

**ANDHRA PRADESH PUBLIC SERVICE COMMISSION::VIJAYAWADA**

**DETAILS OF BREAKUP OF VACANCIES, SCALE OF PAY, AGE, COMMUNITY, EDUCATIONAL QUALIFICATION AND OTHER INFORMATION WITH INSTRUCTIONS FOR LECTURERS IN GOVERNMENT DEGREE COLLEGES IN A.P COLLEGIATE EDUCATION SERVICE  
NOTIFICATION NO.17/2023, DATED: 30/12/2023**

**PARA – 1:**

- 1.1. The Commission has issued Notification bearing No.17/2023, dated: 30/12/2023 inviting online applications to the post of Lecturers in Government Degree Colleges In A.P Collegiate Education Service for a total of 240 vacancies through Commission's Website <https://psc.ap.gov.in> from **24/01/2024 to 13/02/2024** up to 11:59 midnight, wherein, it is notified that the breakup of vacancies, scale of pay, age, community, educational qualifications and other information with instructions will be available on the Commission's Website before 24/01/2024.
- 1.2. **As per enactment of Act 19 of 2021 the previous Roster shall get nullified. Accordingly, the Commissioner of Collegiate Education has furnished revised indent for a total of 290 vacancies in 14 subjects excluded Physics, which shall be treated as final.**
- 1.3. Accordingly, the breakup of vacancies, scale of pay, age, educational qualification and other information with instructions are as hereunder:
- 1.4. The applicant who desires to apply for the recruitment shall login the Commission's Website, with his/her registered OTPR number. In case, the candidate is applying for the first time to the posts notified by A.P.P.S.C. 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, a user ID is generated and 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 email ID registered in OTPR for receiving OTP/SMS for further communication.**
- 1.5. The written examination would be in objective type and questions are to be answered in Computer Based Test (CBT). Instructions regarding computer based recruitment test are attached as Annexure - III.
- 1.6. 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>
- 1.7. 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. No individual correspondence by any means will be entertained under any circumstances.
- 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.
- 1.9. The details of subject-wise vacancies and Scale of Pay are as follows:-

**FRESH VACANCIES**

Post Code No.	Subject	Zone-wise vacancies				Total	Scale of Pay
		I	II	III	IV		
01	Biotechnology	01	01	01	01	04	Rs.57,700 - 1,82,400 (Academic Level-10) Revised UGC Pay Scale, 2016.
02	Botany	04	07	02	07	20	
03	Chemistry	06	06	02	09	23	
04	Commerce	08	12	09	11	40	
05	Computer Applications	10	18	10	11	49	
06	Computer Science	13	16	09	10	48	
07	Economics	04	04	02	05	15	
08	English	01	02	01	01	05	
09	History	03	05	02	05	15	
10	Mathematics	05	10	04	06	25	
11	Microbiology	01	01	01	01	04	
12	Political Science	04	05	02	04	15	
13	Telugu	02	02	01	02	07	
14	Zoology	06	06	04	04	20	
	<b>Total</b>	<b>68</b>	<b>95</b>	<b>50</b>	<b>77</b>	<b>290</b>	

**Note** The Breakup of vacancies may be seen at **Annexure-I**.

**PARA-2: ELIGIBILITY:**

- i. He / She is of sound health, active habits and free from any bodily defect or infirmity rendering him unfit for such service;
- ii. His / Her character and antecedents are such as to qualify him for such service;
- iii. He /She possesses the academic and other qualifications prescribed for the post; and
- iv. 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:**

The candidate should possess the prescribed academic qualification as on the date of this notification i.e., **30/12/2023**. **The date of this notification** shall be the crucial date for calculating the experience including the practical experience. **In respect of other than prescribed Educational Qualifications, claiming equivalence, the decision of the concerned department (Unit Officer) shall be final.**

**Note:** If the applicant possesses an equivalence of qualification other than 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.

Name of the Post	Educational Qualification
Lecturers in Government Degree Colleges in A.P. Collegiate education Service	<p>In terms of G.O. Ms. No. 47, Higher Education (CE-I-1) Department., dt.14/05/2007 and G.O. Ms. No. 128, Higher Education (CE-I-1) Dept., dt.24/08/2010, the following qualifications are prescribed to the post of Lecturers in Government Degree Colleges:</p> <p>i) Good equivalent Grade of B in the 7 point scale with letter grades O, A, B, C, D, E &amp; F at the Masters Degree level, in the relevant subject, obtained from the Universities recognized in India.</p> <p>ii) Should have passed National Eligibility Test (NET) for lecturers conducted by UGC, CSIR or similar tests accredited by the UGC or SLET conducted by the University Concerned.</p> <p>Relaxations as per the above Government Order:</p> <p>1) A relaxation of 5% marks may be provided (from 55% to 50% of marks) at the Master's Level for the SC/ST Category.</p> <p>2) A relaxation of 5% marks may be provided (from 55% to 50% of marks) to the Ph.D., Degree holders who have passed their Master's Degree prior to 19.09.1991.</p> <p>3) NET/SLET shall remain the compulsory requirement for appointment as Lecturer.</p> <p>However, the candidates who have been awarded Ph.D degree in compliance of the University Grants Commission (minimum standards and procedure for award of Ph.D. Degree) Regulations, 2009 shall be exempted from passing for both PG and UG Level teaching.</p>

**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 Persons with Benchmark Disabilities (PBD), 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 vide G.O.Ms.No.77, G.A. (Ser-D) Dept., Dt: 02.08.2023 and G.O.Ms.No.03, G.A. (Ser-D) Dept., Dt: 17.01.2024.**

**"NOTE: The candidates belonging to SC, ST, BC, EWS & PBDs and who avails upper age relaxation will also be considered for Open Category (OC) vacancies".**

- 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 and G.O.Ms.No.03, G.A. (Ser-D) Dept., Dt: 17.01.2024.**
- 4.3 There will be reservations in direct recruitment in respect of Person with Benchmark Disability as per Rule 22, 22 (A) and 22 (B) of State and Subordinate Service Rules and read with Departmental Special Rules.

- 4.4. The Person with Benchmark Disability means a person suffering from not less than forty percent of any disability as certified by a medical authority except hearing Impairment. Hearing Impairment means a) "**deaf**" means persons having 70 DB hearing loss in speech frequencies in both ears; b) "**hard of hearing**" means persons having 60 DB to 70 DB hearing loss in speech frequencies in both ears; as per provision under "Person with Disabilities Act, 1995", The Rights of Persons with Disabilities Act, 2016 and The Rights of Persons with Disabilities Rules, 2017, dt: 15.06.2017 as per G.O.Ms.No.36, Dept., for Women, Children, Differently Abled & Senior Citizens (Prog.II), Dt: 23.08.2023.
- 4.5. The following are the categories of Persons with Benchmark Disabilities as per G.O.Ms.No.77, G.A. (Ser-D) Dept., Dt: 02.08.2023 and G.O.Ms.No.03, G.A. (Ser-D) Dept., Dt: 17.01.2024:
- Blindness and low vision.
  - Deaf and hard hearing.
  - Loco motor disability including cerebral palsy, leprosy cured, dwarfism, acid attack victims and muscular dystrophy.
  - Autism, Intellectual disability, Specific learning disability, Mental illness.
  - Multiple disabilities from amongst persons under clauses (a) to (d) including deaf-blindness in the posts identified for each disabilities.
- 4.6. Evaluation of various physical disabilities and procedure for certification will be as per orders contained in **G.O.Ms.No.36, Dept., for Women, Children, Differently Abled & Senior Citizens (Prog.II), Dt: 23.08.2023.**
- 4.7. The meritorious sportsperson means a sportsman who has represented the State or the Country in a National or International competition or Universities in the Inter-University tournaments conducted by the Inter-University Boards or the State School team in the National Sports/Games for Schools conducted by the All India School Games Federation in any of the games, sports, mentioned below; and any other games/sports as may be specified by the Government from time to time, in terms of Rule 2 (19) of AP State and Subordinate Service Rules.
- 4.8. The reservation to Meritorious Sportspersons will apply as per G.O.Ms.No.13, GA (Ser-D) Dept., dated: 23.01.2018, G.O.Ms.No.74, Youth, Advancement, Tourism and Culture (Sports) Dept., dated: 09.08.2012, G.O.Rt.No.473, Youth, Advancement, Tourism and Culture (Sports & YS) Dept., dated: 03.12.2018 and G.O.Ms.No.08, Youth, Advancement, Tourism and Culture (Sports) Dept., dated: 23.11.2020 read with G.O. Ms. No.77, G.A. (Ser-D) Department, Dt: 02.08.2023 and G.O.Ms.No.03, G.A. (Ser-D) Dept., Dt: 17.01.2024. **In the event of non-availability of eligible Meritorious Sportspersons, two percent (2%) reservation of posts for them stand lapse as per G.O.Ms.No.77, G.A. (Ser-D) Dept., Dt: 02.08.2023.**
- 4.9. 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.
- 4.10. The candidates claiming status of non-creamy layer of Backward Class have to obtain a 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 (Tahasildar) and produce the same at appropriate time of verification. In case of failure to produce the same on the day of verification, the Candidature will be considered against OC, if he / she is otherwise eligible in all aspects.
- 4.11. Economically Weaker Sections means the persons who are not covered under existing scheme of reservations for the SCs, the STs and Socially and Economically 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 persons seeking the benefit of reservation under EWS category shall obtain the necessary EWS Certificate issued by the Tahsildar concerned and produce at an appropriate time to the Commission as per G.O. Ms. No. 73, GA (Ser-D) Dept, Dt: 04-08-2021.
- 4.12. In the case of candidates who claim the benefit of reservation or relaxation from upper age limit on the basis of Caste/Tribe or Community/Category the basic document of proof of Community/Category will be the Certificate issued by the Revenue Authorities not below the rank of Tahsildar in the case of SC/ST/EWS and Non Creamy Layer Certificate issued by the Revenue Authorities in the case of Backward Classes. The list of Caste/Tribe/Community is as incorporated in Schedule-I of above Rules. The list is also appended at Annexure-IV. The candidates have to produce proof of the community claimed in their application at all stages of selection along with the certificates relating to Educational Qualifications and local status certificates etc. Subsequent claim of change of community will not be entertained.

- 4.13. Caste & Community: Community Certificate issued by the competent authority in terms of G.O. Ms No. 58, SW (J) Dept., dt.12/5/97 should be submitted at appropriate time. As per A.P. State and Subordinate Service Rules, Rule -2(28) Explanation: In so far as claiming for SC reservation is concerned, No person who professes a religion different from Hinduism shall be deemed a member of Schedule Caste. However, scheduled caste converts to Buddhism deemed to be scheduled caste. BCs, SCs, STs & EWS belonging to other States are not entitled for reservation.
- 4.14. Horizontal Reservation cuts across vertical reservation (in what is called inter-locking reservation) and persons selected against the quota for Persons with Benchmark Disabilities / Meritorious Sportspersons have to be placed in the appropriate category viz. SC / ST / BC / EWS / Unreserved depending upon the category to which they belong in the roster meant for reservation of SCs/STs/BCs/EWSs as per G.O. Ms. No.77, G.A. (Ser-D) Dept., Dt: 02.08.2023 and G.O.Ms.No.03, G.A. (Ser-D) Dept., Dt: 17.01.2024.
- 4.15. The composition of Districts in each zone is as hereunder:
- Zone-I : Srikakulam, Vizianagaram and Visakhapatnam. (SKM, VZM, VSP)  
 Zone-II : East Godavari, West Godavari and Krishna. (EG, WG, KST)  
 Zone-III : Guntur, Prakasam and Nellore. (GNT, PKM, NLR)  
 Zone-IV : Chittoor, Kadapa, Anantapur and Kurnool. (CTR, CDP, ATP, KNL)
- 4.16. **“Reservation for Local Candidates is not applicable. Candidates may apply even if vacancy is not indicated in any Zone. Selection shall be made on State wide merit and allotment of Zones shall be made as per preference given by candidate, in terms of Departmental Special/Adhoc Rules”.**
- 4.17. Candidates who migrated from Telangana to Andhra Pradesh between 2<sup>nd</sup> June, 2014 and 1<sup>st</sup> June, 2024 as per G.O. Ms. No. 161, General Administration (SPF&MC) Department, dated.27.12.2022 and as per terms laid down in Circular Memo No.4136/SPF & MC/2015-5, Dated.20.11.2017 and Circular Memo No.4136/SPF & MC/2015-17, Dated.27.12.2022 of Government of Andhra Pradesh shall obtain the Local Status Certificate from competent authority and produce at the time of verification.
- 4.18. **The reservations and relaxations to different categories/communities are applicable only in case of availability of vacancies to the respective category/community as announced through this notification.**

**PARA- 5: AGE:**

- 5.1. Minimum 18 years and Maximum 42 years as on 01/07/2023, as per G.O.Ms.No.109, GA (Ser-A) Dept., Dt.10.10.2023.  
 N.B.: No person shall be eligible if less than 18 years and more than 42 years.
- 5.2. Age Relaxation is applicable to the categories as detailed below:

S. No.	Category of candidates	Relaxation of age permissible
1	SC,ST, BC and EWS	5 Years
2	Persons with Benchmark Disabilities	10 Years
3	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.
4	N.C.C. (who have worked as Instructor in N.C.C.)	
5	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.
6	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.3 & 4 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 for Ex-Servicemen 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 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 option. If candidate click on save button the application details are only save due to power/service issues. The applicant has to click on the Save & Submit button 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. 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 later date shall not be considered for the notification on hand.

**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 alter 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 not submitted successfully, 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. The corrections can be made in the application form itself. 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 16.1 of this notification.

E. Before uploading / Submission Application Form, the Candidates 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: (a) FEE:**

- 7.1. Applicant must pay Rs. 250/- (Rupees two hundred and fifty only) towards application processing fee and Rs 120/- (Rupees one hundred 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, PBDs & 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 Physically Handicapped Persons & 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) Candidates 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) through different channels. Otherwise such applications will not be considered and no correspondence on this will be entertained.
- 7.3. **If candidate is eligible for more than one Post (subject), he/she shall submit separate application for each eligible Post (subject).**

7.4. **b) 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. Failure to pay the examination fee and application fee (in non-exempt case) will entail total rejection of application.
- iii) IPOs / Demand Drafts are not accepted.
- iv) In case of corrections Rs.100/- per correction will be charged. However changes are not allowed for Name, Fee and age relaxation.

**PARA-8: SCHEME OF EXAMINATION:**

- 8.1. Scheme of written examination is prescribed as per Annexure-III of G.O.Ms.No.141, (HR-I, Plg & Policy) Dept., dt:01.08.2016 read with G.O Ms. No.100, GA (Ser-A) Dept., dated: 30.09.2022 and Scheme & Syllabus is prescribed for Computer Proficiency Test (CPT) vide G.O.Ms.No.26, G.A. (Ser-B) Dept., Dt: 24.02.2023.
- 8.2. 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 1/3<sup>rd</sup> of the marks prescribed for the question.
- 8.3. The Scheme & Syllabus for written examination and CPT is shown at **Annexure-II**.

**PARA-9: CENTRES FOR THE WRITTEN (OBJECTIVE TYPE) EXAMINATIONS (CBRT):**

The centres of examination will be announced separately. The applicant may choose the Test centre with three preferences. However the Commission reserves the right to allot the applicant to any centre of examination depending on the availability of the resources like centers / systems.

**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 and 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 papers (Paper-I and Paper-II) are set in English and translated in to Telugu language. English version will be considered as the authentic version for valuation purpose. However, the Subject question paper (Paper-II) for Biotechnology, Computer Applications, Computer Science and Microbiology will be in English medium only and the Paper-II for Language subjects, i.e., English and Telugu will be in the same Language.**
- 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 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 cognisance will be taken by Commission of any vacancies arising or reported after the completion of the selection and recruitment process or the last date as decided by the Commission as far as this Notification is concerned, and these will be further dealt with as per G.O. & Rule cited above. 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 from time to time. In A.P. Collegiate Education Service Rules in G.O.Ms. No. 47, Higher Education (CE.I-1) Department, dated: 14.05.2007 and G.O.Ms.No.128, Higher Education (CE.I-1), Department, dated: 24.08.2010, Act 19 of 2021 notified vide G.O. Ms. No.04, Higher Education (UE) Dept., dt:18/01/2022 and Special Rules / Adhoc Rules Governing the recruitment and other related GOs, Rules etc., are applicable.
- 11.3. Rules: 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 departments. Any guidelines or clarification is based on the said Rules, and, in case of any necessity, any matter will be processed as per the relevant General and Special Rules 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 post is State Cadre and organized into Zones. Local reservation is not applicable as per G.O.Ms.No.674, GA (SPF-A) dated: 28.10.1975.
- 11.6. 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.

- 11.7. A candidate shall be disqualified for appointment, if he himself or through relations or friends or any others has canvassed or endeavored to enlist for his candidature, extraneous support, whether from official or non-official sources for appointment to this service.
- 11.8. The Candidates who have obtained Degrees through Open Universities / Distance Education mode are required to 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 G.O.R.t.No.143, Higher Education (EC) Dept., Dt: 11.07.2018 and the Supreme Court judgment dated: 03.11.2017 in this connection.

**PARA- 12 ANNEXURES:**

The candidate 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

**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 of candidates for appointment to the post will be made on the basis of merit in the Written Examination followed by Computer Proficiency Test (CPT).
- 13.3. The standard for the examination and the cut off marks for various categories for selection shall be fixed by the Commission. However 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 from time to time.
- |  |       |
|--|-------|
| 1. OC, Sports Persons, Ex-Servicemen & EWS | : 40% |
| 2. Backward Class                          | : 35% |
| 3. SCs, STs & PBDs                         | : 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. The claims of members of the Scheduled Castes, Scheduled Tribes, Backward Classes, Economically Weaker Section and Women as the case may be, shall also be considered for the vacancies earmarked for open competition, which shall be filled on the basis of open competition. In respect of social reservations viz., Scheduled Castes, Scheduled Tribes, Backward Classes, 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.
- 13.5. In the event of Schedule Caste & Schedule Tribe candidates not coming up for selection with the existing minimum 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 competitive 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.
- 13.7. Zonal preferences will be taken at the time of submission of online application form as well as at the time of verification of Certificates. However, the submission of option for Zonal preferences at the time of verification of Certificates is mandatory and will be considered as final for selection. Candidates are required to visit Commission's website regularly for this purpose.



- 13.8. It is hereby clarified that the said preferences are only indicative for being considered to the extent possible but not binding or limiting the Commission's powers under Article 315 to 320 of the Constitution of India. Therefore, the Commission has the power to assign a candidate to any of the notified posts for which he is considered to be qualified and eligible, subject to fulfilling the selection criterion. Mere claim of preference for any Zone for allotment against vacancy does not confer a right to selection for that Zone in particular or any Zone in general.
- 13.9. 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.
- 13.10. 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, Memorandum of their own Marks can be obtained individually after one month from the date of declaration of selection list in APPSC website on payment of Rs.200/- (Rupees Two hundred only) through IPO/DD in favour of Secretary, A.P. Public Service Commission, Vijayawada, for a period of Three Months only. Rejected, Invalid, Disqualified, ineligible candidates will not be issued any Memorandum of Marks and fees paid by such candidates, if any, will be forfeited to Government account, without any correspondence in this regard. Requests for Memorandum of Marks will not be entertained until the recruitment process is finalized.

#### **PARA-14: DEBARMENT:**

- 14.1. Candidates should make sure of their eligibility to the post applied for and that the declaration made by them in the format of application regarding their eligibility is correct in all respects. Any candidate **furnishing in-correct information or making false declaration regarding his/her eligibility at any stage or suppressing any information** is liable TO BE DEBARRED 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), pager, scientific 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 switched off mode capable of being used as a communication device during the examination is strictly prohibited. Any infringement of these instructions shall entail disciplinary action including ban from future examinations.  
 (b) Candidates are advised in their own interest not to bring any of the banned items including mobile phones/ pagers to the venue of the examination, as arrangement for safe – keeping cannot be assured.

**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.

**VIJAYAWADA,  
DATED: 23/01/2024.**

**Sd/- J. PRADEEP KUMAR, I.R.S.M.A.,  
SECRETARY.**

**ANNEXURE-I****NOTIFICATION NO.17/2023, DATED: 30/12/2023****BREAKUP OF VACANCIES FOR THE POST OF LECTURERS IN GOVT. DEGREE COLLEGES  
IN A.P COLLEGIATE EDUCATION SERVICE****POST CODE – 01 # SUBJECT - BIOTECHNOLOGY**

Category	Zone-I	Zone-II	Zone-III	Zone-IV	TOTAL
OC	01	01	01	01	04
BC-A	-	-	-	-	-
BC-B	-	-	-	-	-
BC-C	-	-	-	-	-
BC-D	-	-	-	-	-
BC-E	-	-	-	-	-
SC	-	-	-	-	-
ST	-	-	-	-	-
EWS	-	-	-	-	-
<b>TOTAL</b>	<b>01</b>	<b>01</b>	<b>01</b>	<b>01</b>	<b>04</b>

**POST CODE – 02 # SUBJECT - BOTANY**

Category	Zone-I	Zone-II	Zone-III	Zone-IV	TOTAL
OC	02	03	01	03	09
BC-A	01	01	-	01	03
BC-B	-	-	-	-	-
BC-C	-	-	-	-	-
BC-D	-	-	-	-	-
BC-E	-	-	-	-	-
SC	01	02	01	02	06
ST	-	01	-	01	02
EWS	-	-	-	-	-
<b>TOTAL</b>	<b>04</b>	<b>07</b>	<b>02</b>	<b>07</b>	<b>20</b>

**POST CODE – 03 # SUBJECT - CHEMISTRY**

Category	Zone-I	Zone-II	Zone-III	Zone-IV	TOTAL
OC	03	03	01	05	12
BC-A	-	-	01	-	01
BC-B	01	01	-	01	03
BC-C	-	01	-	01	02
BC-D	-	-	-	-	-
BC-E	-	-	-	-	-
SC	01	-	-	01	02
ST	01	-	-	-	01
EWS	-	01	-	01	02
<b>TOTAL</b>	<b>06</b>	<b>06</b>	<b>02</b>	<b>09</b>	<b>23</b>

**POST CODE – 04 # SUBJECT - COMMERCE**

Category	Zone-I	Zone-II	Zone-III	Zone-IV	TOTAL
OC	03	04	04	03	14
BC-A	-	01	-	01	02
BC-B	-	01	01	01	03
BC-C	01	-	01	-	02
BC-D	01	01	-	01	03
BC-E	01	01	-	01	03
SC	01	02	01	02	06
ST	-	01	01	01	03
EWS	01	01	01	01	04
<b>TOTAL</b>	<b>08</b>	<b>12</b>	<b>09</b>	<b>11</b>	<b>40</b>

**POST CODE – 05 # SUBJECT – COMPUTER APPLICATIONS**

Category	Zone-I	Zone-II	Zone-III	Zone-IV	TOTAL
OC	03	08	03	06	20
BC-A	02	01	01	01	05
BC-B	01	01	01	01	04
BC-C	-	-	-	-	-
BC-D	-	02	01	01	04
BC-E	-	01	01	-	02
SC	02	02	02	-	06
ST	01	01	-	01	03
EWS	01	02	01	01	05
<b>TOTAL</b>	<b>10</b>	<b>18</b>	<b>10</b>	<b>11</b>	<b>49</b>

**POST CODE – 06 # SUBJECT - COMPUTER SCIENCE**

Category	Zone-I	Zone-II	Zone-III	Zone-IV	TOTAL
OC	07	08	04	03	22
BC-A	-	02	01	01	04
BC-B	01	02	-	01	04
BC-C	-	-	-	-	-
BC-D	01	-	-	01	02
BC-E	-	-	-	01	01
SC	01	02	01	02	06
ST	01	01	02	-	04
EWS	02	01	01	01	05
<b>TOTAL</b>	<b>13</b>	<b>16</b>	<b>09</b>	<b>10</b>	<b>48</b>

**POST CODE – 07 # SUBJECT - ECONOMICS**

Category	Zone-I	Zone-II	Zone-III	Zone-IV	TOTAL
OC	01	01	01	02	05
BC-A	01	-	-	01	02
BC-B	-	-	01	-	01
BC-C	-	-	-	-	-
BC-D	01	01	-	-	02
BC-E	01	-	-	-	01
SC	-	01	-	01	02
ST	-	-	-	-	-
EWS	-	01	-	01	02
<b>TOTAL</b>	<b>04</b>	<b>04</b>	<b>02</b>	<b>05</b>	<b>15</b>

**POST CODE – 08 # SUBJECT - ENGLISH**

Category	Zone-I	Zone-II	Zone-III	Zone-IV	TOTAL
OC	-	01	01	01	03
BC-A	-	-	-	-	-
BC-B	-	-	-	-	-
BC-C	-	-	-	-	-
BC-D	-	-	-	-	-
BC-E	-	-	-	-	-
SC	01	01	-	-	02
ST	-	-	-	-	-
EWS	-	-	-	-	-
<b>TOTAL</b>	<b>01</b>	<b>02</b>	<b>01</b>	<b>01</b>	<b>05</b>

**POST CODE – 09 # SUBJECT - HISTORY**

Category	Zone-I	Zone-II	Zone-III	Zone-IV	TOTAL
OC	01	02	02	03	<b>08</b>
BC-A	-	01	-	-	<b>01</b>
BC-B	01	-	-	01	<b>02</b>
BC-C	-	-	-	-	<b>-</b>
BC-D	-	01	-	-	<b>01</b>
BC-E	-	01	-	-	<b>01</b>
SC	-	-	-	-	<b>-</b>
ST	-	-	-	01	<b>01</b>
EWS	01	-	-	-	<b>01</b>
<b>TOTAL</b>	<b>03</b>	<b>05</b>	<b>02</b>	<b>05</b>	<b>15</b>

**POST CODE – 10 # SUBJECT - MATHEMATICS**

Category	Zone-I	Zone-II	Zone-III	Zone-IV	TOTAL
OC	03	03	01	02	<b>09</b>
BC-A	01	01	-	-	<b>02</b>
BC-B	-	02	-	-	<b>02</b>
BC-C	-	-	-	-	<b>-</b>
BC-D	-	-	01	01	<b>02</b>
BC-E	-	-	-	-	<b>-</b>
SC	01	02	01	02	<b>06</b>
ST	-	01	-	-	<b>01</b>
EWS	-	01	01	01	<b>03</b>
<b>TOTAL</b>	<b>05</b>	<b>10</b>	<b>04</b>	<b>06</b>	<b>25</b>

**POST CODE – 11 # SUBJECT - MICROBIOLOGY**

Category	Zone-I	Zone-II	Zone-III	Zone-IV	TOTAL
OC	01	-	-	01	<b>02</b>
BC-A	-	-	-	-	<b>-</b>
BC-B	-	-	-	-	<b>-</b>
BC-C	-	-	-	-	<b>-</b>
BC-D	-	-	01	-	<b>01</b>
BC-E	-	-	-	-	<b>-</b>
SC	-	-	-	-	<b>-</b>
ST	-	-	-	-	<b>-</b>
EWS	-	01	-	-	<b>01</b>
<b>TOTAL</b>	<b>01</b>	<b>01</b>	<b>01</b>	<b>01</b>	<b>04</b>

**POST CODE – 12 # SUBJECT – POLITICAL SCIENCE**

Category	Zone-I	Zone-II	Zone-III	Zone-IV	TOTAL
OC	02	02	-	01	<b>05</b>
BC-A	-	-	01	01	<b>02</b>
BC-B	01	01	-	-	<b>02</b>
BC-C	-	-	-	-	<b>-</b>
BC-D	-	-	-	01	<b>01</b>
BC-E	-	-	01	01	<b>02</b>
SC	-	01	-	-	<b>01</b>
ST	01	01	-	-	<b>02</b>
EWS	-	-	-	-	<b>-</b>
<b>TOTAL</b>	<b>04</b>	<b>05</b>	<b>02</b>	<b>04</b>	<b>15</b>

**POST CODE – 13 # SUBJECT - TELUGU**

Category	Zone-I	Zone-II	Zone-III	Zone-IV	TOTAL
OC	-	-	01	-	01
BC-A	-	-	-	-	-
BC-B	-	-	-	-	-
BC-C	-	-	-	-	-
BC-D	-	01	-	-	01
BC-E	-	-	-	-	-
SC	01	-	-	01	02
ST	-	-	-	-	-
EWS	01	01	-	01	03
<b>TOTAL</b>	<b>02</b>	<b>02</b>	<b>01</b>	<b>02</b>	<b>07</b>

**POST CODE – 14 # SUBJECT - ZOOLOGY**

Category	Zone-I	Zone-II	Zone-III	Zone-IV	TOTAL
OC	03	02	01	01	07
BC-A	-	-	-	-	-
BC-B	-	01	01	01	03
BC-C	-	-	-	-	-
BC-D	02	01	-	-	03
BC-E	-	01	-	-	01
SC	01	01	01	01	04
ST	-	-	-	01	01
EWS	-	-	01	-	01
<b>TOTAL</b>	<b>06</b>	<b>06</b>	<b>04</b>	<b>04</b>	<b>20</b>

**Note:-** Horizontal (Special) Reservation for women, Meritorious Sports Persons and PBD will be implemented i.e.,  $33\frac{1}{3}\%$  in case of women, 2%, in case of Meritorious Sports Persons and 4 % in case of PBD candidates in accordance with G.O. Ms. No. 77, G.A (Ser.D) Dept., Dt: 02.08.2023 and G.O.Ms.No.03, G.A. (Ser-D) Dept., Dt: 17.01.2024.

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**ANNEXURE – II****SCHEME AND SYLLABUS FOR THE POST OF LECTURERS IN GOVT. DEGREE COLLEGES  
IN A.P COLLEGIATE EDUCATION SERVICE****SCHEME**

(As per Annexure-III of G.O.Ms.No.141, (HR-I, Plg & Policy)Dept.,dt: 01.08.2016 read with G.O.Ms.No.100, GA (Ser-A) Department, dt: 30/09/2022)

<b>Written Examination (Objective Type)</b>			
<b>Papers</b>	<b>No. of Questions</b>	<b>Duration (Minutes)</b>	<b>Maximum Marks</b>
Paper-1: General Studies & Mental Ability (Degree Standard)	150	150	150
Paper-2: Concerned Subject (One only) (PG Standard)	150	150	300
<b>TOTAL</b>			<b>450</b>
<b><u>NEGATIVE MARKS:</u></b> 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.			

**NB:** The Candidates have to choose one of the following subjects relevant to the PG Degree for writing Paper-2:

1. Biotechnology	8. English
2. Botany	9. History
3. Chemistry	10. Mathematics
4. Commerce	11. Microbiology
5. Computer Applications	12. Political Science
6. Computer Science	13. Telugu
7. Economics	14. Zoology

**SYLLABUS****PAPER-1****GENERAL STUDIES & MENTAL ABILITY**

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.

## PAPER-2

### 1. BIOTECHNOLOGY

**CELL BIOLOGY:** Diversity of cell size and shape. Cell theory, microscopic techniques for study of cells. Sub-cellular fractionation and criteria of functional integrity. Cellular organelles-Plasma membrane, cell wall, Mitochondria, Chloroplast, Nucleus and other organelles and their organization, structure and functions. Cell motility-cilia, flagella of eukaryotes. Transport of nutrients, ions and macromolecules across membranes. Liposomes, drug delivery systems, cellular energy transactions-role of mitochondria and chloroplast. Molecular assemblies like membranes; structure and functional aspects. Ribosome's, extra cellular matrix. Cell cycle – Overview of eukaryotic cell cycle, regulation of cell cycle by cell growth and extra cellular signals. Cell cycle check points. Regulators of cell cycle progression – MPF, cyclins and cyclin-dependent kinases. Cell death and proliferation – Apoptosis: definition, differences between apoptosis and necrosis and mechanism. Cancer: Types and Classification, Development and Properties of Cancer cells. Somatic mutations in cancer cells. Biotic and abiotic stress in plants. Signal transduction: types of receptors, second messengers (calcium, phosphoinositides and Nitric oxide). Meiosis, Gametogenesis, fertilization and Development of chick embryo.

**BIOMOLECULES AND ANALYTICAL TECHNIQUES:** - Chemical foundations of Biology water, pH, pK, acids, bases, buffers, weak bonds, covalent bonds. Principles of thermodynamics. Classification, structure and functions of carbohydrates, amino acids, proteins, nucleic acids and lipids. Chromatography Methods; partition, ion exchange, and affinity methods, criteria for purity, proteins and nucleic acids sequencing methods, Hormones, vitamins and minerals. Analytical techniques: Principle, instrumentation and applications of VIS/UV, IR, NMR, LASER Raman Spectroscopy MASS Spectroscopy, Fluorescence Spectroscopy, Differential colorimetry, X-ray Crystallography, Ultra centrifugation, Electron Cryomicroscopy and Scanning Tunneling microscopy. Methods of cell study; confocal microscopy, Flowcytometry and FACS (fluorescence activated cell sorter) and atomic force microscopy. Radiochemical methods; Stable and radioactive isotopes, measurement of radioactivity by Liquid scintillation counting, GM counters and autoradiography. Specific activity and precursor-product relationship. Tracer studies and Effect of radiation on cells.

**MOLECULAR BIOLOGY:** - DNA Structure, replication, repair and recombination, Transcription, regulation and post transcriptional modifications in Prokaryotes and Eukaryotes. Transcriptional and post-transcriptional gene silencing. Translation and regulation in Prokaryotes and eukaryotes, co-translation and post-translational modifications of proteins. Protein Localization-Synthesis of secretory and membrane proteins, import into nucleus, mitochondria, chloroplast and peroxisomes, Biology of Cancer-Oncogenes and Tumour Suppressor genes, Structure, function and mechanism of action of pRB and p53 tumor suppressor proteins. Antisense oligonucleotides, molecular targets of drug action and Ribozyme Technology. Homologous Recombination-Holliday model gene targeting, gene disruption, FLP/FRT and Cre/Lox recombination RecA and other recombinases. Molecular Mapping of Genome, Genes, mutation and mutagenesis, site directed mutagenesis and Human genome project, Transposons

**BIostatistics:** - Frequency distribution, Distribution of data binomial, poisson and normal. Measures of central tendency-mean, median, mode and standard deviation-probability distribution-regression-correlation- Analysis of variance-tests of significance- T-test, F-test, Chi-square test.

**MICROBIOLOGY:** - Discovery of the microbial world; Distinguishing features of prokaryotes and eukaryotes; general role of microorganisms in transformation of organic matter and in the causation of diseases; Microbial taxonomy; Classification, Nomenclature and new approaches to microbial taxonomy; Pure culture techniques; sterilization methods; Principles of microbial nutrition and composition of culture media; culture enrichment techniques; Growth and its mathematical expression; synchronized cultures, Culture collection and maintenance of cultures; Purple and green bacteria Rickettsias; Chlamydia and Mycoplasma. Archea; Viruses: structure and replication of viruses; DNA viruses and RNA viruses; Viroids and Prions; Viruse and their Genetic System; Bacteriophages; RNA phages; Retroviruses, Biomass and Bioenergy.

**IMMUNOLOGY:-** Phylogeny of immune System; Innate and acquired immunity; Hematopoietic and differentiation, cells and organs of the immune system; Lymphocyte trafficking; Antigencity and super antigens; Immunoglobulin types, structure and function, Antigen-antibody interactions; Blood groups, Cell migration and Homing, Immunoglobulin and gene organization. Major histocompatibility



complex, BCR and TCR and generation of diversity; Complement system, Antigen processing and presentation, generation of humoral and cell mediated immune responses; Activation of B- and T-lymphocytes, Cytokines and their role in immune regulation; Cell mediated cytotoxic, Hypersensitivity, Autoimmunity, Transplantation, Tumor Immunology, AIDS and other Immunodeficiency; Hybridoma Technology, Psychoneuro-immunology, Single chain antibodies, theories of antibody diversity, Vaccines – Concept of immunization, routes of vaccination. Types of vaccines – Whole organism (attenuated and inactivated) and component vaccines (synthetic peptides, DNA vaccines, recombinant vaccines, subunit vaccines, conjugate vaccines. Vaccine delivery systems.

**BIOPROCESS ENGINEERING:-** Fermentation-types of fermentors and bioreactor design, cell concentration and stirring. Filtration, methods of cell disruption. Downstream processing, industrial applications of bioprocess. Synchronized and continuous culturing. Industrial production of glutamic acid, citric acid, ethanol, penicillin and riboflavin. Purification and crystallization of products.

**ENZYME TECHNOLOGY:-** Discovery classifications and nomenclature of enzymes. Techniques of enzymes isolation and assay, Intracellular localization of enzymes, Isoenzymes, Multienzyme complexes and multifunctional enzymes Physico-chemical characterization of enzymes, Enzymes kinetics, kinetic of enzymes of inhibition. Allosterism, Enzyme memory and mnemonic enzymes, Various techniques used for the immobilization of enzymes and their applications in Biotechnology. Purification of enzymes and their applications, Single cell proteins. Industrial application of enzyme, applications in biosensors.

**ENVIRONMENTAL BIOTECHNOLOGY:-** Ecological balance, resiliency of ecosystem and sustainable development, environmental pollution and global problems, water, air, soil pollution and their impacts on environment and biotechnological approaches for management, waste water treatment: aerobic and anaerobic processes, bioremediation of contaminated soils and waste land, biotechnological treatment for industrial effluents and solid wastes. GM microbes

**GENETIC ENGINEERING:-** Discovery, properties and application of Restriction enzymes, Cloning and expression vectors, Purification of plasmids, genomic DNA and mRNA. Genomic and cDNA Library construction and screening of recombinants by hybridization methods, Reporter assays, protein engineering- site directed mutagenesis, adding disulfide bonds – changing asparagines to other amino acids modification of metal cofactor requirements. Increasing of specific activity Stability to thermal and salinity conditions, Phage Display library and yeast two hybrid system. Gene transfer methods Tagging, Role of gene tagging analysis; Gene Therapy, Gene silencing methods, Biochips.

**BIOINFORMATICS:-** Biological databases, ORF finding, EST analysis, gene identification, microsatellite repeat patterns, Blast all flavours, Mutation matrix, global Vs local alignments, Dot plots, PAM and BLOSUM matrices, Multiple sequence modeling, alignments dendrograms, phylograms, protein structure prediction methods, molecular modeling, Primer design, QSAR, Drug designing

**PLANT BIOTECHNOLOGY:-** Selection of explants, micro and macro Propagation techniques in plant tissue culture suspension culture, single cell. Anther, pollen and ovary culture for production of haploid plants. Cryopreservation for germplasm conservation. Plant Transformation technology, Transgene stability and gene silencing. Application of plant Transformation for productivity and performance. Metabolic Engineering and Industrial products: Plant secondary metabolites, industrial enzymes, biodegradable plastics, therapeutic proteins, antibodies, edible vaccines. Molecular marker assisted selection and Breeding: RFLP maps, RAPD markers, STS, microsatellites, SCAR (sequence characterized amplified regions), SSCP (single strand conformational polymorphism), AFLP, GM Crops

**ANIMAL BIOTECHNOLOGY: -** Animal cell culture technology, simple and complex growth media, cell culture techniques, primary and established cell lines. Biology and characterization of the cultured cells, measuring growth parameters, maintenance of cell culture, Measurement of viability and cytotoxicity, cell separation. Scaling-up of animal cell culture. Cell synchronization. Cell cloning and micromanipulation. Cell transformation. Stem cell cultures, embryonic stem cells and their applications. Cell culture based vaccines. Organ and histotypic cultures. Apoptosis, measurement of cell death. Biodegradation of Toxicants, Diagnostic aids, organ perfusion studies., GM animals. Principles and preparation of DNA and RNA probes and their applications: Study and expression of cloned genes in prokaryotes and eukaryotic systems. Microbial production of interferon, human

growth hormone, insulin in *E.coli*. Genetic Engineering – Social and moral implications, national and international guidelines/regulations. Biotechnology patents and safeguarding human health.

## 2. BOTANY

### 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.

**Mitochondria:** 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, endoplasmic reticulum.

**Techniques in cell biology:** Immuno techniques; in situ hybridization, FISH, GISH; confocal microscopy.

### 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's '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.

### BIOLOGY AND DIVERSITY OF LOWER 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:** Nitrification; phosphorous solubilization; nitrogen fixation

**Phycology:** Thallus organization; cell ultra structure; 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, biotrophic, 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 pteridophyta; introduction to Psilopsida, Lycopsidea, Sphenopsida and Pteropsida.

### **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.

### **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 C<sub>4</sub> 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, polyamines, jasmonic acid and salicylic 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

### **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 mutants 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.

**PLANT ECOLOGY**

**Climate, soil and vegetation patterns of the world:** Life zones; major biomes and major vegetation and soil 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 and 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 and ecosystems.

**Climate change:** Green house gases (CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, CFCs: sources, trends and role); ozone layer and ozone hole; consequences of climate change (CO<sub>2</sub> 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.

**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.

**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 adventitious 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* – mediated 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.

**3. CHEMISTRY****INORGANIC CHEMISTRY**

1. Atomic structure and chemical bonding – structure and bonding in homo and hetero nuclear molecules. Applications of VSEPR, Valence Bond and Molecular orbital theories in explaining the structures of simple molecules.

2. Transition elements and coordination compounds – physical and chemical characteristics of transition elements – Bonding theories – crystal field theory – crystal field splitting patterns in various geometries. Calculation of CFSE – Jahn-Teller effect – Application of MO theory to octahedral and square planar complexes – Electronic spectra of complexes – Russell Saunders coupling – term

symbols – spectra of octahedral and tetrahedral complexes – charge transfer spectra – magnetic properties of complex compounds.

3. Metal - ligand equilibria in solution – step wise and overall stability constants – factors affecting the stability of metal complexes – Pearson's theory of hard and soft acids and bases (HSAB) – Chelate effect.
4. Reaction mechanisms in complexes – Inert and labile complexes – Ligand substitution reactions of octahedral complexes – Acid hydrolysis, base hydrolysis – conjugate base mechanism – Anation reactions – substitution reactions of square planar complexes – Trans effect – Electron transfer reactions – Inner and outer sphere mechanisms.
5. Metal complexes - EAN rule – structure and bonding of metal carbonyls of Mn, Fe, Co and Ni – Metal nitrosyls – structure and bonding.
6. Cages and ring compounds – preparation, structure and reactions of boranes and carboranes – Boron-nitrogen and Sulfur-nitrogen cyclic compounds.
7. Metal clusters – factors favoring M-M bonds – Structure and bonding in  $\text{Re}_2\text{Cl}_8^{2-}$ ,  $\text{Mo}_6\text{Cl}_8^{4+}$ ,  $\text{Nb}_6\text{X}_{12}^{2+}$ ,  $\text{Re}_3\text{Cl}_9$  and  $\text{Re}_3\text{Cl}_{12}^{3-}$ .
8. Bio-inorganic chemistry – metal complexes as oxygen carriers – hemoglobin and myoglobin – oxygen transport – non heme proteins – hemerythrin and hemocyanin.
9. Analytical chemistry – chromatography – general principles involved in separations by paper, thin layer and column chromatography – GC and HPLC.

### **Physical Chemistry**

#### **1. Thermodynamics**

Brief review of concepts of I and II laws of thermodynamics. Concept of entropy. Entropy as a state function. Calculation of entropy changes in various processes. Entropy changes in an ideal gas. Entropy changes on mixing of ideal gases. Entropy as a function of V and T. Entropy as a function of P and T. Entropy change in isolated systems- Clausius inequality. Entropy change as criterion for spontaneity and equilibrium.

Third law of thermodynamics. Evaluation of absolute entropies from heat capacity data for solids, liquids and gases. Standard entropies and entropy changes of chemical reactions. Helmholtz and Gibbs free energies (A and G). A and G as a criteria for equilibrium and spontaneity. Physical significance of A and G. Driving force for chemical reactions- relative signs of  $\Delta H$  and  $\Delta S$ .

Thermodynamic relations. Gibbs equations. Maxwell relations. Temperature dependence of G. Gibbs- Helmholtz equation. Pressure dependence of G.

Chemical potential: Gibbs equations for non-equilibrium systems. Material equilibrium. Phase equilibrium. Clapeyron equation and Clausius-Clapeyron equation .

Conditions for equilibrium in a closed system. Chemical potential of ideal gases. Ideal-gas reaction equilibrium-derivation of equilibrium constant. Temperature dependence of equilibrium constant-the van't Hoff equation.

Solutions: Specifying the Solution composition. Partial molar properties-significance. Relation between solution volume and partial molar volume. Measurement of partial molar volumes- slope and intercept methods. The chemical potential. Variation of chemical potential with T and P. Gibbs-Duhem equation-derivation and significance

Ideal solutions. Thermodynamic properties of ideal solutions. Mixing quantities. Vapour pressure-Raoult's law. Thermodynamic properties of ideally dilute solutions. Vapour pressure- Henry's law.

Nonideal systems. Concept of fugacity, fugacity coefficient. Determination of fugacity. Non ideal solutions. Activities and activity coefficients. Standard-state conventions for non ideal solutions. Determination of activity coefficients from vapour pressure measurements. Activity coefficients of nonvolatile solutes using Gibbs-Duhem equation.

Multicomponent phase equilibrium: Vapour pressure lowering, freezing point depression and boiling point elevation

#### **2. Statistical Thermodynamics**

Concepts of distribution and probability. Estimation of probability and the most probable distribution. Systems composed of noninteracting particles. Derivation of Boltzmann distribution law.

The molecular partition function. Systems composed of interacting particles. The concept of ensemble and canonical ensemble. Canonical partition function and its relation to molecular partition function. The factorization of molecular partition function – translational, rotational, vibrational and electronic partition functions. Derivation of expressions for translational, rotational (diatomic) and vibrational partition functions. Relationship between partition functions and thermodynamic functions.

The relationship between partition functions and thermodynamic functions. Specific heats of solids – Einstein equation of heat capacity of solids – derivation. Explanation of heat capacity at very low and very high temperatures – Dulong and Petits Law. Debye theory.

The entropy of a monoatomic ideal gas. The Sackur-Tetrode equation- derivation. Mean translational and vibrational energies.

#### **3. Electrochemistry**

**Electrochemical Cells:** Derivation of Nernst equation – problems. Chemical and concentration cells (with and without transference). Liquid junction potential – derivation of the expression for LJP – its

determination and elimination. Applications of EMF measurements : Solubility product, potentiometric titrations, determination of transport numbers, equilibrium constant measurements. Decomposition potential and its significance. Electrode polarization – its causes and elimination. Concentration overpotential.

Concept of activity and activity coefficients in electrolytic solutions. The mean ionic activity coefficient. Debye-Huckel theory of electrolytic solutions. Debye-Huckel limiting law (derivation not required). Calculation of mean ionic activity coefficient. Limitations of Debye-Huckel theory. Extended Debye-Huckel law.

Theory of electrolytic conductance. Derivation of Debye-Huckel-Onsager equation – its validity and limitations.

Concept of ion association – Bjerrum theory of ion association (elementary treatment) - ion association constant – Debye-Huckel-Bjerrum equation.

#### **4. QUANTUM CHEMISTRY**

Black body radiation-Planck's concept of quantization-Planck's equation, average energy of an oscillator (derivation not required). Wave particle duality and uncertain principle-significance of these for microscopic entities. Emergence of quantum mechanics. Wave mechanics and Schroedinger wave equation.

Operators-operator algebra. Commutation of operators, linear operators. Complex functions. Hermitian operators. Operators  $\nabla$  and  $\nabla^2$ . Eigenfunctions and eigenvalues. Degeneracy. Linear combination of eigenfunctions of an operator. Well behaved functions. Normalized and orthogonal functions.

**Postulates of quantum mechanics.** Physical interpretation of wave function. Observables and operators. Measurability of operators. Average values of observables. The time dependent Schrodinger equation. Separation of variables and the time-independent Schrodinger equation.

**Theorems of quantum mechanics.** Real nature of the eigen values of a Hermitian operator-significance. Orthogonal nature of the eigen values of a Hermitian operator-significance of orthogonality. Expansion of a function in terms of eigenvalues. Eigen functions of commuting operators-significance. Simultaneous measurement of properties and the uncertainty principle.

*Particle in a box-* one dimensional and three dimensional. Plots of  $\psi$  and  $\psi^2$ -discussion. Degeneracy of energy levels. Comparison of classical and quantum mechanical particles. Calculations using wave functions of the particle in a box-orthogonality, measurability of energy, position and momentum, average values and probabilities. Application to the spectra of conjugated molecules.

Cartesian, Polar and spherical polar coordinates and their interrelations

*Schrodinger equation for the hydrogen atom-* separation into three equations. Hydrogen like wave functions. Radial and angular functions. Quantum numbers  $n$ ,  $l$  and  $m$  and their importance. The radial distribution functions. Hydrogen like orbitals and their representation. Polar plots, contour plots and boundary diagrams.

*Many electron systems.* Approximate methods. The variation method-variation theorem and its proof. Trial variation function and variation integral. Examples of variational calculations. Particle in a box. Construction of trial function by the method of linear combinations. Variation parameters. Secular equations and secular determinant.

*Bonding in molecules.* Molecular orbital theory-basic ideas. Construction of MOs by LCAO,  $H_2^+$  ion. The variation integral for  $H_2^+$  ion. Detailed calculation of Wave functions and energies for the bonding and antibonding MOs. Physical picture of bonding and antibonding wave functions. Energy diagram. The MO and VB wave functions for  $H_2$  molecule and their comparison.

#### **5. Chemical Kinetics**

Theories of reaction rates: Collision theory, steric factor. Transition state theory. Reaction coordinate, activated complex and the transition state. Thermodynamic formulation of transition state theory. Unimolecular reactions and Lindemann's theory.

Complex reactions- Opposing reactions, parallel reactions and consecutive reactions (all first order type). Chain reactions-general characteristics, steady state treatment. Example-  $H_2-Br_2$  reaction. Derivation of rate law.

Effect of structure on reactivity- Linear free energy relationships. Hammett and Taft equations-substituent ( $\sigma$  and  $\sigma^*$ ) and reaction constant ( $\rho$  and  $\rho^*$ ) with examples.

Factors affecting reaction rates in solution. Diffusion controlled reactions. Influence of dielectric constant and ionic strength on ion-ion, ion-dipole and dipole-dipole reactions. Primary and secondary salt effects. Kinetic isotope effects: Primary and secondary isotope effects. Solvent isotope effects.

**Enzyme catalysis:** Chemical catalysis and enzyme catalysis – distinction – energy considerations and rate accelerations – examples.

Michaelis-Menten mechanisms of enzyme catalyzed reactions involving one and two intermediates. Steady-state approximation. Derivation of kinetic equations. Evaluation of kinetic parameters. Enzyme-substrate complex: Fischer's lock and key and Koshland's induced fit hypotheses. Specificity of enzyme-catalyzed reactions. Discussion of the various types of forces involved in the formation of E-S complex. pH dependence of enzyme-catalyzed reactions – the kinetics and the equations involved.

#### **6. Photochemistry**

Electronic transitions in molecules. The Franck Condon principle. Electronically excited molecules-singlet and triplet states. Radiative life times of excited states-theoretical treatment. Measured lifetimes. Quantum yield and its determination. Actinometry-ferrioxalate and uranyl oxalate actinometers-problems.

Derivation of fluorescence and phosphorescence quantum yields. E-type delayed fluorescence-evaluation of triplet energy splitting( $\Delta E_{ST}$ ). Photophysical processes-photophysical kinetics of unimolecular reactions. Calculation of rate constants of various photophysical processes-problems, State diagrams.

Photochemical primary processes. Types of photochemical reactions- electron transfer, photodissociation, addition, abstraction, oxidation and isomerization reactions with examples. Effect of light intensity on the rates of photochemical reactions. Photosensitization. Quenching-Stern Volmer equation. Experimental set up of a photochemical reaction. Introduction to fast reactions- Principle of flash photolysis.

7. Solid state chemistry.

Magnetic properties of solids- classification of magnetic materials, Magnetic susceptibility, Langevin diamagnetism, Weiss theory of para magnetism.

Electronic properties of metals, insulators and semi conductors: Electronic structure of solids, Band theory, band structure of metals, insulators and semiconductors. Electrons, holes and Excitons. The temperature dependence of conductivity of extrinsic semi conductors. Photo conductivity and photovoltaic effect-p-n junctions.

Superconductivity. Occurrence of superconductivity. Destruction of superconductivity by magnetic fields-Meisner effect. Types of superconductors. Theories of super conductivity- BCS theory.

## **ORGANIC CHEMISTRY**

1. IUPAC nomenclature of organic molecules including structural, positional, functional, regio- and stereoisomers.

2. Molecular representations: Wedge, Fischer, Newman and Saw-horse formulae, their description and interconversions. Stereoisomers-classification-configuration -R,S-nomenclature-Criteria for Chirality. Axially chiral allenes, spiranes, alkylidene cycloalkanes, chiral biaryls, atropisomerism. Planar chiral ansa compounds and trans- cyclooctene. Helically chiral compounds, Determination of absolute configuration by chemical correlation methods. Determination of configuration in E,Z-nomenclature: Spectral and Chemical methods of configuration determination of E,Z isomers. Determination of configuration in aldoximes and ketoximes.

3. Nature of Bonding in Organic Molecules and Aromaticity, Delocalized chemical bonding-conjugation, cross conjugation, resonance, hyperconjugation, tautomerism, Huckle's rule and the concept of aromaticity, aromaticity in benzenoid and non-benzenoid compounds, alternant and non-alternant hydrocarbons, metallocenes- Ferrocene, Azulenes, Fulvenes, Annulenes, anti-aromaticity, pseudo-aromaticity, homo-aromaticity.

4. Reactive intermediates and Molecular rearrangements. Reactive Intermediates: Generation, detection, structure, stability and reactions of carbocations, carbanions, carbenes, nitrenes and free radicals. Molecular rearrangements: Definition and classification. Molecular rearrangements involving 1) electron deficient carbon: Wagner- Meerwein, Pinacol-Pinacolone, Allylic and Wolf rearrangement. 2) Electron deficient Nitrogen: Hofmann, Lossen, Curtius, Schmidt and Beckmann rearrangements 3) electron deficient Oxygen: Baeyer-Villiger oxidation. 4) Base catalyzed rearrangements: Benzilic acid, Favourski, Transannular, Sommelet-Hauser and Smiles rearrangement.

5. Organic Reaction mechanism-I Electrophilic addition to carbon-carbon double bond: Stereoselective addition to carbon-carbon double bond; *anti* addition- Bromination and epoxidation followed by ring opening. *Syn* addition of OsO<sub>4</sub> and KMnO<sub>4</sub>. Hydroboration. Michael reaction. Elimination reactions E2, E1, E1CB mechanisms. Orientation and stereoselectivity in E2 eliminations. Pyrolytic *syn* elimination and  $\alpha$ -elimination, elimination Vs substitution. Determination of reaction mechanism: Energy profiles of addition and elimination reactions, transition states, product isolation and structure of intermediates, use of isotopes, chemical trapping, crossover experiments.

6. Importance of heterocyclic compounds as drugs. Nomenclature of heterocyclic systems based on ring size, number and nature of hetero atoms. Synthesis and reactivity of pyrrole, furan, thiophene, pyridine, indole, benzofuran, benzothiophene, quinoline, isoquinoline.

7. Alkaloids and terpenoids- Importance of natural products as drugs. Isolation of natural products by steam distillation, solvent extraction and chemical methods. Structure determination and synthesis of papaverine, nicotine and quinine-General methods in the structure determination of terpenes. Isoprene rule, structure determination and synthesis of  $\alpha$ -terpenol and camphor.

8. Organic Photochemistry, Photochemical energy, Frank-Condon principles, Jablonski diagram, singlet and triplet states, dissipation of photochemical energy, photosensitization, quenching, quantum efficiency and quantum yield. Photochemistry of carbonyl compounds -  $n \rightarrow \pi^*$  and  $\pi \rightarrow \pi^*$  transitions. Norrish type-I and Norrish type-II cleavages. Paterno-Buchi reactions, Photoreduction, photochemistry of enones - hydrogen abstraction, rearrangements of  $\alpha,\beta$ -unsaturated ketones and cyclohexadienones, photochemistry of *p*-benzoquinones. Dienes - photochemistry of 1,3-butadienes, (2+2) additions leading to cage structures, photochemistry of cyclohexadienes, photochemistry of aromatic compounds, excited state of benzene and its 1,2-, 1,4- additions.

9. Pericyclic ReactionsMolecular orbital symmetry, Frontier orbitals of ethylene, 1,3 butadiene, 1,3,5 hexatriene and allyl system. Classification of pericyclic reactions. Woodward - Hoffmann

correlation diagrams. FMO and PMO (Möbius Hückel) approaches. Electrocyclic reactions-Conrotatory and disrotatory.  $4n$ ,  $4n+2$  and allyl systems. Cycloadditions-antarafacial and suprafacial additions,  $4n$  and  $4n+2$  systems,  $2+2$  addition of ketene, 1,3 dipolar cycloadditions Sigmatropic rearrangements - Suprafacial and antarafacial shifts of H, Sigmatropic shifts involving carbon moieties, 3,3 and 5,5 sigmatropic rearrangements.

**10.** Structure determination of organic compounds by UV IR, NMR and Mass Various electronic transitions, Beer-Lambert's law, effect of solvent on electronic transitions, ultraviolet bands for carbonyl compounds, unsaturated carbonyl Compounds, dienes, conjugated polyenes, Effect of hydrogen bonding and solvent effects-NMR-Shielding mechanism, mechanism of measurement, chemical shift values, chemical exchange, complex spin-spin interaction,  $^{13}\text{C}$  NMR spectroscopy, chemical shift-Mass spectral fragmentation of organic compounds, common functional groups, molecular-ion peak, metastable peak,

#### **4. COMMERCE**

**Financial management:** Meaning, nature, objectives and scope of financial management. Capital budgeting, process, techniques. Sources of finance. Cost of capital – cost of various sources of finance. Leverages – operating and financial leverages. Capital structure theories. Dividend decisions Working .capital management- cash, receivables and inventory management.

**Financial and management accounting:** Techniques of analysis of financial statements – comparative and common size statements, trend analysis and ratio analysis. Funds flow and cash flow analyses. Marginal costing and decision making.

**Managerial economics:** Meaning, nature and scope of managerial economics. Demand analysis. Production and cost analysis. Market structure – perfect and imperfect markets.

**Business environment:** Meaning and components of business environment. Industrial policies 1956, and 1991. Liberalization, privatization and globalization. WTO.

**Marketing management:** Meaning, concepts, nature, and scope of marketing management – Marketing environment. Consumer behavior and market segmentation. Product, Price, Promotion and Channel management.

**Human resources management:** HR functions. HR planning – job analysis, recruitment and job evaluation, Training and development methods. Performance appraisal methods. Trade unions and collective bargaining.

**Quantitative techniques:** Sampling and sampling methods. Probability and probability distributions – Hypothesis testing. Parametric tests ( $Z$ ,  $t$ -tests, and ANOVA) and non-parametric tests (Chi-square test).

**IT and e-commerce:** E-Commerce business models – Internet and web technologies. E-payment methods – e-cash, e-cheques, credit cards, smart cards, and debit cards.

#### **5. COMPUTER APPLICATIONS**

##### **6. COMPUTER SCIENCE**

###### **1. Mathematical Foundations:**

Mathematical Logic – Propositional Logic, First Order Logic; Probability: Conditional Probability, Mean, Median, Mode and Standard deviation; Random Variables; Distributions - Uniform, Normal, Exponential, Poisson, Binomial. Set Theory and Algebra: Sets, Relations, Functions, Groups, Partial Orders, Lattices, Boolean Algebra. Combinatorics: Permutations, Combinations, Counting, Summation, Generating Functions, Recurrence Relations.

###### **2. Programming:**

Programming in C, C++ and Java: Object Oriented Programming Concepts including Classes; Polymorphism; Inheritance and Programming in C, C++ and Java.

###### **3. Data and File Structures:**

Data structure – Definition, Arrays, stacks, queues, linked lists, trees, graphs, priority queues and heaps.

*File Structures* - Fields, records and files, Sequential, direct, index-sequential and relative files, Hashing, inverted lists and multi-lists B trees and B+ trees.

###### **4. Design and Analysis of Algorithms:**

Asymptotic notation, Notations of Space and Time complexities, Worst and Average case analysis; Design: Greedy Approach, Dynamic Programming, Divide and Conquer; Tree and Graph traversals, connected components, spanning trees, shortest paths; Hashing, Sorting, Searching. Asymptotic analysis (best, worst and average cases) of time and space, upper and lower bounds.



**5. Computer Organization:**

Machine instructions and addressing modes, Main Memory Organization, CPU Organization, I/O Organization, Micro-programmed Control, Cache Memory, Secondary Storage.

**6. Operating Systems and Unix:**

Processes, Threads, Inter-process communication, Concurrency, Synchronization, Deadlock, CPU scheduling, Memory management and virtual memory, File systems, I/O systems, Protection and security.

Unix System - File system, process management, bourne shell, Shell variables, command line programming.

Filters and Commands - Pr, head, tail, cut, paste, sort, uniq, tr, join, etc., grep, egrep, fgrep, etc., sed, awk, etc.

System Calls (like) - Creat, open, close, read, write, lseek, link, unlink, stat, fstat, umask, chmod, exec, fork, wait, system.

**7. Relational Database Design and SQL**

E R diagrams and their transformation to relational design, normalization - 1NF, 2NF, 3NF, BCNF and 4NF, Limitations of 4NF and BCNF.

SQL - Data Definition language (DDL), Data Manipulation Language (DML), Data Control language (DCL) commands. Database objects like-Views, indexes, sequences, synonyms, data dictionary.

Transaction Management, concurrency control and system recovery.

**8. Software Engineering:**

Software Characteristics, Software Process Models, Analysis, Design, Coding, Testing, and Software Quality Assurance, Software Metrics.

**9. Computer Graphics:**

Line Drawing, Graphic Primitives and Polygons, 2D Transformations, Windowing and Clipping, 3-D Graphics, Curves and Surfaces.

**10. Computer Networks:**

ISO/OSI stack, LAN technologies, (Ethernet and Token ring), Flow and error control techniques, Routing algorithms, Congestion control, TCP/UDP and Sockets, IP (v4), Application layer protocols (icmp, dns, smtp, pop, ftp, http).

11. **Data Warehousing and Mining:** Data Warehousing Concepts and Architectures, OLAP, Data Pre-processing, Data Cube Technology, Data mining Functionalities, Primitives, Data Characterization, Association Mining, Classification and regression, Clustering and Outlier Analysis.

**12. Web Technologies:**

HTML, XML, Basic Concepts of Client Server computing, Static, Dynamic and Active Web pages, Client and Server Side Scripting.

**13. E Commerce and Security:**

Electronic Commerce - Framework, Media Convergence of Applications, Consumer Applications, Organisation Applications.

Electronic Payment Systems - Digital Token, Smart Cards, Credit Cards, Risks in Electronic Payment System, Designing Electronic Payment Systems.

Electronic Data Interchange (EDI) - Concepts, Applications, (Legal, Security and Privacy) issues, EDI and Electronic Commerce, Standardization and EDI, EDI Software Implementation, EDI Envelope for Message Transport, Internet-Based EDI.

Cryptography - Fundamentals of Cryptology, Cipher Methods, Cryptographic Algorithms, Cryptographic Tools, Protocols for Secure Communication, Attacks on Crypto systems. Security Technologies – Firewalls, Intrusion Detection and Prevention Systems, VPNs.

**14. Theory of Computation and Compiler Design:**

Regular languages and finite automata, Context free languages and Push-down automata, Recursively enumerable sets and Turing machines, Undecidability. Compiler Design: Lexical analysis, Parsing, Syntax directed translation, Runtime environments, Intermediate and target code generation, Basics of code optimization.

**15. Cryptography and Network Security:**

Data Encryption and Decryption, Symmetric Key algorithms like DES, IDEA and AES, Public Key Cryptography, RSA algorithm, Digital Signatures & Authentication, Firewalls and VPN.

**16. Artificial Intelligence:**

AI Approach to problem solving, State Space Search, Problem Characteristics, Production System Model, Breadth First and Depth First Search, Heuristic Search Techniques, Predicate Logic and Resolution for Theorem Proving, Knowledge representation using Rules, Frames, Semantic Nets, Script, and CD Diagrams, Uncertain reasoning Techniques, TMS, Linear and Nonlinear Planning.

**7. ECONOMICS****1. Microeconomic Analysis**

Demand analysis – Marshallian, Hicksian and Revealed preference approaches; axiomatic approach Theory of Production and Costs Pricing and output under different forms of market structure; collusive and non-collusive oligopolies. Factor Pricing analysis. Elements of General Equilibrium analysis and new welfare economics.

## 2. Macroeconomic Analysis

National income accounting – basic concepts, methods of estimation. Determination of output and employment – Classical approach, Keynesian approach. Real balance effect – Patinkin and Pigou. Theories of inflation. Phillips Curve analysis. Business cycles – Models of Samuelson, Hicks and Kaldor. IS-LM Analysis - Relative roles of monetary and fiscal policies. Mundell-Fleming open economy model. Rational expectations; new classical / tenets.

## 3. Development and Growth

Development and Growth – Role of institutions.

Theories of growth and development – Models of growth of Joan Robinson and Kaldor; Technical Progress – Hicks, Harrod and learning by doing, production function approach to the determinants of growth ; Endogenous growth : role of education, research and knowledge – explanation of cross country differentials in economic development and growth.

Theories of development – Classical, Marx, Schumpeter and structural analysis of development – Imperfect market paradigm, Lewis model of development, Ranis-Fei model, Dependency theory of development.

Factors in economic development – natural resources, population, capital, human resource development – Measurement of development – Conventional, HDI and Quality of Life indices.

Trade and development – trade as engine of growth, two-gap analysis, Prebisch, Singer and Myrdal views; gains from trade and LDCs.

## 4. Money and Banking

Definition and functions of money; empirical definition of money – monetary aggregates; monetarism; demand for money – Fisher, Cambridge, Keynesian, Friedman, Baumol and Tobin; supply of money – determinants; money multiplier. Role and functions of Central bank; NBFIs; instruments of monetary control; stabilization policies; monetary and interest rate targeting.

Social responsibility of banks; banking sector reforms, Basel I and II; deregulation, competition and efficiency; NPAs. Specialized financial and investment institutions.

## 5. Public Finance

Role of government in a mixed economy – allocation, distribution and stabilization.

Private, public and merit goods. Theories of Social choice. Theories of taxation, types, incidence and effects. Theories of public expenditure – effects on savings, investment and growth Burden of public debt; Wagner and Peacock – Wiseman hypotheses. Union Finance – Trends in Revenue and Expenditure of the Government of India. State Finance – Trends in Revenue and Expenditure of the State Governments. Public Debt – Effects and Burden and Management of public debt. Government Budget – Forms of Budgeting, Zero based budgeting, Different Budget deficits. Fiscal Federalism – Horizontal and vertical imbalances; methods of fiscal adjustment.

## 6. International Trade and Finance

Theories of International Trade : Empirical verification and relevance. International Trade under Imperfect competition. Terms of Trade and Economic Growth – Secular Deterioration of Terms of Trade Hypothesis – a critical review. Equilibrium / disequilibrium in Balance of Payment – Traditional, Absorption and monetary approaches to adjustment in Balance of Payments. Impact of Tariffs on Partial and general equilibrium analysis; Political economy of Non-Tariff Barriers. Theory of regionalism at Global level – Trade blocks – SAARC and ASEAN. Trade Policy and Reforms in India. Optimum currency areas – Euro - ERM

## 7. Indian Economy:

Basic features of Indian economy; growth and structural changes – composition and trends in National Income.

Demography – Demographic features; demographic transition and demographic dividend; rural urban migration and rural urban divide.

Planning : Objectives and strategies of planning; and achievements of programmes for poverty alleviation and regional imbalances.

Agriculture : Land reforms and New Green Revolution – Role of technology; regional disparities in Indian agriculture; Pricing Policy; Food subsidy and Public distribution system.

Industry : Industrial growth and Productivity – New industrial policy; Privatisation, Disinvestment – FDI and role of MNCs. SMEs and industrial development.

Public Finance : Composition and growth of public expenditure and debt; Fiscal reforms and rationalization of subsidies; Centre – State financial relations.

WTO and its impact on Indian economy; Energy and Environment: Energy Security; Environmental Policy of Government of India, Rationale of Social Forestry.

## 8. QUANTITATIVE METHODS:

### a. Statistical Methods

Measures of Central tendency, dispersion, skewness and kurtosis Fundamentals of probability – Binomial, Poisson and Normal distributions. Simple correlation and regression analysis.

Statistical inferences – Applications, sampling distributions ( t, Chi-square and F tests), Sampling of attributes, testing of hypothesis Index numbers and time series analysis Sampling and census methods, types of sampling and errors.

**b. Econometric Methods:**

i) Single Equation Linear Model : Assumption and properties of OLS Multiple Regression Model – Estimation and Interpretation Multi-collinearity, auto-correlation and heteroscedasticity – Causes, detection, consequences and remedy. Dummy variables, distributed lags – need, limitations and interpretation Applications in economics.

ii) Simultaneous Equation Models:

Structural and reduced forms, Endogenous and exogenous variables, Identification problems and conditions.

Single equation methods of estimations – two stage least squares, indirect least squares, and least variance ratio.

**c. Time Series Models**

Auto-regressive (AR), moving average (MA) and mixed processes (ARMA, ARIMA)

Concepts of unit root, integration and cointegration, random walks.

**d. Mathematical Methods**

i) Principles of optimization: maxima and minima of functions of a single variable.

ii) Basic concepts of Game Theory – Two-person, Zero-sum Game, Pure and Mixed strategy, Saddle point solution, Linear programming and input output analysis.

**8. ENGLISH****I. Movements and Concepts**

Renaissance, Metaphysical poetry, Neo-classicism, Romanticism, Rise of the novel, Modernism, Postmodernism, Colonialism, Postcolonialism, Diaspora, Psychoanalytical criticism, Myth and archetype, Feminism, Structuralism, Poststructuralism, Deconstruction.

**II. Writers and Texts**

- |                            |  |
|----------------------------|--|
| 1) William Shakespeare     | <i>Hamlet, Tempest</i>   |
| 2) John Milton             | <i>Paradise Lost-Book 1 and 9</i>                                  |
| 3) William Wordsworth      | "Immortality Ode", <i>Tintern Abbey</i>                            |
| 4) John Keats              | "Ode to a Nightingale", "To Autumn"                                |
| 5) Robert Browning         | "My Last Duchess", "The Last Ride Together"                        |
| 6) <b>Charles Dickens</b>  | <b>David Copperfield</b>   |
| 7) <b>TS Eliot</b>         | <b>"The Waste Land", Murder in the Cathedral</b>                   |
| 8) <b>GB Shaw</b>          | <b>Saint Joan</b>  |
| 9) <b>Virginia Woolf</b>   | <b>"A Room of One's Own"</b>                                       |
| 10) <b>Samuel Beckett</b>  | <b>Waiting for Godot</b>   |
| 11) <b>William Golding</b> | <b>Lord of the Flies</b>   |
| 12) <b>Robert Frost</b>    | <b>"Home Burial", "The Road Not Taken"</b>                         |
| 13) <b>Eugene O'Neill</b>  | <b>The Hairy Ape</b>   |
| 14) <b>Toni Morrison</b>   | <b>Beloved</b>   |
| 15) <b>Mulk Raj Anand</b>  | <b>Untouchable</b>   |
| 16) <b>AK Ramanujan</b>    | "Love Poem for a Wife", "Small-Scale Reflections on a Great House" |
| 17) <b>Girish Karnad</b>   | <b>Hayavadana</b>  |
| 18) <b>Salman Rushdie</b>  | <b>Midnight's Children</b>   |
| 19) <b>Chinua Achebe</b>   | <b>Things Fall Apart</b>   |
| 20) <b>Margaret Atwood</b> | <b>Edible Woman</b>  |
| 21) <b>AD Hope</b>         | <b>"Australia", "Crossing the Frontier"</b>                        |
| 22) <b>Bessie Head</b>     | <i>A Question of Power</i>   |

**III. English Language Teaching**

- 1) ELT in India: (History and status of English in India; English as second Language, English as Foreign Language, and English as Global Language).
- 2) Methods and Approaches: (Grammar Translation method, Direct method Audio-Lingual method; Structural approach, Communicative language teaching)
- 3) Teaching of Language Skills: (Teaching of Listening, Speaking, Reading, and Writing Skills; Teaching of Grammar and Functional English; Teaching of Vocabulary Classroom techniques; Use of authentic materials)
- 4) Testing and Evaluation: (Principles, Types, Objectives of testing and evaluation)
- 5) Phonetics and Phonology; Syntax and Structure.

## **9. HISTORY**

### **Ancient India:**

1. Pre and protohistoric background – Stone ages and Chalcolithic cultures.
2. Harappan Civilization – Extent, major cities, characteristic features, social and economic conditions, script, religious practices, causes for the decline.
3. Iron Age – Aryan migration – Second urbanization.
4. Vedic Age: Importance literature, Political, Social and economic conditions in the early and later vedic age.
5. India in the 6<sup>th</sup> century B.C.: Political, Social and economic conditions, Rise and spread of Jainism and Buddhism.
6. Mauryan Age: Political history of the Mauryans, Ashoka, Mauryan Administration, social and economic conditions, decline of the Mauryan empire.
7. The Satavahanas: Political history, administration, contribution to the culture.
8. Gupta Period: Political history, administration, social and economic conditions, growth of culture, decline of the empire.
9. India in the 7<sup>th</sup> century A.D.: Harsha Vardhana, Pallavas and Chalukyas, Rashtrakutas their political history and their contribution to culture.

### **Medieval India:**

10. India between 650 and 1200 A.D. – Political, social and economic conditions, Chola administration and culture.
11. Age of the Delhi Sultanate: (1206-1526), Political history, Military and Administrative organisation, changes in society and economy, Bhakti movement.
12. The Vijayanagar Empire: Origin, History, Krishnadevaraya, social and economic conditions, contribution to art and architecture, decline.
13. Mughal Age (1556-1707): Political history, Akbar, Administration, Social and economic conditions, culture, decline of the Mauryan empire, Marattas and Shivaji.

### **Modern India (1757-1947):**

14. Historical forces and factors which led to the establishment of the British power in India – Early resistance to the British power in India – Hyder Ali, Tipu Sultan, causes for their failure.
15. Evolution of British paramountcy in India: Policies of Wellesley and Dalhousie – Economic policies of the British.
16. Socio-religious reform movements – Rajaram Mohan Roy, Dayananda Saraswathi and others – Educational policies of the British and their impact on Indian society.
17. Revolt of 1857: Causes, results, significance.
18. Rise and growth of the Indian National Movement: Birth of the Indian National Congress, the national movement from 1885 to 1905; movement from 1905 to 1920. Role of Tilak and Annie Besant: The movement from 1920 to 1947; Emergence of Gandhi; Non-cooperation movement, Salt Satyagraha and the Quit India Movement.  
Freedom movement in Andhra Pradesh with special reference to the role of Alluri Sitarama Raju and Tanguturi Prakasam, Revolt against the nizam's rule in Telangana.

### **Modern World:**

19. Industrial Revolution – Significance and results.
20. American War of Independence – course, results, significance.
21. French Revolution – course, effects, significance.
22. National liberation movements in Italy and Germany in the 19<sup>th</sup> century – Mazzini, Cavour, Garibaldi, Bismarck.
23. World War-I – Causes and effects.
24. The Russian Revolution of 1917 – Causes, results and importance.
25. The World between the two world wars – Nazism in Germany, Fascism in Italy, Turkey under Mustafa Kamal Pasha.
26. Developments in China 1911-1949 – Nationalist Revolution of 1911 – Communist Revolution of 1948.
27. World War-II – Causes and effects.

## **10. MATHEMATICS**

### **I. Real Analysis**

Finite, countable and uncountable sets – Real Number system  $\mathbb{R}$  – infimum and supremum of a subset of  $\mathbb{R}$  – Bolzano – Weierstrass theorem.

Sequences, convergence, limit superior and limit inferior of sequences, sub sequences, Heine Borel Theorem.

Infinite series – Tests of convergence.

Continuity and uniform continuity of real valued functions of real variable. Monotonic functions and functions of bounded variation.

Differentiability and mean value theorems.

Riemann integrability.

Sequences and Series of functions.

### **II. Metric Spaces**

Metric spaces – completeness, compactness and connectedness – continuity and uniform continuity of functions from one metric space into another.

Topological spaces – base and subbase – continuous function.

### **III. Elementary Number**

Primes and composite numbers – Fundamental Theorem of arithmetic – divisibility – congruences – Fermat's theorem – Wilson's Theorem – Euler's  $\phi$  - function.

### **IV. Group Theory**

Groups, subgroups, normal subgroups – quotient groups – homomorphisms and isomorphism theorems – permutation groups, cyclic groups, Cayley's theorem. Sylow's theorems and their applications.

### **V. Ring Theory**

Rings, integral domains, fields – subrings and ideals – Quotient rings – homomorphisms – Prime ideals and maximal ideals – polynomial rings – Irreducibility of polynomials – Euclidean domains and principal ideal domains.

### **VI. Vector Spaces**

Vector Spaces, Subspaces – Linear dependence and independence of vectors – basis and dimension – Quotient spaces – Inner product spaces – Orthonormal basis – Gram – Schmidt process.

### **VII. Matrix Theory**

Linear transformations – Rank and nullity – change of bases.

Matrix of a linear transformation – singular and non-singular matrices – Inverse of matrix – Eigenvalues and eigenvectors of matrix and of linear transformation – Cayley – Hamilton's theorem.

### **VIII. Complex Analysis**

Algebra of complex numbers – the complex plane – Complex functions and their Analyticity – Cauchy-Riemann equations – Mobius transformations.

Power Series.

Complex Integration – Cauchy's theorem – Morera's Theorem – Cauchy's integral formula – Liouville's theorem – Maximum modulus principle – Schwarz's lemma – Taylor's series – Laurent's series.

Calculus of residues and evaluation of integrals.

### **IX. Ordinary Differential Equation**

Ordinary Differential Equation (ODE) of first order and first degree – Different methods of solving them – Exact Differential equations and integrating factors.

ODE of first order and higher degree – equations solvable for  $p$ ,  $x$  and  $y$  – Clairaut's equations – Singular Solutions.

Linear differential equations with constant coefficients and variable coefficients – variation of parameters.

### **X. Partial Differential Equations**

Formation of differential equations (PDE) – Lagrange and Charpit methods for solving first order – PDE's – Cauchy problem for first order PDE's Classification of second order PDE's – General solution of higher order PDE's with constant coefficients.

## **11. 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 -  $\beta$ -Haemolytic streptococci, *Mycobacterium tuberculosis*, *Neisseria gonorrhoea*, *E.coli*, *Salmonella typhi*, *Staphylococcus aureus*, *Clostridium 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, mycorrhiza and phyllosphere. Microbial degradation of carbonaceous materials in soil. Biology and biochemistry of Nitrogen fixation. Biofertilizers, Biopesticides, Persistence and degradation of pesticides, herbicides, fungicides and insecticides. Sewage treatment and bioremediation.



4. Urban Local Government : Structure and functions, 74<sup>th</sup> Amendment of Indian constitution

5. Regional Inequalities – Demand for Autonomy and statehood.

### **VIII Public Administration**

1. Emergence of Public Administration as a discipline – Nature, Scope and importance of Public Administration.

2. Theories and principles of organization.

3. Human Resources Management and Bureaucracy.

4. Leadership and Decision-making.

5. Good Governance – problem of corruption – Right to Information – Need for Lokpal.

### **IX Public Policy and Political Analysis**

1. Public Policy – Nature, Scope and Importance – Public Policy as a Policy Science.

2. Theories of Public Policy – Group theory, Incrementalism, Elite theory, Decision-making theory.

3. Policy making Institutions – Legislature, Executive and Judiciary – Planning Commission

4. Policy Process - Role of Media, Political Parties and Pressure Groups.

5. Policy Evaluation.

### **X International Relations**

1. Approaches to the study of International Relations.

2. Elements of National Power.

3. Basic Issues – Disarmament, Arms control, Diplomacy, Cold war, War and conflict Resolution.

4. UNO : Aims, objectives, structure and its changing role in the contemporary world.

5. Indian Foreign Policy – Non-Alignment, Relations with neighbors and security concerns and Globalization.



## 13. TELUGU

## తెలుగు

1. (ఎ) సంప్రదాయ సాహిత్యకవుల అధ్యయనం - కాలం - రచనలు  
 నన్నయ, తిక్కన, ఎర్రన, శివకవులు (నన్నెచోడుడు, మల్లికార్జున పండితారాధ్యుడు, పాల్కురికి సోమనాథుడు), నాచనసోమన - భాస్కర రామాయణ కవులు, రంగనాథ రామాయణ కవి - శ్రీనాథుడు - పోతన - పిల్లలమర్రి పినవీరభద్రుడు - గౌరన - జక్కన - అనంతమాత్యుడు - కొరవి గోపరాజు - నంది మల్లన, ఘంట సింగన - అష్టదిగ్గజ కవులు - తాళ్ళపాక కవులు - శ్రీకృష్ణదేవరాయలు - పొన్నగంటి తెలగన్న - చేమకూర వెంకటకవి - తంజావూరు రాజకవులు - కవయిత్రులు - కూచిమంచి తిమ్మకవి - జగ్గకవి.  
 (బి) వేమన తాత్వికత - సమకాలిక పరిశీలన, దృక్పథం - సమాజంపై వేమన కవిత్వ ప్రభావం.
2. సాహిత్య ధోరణుల అధ్యయనం - యుగప్రభావం - రూపాలు - మొదలైనవి. ఇతిహాసం - పురాణం ప్రబంధం - శతకం - సంకీర్తన సాహిత్యం - చారిత్రక కావ్యం - సంప్రదాయ, ఆధునిక గద్య రచనలు - నవల - కథానిక - వ్యాసం - ఏకాంకిక మొదలైనవి - వాదాలు (దళిత, హేతు, స్త్రీ, ప్రాంతీయ)
3. జానపద విజ్ఞానం - గేయాలు - కథాగేయాలు - గద్యాభ్యాసాలు - (పురాణగాథలు - ఇతిహాసాలు - కథలు), సామెతలు - పొడుపుకథలు - జానపద కళలు - (వీధి నాటకాలు, యక్షగానాలు, బొమ్మలాటలు, పగటివేషాలు, చిందు, గంగ జాతర కళారూపాలు.
4. ఆధునిక కవుల అధ్యయనం - ఆధునిక ధోరణులు వారి రచనలు - గురజాడ - రాయప్రోలు - వీరేశలింగం - చిలకమర్తి - పానుగంటి - విశ్వనాథ - దేవులపల్లి - బసవరాజు - పింగళి - కాటూరి - దువ్వూరి - పుట్టపర్తి - శ్రీశ్రీ - ప్రసిద్ధ ఆధునిక కవులు - భావ అభ్యుదయ - దిగంబర.
5. తెలుగు వ్యాకరణ, ఛందస్సు అధ్యయనం :  
 వ్యాకరణం - బాల వ్యాకరణం (సంజ్ఞ, సంధి, క్రియా, తత్సమ, ఆచ్ఛిక ప్రకరణాలు)  
 ప్రౌఢ వ్యాకరణం (సంజ్ఞ, సంధి, కారక, శబ్ద వాక్య పరిచ్ఛేదాలు)  
 ఛందస్సు - వృత్తాలు, జాతులు, ఉపజాతులు  
 (ఉత్పలమాల, చంపకమాల, శార్దూలం, మత్తేభం, ద్విపద, తరువోజ, సీసం, కందం, స్రగ్ధర, పంచచామరం)

అలంకారాలు - అర్థాలంకారాలు, శబ్దాలంకారాలు

తెలుగు భాషా చరిత్ర పరిణామం - (ప్రాజ్ఞన్నయ యుగం నుండి నేటి వరకు)- ద్రావిడ భాషా కుటుంబాలలో తెలుగు స్థానం - భౌగోళిక విభజన - మాండలికాలు.

7. భాషా విజ్ఞాన అధ్యయనం - భాషా శాస్త్రం, అర్థ విపరిణామం - ఆధునిక కాలం : శాసన భాష నుండి సాహిత్య భాష వరకు (వ్యావహారిక భాషా ఉద్యమం వంటివి)
8. తెలుగు సాహిత్య పరిణామం - (ప్రాజ్ఞన్నయ యుగం నుండి నేటి వరకు)
9. సౌందర్య, సాహిత్య విమర్శ అధ్యయనం (ప్రాక్, పశ్చిమ) ఆధునిక తెలుగు సాహిత్య విమర్శ.
10. సంస్కృత వ్యాకరణం, కావ్యాలు - సంస్కృత వ్యాకరణం ప్రాథమిక విజ్ఞానం, సామాన్య ప్రామాణిక గద్య, పద్య పాఠ్యాంశాలు - హితోపదేశం, కాళిదాసుని కృతులు, సంస్కృత పంచకావ్యాల పరిచయం.

## 14. ZOOLOGY

### General Concepts:

1. Levels of structural organization : Unicellular, colonial and multicellular forms. Prokaryotic and Eukaryotic cells. Levels of organization of tissues, organs & systems.
2. Acoelomata, Pseudocoelomata, Coelomata, Proterostomia and Deuterostomia.
3. Concepts of species and hierarchical taxa, biological nomenclature, classical methods of taxonomy of animals.

### Non-Chordata:

1. General characteristics and classification of invertebrates up to class level.
2. Protozoa: Locomotion, Nutrition and Reproduction in protozoa, Protozoan diseases of man.
3. Porifera: Canal system in porifera, skeleton in porifera, Reproduction in sponges.
4. Coelenterata : Polymorphism, Metagenesis, coral formation, Etenophora.
5. Helminths: Common Helminthic parasites of Man – *Taenia solium*, *Schistosoma sp.*, *Ascaris*, *Ancylostoma*, *Oxyuris*, *Loa*, *Trichinella*, *Strongyloides* – their life cycles. Parasitism and parasitic adaptations.
6. Annelida: Excretory system, Coelom formation, coelom and coelomoducts.
7. Arthropoda: Mouthparts of Insects, useful and harmful insects, Metamorphosis in insects. Apiculture and sericulture in India, crustacean larvae.
8. Mollusca: Respiration, Torsion and De-torsion, pearl formation and Pearl industry.
9. Echinodermata: Echinoderm larvae, Water vascular system.

### CHORDATA:

1. General Characters and classification of chordates upto class, Origin of Chordates, phylogeny and affinities of Hemichordata, Retrogressive metamorphosis.
2. Vertebrate integument and derivatives, Comparative account of Digestive, Respiratory, Circulatory, Excretory and Reproductive systems of Vertebrates.
3. Pisciculture in India, Common edible fishes of Andhra Pradesh.
4. Origin and evolution of Amphibia, Paedogenesis, Neotony.
5. Important Snakes of India, Dinosaurs.
6. Flight adaptations and Migration in birds. Archeopteryx, Poultry in India.
7. Adaptive radiation and Dentition in Mammals.

### CELL BIOLOGY:

1. Prokaryotic and Eukaryotic cell, Plasma Membrane-Ultrastructure, Permeability, intercellular communication, Endocytosis, Exocytosis, Phagocytosis, Active transport, membrane pumps.
2. Structure & function of Intracellular organelles – Nucleus, Mitochondria, Golgi bodies, lysosomes, endoplasmic reticulum, peroxisomes, plastids, vacuoles, Cell wall, Cytoskeleton and its role in motility.
3. Organization of genes and chromosomes - Operon, unique and repetitive DNA, structure of chromatin and chromosomes, heterochromatin, euchromatin, transposons.

4. Cell division and cell cycle - Mitosis and meiosis, their regulation, steps in cell cycle, regulation and control of cell cycle.
5. DNA replication, repair and recombination - Unit of replication, replication origin and replication fork, Recombinant technology, Transgenic and cloned animals, DNA damage and repair mechanisms.
6. Protein synthesis - initiation, elongation and termination of Genetic code.
7. Regulation of gene expression - Lac operon, Lambda operon.

#### **GENETICS:**

1. Mendel's law of inheritance - Critical review and Linkage.
2. Gene mapping methods: Linkage-complete and Incomplete linkage; Linkage maps, Recombination, mapping with molecular markers, somatic cell hybrids.
3. Crossing over : Types (Somatic or mitotic crossing over and Germinal or meiotic crossing over), theories about the mechanism of crossing over, tetrad analysis, and cytological detection of crossing over.
4. Mutations: Types (Spontaneous and Induced), causes and detection, mutant types (lethal, conditional, biochemical, loss of function, gain of function, germinal versus somatic mutants), Molecular basis of mutations.
5. Chromosomal aberrations (deletion, duplication, inversion and translocation, ploidy and their genetic implications); Autosomal abnormalities (Down's syndrome, Trisomy-13, -18); Sex anomalies (Turner's syndrome, Klinefelter's syndrome, Hermaphroditism).
6. Human genetics: Human karyotyping, Genetic disorders due to mutant genes (Huntington's chorea), Inborn errors of metabolism-Pheynylketonuria, alkaptonuria, Sickle cell anemia.

#### **SYSTEM AND CELL PHYSIOLOGY:**

1. Blood and circulation - Blood corpuscles, haemopoiesis, plasma function, blood groups, haemoglobin, haemostasis.
2. Cardiovascular System : Neurogenic, myogenic hearts, cardiac cycle, heart as a pump, neural and chemical regulation of all above.
3. Respiratory system - Transport of gases, exchange of gases, waste elimination, neural and chemical regulation of respiration.
4. Nervous system - Neurons, action potential, Conduction of nerve impulse, synapse, Neurotransmitters.
5. Muscle : Ultra structure and mechanism of muscle contraction.
6. Sense organs – Eye, Ear.
7. Excretory system - Comparative physiology of excretion, urine formation, micturition.
8. Osmoregulation – Osmoregulation in fishes, Hormonal control of osmoregulation.
9. Digestive system - Digestion, absorption, assimilation and egestion.
10. Endocrinology and reproduction - Endocrine glands, basic mechanism of hormone action, hormones and diseases, reproduction in mammals.
11. Chemical bonds (Covalent, Hydrogen and Ionic bonds, Van der waals interactions).
12. Outline classification of organic compounds (carbohydrates, proteins and lipids).
13. Order of protein structure, primary, secondary, tertiary and quaternary; Ramachandran plot.
14. Glycolysis, TCA cycle and their Biomedical importance. Pentose phosphate pathway, Gluconeogenesis. Redox Potentials, Mitochondrial electron transport system, Oxidative phosphorylation.

#### **EVOLUTION:**

1. Origin of life - Modern concepts, theories of Evolution.
2. Isolation, Speciation, Natural Selection.
3. Hardy weinberg' Law.
4. Population Genetics (Gene pool, Gene frequency), Genetic drift and convergent evolution, Adaptive radiation.
5. Evolution of Man.
6. Zoogeographical realms of the world.

#### **DEVELOPMENTAL BIOLOGY:**

1. Speamatogenesis, oogenesis.
2. Fertilization, cleavage, gastrulation formation of germ layers, parthenogenesis.
3. Embryogenesis in vertebrates.
4. Formation and function of foetal membranes.
5. Types of Placenta.
6. Regulation, genetic control of development.
7. Development of Frog and chick.

#### **HISTOLOGY:**

1. Histology of Mammalian tissues and organs - Epithelial, connective, blood, bone, cartilage, skin, stomach, intestine, liver, pancreas, kidney, Testis and Ovary.

**ECOLOGY:**

1. Concept of Ecosystem.
2. Biogeochemical cycles (Carbon, Nitrogen and Phosphorous).
3. Influence of environmental factors on animals, energy flow in Ecosystem, food chains, food web and trophic levels.
4. Community and population ecology. Ecological succession.
5. Environmental pollution-Air, water, land, noise, radioactive, thermal and visual, effects of pollution on ecosystem, prevention of pollution.
6. Wildlife in India-conservation, Chipko movement.
7. Biodiversity-Economic significance, conservation, hot spots of India.

**IMMUNOLOGY:**

1. Cells of the immune system: Lymphoid cells, Mononuclear cells, granulocytic cells, Mast cells.
2. Organs of the immune system - primary and secondary lymphoid organs, lymphatic system.
3. Antigens: Antigenic determinants or epitopes, immunogenicity, Haptens.
4. Innate (Non-specific immunity): Anatomical barriers, phagocytosis, NK cells, interferon.
5. Humoral immunity: Immunoglobulins (fine structure of immunoglobulins and immunoglobulin classes); the complement system, Classical and alternate pathway, inflammation.
6. Cell mediated immunity: Mechanism of cell mediated immunity; Brief account on Antigen presentation, Major histocompatibility complex.
7. Antigen-Antibody interactions: Affinity, Avidity, Cross-reactivity, precipitation reactions, and Agglutination reactions and ELISA.
8. Brief account on immunological Hypersensitivity disorders:
  - a) Tolerance and Autoimmunity
  - b) Transplantation.
  - c) Immunodeficiency diseases - HIV.
  - d) Immunization (Active and passive immunity).

**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 Website (<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 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, 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. If the candidate notices any discrepancy printed on the Hall ticket, as to community, date of birth etc., he/she may immediately bring it to the notice of Commission's officials/Chief Superintendent in the examination centre and necessary corrections can be made in the Nominal Roll, in the Examination Hall against his/her Hall Ticket Number for being verified by the Commission's Office.
- C.2. 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.3. 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.4. 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.5. 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.6. 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.7. Candidates trying to use unfair means shall be disqualified from the selection. No correspondence whatsoever will be entertained from the candidates.
- C.8. 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.9. (a) Wherever the candidates are totally blind, they will be provided a scribe to write the examination and 20 minutes extra time is permitted to them per hour. Eligible candidates are also allowed to bring their own scribe after due intimation to the Commission after duly providing the full identification details of the scribe like name, address and appropriate proof of identification.
- (b) The applicants shall upload the certificate relating to percentage of disability for considering the appointment of scribe in the examination.
- (c) An extra time of 20 minutes per hour is also permitted for the candidates with locomotor disability and CEREBRAL PALSY where dominant (writing) extremity is affected for the extent slowing the performance of function (Minimum of 40% impairment). No scribe is allowed to such candidates.
- (d) The candidate as well as the scribe will have to give a suitable undertaking conforming to the rules applicable.
- C.10. In case the Hall-Ticket is without photo or too small, he/she should affix a passport size photo on Hall-ticket and appear by duly getting attested by Gazetted Officer. He/she shall handover similar photo for each paper to Chief Superintendent for affixing the same on the Nominal Rolls.
- C.11. The candidate will not be admitted to the examination Hall without procedural formalities.
- C.12. The candidate admission to the Examination is provisional, subject to the eligibility, confirmation/satisfaction of conditions laid down in this notification.
- C.13. The candidates 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.14. 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**

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

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



- 59 Sindhollu, Chindollu
- 60 Yatala (Srikakulam Dist. Only) Memo No. 8183/CV-1/2006-10 SW (CV-I) Dept., Dt. 31/03/2008
- 61 Valluvan \* (Chittoor and Nellore Dist. Only) Memo No. 8183/CV-1/2006- 10 SW (CV-I) Dept., Dt. 31/03/2008
- \* As for the Constitution (Scheduled Caste) orders (Second Amendment) Act 2002, Act No. 61 of 2002

**LIST OF SCHEDULED TRIBES**

1. Andh, Sadhu Andh \*
2. Bagata
3. Bhil
4. Chanchu (Chenchwar omitted) \*
5. Gadabas, Boda Gadaba, Gutob Gadaba, Kallayi Gadaba, Parangi Gadaba, Kathera Gadaba, Kapu Gadaba \*
6. Gond, Naikpod, Rajgond, Koitur \*
7. Goudu (in the Agency tracts)
8. Hill Reddis
9. Jatapus
10. Kammara
11. Kattunayakan
12. Kolam, Kolawar \*
13. Konda Dhoras, Kubi \*
14. Konda Kapus
15. Konda Reddis
16. Kondhs, Kodi, Kodhu, Desaya Kondhs, Dongria Kondhs, Kuttiya Konds, Tikiria Khondhs, Yenity Khondhs, Kuvinga \*
17. Kotia, Bentho Oriya, Bartika, Dulia, Holva, Sanrona, Sidhopaiko (Dhulia, Paiko, Putiya- omitted \*)
18. Koya, Doli Koya, Gutta Koya, Kammara Koya, Musara Koya, Oddi Koya, Pattidi Koya, Rajah, Rasha Koya, Lingadhari Koya (Ordinary), Kottu Koya, Bhine Koya, Raj Koya (Goud-omitted \*)
19. Kulia
20. Malis (excluding Adilabad, Hyderabad, Karimnagar, Khammam, Mahabubnagar, Medak, Nalgonda, Nizamabad and Warangal District)
21. Manna Dhora
22. Nayaks (in the Agency tracts)
23. Mukha Dhora, Nooka Dhora
24. Pardhan
25. Porja, Parangi Perja
26. Reddi Dhoras
27. Rona, Rena
28. Savaras, Kapu Savaras, Maliya Savaras, Khutto Savaras
29. Sugalis, Lambadis, Banjara \*
30. Thoti (in Adilabad, Hyderabad, Karimnagar, Khammam, Mahabubnagar, Medak, Nalgonda, Nizamabad and Warangal Districts)
31. Valmiki (in the Scheduled Areas of Vishakapatnam, Srikakulam, Vizianagaram, East Godavari and West Godavari Districts \*)
32. Yenadis, Chella Yenadi, Kappala Yenadi, Manchi Yenadi, Reddi Yenadi \*
33. Yerukulas, Koracha, Dabba Yerukula, Kunchapuri Yerukula, Uppu Yerukula \*
34. Nakkala Kurivikaran (Nakkala – A.P. Gazette, Part – III (B) Central Acts ordinance and Regulations Issue No. 05 Dt. 02/10/2003 )
35. Dhulia, Paiko, Putiya (in the districts of Vishakapatnam, Vizianagaram \*)

\* As for the Scheduled Castes and Scheduled Tribes Orders (Amendment) Act 2002, Act No. 10 of 2003

**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, Vadabaliya, 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 (Khatiri)
15. Perika (Perikabaliya, 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 Natakavallu. (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 Baliya, (Kalavanthulu) Ganika (amended vide G.O.Ms. No. 20, BCW(P2) Dept., Dt. 19.07.1994)
15. Krishanabaliya (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
24. deleted vide G.O. Ms.No. 16 Backward Classes Welfare (C2) Dept., dt. 19/02/2009
25. Passi
26. Rangrez or Bhavasarakshtriya
27. Sadhuchetty
28. Satani (Chattadasrivaishnava)
29. 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).
30. Turupukapus or Gajula kapus {... the words "of Srikakulam, 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)
31. Uppara or Sagara
32. Vanjara (Vanjari)
33. Yadava (Golla)
34. 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)
35. Sadara, Sadaru of Anantapur Dist. Only vide G.O.Ms.No. 11 BCW (C-2) Dept., Dt. 9-04-2008
36. Arava of Srikakulam District only. Included in vide G.O. MS. No. 24 BC W (C2) Dept., Dt. 4/07/08
37. 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/Lingabaliya, 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, Singamvally, Achchupanivally, 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, Fhakhir Budbudki, Ghanti, Fhakhir, Ghanta Fhakhiru, Turaka Budbudki, Derves, Fakeer
5. Garadi Muslim, Garadi Saibulu, Pamulavally, Kani-Kattuvally, Garadollu, Garadiga.
6. Gosangi Muslim, Phakeer Sayebulu
7. Guddi Eluguvally, Elugu Bantuvally, Musalman Keelu Gurrallavally
8. Hajam, Nai, Nai Muslim, Navid
9. Labbi, Labbai, Labbon, Labba
10. Pakeerla, Borewale, Deraphakhiru, 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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