and induced mutations; physical and chemical mutagens; molecular basis of gene mutations; transposable elements in prokaryotes and eukaryotes; mutations induced transposons; site-directed mutagenesis; DNA damage and repair mechanisms.
- ✧ **Plant Breeding:** Principles and methods of plant breeding; Marker assisted breeding.
- ✧ **Biostatistics:** Mean, Variance, Standard deviation, Standard error, Student't' test, chi-square and ANOVA.
- ✧ **Molecular cytogenetic:** Nuclear DNA content; C-value paradox; cot curve and its significance; restriction mapping – concept and techniques; multigene families and their evolution.

3) BIOLOGY AND DIVERSITY OF LOWEER PLANTS: CRYPTOGAMS:

- ✧ **Microbiological techniques:** Pure culture, enrichment and anaerobic culture.
- ✧ **Importance of microorganisms:** Microbes in medicine, agriculture and environment.
- ✧ **Microbial growth:** Nutritional requirements of microorganisms and methods to measure growth.
- ✧ **Microbial Ecology:** Genetrification; phosphorous solubilization; nitrogen fixation
- ✧ **Phycology:** Thallus organization; cell ultrastructure; reproduction (vegetative, sexual, asexual); criteria for classification of algae: pigments, reserve food, flagella; classification, salient features of Chlorophyta, Charophyta, Xanthophyta, Bacillariophyta, Phaeophyta and Rhodophyta; algal blooms, algal biofertilizers; algae as food, feed and uses in industry.
- ✧ **Mycology:** General characters of fungi; substrate relationship in fungi; cell ultrastructure; unicellular and multicellular organization; cell wall composition; nutrition (saprobic, biotropic, symbiotic); reproduction (vegetative, asexual, sexual); heterothallism; heterokaryosis parasexuality; Molecular aspects in classification.
- ✧ General account of Mastigomycotina, Zygomycotina, Ascomycotina, Basidiomycotina, Deuteromycotina; fungi in industry, medicine and as food; fungal diseases in plants and humans; Mycorrhizae; fungi as biocontrol agents.

- **Bryophyta:** Morphology, structure, reproduction and life history; distribution; classification, general account of Marchantiales, Junger maniales, Anthoceratales, Sphagnales, Funariales and Polytrcales; economic and ecological importance.
- **Pteridophyta:** Morphology, anatomy and reproduction; classification; evolution of stele; heterospory and origin of seed habit; general account of fossil pteriodophyta; introduction to Psilo psida, Lycopsida, Sphenopsida and Pteropsida.

4) TAXONOMY AND DIVERSITY OF SEED PLANTS:

- **Introduction and classification of Gymnosperms**
- **Structure and reproduction in** Cycadales, Ginkgoales, Coniferales, Ephedrales, Welwitschiales and Gnetales.
- **The species concept:** Taxonomic hierarchy, species, genus, family and other categories; principles used in assessing relationship, delimitation of taxa and attribution of rank.
- Salient features of the International Code of Botanical nomenclature.
- **Taxonomic tools:** Herbarium; floras; histological, cytological, phytochemical, serological, biochemical and molecular techniques; computers and GIS.
- **Systems of angiosperm classification:** Phenetic versus phylogenetic systems; cladistics in taxonomy; relative merits and demerits of major systems of classification.
- **Concepts of phytogeography:** Endemism, hotspots; plant explorations; invasions and introductions.

5) PLANT PHYSIOLOGY AND METABOLISM:

- **Energy flow:** Principles of thermodynamics, free energy and chemical potential, redox reactions, structure and functions of ATP.
- **Fundamentals of enzymology:** General aspects, allosteric mechanism, regulatory and active sites, isoenzymes, kinetics of enzymatic catalysis, Michaelis – Menton equation and its significance.
- **Membrane transport and translocation of water and solutes:** Plant water relations, mechanism of water transport through xylem, passive and active solute transport, membrane transport proteins.
- **Signal transduction:** Receptors and G-proteins, phospholipid signaling, role of cyclic nucleotides, calcium calmodulin cascade, diversity in protein kinases and phosphatases.
- **Photochemistry and photosynthesis:** Photosynthetic pigments and light harvesting complexes, photo oxidation of water, mechanisms of electron and proton transport, carbon assimilation – the Calvin cycle, photorespiration and its significance, the C4 cycle, the CAM pathway, biosynthesis of starch and sucrose.
- **Respiration and lipid metabolism:** Glycolysis, the TCA cycle, electron transport and ATP synthesis, pentose phosphate pathway, glyoxylate cycle, alternative oxidase system, structure and function of lipids, fatty acid biosynthesis, synthesis of membrane lipids, structural lipids and storage lipids and their catabolism.
- **Nitrogen fixation and metabolism:** Biological nitrogen fixation, nodule formation and nod factors, mechanism of nitrate uptake and reduction, ammonium assimilation.
- **Photobiology:** Photochromes and cryptochromes, photophysiology of light –induce responses, cellular localization.
- **Plant growth regulators and elicitors:** Physiological effects and mechanism of action of auxins, gibberellins, cytokinins, ethylene, abscisic acid, brassinosteroids, polymines, jasmonic acid and salicyclic acid.
- **The flowering process:** Photoperiodism, endogenous clock and its regulation, floral induction and development – genetic and molecular analysis, role of vernalization.
- **Stress physiology:** Plant responses to biotic and abiotic stress; mechanisms of biotic and abiotic stress tolerance, HR and SAR, water deficit and drought resistance, salinity stress, metal toxicity, freezing and heat stress, oxidative stress.
- **Coping with biotic stress:** Chemical control, Biological control, IPM

6) PLANT DEVELOPMENT AND REPRODUCTION:

- **Shoot development:** Organization of the shoot apical meristem (SAM); control of cell division and cell to cell communication; control of tissue differentiation especially xylem and phloem: secretory ducts and laticifers.
- **Phyllotaxy and leaf differentiation**
- **Root development:** Organization of root apical meristem (RAM); cell fates and lineages; vascular tissue differentiation; homeotic muntants in Arabidopsis and Antirrhinum, sex determination.
- **Male gametophyte**: Structure of anthers; microsporogenesis, role of tapetum; pollen development and gene expression; male sterility; sperm dimorphism and hybrid seed production; pollen germination, pollen tube growth and guidance; pollen storage; pollen allergy, pollen embryos.
- **Female gametophyte:** Ovule development; megasporogenesis; organization of the embryo sac, structure of the embryo sac cells.
- **Pollination, pollen – pistil interaction and fertilization:** Floral characteristics, pollination mechanisms and vectors; self-incompatibility; double fertilization.
- **Seed development and fruit growth:** Endosperm development during early, maturation and desiccation stages; embryogenesis, cell lineages during late embryo development; storage proteins of endosperm and embryo; polyembryony; apomixes; embryo culture; fruit maturation.
- **Dormancy:** Seed dormancy; overcoming seed dormancy; bud dormancy.
- **Senescence and programmed cell death (PCD):** Types of cell death, PCD in the life cycle of plants, metabolic changes associated with senescence and its regulation; influence of hormones and environmental factors on senescence.

7) PLANT ECOLOGY:

- **Climate, soil and vegetation patterns of the world:** Life zones; major biomes and major vegetation and sol types of the world.
- **Vegetation organization:** Concepts of community and continuum; analysis of communities (analytical and synthetic characters)
- **Ecological succession**: Hydrosere and xerosere.
- **Ecosystem organization**: Structure and functions; primary production (methods of measurement, global pattern, controlling factors); energy dynamics (trophic organization, energy flow Pathways, ecological efficiencies); litter fall and decomposition (mechanism, substrate quality land climatic factors); global biogeochemical cycles of C, N, P and S; mineral cycles (pathways, processes, budgets) in terrestrial and aquatic ecosystems.
- **Biological diversity**: Concept and levels; role of biodiversity in ecosystem functions and stability; speciation and extinction; IUCN categories of threat; distribution and global patterns, terrestrial biodiversity hot spots; inventory.
- **Air, water and soil pollution:** Kinds, sources, quality parameters; effects on plants ecosystems.
- **Climate change:** Greenhouse gases (CO_2, CH_4, N_2O, CFCs: sources, trends and role); ozone layer and ozone hole; consequences of climate change (CO_2 fertilization, global warming, sea level rise, UV radiation).
- **Ecosystem stability:** Concept (resistance and resilience); ecological perturbations (natural and anthropogenic) and their impact on plants and ecosystems; ecology of plant invasion; environmental impact assessment; ecosystem restoration.
- **Ecological management:** Concepts; sustainable development; sustainability indicators.

8) PLANT RESOURCE UTILIZATION AND CONSERVATION:

- **Plant Biodiversity and sustainable development**
- **Origin, evolution, botany, cultivation and uses of** (i) Food forage and fodder crops (ii) fibre crops (iii) medicinal and aromatic plants and (iv) vegetable oil-yielding crops. Ethnobotany
- **Important fire-wood and timber – yielding plants and non-wood forest products (NWFPs)** such as bamboos, rattans, raw materials for paper-making, gums, tannins, dyes, resins and fruits.
- **Green revolution:** Benefits and adverse consequences.

- ✧ **Plants used as avenue trees** for shade, pollution control and aesthetics.
- ✧ Principles of conservation; extinctions; environmental status of plants based on International Union for Conservation of Nature.
- ✧ **Strategies for conservation – in situ conservation:** International efforts and Indian initiatives; protected areas in India – sanctuaries, national parks, biosphere reserves, wetlands, mangroves and coral reefs for conservation of wild biodiversity.
- ✧ **Strategies for conservation – ex situ conservation:** Principles and practices; botanical gardens, field gene banks, seed banks, in vitro repositories, cryobanks; general account of the activities of Botanical Survey of India (BSI), National Bureau of Plant Genetic Resources (NBPGR), Indian Council of Agricultural Research (ICAR), Council of Scientific and Industrial Research (CSIR) and the Department of Biotechnology (DBT) for conservation, non-formal conservation efforts.

9) BIOTECHNOLOGY AND GENETIC ENGINEERING OF PLANTS AND MICROBES:

- ✧ **Plant Biotechnology –** Principles, scope and applications.
- ✧ **Plant cell and tissue culture:** General introduction, scope, cellular differentiation, and totipotency.
- ✧ **Organogenesis and adventives embryogenesis:** Morphogenesis; somatic embryogenesis.
- ✧ **Somatic hybridization:** Protoplast isolation, fusion and culture.
- ✧ **Applications of plant tissue culture:** Clonal propagation, artificial seed, production of hybrids and soma clones, production of secondary metabolites / natural products, cryopreservation and germplasm storage.
- ✧ **Recombinant DNA technology:** Gene cloning principles and techniques, genomic / c DNA libraries, vectors, DNA synthesis and sequencing, polymerase chain reaction, DNA fingerprinting and DNA markers.
- ✧ **Genetic engineering of plants:** Transgenic plants, Methods of gene transfer – *Agrobacterium* – medicated and microprojectile, chloroplast transformation, intellectual property rights, ecological risks and ethical concerns.
- ✧ **Microbial genetic manipulation:** Bacterial transformation, selection of recombinants and transformants, genetic improvement of industrial microbes.
- ✧ **Genomics and proteomics:** High throughput sequencing, genome projects, bioinformatics, functional genomics, microarrays.

B. ECOLOGY

- ✧ **Introduction to Ecology:** Levels of organization- individual, population, community, concept of Ecosystem, biosphere; Abiotic and biotic ecological factors, Ecological adaptations.
- ✧ **Concepts of Ecology:** Climate, soil and vegetation patterns of the world: Life zones; major biomes and major vegetation and sol types of the world. Vegetation organization- Concepts of community and continuum; analysis of communities (analytical and synthetic characters), Ecological succession- Hydrosere and xerosere.
- ✧ **Ecosystem organization:** Structure and functions; primary production (methods of measurement, global pattern, controlling factors); energy dynamics (trophic organization, energy flow Pathways, ecological efficiencies); litter fall and decomposition (mechanism, substrate quality land climatic factors); global biogeochemical cycles of C, N, P and S; mineral cycles (pathways, processes, budgets) in terrestrial and aquatic ecosystems.
- ✧ **Biological diversity:** Concept and levels; role of biodiversity in ecosystem functions and stability; speciation and extinction; IUCN categories of threat; distribution and global patterns, terrestrial biodiversity hot spots; inventory. Air, water and soil pollution: Kinds, sources, quality parameters; effects on plants ecosystems. Climate change- Greenhouse gases (CO_2, CH_4, N_2O, CFCs: sources, trends and role); ozone layer and ozone hole; consequences of climate change (CO_2 fertilization, global warming, sea level rise, UV radiation). Wildlife in India-conservation, Chipko movement, Biodiversity-Economic significance, conservation, hot spots of India.
- ✧ **Ecosystem stability:** Concept (resistance and resilience); ecological perturbations (natural and anthropogenic) and their impact on plants and ecosystems; ecology of plant invasion; environmental impact assessment; ecosystem restoration. Ecological management: Concepts; sustainable development; sustainability indicators.

- **Population Ecology:** Population growth models- Exponential growth, logistic growth, density-dependent and density-independent factors, life tables, survivorship curves; Population dynamics- Age structure, sex ratio, life history strategies (r-selected vs. K-selected); Metapopulations- Habitat fragmentation, connectivity, and extinction risk.
- **Community Ecology:** Community Structure-Food webs, trophic levels, keystone species; Species interactions - Competition, predation, mutualism, parasitism; Succession- Primary and secondary succession, community stability.
- **Ecosystem Ecology:** Energy flow in ecosystems- Primary production, trophic levels, energy pyramids; water cycles; Ecosystem services and human impacts.
- **Behavioural Ecology:** Introduction to animal behaviour- Proximate and ultimate causes of behaviour; Foraging behaviour; Communication; Conflict and aggression; Migration, dispersal, and navigation; Social behaviour; Sexual selection and mating systems; Parental care.
- **Molecular Ecology**: Application of molecular techniques to study ecological relationships, genetic variation and population structure.
- **Evolutionary Ecology**: Study of the relationship between ecological processes and evolutionary changes.
- **Human Impacts on Ecosystems:** Anthropogenic pressures: Land use and land-cover change; Climate change, pollution, invasive species.
- **Energy and Environment**: Sun as a source of energy; solar radiation and its spectral characteristics. Fossil fuels, Principles of generation of hydro-power, tidal energy, ocean thermal energy conversion, wind power, geothermal energy, and solar energy, nuclear energy, Bioenergy, Environmental implications of energy use.
- **Solid and Hazardous Waste Management:** Solid Waste, Solid waste processing and recovery, Solid waste collection and transportation, Hazardous waste, e-waste, fly ash, Plastic waste.
- **Statistical Approaches and Modelling in Environmental Sciences:** Attributes and Variables: types of variables, scales of measurement, measurement of Central tendency and Dispersion, Standard error, Moments – measure of Skewness and Kurtosis, Basic concept of probability theory, Sampling theory, Distributions – Normal, log-normal, Binomial, Poisson. Approaches to development of environmental models: linear, simple and multiple regression models, validation and forecasting. Models of population growth and interactions: Lotka-Volterra model, Leslie's matrix model.
- **Act and policies:** Biodiversity Act 2002; National Water Policy, 2002, National Environmental Policy, 2006. Agricultural biodiversity; International Treaty on Plant Genetic Resources for Food and Agriculture (PGRFA); Conservation strategies for seed gene bank; Climate change and conservation of plant genetic resources; Strategies on PPVFR and Biodiversity Acts.

C. MICROBIOLOGY

- **General Microbiology and Microbial Physiology:** History of Microbiology. Contributions of Scientists. Types, applications and importance of microscopy. Structure of microbial cells. Methods of sterilization: Physical methods –chemical methods and their application. Pure culture techniques. Preservation methods and Maintenance of Microbial cultures. Microbiological media and cultivation of microorganisms. Microbial identification methods. Principles of bacterial taxonomy and classification. Microbial growth curve. Measurement of Growth. Synchronous cultures – methods of synchronous culturing. Continuous culturing methods, factors effecting growth. Phenomenon of bacterial sporulation.

- **Cell and Molecular Biology, Virology:** DNA structure, types and replication, Structure and types of RNA. Transcription and translation. Concept of ribozyme. Genetic code and Wobble hypothesis, Gene regulation. Cloning and expression vectors. Construction and screening of genomic and cDNA libraries. Types of mutagens, molecular basis and analysis of mutations, site directed mutagenesis. DNA damage and repair mechanisms. Recombination in bacteria by Transformation, Conjugation, Transduction. Transposable elements. Cell cycle and programmed cell death. Signal transduction, Protein folding & roles of Molecular chaperones.

- Structure of viruses. Cultivation of viruses. Structure, genetics and Replication of Bacteriophages (Lytic and Lysogenic cycle), Plant Virus (TMV), Animal/human viruses (eg. Influenza virus, HIV and Adeno virus). Viral Interference and Interferons. Biochips. DNA

markers: RFLP, Micro/mini satellites, SNPS, RAPDs and AFLP. Finger printing. DNA sequencing. Expression of recombinant proteins Protein-protein and protein-DNA interaction. Applications of recombinant DNA technology and Gene therapy.

- **Biochemistry and Techniques:** pH and its biological relevance. Redox potentials, Electron transport, oxidative phosphorylation. Microbial respiration and fermentation. Classification, properties and chemical structure of carbohydrates and lipids. Classification, Properties and structure of amino acids and proteins. Biosynthesis and degradation of amino acids and proteins. Metabolism of carbohydrates and lipids – glycolytic pathways, TCA cycle, gluconeogenesis, glycogenesis. Biosynthesis of triacyl-glycerols and oxidation of fatty acids. Enzymes - nomenclature, classification, methods for determination of enzyme activity. Enzyme kinetics - Michelis-Menton kinetics. Optical methods - colourimetry and spectrophotometry, fluorimetry, optical rotation, Circular dichroism, NMR, ESR spectroscopy, X-ray diffraction, types of mass spectrometry. Chromatographic techniques, diffusion, dialysis, cell disruption methods, centrifugation techniques, electrophoreses and blotting techniques. Radio isotopes – detection and measurement.

- **Immunology:** Components of immune system, Clonal selection theory. Antigen and antibody structure. Major Histocompatibility Complex (MHC) and transplantation. Antigen and antibody reactions. Immune response to infectious diseases. Hybridoma technology. Hypersensitivity, Tumor immunology, Immunological tolerance and immuno-suppression. Immune deficiency diseases. Immunotherapy of infectious diseases. Vaccines and Immunization.

- **Biostatistics:** Variations and frequency distributions, measures of central tendency and dispersion, standard deviation, standard error, elements of probability, correlation and linear regression. Normal curve test, 't' test, 'F' test, 'Z'-test, ANOVA, Chi-square test, and confidence intervals. Experimental designs using statistical tools.

- **Bioinformatics:** Basics of computers, Disk operating systems (DOS), Windows, MS office, information networking. Databases, Sequence and structure analysis of DNA and Proteins. Primer design. Protein engineering and drug designing. Tools and packages of networking.

- **Industrial Microbiology:** Exploitation of microbes and industrial products. Types of fermentations, Detection and assay of fermentation products. Scale up of fermentations, Product recovery methods, Strain development strategies. Immobilization methods. Fermentative production of Ethanol, beer, wine, Antibiotics, citric acid, Vitamin B12, Glutamic acid and microbial enzymes. Steroid Biotransformations – Principles of vaccine production. Microbial biopesticides, Microbial products from genetically modified (cloned) organisms eg. Insulin. QA, QC, GLP, GMP, Patents & IPR.

- **Medical Microbiology:** Principles of Medical Microbiology, Normal flora of human body. Properties of pathogenic microorganisms. Bacterial, viral, fungal and parasitic infectious diseases (air born, water born, food born, insect born and zoonotic infections). Principles of diagnostic microbiology. Systematic Medical Microbiology - β-Haemolytic streptococci, Mycobacterium tuberculosis, Neisseria gonorrhoea, E. coli, Salmonella typhi. Staphylococcus aureus, Clostridiuym tetani, Pseudomonas, HIV, Polio, Rabies and Amoebiasis, Malaria and Trichomoniasis and Fungal diseases. Medical diagnostics.

- Mode of action of important drugs – Cell wall inhibitors (Betalactum – eg. Penicillin), membrane inhibitors (polymyxins), macromolecular synthesis inhibitors (streptomycin), Antifungal antibiotics (nystatin). Drug resistance. Antiviral agents. Microbiological assays.

- **Food, Environment and Agriculture Microbiology:** Dairy Microbiology. microbiological examination of fresh and canned foods. Fermented foods, spoilage of foods and food preservation methods. Current and future implications concerning food safety, hazards and risks. Microbes and animal interactions – Rumen Microbiology, termite microbial communities. Probiotics, Prebiotics and their significance in human beings and animals. Microorganisms in air, water and soil and their importance. Microbial diversity in the environment. Microbial mineralization and C, N, S, P and Fe cycles. Soil humus formation. Rhizosphere, mycorhiza and phyllosphere. Microbial degradation of carbonaceous materials in soil. Biology and biochemistry of Nitrogen fixation. Biofertilizers, Biopesticides, Persistance and degradation of pesticides, herbicides, fungicides and insecticides. Sewage treatment and bioremediateion.

D. BIO-CHEMISTRY

- **CHEMISTRY, METABOLISM OF PROTEINS AND LIPIDS:** Chemistry of Amino Acids, Peptides and Proteins. Metabolism of Amino Acids, Peptides and Proteins. Chemistry of Lipids and Porphyrins. Metabolism of Lipids and Porphyrins.

- **CHEMISTRY, METABOLISM OF CARBOHYDRATES AND NUCLEIC ACIDS:** Chemistry of Carbohydrates. Metabolism of Carbohydrates. Chemistry and Metabolism of Nucleic Acids. Chemistry and Metabolism of Vitamins.

- **BIOANALYTICAL TECHNIQUES:** Spectroscopy, Chromatography, Centrifugation and Electrophoresis, Microscopy and Tracer Techniques.

- **BIOENERGETICS AND CELL BIOLOGY:** Bioenergetics, Cell Structure of Prokaryotes, Cell Structure of Eukaryotes, Methods of Cell Study.

- **ENZYMOLOGY:** Enzymes and coenzymes, Enzyme Kinetics, Catalytic mechanisms, Enzyme regulation

- **MOLECULAR BIOLOGY:** DNA replication, DNA repair, Transcription and Translation, Protein sorting, targeting and degradation.

- **BIOCHEMICAL GENETICS & MODEL ORGANISMS:** Mendelian Genetics, Linkage and Mapping, Bacterial Genetics, Model Organisms.

- **CELL – CELL COMMUNICATION:** Extracellular matrix and cell surface, Cell signaling, Signal transduction and cancer, Signal transduction in bacteria and plants.

- **REGULATION OF GENE EXPRESSION & RECOMBINANT DNA TECHNOLOGY:** Gene Regulation in prokaryotes and viruses, Gene Regulation in eukaryotes, Recombinant DNA technology, Genetic engineering.

- **IMMUNOLOGY:** Basic immunology, Immune response, Transplantation & Applied immunology, Disorders of the immune system.

- **VIROLOGY AND CLINICAL BIOCHEMISTRY:** Prokaryotic viruses, Eukaryotic viruses, Clinical diagnosis, Pathophysiology & Clinical enzymology.

- **ENDOCRINOLOGY, PHYSIOLOGY AND NUTRITION:** Endocrine systems, Hormones, Body fluids & clinical testing, Physiology of body fluids and Nutrition.

- **BIOTECHNOLOGY:** Microbial biotechnology, Plant biotechnology, Animal biotechnology, Protein engineering.

- **BIOSTATISTICS, COMPUTERS AND BIOINFORMATICS:** Biostatistics, Computers and Bioinformatics, Genomics, Transcriptome and Proteomics.

E. MEDICINE

- **HUMAN ANATOMY:** Gross and microscopic anatomy and movements of shoulder hip and knee joints – Gross and microscopic anatomy and block supply of lungs, heart, kidneys, liver, testis and uterus – Gross anatomy of pelvis, perineus 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 abnormalistics – Placenta and placental barrier – Neural pathways for cutaneous sensation 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;

12 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 Henderson – 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 histopathology 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; Escherichia; 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, Chloroquine, - Mechanism of action, dosage and toxicity of the antibiotics: Ampicillin, Cephalexin, Doxycycline, Chloramphenicol, Rifampicin, Cefotaxime – Indications, dosage, side-effects and contraindications of the following anti-cancer drugs:- Methotrexate, vincristine 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 glomerulonephritis, Nephrotic syndrome, chronic pyelonephritis and renal failure – 5. Gastro-Intestinal disorders – Acid Peptic diseases, Malabsorption syndromes, viral hepatitis, Cirrhosis of liver pancreatitis - 6. Haematological diseases – Anaemias, Coagulation failures, Leukaemia, 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 warm, Guinea worm, Amoebiasis – 10. Nutritional disorders – Normal nutrition, and deficiency diseases in India.

- **GENERAL SURGERY:** 1. Cervical lymph nodes, parotid tumour and oral cancers – 2. Peripheral arterial diseases – varicose veins, Filariasis – 3. Dysfunctions of Thyroid, Parathyroid adrenal tumours and the surgical aspects – 4. Abscess breast and cancer breast – 5. Acute and Chronic Appendicitis bleeding peptic ulcer, T.B. of bowel intestinal obstructions – 6. Renal mass, retention of Urine Benign Prostatic Hypertrophy – 7. Splenomegaly, Chronic Cholecystitis portal Hypertension liver abscess peritonitis, Cancer

head of Pancreas – 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, Fetoplacental development – 2. Labour management, complications of 3rd stage, post-partum haemorrhage, Inversion, 13 Resuscitation of the new born and premature baby – 3. Diagnosis and management of Pregnancy – induced – hypertension Eclampsia, anaemias – 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 leukorrhea, 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.

SCHEME & SYLLABUS OF THE COMPUTER PROFICIENCY TEST (CPT)

Scheme for Computer Proficiency Test

(As per G.O.Ms.No.26, G.A. (Ser.B) Dept., dt: 24.02.2023)

Scheme of the examination (Practical Type)					
Test	Duration (Minutes)	Maximum Marks	Minimum Qualifying Marks		
			SC/ST	B.C's	O.C's
Proficiency in Office Automation with usage of Computers and Associated Software.	60	100	30	35	40

Syllabus for Computer Proficiency Test

PART-A

1. **INTRODUCTION TO COMPUTERS:** Introduction to Computers - Components and their classification - Peripheral devices and their purpose. Input Devices - Keyboard, Mouse, Scanner, Lighten, Touch screens, Joystick, Micro phone, Scanner, Digital camera, Bar code reader, Biometric sensor. Output Devices: Display devices, Printers, Monitor, Speaker, Plotter, Secondary Storage Devices – Feature- Driven Development (FDD), Magnetic tape, Universal Serial Bus(USB), Pen Drives, Disks - The Role of input Processing / output processing devices - Computing Concepts - Data - Information – Random - Access Memory (RAM) – Read-Only Memory(ROM) - Control Unit - Memory Unit – Arithmetic Logic Unit(ALU).
2. **COMPUTER SOFTWARE TYPES:** System Software, Application Software, Embedded software, Proprietary Software, Open source software (their purpose and characteristics only).
3. **OPERATING SYSTEM:** Purpose of operating system, Single User and Multi User Operating Systems with Examples.
4. **WINDOWS OPERATING SYSTEM:** Interfacing Graphical User Interface (GUI), Differences between Character User Interface (CUI) and Graphical User Interface(GUI) - working With Files and Folders - More About Files - Running An Application Through the File Manager - Running an Application Through the Program Manager - Setting up of Printer, Webcam, Scanner and other peripheral devices.
5. **LINUX/MAC OS (only basic concepts):** Introduction to Linux - Features and advantages of Linux, File handling commands, directory handling commands - User Management - File permissions Macintosh Apple Computer (MAC) OS - Introduction - Advantages of Macintosh Apple Computer (MAC) OS. Basics commands
6. **INTERNET CONCEPTS (only basic concepts):** Minimum Hardware and Software Requirements for a system to use internet, Communication Protocols and Facilities - Various browsers - What is Internet Protocol (IP) Address - Steps required in connecting system to network - Uploading and Downloading Files from Internet
7. **ELECTRONIC MAIL (only basic concepts):** Sending and receiving mails, Basic E-Mail Functions, Using your word processor for E-mail, Finding E-Mail Address, Mailing Lists and lists Servers.

8. **WORLD WIDE WEB (only basic concepts):** WWW advantages of the Web - how to navigate with the Web - Web Searching.

PART – B

1. **OFFICE SUITE**: MSOFFICE or any open source office like Libre Office /Apache Open Office Neo office for Windows/Linux/Macintosh Apple Computer (MAC)OS.
2. **GETTING STARTED WITH OFFICE:** Introduction to Office Software- Starting and Exiting the Office Applications - Introducing the Office Shortcut Bar - Customizing Office Shortcut Bar.
3. **FILE OPERATIONS IN THE OFFICE:** Common Office Tools and Techniques - Opening An Application - Creating Files - Entering And Editing Text - Saving Files - Opening Files - Closing a File - Exiting The Application - Managing Your files With the Office Applications.
4. **TOOLS IN THE OFFICE APPLICATIONS:** Key Combinations - Cut, Copy and Paste - Drag And Drop Editing - Menu Bars And Toolbars - Undo and - Redo - Spell Checking - Auto Correct - Find and Replace - Help And The Office Assistants - Templates and Wizards.
5. **WORD PROCESSING (MS WORD or its equivalent in Libre office** /Apache Open Office / Neo office for Windows/s/Linux/Mac OS): Starting Word

- Title Bar - Menu Bar - Format Bar - Standard Bar - Ruler - Workspace Area - Scroll Bar - Status Bar - Different Toolbars - Option a Menu Bar - Creating New Document When Word is Running - Opening Pre existing Documents When Word is Running - Designing Your Document - Typing Text - Selection text - Deleting Text - Formatting text and document - copying and moving - Saving Document - Page Setup - Properties of a document - Undo-Redo-Cut-Copy a Document - Pasting a Document - Print Preview - Printing - Select All - Find - Replace - Go To - Four Different View Of A Document - Normal, Web Layout, Print Layout, and Outline Layout- Document Map - Full Screen - Zoom - Objects - Page Break - Header and Footer - Page Number - Auto Format - Auto Text - Inserting Date And Time - Working With Header, Footers-footnotes-Fields-Symbols-Caption Cross Reference-Index-Tabs-Table and Sorting - Working With Graphics - Inserting Pictures - Modifying Pictures - Word Art - Inserting Chart - Inserting Files - Hyper Linking - Bookmark - Using Different Fonts - Paragraph – Bullets Borders and Shading-Columns-Drop Cap-Theme-Change Case Background-Frames-Style-Spelling And Grammar - Set Language - Word Count - Auto Summarize - Auto Correct - Merge Document - Protect Document - Envelopes And Labels - - Templates, Wizards And Sample Documents - drawing Tables - Merge Cell - Spilt Cells - Spilt Table - Table Auto Format - Auto Fit - Sort - Formula - Arrange All-Split-Micro Soft Word Help - Macros - Custom Toolbars - Keyboard Shortcuts - Menus - Mail Merge.

6. **SPREAD SHEET (MS Excel or its equivalent in Libre Office / Apache Open Office / Neo office for Windows/Linux/Mac OS)**:
   Features Of Excel - Excel worksheet - Selecting Cell - Navigating With The Mouse And Keyboard - Entering And Editing Text - Text Boxes - Text Notes - Checking Spelling - Undoing And Repeating Action - Entering And Editing Formulas - Referencing Cells - Order Of Evolution in Formulas - Copying Entries And Equations To Minimize Typing - More Auto Fill Examples - Creating Custom Fill Lists Protecting And Un Protecting Documents And Cell - Creating A New Worksheet - Excel Formatting Tips And Techniques - Moving cell - Copying Cells - Sorting Cell Data - Insertion Cells Inserting As You Paste - Deleting Parts Of Worksheet - Clearing Parts Of A Worksheet - Excel Page Setup - Changing Column Width And Row Heights - Auto Format - Manual Formatting - Using style - Format Code Alter A Number's Appearance - Format Painter Speeds-Up Format Copying - Changing Font Size And Attributes - Adjusting Alignments - Cantering Text Across Column - Using Border Buttons And Commands - Changing Color And Shading - Inserting And Removing Page Breaks - Hiding Rows And Columns - Rearranging Worksheet - Entering Formula - Excel Functions - Inserting Rows And Columns - Saving A Worksheet - Printing A Worksheet - Printing Tips For Large Excel Project - Parts Of A Function - Functions Requiring Add-ins - Function Wizard - Example Of Functions By Category - Organizing Your Data - Excel's Chart Features - Chart Parts And Terminology - Instant charts with The chart wizard - Creating Chart On Separating Worksheets - Resizing And Moving Charts - Adding Chart Notes And Arrows - Editing Charts - Rotating 3-D Charts - Printing Charts - Deleting Charts Setting The Default Chart Type - Creating

Trend Lines Data Map - Working With Graphics in Excel - Creating And Pacing Graphic objects - Resizing Graphs - Possible Sources Of Excel Graphics - Creating and Running Macro - Sorting Excel Data - Adding Subtotals To Databases - Customizing Excel - Customizing Workspace – Comma Separated Value (CSV) File format - Using Worksheet As Databases.

7. **PRESENTATION SOFTWARE (MS Power Point or its equivalent in Libre Office/Apache Open office/Neo office for Windows/Linux/Mac Os):** Introduction - Starting Presentation Software - Views in Presentation Software - Slides - Terminology - Color Schemes - Formatting Slides - Creating a Presentation - Using the Auto Content Wizard - Masters- - Using a Template - Creating a Blank Presentation - Working with Text in Power Point - Adding Slides Editing And Working Text - Working in Outlaying view – Spell checking - Finding And Replacing Text - Formatting Text - Aligning Text - Developing Your Presentation - Importing images From The Outside World - The Clipart Gallery - Drawing in Presentation software- Bringing A Presentation to Life - Inserting Objects in Your Presentation - Inserting A Picture - Working With Graphics - Multimedia in Power Point - Animating The Objects, Pictures, Graphics, - Enhancements to the Slide Show Showing Slides Out Of Order Printing Presentation Elements - Finalizing The Presentation - Assigning Transitions And Timings - Setting The Master Slide - Setting Up The Slide Show - Running The Slide Show.

Assessment Pattern:

Part-A: Test may be designed to assess the candidate by means of MCQs.
(20%of Total Marks)

Part-B: A computer based assessment test where they need to:

1. Prepare a model document and organize the same in a formatted manner. This should cover evaluating the typing speed, organizing the document and covering several other aspects such as inserting tables, inserting Images/WordArt, mail merge, etc.)
2. Evaluating typing speed **(25% of Total Marks)**
   (This may be made mandatory for qualifying based on the norms existing)
3. Organizing and inserting different objects **(15% of Total Marks)**
4. Prepare an Excel Sheet to fill with data and format the sheet, merging/splitting cells, formulae for calculation in the cells, conditional formatting, preparation of different graphs based on the data.
   (20%of Total Marks)

5. Prepare a Power Point presentation using the standard layouts available and filling different slides with content (Formatted text, images, tables, transition effects, animation etc.). **(20%of Total Marks)**

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ANNEXURE-III

INSTRUCTIONS TO CANDIDATES

A. INSTRUCTIONS REGARDING ONLINE APPLICATION:

A.1. The applicants are required to go through the user guide and satisfy themselves as to their eligibility for this recruitment carefully before applying and enter the particulars completely online.

A.2. Applicant must compulsorily fill-up all relevant columns of application and submit application through website only. The particulars made available in the website will be processed through computer and the eligibility decided in terms of notification and confirmed accordingly.

A.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 delay/discrepancy on part of the candidate.

A.4. Applicants must compulsorily upload his/her own scanned photo and signature through .jpg format.

A.5. The applicants should not furnish any particulars that are false, tampered, fabricated or suppress any material information while making an application through website.

A.6. Important: Hand written/typed/Photostat copies/printed application form will not be entertained.

A.7. The applicant shall produce all the essential certificates issued by the competent authority, for verification by the commission, as and when called for. If candidates fail to produce the same, his/her candidature shall be rejected / disqualified without any further correspondence.

A.8. The following certificate formats are available on the Commission's https://psc.ap.gov.in for reference.

A.8.1. Community, Nativity and Date of Birth Certificate
A.8.2. Declaration by the Un-Employed
A.8.3. School Study Certificate
A.8.4. Certificate of Residence
A.8.5. Medical Certificate for the Blind
A.8.6. Certificate of Hearing Disability and Hearing Assessment
A.8.7. Medical Certificate in respect of Orthopedically Handicapped Candidates
A.8.8. Creamy Layer Certificate
A.8.9. Local status certificate (if applicable)

B. INSTRUCTIONS REGARDING ON-LINE (CBT) EXAMINATION:

B.1. The candidates should take their seats at the prescribed time before the commencement of the examination. Biometric identification would be conducted before entry into examination hall. The entry time would be mentioned in the hall ticket. Late entry after the given entry time would not be allowed. Candidates should not leave the examination hall till the expiry of fulltime. Loaning and interchanging of articles among the candidates is not permitted in the examination hall. Electronic devices including cell phones and pagers are not allowed in the examination hall.

B.2. The starting time of each examination paper and the entry time would be mentioned in the hall ticket.

B.3. Candidates will not be permitted to leave the examination hall till the expiry of full time. If any candidate leaves the examination hall in the middle, he would be disqualified. If there is any problem with computer system in case of Computer Based Test/Computer Proficiency Test, the candidates have to wait without talking to others till the system is restored. In case of any violation, the candidate will be disqualified.

B.4. The examination link with the login screen will already be available on your system. Please inform the invigilator if this is not the case.

B.5. 10 minutes prior to the exam, you'll be prompted to login. Please type the Login ID (Roll No) and the Password (Password for Candidate will be given on exam day) to proceed further.

B.6. Invigilator will announce the password 15 minutes before commencement of the Examination.

B.7. Copying or noting down questions and/or options is not allowed. Severe action will be taken if any candidate is found noting down the questions and/or options.

B.8. After logging in, your screen will display:

*Profile Information - Check the details & click on "I Confirm" or "I Deny".

*Detailed exam instructions - Please read and understand thoroughly.

*Please click on the "I am ready to Begin" button, after reading the instructions.

B.9. You have to use the mouse to answer the multiple choice type questions with FOUR alternative answers.

B.10. To answer any numerical answer type question, you need to use the virtual numeric key pad and the mouse.

B.11 On the online exam question screen, the timer will display the balance time remaining for the completion of exam.

B.12. The question numbers are color coordinated and of different shapes based on the process of recording your response: White (Square) - For un-attempted questions. Red (Inverted Pentagon) - For unanswered questions. Green (Pentagon) - For attempted questions. Violet (Circle) - Question marked by candidate for review, to be answered later. Violet (Circle with a Tick mark) - Question answered and marked by candidate for review.

B.13. After answering a question, click the SAVE & NEXT button to save your response and move onto the next question.

B.14. Click on Mark for Review & NEXT to mark your question for review, and then go to the next question.

B.15. To clear any answer chosen for a particular question, please click on the CLEAR RESPONSE button.

B.16. A summary of each section, (i.e. questions answered, not answered, marked for review) is available for each section. You have to place the cursor over the section name for this summary.

B.17. In case you wish to view a larger font size, please inform the Invigilator. On the Invigilator's confirmation, click on the font size you wish to select. The font size will be visible on the top.

B.18. You may view INSTRUCTIONS at any point of time during exam, by clicking on the INSTRUCTIONS button on your screen.

B.19. The SUBMIT button will be activated after 150 Minutes. Please keep checking the timer on your screen.

B.20. In case of automatic or manual log out, all your attempted responses will be saved. Also, the exam will start from the time where it had stopped.

B.21. You will be provided a blank sheet for rough work. Do write your Login ID and Password on it. Please ensure that you return it to the invigilator at the end of the exam after tearing only the password from it.

B.22. Please don't touch the key board as your exam ID will get locked. If your ID gets locked, please inform a nearby invigilator who will help in unlocking your ID and then you can continue with the exam.

B.23. Please inform the invigilator in case of any technical issues.

B.24. Please do not talk to or disturb other candidates.

B.25. In case you are carrying articles other than the admit card, photo identity proof and pen; please leave them outside the exam room.

B.26. You cannot leave exam room before submitting the paper. Please inform the invigilator if you want to use the wash room.

C. GENERAL INSTRUCTIONS:

C.1.The candidate should satisfy the Invigilator of his/her identity with reference to the signature and photographs available on the Nominal Rolls and Hall Ticket.

C.2.The candidates should take their seats at the given time before the commencement of the examination and are not to be allowed after the scheduled time. The time of Examination and entry time would be mentioned in the hall ticket. Late entry after the given entry time would not be allowed. Candidates should not leave the examination hall till the expiry of fulltime.

C.3. The candidates must note that his/her admission to the examination is strictly provisional. The mere fact that an Admission to the examination 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. The candidates have to be found suitable after verification of original certificates; and other eligibility criteria. The Applicants have to upload his/her scanned recent colour passport photo and signature to the 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.

C.4. The candidates are not allowed to bring any Electronic devices such as mobile / cell phones, programmable calculators, tablets, iPad, Bluetooth, pagers, watches or any other computing devices to examination Hall. Non programmable calculators would be permitted, wherever necessary. Loaning and interchanging of articles among the candidates is not permitted in the examination hall and any form of malpractice will not be permitted in the exam hall.

C.5. The candidates are expected to behave in orderly and disciplined manner while writing the examination. Their candidature will be rejected in case of impersonation/disorder/ rowdy behaviour during Examination and necessary F.I.R. for this incident will be lodged with concerned Police Station. The Chief Superintendent of the centre is authorized to take spot decision in this matter.

C.6. Candidates trying to use unfair means shall be disqualified from the selection. No correspondence whatsoever will be entertained from the candidates.

C.7. 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 Examination. Action will be taken to penalize as per G.O.Ms.No.385, G.A. (Ser. A) Dept., Dt.18/10/2016.

C.8. The candidate will not be admitted to the examination Hall without procedural formalities.

C.9. The candidate admission to the Examination is provisional, subject to the eligibility, confirmation/satisfaction of conditions laid down in this notification.

C.10. The candidate should put his/ her signature and get the signature of the invigilator at the appropriate places in the Nominal Roll or OMR Answer Sheet.

C.11. All the Instructions to be followed scrupulously in the Examination Hall.

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ANNEXURE - IV
LIST OF SCHEDULED CASTES
(Definition 28 of General Rule - 2)
SCHEDULE – I

(As per the Ordinance No.2 of 2025, dt: 17/04/2025, read with G.O. Ms. No.7, Social Welfare (CV) Department, dt: 18/04/2025 and G.O. Ms. No.46, General Administration (Services-D) Department, dt: 19/04/2025)

GROUP - I

Sl. No.	Caste Sl. No. as per Ordinance	Name of the Caste
1	8	Bavuri
2	12	Chachati
3	16	Chandala
4	18	Dandasi
5	20	Dom, Dombara, Paidi, Pano
6	22	Ghasi, Haddi, Relli - Chachandi
7	23	Godagali, Godagula
8	48	Mehtar
9	51	Paky, Moti, Thoti
10	53	Pamidi
11	55	Relli
12	58	Sapru
		Total – 12 Castes

GROUP – II

Sl. No.	Caste Sl. No. as per Ordinance	Name of the Caste
1	5	Arundhatiya
2	10	Bindla
3	14	Chamar, Mochi, Muchi, Chamar – Ravidas, Chamar – Rohidas
4	15	Chambhar
5	17	Dakkal, Dokkalwar
6	19	Dhor
7	24	Godari
8	25	Gosangi
9	28	Jaggali
10	29	Jambuvulu
11	30	Kolupulvandlu, Pambada, Pambanda, Pambala
12	32	Madiga
13	33	Madiga Dasu, Mashteen
14	43	Mang
15	44	MangGarodi
16	47	Matangi
17	56	Samagara
18	59	Sindhollu, Chindollu
		Total – 18 Castes

GROUP – III

Sl. No.	Caste Sl. No. as per Ordinance	Name of the Caste
1	2	Adi Dravida
2	3	Anamuk
3	4	Aray Mala
4	6	Arava Mala
5	7	Barki
6	11	Byagara, Byagari
7	13	Chalavadi

8	21	Ellamalawar, Yellammalawandlu
9	26	Holeya
10	27	Holeya Dasari
11	31	Madasi Kuruva, Madari Kuruva
12	34	Mahar
13	35	Mala, Mala Ayawaru
14	36	Mala Dasari
15	37	Mala Dasu
16	38	Mala Hannai
17	39	Malajanagam
18	40	Mala Masti
19	41	Mala Sale, Netkani
20	42	Mala Sanyasi
21	45	Manne
22	50	Mundala
23	57	Samban
24	60	Yatala
25	61	Valluvan
26	1	Adi Andhra
27	46	Mashti
28	49	Mitha Ayyalvar
29	54	Panchama, Pariah
		Total – 29 Castes

LIST OF SOCIALLY AND EDUCATIONALLY BACKWARD CLASSES

(Amended from time to time as on 31/08/2007)

GROUP- A

Aboriginal Tribes, Vimuktha Jathis, Nomadic and Semi Nomadic Tribes etc.,

1. Agnikulakshatriya, Palli, Vadabalija, Besta, jalari, Gangavar, Gangaputra, Goondla, Vanyakulakshatriya (Vannekapu, Vannereddi, Pallikapu, Pallireddy Neyyala and Pattapu) *Mudiraj / Mutrasi / Tenugollu, The G.O. Ms.No. 15 BCW(C2) Dept., dt. 19/02/2009 is suspended. Hence the inclusion of Mudiraj / Mutrasi / Tenugollu is suspended)vide Hon'ble A.P. High Court orders in WP No. 2122/2009 dated: 29-04- 2009. Kandra added as per G.O.Ms.No.09 Backward Classes Welfare(F)Dept.,Dt:20.04.2023.
2. Balasanthu, Bahurupi
3. Bandara
4. Budabukkala
5. Rajaka (Chakali Vannar)
6. Dasari (formerly engaged in bikshatana)
   (amended vide G.O.Rt.No. 32, BCW(M1) Department, dated 23/02/1995)
7. Dommara
8. Gangiredlavaru
9. Jangam (whose traditional occupation is begging)
10. Jogi
11. Katipapala
12. Korcha
13. Lambada or Banjara in Telangana Area
    (deleted and included in S.T. list vide G.O.Ms.No. 149, SW, dated 3/5/1978)
14. Medari or Mahendra
15. Mondivaru, Mondibanda, Banda
16. Nayee Brahmin (Mangali), Mangala and Bajantri
    (amended vide G.O.Ms.No. 1, BCW(M1) Department, dated 6/1/1996)
17. Nakkala (Deleted vide G.O. Ms. No. 21, BCW(C2) Dept., Dt. 20/06/2011)
18. Vamsha Raj (amended vide G.O.Ms.No. 27, BCW(M1) Department, dated 23/06/1995 deleting the Original name Pitchiguntla)

19. Pamula
20. Pardhi (Mirshikari)
21. Pambala
22. Peddammavandlu, Devaravandlu, Yellammavandlu, Mutyalammavandlu (Dammali, Dammala, Dammula, Damala Castes confined to Srikakulam dist. Vide G.O.Ms. No.: 9 BCW(C2) Dept., Dt. 9/04/2008)
23. Veeramushti (Nettikotala), Veera bhadreeya (Amended vide G.O. Ms. No. 62, BCW (M1) Dept., Dt. 10/12/1996)
24. Valmiki boya (Boya, Bedar, Kirataka, Nishadi, Yellapi, Pedda Boya) Talayari and Chunduvallu (G.O.Ms. No. 124, SW, Dt. 24.06.85) Yellapi and Yellapu are one and the same amended vide G.O. Ms. No. 61, BCW(M1) Dept., Dt. 05.12.1996)
25. Yerukalas in Telangana area (deleted and included in the list of S.Ts)
26. Gudala
27. Kanjara - Bhatta
28. Kalinga (Kinthala deleted vide G.O.Ms. No. 53, SW, Dt. 07.03.1980)
29. Kepmare or Reddika
30. Mondipatta
31. Nokkar
32. Pariki Muggula
33. Yata
34. Chopemari
35. Kaikadi
36. Joshinandiwalas
37. Odde (Oddilu, Vaddi, Vaddelu)
38. Mandula (Govt. Memo No. 40-VI/70-1, Edn., Dt. 10.02.1972)
39. Mehator (Muslim) (Govt. Memo No. 234-VI/72-2, Edn., Dt.05.07.1972)
40. Kunapuli (Govt. Memo No. 1279/P1/74-10, E&SW, Dt. 03.08.1975)
41. Patra (included in G.O. Ms. No. 8, BCW(C2) Dept., Dt. 28.08.2006)
42. kurakula of Srikakulam, Vizianagaram and Visakhapatnam Districts only. Included vide in G.O.MS.No. 26 BC W (C2) Dept., Dt. 4/07/08
43. Pondara of Srikakulam, Vizianagaram, and Visakhapatnam Districts only. Included vide G.O.MS.No. 28 BC W (C2) Dept., Dt. 4/07/08
44. Samanthula, Samantha, sountia, Sauntia of Srikakulam District only. Included vide G.O.MS.No. 29 BC W (C2) Dept., Dt. 4/07/08
45. pala-Ekari, Ekila, Vyakula, Ekiri, Nayanivaru, Palegaru, Tolagari, Kavali of Chittor, Cuddapah, Kurnool, Anantapur, Nellore, Hyderabad and Rangareddy Districts only. Included Vide G.O. MS. No. 23 B.C. W (C2) Dept., Dt. 4/07/08
46. Rajannala, Rajannalu of Karimnagar, Warangal, Nizamabad and Adilabad Districts only. (included in vide G.O.Ms. No. 44 B.C.W(C2) Dept., Dt.07/08/2008).
47. Bukka Ayyavars, Included vide G.O.Ms.No. 6 Backward Classes Welfare (C2) Dept., dt. 19/02/2009.
48. Gotrala, Included vide G.O.Ms.No. 7 Backward Classes Welfare (C2) Dept., dt. 19/02/2009. The area of operation shall be confined to Telangana Region only.
49. Kasikapadi / Kasikapudi, Included vide G.O.Ms.No. 8 Backward Classes Welfare (C2) Dept., dt. 19/02/2009. The area of operation shall be confined to Hyderabad, Rangareddy, Nizamabad, Mahaboobnagar and Adilabad Districts of Telangana Region only.
50. Siddula, Included vide G.O.Ms.No. 9 Backward Classes Welfare (C2) Dept., dt. 19/02/2009. The area of operation shall be confined to Telangana Region only.
51. Sikligar / Saikalgar, Included vide G.O.Ms.No. 10 Backward Classes Welfare (C2) Dept., dt. 19/02/2009.

52. Poosala included vide G.O. Ms.No. 16 Backward Classes Welfare (C2) Dept., dt. 19/02/2009.
53. Aasadula / Asadula, included vide G.O. Ms. No. 13, Backward Classes Welfare (C2) Dept., Dt. 27/05/2011. The area of operation shall be confined to East Godavari and West Godavari Districts only.
54. Keuta/Kevuto/Keviti, included vide G.O. Ms. No. 15, Backward Classes Welfare (C2) Dept., Dt. 27/05/2011. The area of operation shall be confined to Srikakulam District only.

Group-B (Vocational)

1. Achukatlavandlu in the Districts of Visakhapatnam and Guntur confined to Hindus only as amended vide G.O. Ms. No. 8, BCW(C2) Dept., Dt. 29.03.2000
2. Aryakshatriya, Chittari , Giniyar, Chitrakara, Nakshas (Muchi Telugu Speaking deleted vide G.O. Ms. No. 31, BCW (M1) Dept., 11.06.1996)
3. Devanga
4. Goud (Ediga) Gouda (Gamella) Kalalee, Goundla, Settibalija of Vishaphapatnam, East Godavari, West Godavari and Krishna Districts and Srisayana (Segidi) – (amended vide G.O. Ms. No. 16, BCW (A1) Dept., dt. 19.06.1997
5. Dudekula, Laddaf, Pinjari or Noorbash
6. Gandla, Telikula, Devatilakula (Amended vide G.O. Ms. No. 13, BCW(A1) Dept., dt. 20.05.1997)
7. Jandra
8. Kummara or Kulala, Salivahana (Salivahana added vide G.O. Ms. No. 28, BCW(M1) Dept., 24.06.1995)
9. Karikalabhakthulu, Kaikolan or Kaikala (Sengundam or Sengunther)
10. Karnabhakthulu
11. Kuruba or Kuruma
12. Nagavaddilu
13. Neelakanthi
14. Patkar (Khatri)
15. Perika (Perikabalija, Puragirikshatriya)
16. Nessi or Kurni
17. Padmasali (Sali, Salivan, Pattusali, Senapathulu, Thogata Sali)
18. Srisayana ((**sagidi**)- deleted and added to Sl.No. 4 of Group-B)
19. Swakulasali
20. Thogata, Thogati or Thogataveerakshtriya
21. Viswabrahmin, Viswakarma (Ausula or Kamsali, Kammari, Kanchari Vadla or Vadra or Vadrangi and Silpis) (Viswakarma added vide G.O. Ms. No. 59 BCW(M1) Dept., Dt. 06.12.1995)
22. Kunchiti, Vakkaliga, Vakkaligara, Kunchitiga of Anantapur Dist. Only vide G.O. Ms.No. 10 BCW(C-2) Dept., Dt. 9-04-2008
23. Lodh, Lodhi, Lodha of Hyderabad, Rangareddy, Khammam and Adilabad Districts only. Included in Vide G.O.MS.No. 22 BC W (C2) Dept., Dt. 4/07/08
24. Bondili (included in vide G.O.Ms. No. 42, B.C.W(C2) Dept., Dt.07/08/2008)
25. Are Marathi, Maratha(Non-Brahmins), Arakalies and Surabhi Natakalavallu. (included in vide G.O.Ms. No. 40, B.C.W(C2) Dept., Dt.07/08/2008). Tholu Bommalatavallu added as per G.O.Ms.No.08, Backward Classes Welfare(F) Dept., Dt:20.04.2023.
26. Neeli (included in vide G.O.Ms. No. 43, B.C.W(C2) Dept., Dt.07/08/2008).
27. Budubunjala/Bhunjwa/Bhadbhunja, included vide G.O.Ms. No. 11, Backward Classes Welfare (C2) Dept., Dt. 27/05/2011. The area of operation shall be confined to Hyderabad and Ranga Reddy District only.
28. Gudia/Gudiya, included vide G.O.Ms. No. 14, Backward Classes Welfare (C2) Dept., Dt. 27/05/2011. The area of operation shall be confined to Srikakulam, Vizianagaram and Vishakhapatnam, district only.

GROUP – C
Scheduled Castes converts to Christianity and their progeny (Substituted in G.O.Ms.No.159, G.A.(Ser.D) Dept., dt. 02/04/1981)

GROUP – D (Other Classes)

1. Agaru
2. Are-Katika, Katika, Are-Suryavamsi(Are-Suryavamsi added vide G.O. Ms. No. 39, B.C. W(C2) Dept., Dt. 7/08/08)
3. Atagara
4. Bhatraju
5. Chippolu (Mera)
6. Gavara
7. Godaba
8. Hatkar
9. Jakkala
10. Jingar
11. Kandra Deleted and added to Sl.No. 01 Under BC-A Group as per G.O.Ms.No.09 BCW(F)Dept., Dt:20.04.2023.
12. Kosthi
13. Kachi
14. Surya Balija, (Kalavanthulu) Ganika (amended vide G.O.Ms. No. 20, BCW(P2) Dept., Dt. 19.07.1994)
15. Krishanabalija (Dasari, Bukka)
16. Koppulavelama
17. Mathura
18. Mali (Bare, Barai, Marar and Tamboli of all Districts of Telangana Region added as synonyms vide G.O. Ms. No. 3, BCW(C2) Dept., Dt. 09.01.2004 and G.O. Ms. No. 45, B.C.W(C2) Dept., Dt.07/08/2008)
19. Mudiraj / Mutrasi / Tenugollu.
20. Munnurukapu (Telangana)
21. Nagavamsam (Nagavamsa) vide G.O.Ms.No. 53, BC Welfare Dept., dated:19/09/1996
22. Nelli(deleted vide G.O.Ms. No. 43, B.C.W(C2) Dept., Dt.07/08/2008)
23. Polinativelmas of Srikakulam and Visakhapatnam districts deleted vide G.O. Ms.No. 16 Backward Classes Welfare (C2) Dept., dt: 19/02/2009.
24. Passi
25. Rangrez or Bhavasarakshtriya
26. Sadhuchetty
27. Satani (Chattadasrivaishnava)
28. Tammali (Non-Brahmins) (Shudra Caste) whose traditional occupation is playing musical instruments, vending of flowers and giving assistance in temple service but not Shivarchakars. Included vide G.O. Ms. No. 7, Backward Classes Welfare (C2) Dept., Dt. 19/02/2011).
29. Turupukapus or Gajula kapus {… the words “of Srikakulkam, Vizianagaram and Vishakapatnam Districts” were deleted vide G.O.Ms.No. 62, Backward Classes Welfare (C2) Dept., dt. 20/12/2008 and G.O. Ms.No. 19 Backward Classes Welfare (C2) Dept., dt. 19/02/2009} who are subject to Social customs or divorce and remarriage among their women (G.O. Ms. No. 65, E&SW, dt. 18.02.1994)
30. Uppara or Sagara
31. Vanjara (Vanjari)
32. Yadava (Golla)
33. Are, Arevallu and Arollu of Telangana District (Included vide G.O.Ms.No. 11, Backward Classes Welfare (C-2) Department, dt. 13/5/2003 and G.O.Ms. No. 41, B.C.W(C2) Dept., Dt.07/08/2008)
34. Sadara, Sadaru of Anantapur Dist. Only vide G.O.Ms.No. 11 BCW (C-2) Dept., Dt. 9- 04-2008
35. Arava of Srikakulam District only. Included in vide G.O. MS. No. 24 BC W (C2) Dept., Dt. 4/07/08

36. Ayyaraka, of Srikakulam, Vizianagaram, Visakhapatnam, East Godavari, West Godavari, Krishna, Guntur, Khammam and Warangal Districts only. Included in vide G.O. MS. No. 25 BC W (C2) Dept., Dt. 4/07/08
38. Nagaralu of Srikakulam, Vizianagaram, Visakhapatnam, Krishna, Hyderabad and Rangareddy Districts only. Included in vide G.O. MS. No. 27 BC W (C2) Dept., Dt. 4/07/08
39. Aghamudian, Aghamudiar, Agamudivellalar and Agamudimudaliar including Thuluva Vellalas of Chittoor, Nellore, Kurnool, Anantapur, Hyderabad and Rangareddy Districts only. Included in vide G.O. MS. No. 20 BC W (C2) Dept., Dt. 4/07/08
40. Beri Vysya, Beri Chetty of Chittoor, Nellore and Krishna Districts only. Included in vide G.O. MS. No. 21 BC W (C2) Dept., Dt. 4/07/08
41. Atirasa included vide G.O. Ms.No. 5 Backward Classes Welfare (C2) Dept., dt. 19/02/2009. The area of operation shall be confined to East Godavari and West Godavari Districts only.
42. Sondi / Sundi included vide G.O. Ms.No. 11 Backward Classes Welfare (C2) Dept., dt. 19/02/2009.
43. Varala included vide G.O. Ms.No. 12 Backward Classes Welfare (C2) Dept., dt. 19/02/2009. The area of operation shall be confined to Telangana region only.
44. Sistakaranam included vide G.O. Ms.No. 13 Backward Classes Welfare (C2) Dept., dt. 19/02/2009.
45. Lakkamari Kapu included vide G.O. Ms.No. 14 Backward Classes Welfare (C2) Dept., dt. 19/02/2009. The area of operation shall be confined to Telangana region only.
46. Veerashaiva Lingayat/Lingabalija, included vide G.O. Ms.No. 22 Backward Classes Welfare (C2) Dept., dt. 28/02/2009.
47. Kurmi, included vide G.O.Ms. No. 12, Backward Classes Welfare (C2) Dept., Dt. 27/05/2011. The area of operation shall be confined to Telangana Region and also Krishna District only.
48. Kalinga Komati / Kalinga Vysya vide G.O. Ms. No.10 Backward classes Welfare(c) Department Dated.24.9.2014. The area of operation shall be confined to Srikakulam, Vizianagaram and Visakhapatnam districts only.

GROUP – E

(Socially and Educationally Backward Classes of Muslims)

1. Achchukattalavandlu, Singali, Singamvallu, Achchup anivallu, Achchukattuvaru, Achukatlavandlu.
2. Attar Saibuli, Attarollu
3. Dhobi Muslim/ Muslim Dhobi/ Dhobi Musalman, Turka Chakla or Turka Sakala, Turaka Chakali, Tulukka Vannan, Tskalas or Chakalas, Muslim Rajakas.
4. Faqir, Fhakir Budbudki, Ghanti, Fhakir, Ghanta Fhakirlu, Turaka Budbudki, Derves, Fakeer
5. Garadi Muslim, Garadi Saibulu, Pamulavallu, Kani-Kattuvallu, Garadollu, Garadiga.
6. Gosangi Muslim, Phakeer Sayebulu
7. Guddi Eluguvallu, Elugu Bantuvallu, Musalman Keelu Gurralavallu
8. Hajam, Nai, Nai Muslim, Navid
9. Labbi, Labbai, Labbon, Labba
10. Pakeerla, Borewale, Deraphakirlu, Bonthala
11. Kureshi/ Khureshi, Khasab, Marati Khasab, Muslim Katika, Khatik Muslim
12. Shaik/ Sheikh
13. Siddi, Yaba, Habshi, Jasi
14. Turaka Kasha, Kakkukotte Zinka Saibulu, chakkitakanevale, Terugadu Gontalavaru, Thirugatiganta, Rollaku Kakku Kottevaru, Pattar Phodulu, Chakketakare, Thuraka Kasha
15. Other Muslim groups excluding Syed, Saiyed, Sayyad, Mushaik; Mughal, Moghal;Pathans; Irani; Arab; Bohara, Bohra; Shia Imami Ismaili, Khoja; Cutchi-Memon; Jamayat; Navayat; and all the synonyms and sub-groups of the excluded

groups; and except those who have been already included in the State List of Backward Classes.

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.

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ANNEXURE-V

The criteria of Normalization

The Commission has been using Computer Based Recruitment Test (CBRT) for various recruitments. The CBRT involves the Normalization of the Scores of candidates for the Examinations which are conducted in Multi-sessions. Further, the process of normalization as adopted by major leading organizations at National and State level in the conduct of Recruitment Examinations and Entrance Examinations is also adopted by the Commission.

The Commission has adopted the following formula to calculate final score of candidates in the multi-session CBRT Examinations as recommended by the Experts' Committee constituted by the Commission.

NORMALIZATION FORMULA

$$\widehat{M}_{ij} = \frac{\bar{M}_t^g - M_q^g}{\bar{M}_{ti} - M_{iq}} \left(M_{ij} - M_{iq}\right) + M_q^{gm}$$

N.B.

Where:

$\widehat{M}_{ij}$ = Normalized marks of j^{th} candidate in the i^{th} shift.

$\bar{M}_t^g$ = is the average marks of the top 0.1% of the candidates considering all shifts (number of candidates will be rounded-up).

M_q^g = is the sum of mean and standard deviation marks of the candidates in the examination considering all shifts.

$\bar{M}_{ti}$ = is the average marks of the top 0.1% of the candidates in the i^{th} shift (number of candidates will be rounded-up).

M_{iq} = is the sum of mean marks and standard deviation of the i^{th} shift.

M_{ij} = is the actual marks obtained by the j^{th} candidate in i^{th} shift.

M_q^{gm} = is the sum of mean marks of candidates in the shift having maximum mean and standard deviation of marks of candidates in the examination considering all shifts.

N.B.

1. Calculation of normalized marks will be done up to 5 decimal places.
2. Normalized marks of the candidate may vary from the original/absolute marks obtained.
3. Normalized marks of the candidate only shall be taken for General Ranking List (GRL) preparation.

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