TELANGANA STATE PUBLIC SERVICE COMMISSION: HYDERABAD
NOTIFICATION NO. 22/2017, Dt.02/06/2017

DEGREE COLLEGE LECTURERS IN RESIDENTIAL DEGREE COLLEGES(WOMEN)
(GENERAL RECRUITMENT)

PARA – I:
1) Applications are invited Online from qualified women candidates through the proforma Application to be made available on Commission’s WEBSITE (www.tspsc.gov.in) to the post of Degree College Lecturers in Residential Degree Colleges(women).
   i. Submission of ONLINE applications from Dt. 06/06/2017
   ii. Last date for submission of ONLINE applications Dt. 24/06/2017
   iii. Hall Tickets can be downloaded 07 days before commencement of Examination.
   iv. The question paper of Preliminary (Screening Test) will be supplied in English version only. The question paper of Main examination will be supplied in English version only except languages.

2) The Preliminary (Screening Test) is of Objective Type and is likely to be held on Dt.16/07/2017 and the Main Examination (Objective Type) is likely to be held on 12 OR 13/08/2017. The Commission reserves the right to conduct the Examination either COMPUTER BASED RECRUITMENT TEST (CBRT) or OFFLINE OMR based Examination of objective type.

Before applying for the posts, candidates shall register themselves as per the One Time Registration (OTR) through the Official Website of TSPSC. Those who have registered in OTR already, shall apply by login to their profile using their TSPSC ID and Date of Birth as provided in OTR.

IMPORTANT NOTE: Candidates are requested to keep the details of the following documents ready while uploading their OTR Applications.
   i. Aadhar number
   ii. Educational Qualification details i.e., SSC, INTERMEDIATE, DEGREE, POST GRADUATION etc. and their Roll numbers, Year of passing etc.
   iii. Community/ Caste Certificate obtained from Mee Seva/ E Seva i.e., Enrollment number and date of issue for uploading in OTR.

3) The candidates who possess requisite qualification may apply online by satisfying themselves about the terms and conditions of this recruitment. The details of vacancies are given below:-

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the Post</th>
<th>No. of Vacancies</th>
<th>Age as on 01/07/2017 Min. Max.</th>
<th>Scale of Pay Rs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Degree College Lecturers in Mahatama Jothiba Phule Telangana Backward Classes Welfare Residential Degree Colleges(Women).</td>
<td>36</td>
<td>18-44*</td>
<td>40,270-93,780</td>
</tr>
<tr>
<td>2</td>
<td>Degree College Lecturers in Telangana Social Welfare Residential Degree Colleges(Women).</td>
<td>510</td>
<td></td>
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</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>546</strong></td>
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<td></td>
</tr>
</tbody>
</table>

(The Details of Vacancies department wise i.e., Community and Gender wise (General / Women) may be seen at Annexure-I.)

IMPORTANT NOTE: The number of vacancies are subject to variation on intimation being received from the appointing authority

4) EDUCATIONAL QUALIFICATIONS:
   Applicants must possess the qualifications from a recognized University/ Institution as detailed below or equivalent thereto as specified in the relevant Bye Laws/ Service Regulations, indented by the Residential Educational Institutions Societies as on the Date of Notification.
<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the Post</th>
<th>Educational Qualifications</th>
</tr>
</thead>
</table>
| 1      | Degree College Lecturers in Mahatama Jothiba Phule Telangana Backward Classes Welfare Residential Degree Colleges (Women). | **Academic Qualifications**  
   i) Good academic record in Post Graduation in the relevant subject (as shown in Annexure-A) with A minimum of 55% marks of an equivalent Grade of B in the 7 point scale with letter Grades O, A, B, C, D, E and F obtained from the Universities recognized in India.  
   ii) Should have passed National Eligibility Test (NET) for lecturers conducted by UGC/CSIR or similar Test accredited by the UGC or SLET conducted by PSC/Universities of the State.  
   iii) If a candidate possesses Ph.D., or equivalent is exempted from passing National Eligibility Test (NET) for lecturers conducted by UGC/CSIR or similar Test accredited by the UGC or SLET conducted by the PSC/Universities of the State.  
| 2      | Degree College Lecturers in Telangana Social Welfare Residential Degree Colleges (Women). | **Note:**  
   1. In case of candidates belonging to SC/ST/Differently abled category, the Minimum % of marks shall be 50% (instead of 55%).  
   2. A relaxation of 5% marks may be provided (from 55% to 50%) to the Ph.D. Degree holder who passed Master Degree prior to 19-09-1991.  

**ANNEXURE–A**  
**SUBJECTS FOR THE POST OF DEGREE COLLEGE LECRURERS**  
**Subjects in PG / Graduation**  
1. **English:** M.A. English or its equivalent Degree  
2. **Telugu:** M.A. Telugu or its equivalent Degree  
3. **Maths:** M.Sc., Mathematics or its equivalent Degree  
4. **Physics:** M.Sc Physics or its equivalent Degree  
5. **Chemistry:** M.Sc Chemistry or its equivalent Degree  
6. **Statistics:** M.Sc Statistics or its equivalent Degree  
7. **Computer Science:** M.Sc Computer Science/ MCA or its equivalent Degree  
8. **Botany:** M.Sc., Botany or its equivalent Degree  
9. **Zoology:** M.Sc. Zoology or its equivalent Degree  
10. **Micro-Biology:** M.Sc. Micro-Biology or its equivalent Degree  
11. **Electronics:** M.Sc. Physics(with Electronics specialization) or its equivalent Degree  
12. **Geology:** M.Sc. Geology or its equivalent Degree  
13. **Genetics:** M.Sc. Genetics or its equivalent Degree  
14. **Bio-Technology:** M.Sc. Bio-Technology or its equivalent Degree  
15. **Food Science:** M.Sc. Food Science/Technology/Science and Technology or its equivalent Degree
16. **Bio-Chemistry:** M.Sc. Bio-Chemistry or its equivalent Degree
17. **Nutrition & Dietetics:** M.Sc. Applied Nutrition or its equivalent Degree
18. **History:** M.A. History or its equivalent Degree
19. **Economics:** M.A. Economics or its equivalent Degree
20. **Political Science:** M.A. Political Science or its equivalent Degree
21. **Public Administration:** M.A. Public Administration or its equivalent Degree
22. **Journalism:** M.A. Journalism or its equivalent Degree
23. **Psychology:** M.A. Psychology or its equivalent Degree
24. **Sociology:** M.A. Sociology or its equivalent Degree
25. **Commerce:** M.Com or its equivalent Degree
26. **Business Administration:** MBA or its equivalent Degree

5) **AGE:** Minimum 18 years & Maximum 44* years. The age is reckoned as on 01/07/2017 (Rule- 12(1)(a)(v) of State and Subordinate Service Rules).

 Minimum Age (18 years): A Candidate should not be born after 01/07/1999.

 Maximum Age (44 years): A candidate should not be born before 02/07/1973.

 The Upper Age limit will be relaxed as per Rules and will be calculated on the above lines.

 *As per G.O. Ms. No. 329 GA(Ser.A) Dept., Dt. 27/07/2015 read with G.O. Ms. No. 264 GA(Ser.A) Dept. Dated: 26-07-2016, the upper age limit is raised up to 10 years.

 N.B.: 1) No person shall be eligible if he/she is less than 18 years of age.
 2) No person shall be eligible if he/she crossed 58 years of age (Superannuation age).

 **Age Relaxations:** The upper age limit prescribed above is however relaxable in the following cases:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Category of candidates</th>
<th>Relaxation of age permissible</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Retrenched temporary employees in the State Census Department with a minimum service of 6 months.</td>
<td>3 Years</td>
</tr>
<tr>
<td>2</td>
<td>Telangana State Government Employees (Employees of TSRTC, Corporations, Municipalities etc. are not eligible).</td>
<td>5 Years based on the length of regular service.</td>
</tr>
<tr>
<td>3</td>
<td>Ex-Service men</td>
<td>3 years &amp; length of service rendered in the armed forces.</td>
</tr>
<tr>
<td>4</td>
<td>N.C.C.(who have worked as Instructor in N.C.C.)</td>
<td>3 Years &amp; length of service rendered in the N.C.C.</td>
</tr>
<tr>
<td>5</td>
<td>SC/ST and BCs</td>
<td>5 Years</td>
</tr>
<tr>
<td>6</td>
<td>Physically Handicapped persons</td>
<td>10 Years</td>
</tr>
</tbody>
</table>

6) **(a) FEE:** (Remittance of Fee) Each applicant must pay Rs. 200/- (RUPEES TWO HUNDRED ONLY) towards Online Application Processing Fee. This apart, the applicants have to pay Rs. 120/- (RUPEES ONE HUNDRED AND TWENTY ONLY) towards Examination Fee. However, the following category of candidates belonging to Telangana State only are exempted from payment of Examination fee.

 a) SC, ST, BC & PH.
 b) Unemployed applicants in the age group of 18 to 44 years (They have to submit declaration at an appropriate time to the Commission that they are unemployed).
N.B.: BC's, SC's and ST's belonging to other states are not exempted from payment of Application processing Fee and Examination Fee and they are not entitled for any kind of reservation.

b) Mode of Payment of Fee:
The Fee mentioned at Para-I(6)(a) is to be paid online through SBI ePay duly following online instructions once the application form details are submitted by filling TSPSC ID, date of birth and other particulars. The fee once remitted, shall not be refunded or adjusted under any circumstances. Failure to pay the examination fee, application fee, wherever applicable will entail total rejection of application. The list of Banks providing service for the purpose of online remittance of fee is given in ANNEXURE – II.

PARA-II: CENTRES FOR THE WRITTEN EXAMINATION:
1) The Screening Test will be held at HYDERABAD (including HMDA Jurisdiction) only or all erstwhile District head quarters. However, the Commission reserves the right either to increase or decrease the number of Centres.
2) The Main (Objective Type)Examination will be held at HYDERABAD (including HMDA Jurisdiction) only.
3) However, the Commission reserves the right to abolish / create new centre or centres for administrative reasons. Request for change of the centre will not be entertained.

PARA-III: HOW TO APPLY:
A) HOW TO UPLOAD THE APPLICATION FORM:
(i) The Applicants have to read the User Guide for Online Submission of Applications and then proceed further.

I STEP: The Candidate has to visit the WEBSITE http://www.tspsc.gov.in and fill the OTR application if not registered earlier to obtain TSPSC ID. While filling the same, the candidates have to ensure that there are no mistakes in it. The Commission bears no responsibility for the mistakes, if any, made by the candidates.

II STEP: The candidates have to visit the website http://www.tspsc.gov.in to submit Application and Click on the Link with Notification Number and Name, provide TSPSC ID and Date of Birth to proceed further.
Candidate has to verify the details fetched from various databases pertaining to qualification, caste, Aadhar etc, and displayed on the screen. If the displayed details are correct he/she has to click Yes on confirm button. If any details are not displayed or need to be changed, he/she should click No on confirm button. If details are not displayed a text box will open and candidate has to feed the details manually. Required documents have to be uploaded by clicking the upload button. In addition to the details obtained from OTR database, Notification specific details such as Examination Centre opted, required qualification, university details, eligibility and accepting declarations etc. are to be filled by the candidate. Preview and Edit facility is available to make changes and submit for proceeding to Next step of making online payment of fee.

III STEP:-Immediately on entering the above details, the applicant will get payment gateway of SBI ePay.

IV STEP:-The applicant should pay the prescribed fee as specified through any of the four modes of payment online. Separate instructions have to be followed for each mode of payment.

V STEP:-After payment of fee, the PDF Application will be generated which contains the particulars furnished by the candidates. The ID No in the PDF Application form has to be quoted for future reference/correspondence.

i) Candidate shall note that, the details available with OTR database at the time of submitting the application will be considered for the purpose of this notification. If, any changes are made by the candidate to OTR database at a later date will not be considered for the purpose of this Notification.

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

iii) The applicants should be willing to serve anywhere in Telangana State.

iv) For any Technical problems related to Online submission and downloading of Hall-Tickets please contact 040-23120301 or 040-23120302(Call Time: 10.30 A.M to 1.00 P.M & 1.30 P.M to 5.30 P.M) or mail to helpdesk@tspsc.gov.in
NOTE:
1. The Commission is not responsible, for any discrepancy in Bio-data particulars while submitting the application form through Online. The applicants are therefore, advised to strictly follow the instructions and User guide in their own interest before submitting the application.
2. The particulars furnished by the applicant in the Application Form will be taken as final, and data entry is processed, based on these particulars only by Computer. Candidates should, therefore, be very careful in Uploading / Submitting the Application Form Online.
3. Incomplete/incorrect application form will be summarily rejected. The information if any furnished by the candidate subsequently in any form will not be entertained by the Commission under any circumstances. Applicants should be careful in filling-up the application form and submission. If any lapse is detected during the scrutiny, the candidature will be rejected even though he/she comes through the final stage of recruitment process or even at a later stage.
4. Before Uploading/Submission of Application Form, the Candidates should carefully ensure his/her eligibility for this examination. No relevant column of the application form should be left blank, otherwise application form will not be accepted.

PARA- IV GENERAL PROVISIONS
1. Applicant must compulsorily fill-up all relevant columns of application and submit application through website only. The particulars made available in the website shall be processed through computer and the eligibility decided in terms of notification.
2. The applications received online in the prescribed proforma available in the website and within the time shall only be considered and the Commission will not be held responsible for any kind of discrepancy.
3. Applicants must upload his/her own scanned photo and signature through J.P.G format.
4. The applicants should not furnish any particulars that are false, tampered, fabricated or suppress any material information while making an application through website.
5. All the essential certificates issued by the competent authority of Telangana State shall compulsorily be kept with the applicants to produce as and when required to do so. Failure to produce the required certificates on the day of verification will lead to disqualification.
6. Important – The claim of the candidates with regard to the date of birth, educational / technical qualifications, experience and community are accepted only provisionally on the information furnished by them in their application form and is subject to verification and satisfaction of the Commission. Mere admission to any test or interview or inclusion of the name of a candidate in a Merit List will not confer on the candidate any right for appointment. The candidature is therefore, provisional at all stages and the Commission reserve the right to reject candidature at any stage of the selection even after the advice has been made.
7. This Recruitment is entrusted to TSPSC along with Finance Clearance vide G.O. Ms. No. 46 Finance (HRM-II) Department, Dt. 07/04/2016 and G.O. Ms. No. 94 Finance (HRM-VII) Department, Dt. 03/08/2016.

The following certificates must be kept ready by the candidates for the purpose of verification and also at the time of making Online application.

- Aadhar Card.
- Proof of Educational Qualifications.
- Date of Birth Certificate / S.S.C
- School Study Certificate
- Declaration by the Unemployed (For claiming exam fee exemption)
- No Objection Certificate from Employer (if anywhere employed)

The following Certificates should be obtained from Govt. of Telangana State in prescribed proforma for the purpose of verification.

- Community Certificate.
- Non-Creamy Layer Certificate as per Form- VIIB / Creamy Layer Certificate as per Form- VIIC.
- Certificate of Residence / Nativity (where the Candidates not studied in School / Private Study)
The following Certificates (whichever is applicable) should be obtained from Competent Medical authority for the purpose of verification.

iv. a) Medical Certificate for the Blind
   b) Certificate of Hearing Disability and Hearing Assessment
   c) Medical Certificate in respect of Orthopedically Handicapped Candidates

PARA-V:- IMPORTANT LEGAL PROVISIONS GOVERNING THE RECRUITMENT PROCESS:

1. **Vacancies**: The recruitment will be made to the vacancies notified before the examination only. There shall be no waiting list as per G.O. Ms. No. 81 General Administration (Ser.A) Department, Dated 22/02/1997. If additional vacancies are reported by the Government an addendum to that effect will be issued.
   
   Note: The vacancies reported by the Residential Educational Institutions are in Degree Colleges (Women). As such all these vacancies are earmarked for women candidates only.

2. **Recruitment**: The recruitment will be processed as per the Notification and also as per the Byelaws / Service Regulations, B.O.G recommendations of the Residential Educational Institution Societies and orders / Instructions issued by the Government and also as decided by the Commission from time to time.

3. **Constitutional Provisions**: The Commission is empowered under the provisions of Article 315 and 320 of the Constitution of India read with relevant laws, rules, regulations and executive instructions and all other enabling legal provisions in this regard to conduct examination for appointment to the posts notified herein, duly following the principle of order of merit as per Rule 3d(ix)(a) of the TSPSC Rules of procedure read with reference to relevant statutory provisions and ensuring that the whole recruitment and selection process is carried out with utmost regard to maintain secrecy and confidentiality so as to ensure that the principle of merit is followed. A candidate shall be disqualified for appointment, if he himself / she herself or through relations or friends or any others has canvassed or endeavored to enlist for his candidature, extraneous support, whether from official or non-official sources for appointment to this service.

4. **State Cadre Post**: The post is identified as State Cadre Post, hence reservation for Local Candidates is not applicable

5. **Employed**: The persons already in Government Service/ Autonomous bodies/ Government aided institutions etc., whether in permanent or temporary capacity or as work charged employees are required to inform in writing to the Head of Office / Department, as the case may be and required to submit the "No objection" from the concerned Head of Office / Department to the Commission as and when required to do so.

6. **Penal Action**: The Commission is also empowered to invoke the penal provisions of the A.P. Public Examinations (Prevention of Malpractices and Unfair means) Act 25/97 for matters connected therewith or incidental there to and as per the Rules of Procedure of TSPSC published in Telangana Gazette No: 60 dated 28/12/2015 in respect of this Notification.

7. **Caste & Community**: Community Certificate issued by the competent authority (obtained from Government of Telangana State) in terms of G.O.Ms No. 58, SW (J) Dept., dt: 12/5/97 read with G.O. Ms. No. 5 Scheduled Castes Development (POA.A2) Dept., Dt. 08/08/2014, G.O. Ms. No. 11 Scheduled Castes Development (POA.A2) Dept., Dt. 17/09/2014 and G.O. Ms. No. 2 Scheduled Castes Development (POA.A2) Dept., Dt. 22/01/2015 should be submitted at appropriate time in respect of SC & ST Candidates. In respect of candidates belonging to Backward Classes are required to produce Community Certificate (BC-A, BC-B, BC-C, BC-D& BC-E) from Competent Authority i.e., from Tahsildars in the State of Telangana not below the rank of Deputy Tahsildar through e-seva/ mee-seva(G.O. Ms. No. 16 BCW(OP) Dept., Dt. 11/03/2015) and orders and instructions issued by the Government from time to time. As per General Rules for State and Subordinate Service Rules, Rule -2(28) Explanation: No person who professes a religion different from Hinduism shall be deemed a member of Schedule Caste.

8. **Reservation**: (i)The Reservation and eligibility in terms of General Rule 22 & 22 (A)(3) of State and Subordinate Service Rules are applicable.
   (ii) Reservation to Disabled persons is subject to their eligibility to any of the above category of posts and shall be subject to Telangana State and Subordinate
Service Rules governing the posts. The required extent of deformity and the genuineness of the Medical Certificate and in the case of ambiguity or doubt, the same shall be referred to the Appellate Medical Boards as per the instructions of the Government.

(iii) As per G.O.Rt.No.1274, G.A (Ser-B) Department, Dated 04-06-2016:
   (a) Women staff shall only be recruited in all cadres of posts in the Schools/Institutions meant for Girls, in terms of Sub-Rule (3) of rule 22-A of Telangana State and Subordinate Service Rules.
   (b) Separate rosters in each cadre shall be maintained for Girls Schools / Institutions.

(iv) Reservation to BC-E group will be subject to the adjudication of the litigation before the Honorable Courts including final orders in Civil Appeal No: (a) 2628-2637 of 2010 in SLP. No. 7388-97 of 2010, dated. 25/03/2010 and orders from the Government.

9. **Distance Education**: The Candidates who have obtained Degrees through Open Universities / Distance Education mode are required to have recognition by the University Grants Commission / AICTE / Distance Education Council as the case may be. Unless such Degrees had been recognised by the relevant Statutory Authority, they will not be accepted for purpose of Educational Qualification. The onus of Proof of recognition by the relevant Statutory Authority that their Degrees / Universities have been recognised, rests with the Candidate.

**PARA-VI**: Reservation to the Local candidates is not applicable as the selection will be made on state-wide merit and allotment of zones will be made as per preference given by the candidates.

The following are the Present Zones in the Telangana State:

- **V** Adilabad, Karimnagar, Warangal and Khammam. (ADB, KRMN, WGL, KMM)
- **VI** Hyderabad, Ranga Reddy, Nizamabad, Mahaboobnagar, Medak and Nalgonda. (HYD, RRD, NZB, MBNR, MDK, NLG)

**PARA-VII: SCHEME OF EXAMINATION**: The Scheme & Syllabus for the examination has been shown in **ANNEXURE-III**.

**PARA-VIII: PROCEDURE OF SELECTION**: The selection to these posts will be based on the Scheme & Syllabus shown at Annexure-III

THE FINAL SELECTION OF THE POST WILL BE BASED ON MARKS SECURED IN THE MAIN EXAMINATION EITHER ONLINE OR OMR BASED AND INTERVIEW / DEMONSTRATION/VIVA-VOCE MARKS PUT TOGETHER.

1. The applicants will be subjected to a “Preliminary (Screening Test)” of Objective Type for the purpose of short listing the number of candidates to be admitted to the main examination (Objective Type) and the marks secured by the candidates in the preliminary (Screening Test) will not be counted for the purpose of final selection as preliminary examination is only a qualifying examination in terms of G.O.Ms.229, GA(Ser.A) Dept., dated 30-06-2016 read with G.O.Ms.No.316, GA(Ser.A) Dept., dated 17-08-2016.

2. The candidates will be picked up for the main examination based on their performance in preliminary examinations in the ratio of 1:2 in their respective categories duly following the Rule of reservation.

3. Those candidates who qualify in the Main Examination (Objective Type) in order of merit will be called for in 1:2 ratio for verification of Certificates and Interview/Demonstration /viva-voce Community and Category wise for the vacancies available. The minimum qualifying marks for Selection are OCs 40%, BCs 35% SCs, STs and PHs 30%. The minimum qualifying marks are relaxable in the case of SC/ST/BC/PH at the discretion of the Commission.

4. The selection to the post will be based on marks secured in the main examination and Interview/Demonstration /viva-voce marks put together.
5. The candidates will be selected and allotted to the Residential Educational Institutions Societies in Telangana State as per their rank in the merit list and as per zonal preference for allotment of candidates against vacancies and for the vacancies available. Selection will be made on State wide merit and allotment of zones will be made as per preference given by the candidates against the vacancies.

N.B.: Mere securing minimum qualifying marks does not vest any right in a candidate for being considered for selection.

6. The appearance in all papers at the Written Examination as per rules is compulsory. Absence in any paper/papers will automatically render his candidature as disqualified.

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

8. While the Commission calls for preference of candidates in respect of posts/R.E.I. Societies etc., in the application form, it is hereby clarified that the said preferences are only indicative for being considered to the extent possible but not binding or limiting the Commission’s powers enjoyed under Article 315 and 320 of the Constitution of India. Therefore, the Commission has the power to assign a successful candidate to any of the notified posts for which he is considered by them to be qualified and eligible, subject to fulfilling the selection criterion.

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

PARA-IX: DEBARMENT:
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 for five years from appearing for any of the examinations conducted by the commission, and summarily rejection of their candidature for this recruitment.


b) 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 and as may be decided by the Commission.

c) Any candidate is or has been found impersonating or procuring impersonation by any person or resorting to any other irregular or improper means in connection with his / her candidature for selection or obtaining support of candidature by any means, such a candidate may in addition to rendering himself/ herself liable to criminal prosecution, will be debarred permanently from any exam or selection held by the Service Commission in the country.

d) MEMORANDUM OF MARKS - Memorandum of Marks will be issued on payment of Rs.200/- (Rupees Two Hundred Only) through Online Payment in favour of the Secretary, T.S. Public Service Commission, Hyderabad. Request for Memorandum of Marks from candidates, will be entertained after one month from the date of publication of the final results in TSPSC Website. The Memorandum of Marks will be issued to the candidates for a period of 90 days only. Request for revaluation or recounting will not be undertaken under any circumstances. Invalid, disqualified, ineligible candidates will not be issued any Memorandum of Marks and fees paid by such candidates, if any, will be forfeited to Government account, without any correspondence in this regard.
In case of Off-line examination, if any candidate fails to mark the Booklet Series, Roll Number etc., in the OMR Answer Sheet, the Commission reserves the right to invalidate such Answer Sheets as Answer Sheets are valued by Optical Mark Scanner. No request for reconsideration of such rejected/invalidated cases will be entertained under any circumstances whatsoever.

PARA-X: - Please read the following Annexures appended to the Notification before filling the application form.
   i) Breakup of Vacancies  
   ii) Payment gateway  
   iii) Scheme and Syllabus  
   iv) Instructions to the Candidates  
   v) List of Communities  

PARA XI: SPECIAL INSTRUCTIONS TO CANDIDATES:
Candidates are directed to follow the Commission’s Website (www.tspsc.gov.in) regularly to know the latest developments of this Recruitment and any changes/ Modifications/ Addendum/ Corrigendum, dates of Examination, calling of candidates for verification of Certificates/ Interviews/ Results etc. Candidates are advised to go through the Instructions to Candidates enclosed to this Notification at Annexure-IV.

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

HYDERABAD                  Sd/-
DATE: 02/06/2017            SECRETARY
## ANNEXURE-I
### GENERAL RECRUITMENT

**DEGREE COLLEGE LECTURERS IN MJPTBC AND TELANGANA SOCIAL WELFARE RESIDENTIAL EDUCATIONAL INSTITUTIONS SOCIETY FOR WOMEN**

**Break-up of Vacancies**

<table>
<thead>
<tr>
<th>Society</th>
<th>Subject</th>
<th>State /Zone</th>
<th>OC</th>
<th>SC</th>
<th>ST</th>
<th>BC-A</th>
<th>BC-B</th>
<th>BC-C</th>
<th>BC-D</th>
<th>BC-E</th>
<th>VH</th>
<th>Grand Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>MJPTBCWREIS</td>
<td>Telugu</td>
<td>Zone V</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>02</td>
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<td><strong>TOTAL</strong></td>
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<td></td>
<td>254</td>
<td>80</td>
<td>33</td>
<td>40</td>
<td>32</td>
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<td>8</td>
<td>28</td>
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<td><strong>510</strong></td>
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### ANNEXURE-II

List of Banks for making payment through SBI ePay.

<table>
<thead>
<tr>
<th>LIST – A</th>
<th>LIST – B</th>
<th>LIST – C</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. State Bank of Hyderabad</td>
<td>11. ING Vysya Bank</td>
<td></td>
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<tr>
<td>7. Vijaya Bank</td>
<td>15. Tamilnadu Mercantile Bank</td>
<td></td>
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<tr>
<td>8. City Union Bank</td>
<td>16. DCB Bank</td>
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</tr>
<tr>
<td>18. Punjab &amp; Sind Bank</td>
<td>19. IDBI Bank</td>
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<tr>
<td>19. Punjab National Bank</td>
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<tr>
<td>20. Indusind Bank</td>
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<tr>
<td>21. Syndicate Bank</td>
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<tr>
<td>22. ICICI Bank</td>
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<tr>
<td>23. Bank of Maharashtra</td>
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<tr>
<td>24. Canara Bank</td>
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<tr>
<td>25. Corporation Bank</td>
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<tr>
<td>26. Central Bank of India</td>
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<tr>
<td>27. Deutsche Bank</td>
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<tr>
<td>28. Dhanalaxmi Bank</td>
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<td>29. KarurVysya Bank</td>
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<tr>
<td>30. South Indian Bank</td>
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<tr>
<td>31. Tamilnadu Mercantile Bank</td>
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<td>32. HDFC Bank</td>
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<td>33. Vijaya Bank</td>
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<tr>
<td>34. Indian Bank</td>
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<td></td>
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<tr>
<td>35. United Bank of India</td>
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<tr>
<td>36. Syndicate Bank</td>
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<tr>
<td>37. Kotak Bank</td>
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</tbody>
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<tr>
<th>CHANNEL</th>
<th>AMOUNT RS.</th>
<th>PRICING IN RS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet Banking</td>
<td>All amounts</td>
<td>Rs.3/-per transaction +Taxes</td>
</tr>
<tr>
<td>All other Banks</td>
<td>List-A (21 Banks)</td>
<td>All amounts</td>
</tr>
<tr>
<td>Credit card</td>
<td>Up to 2000/-</td>
<td>0.75 % of the transaction amount + Taxes</td>
</tr>
<tr>
<td></td>
<td>2001/- &amp; above</td>
<td>1.00% of the transaction +Taxes</td>
</tr>
<tr>
<td>All Banks ( Master/Mastreo/Visa/Rupay )</td>
<td>All amounts</td>
<td>1.00% of transaction amount + Taxes</td>
</tr>
<tr>
<td>IMPS – Mobile payments</td>
<td>All Amounts</td>
<td>Rs. 7/- of the transaction Amount + Taxes</td>
</tr>
</tbody>
</table>
ANNEXURE-III

Scheme and Syllabus for the post of Degree Lecturers in Residential Educational Institution Societies

Preliminary (Screening Test)

Scheme of Examination

<table>
<thead>
<tr>
<th>Written Examination (Objective Type)</th>
<th>No. of Questions</th>
<th>Duration (Minutes)</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper General Studies, General Abilities and Basic Proficiency in English</td>
<td>150</td>
<td>150</td>
<td>150</td>
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</tbody>
</table>

Syllabus

Paper: General Studies, General Abilities and Basic Proficiency in English

Section-I: General Studies
2. Indian Constitution; Indian Political System; Governance and Public Policy.
3. Social Exclusion; Rights issues such as Gender, Caste, Tribe, Disability etc.and inclusive policies.
4. Society Culture, Civilization Heritage, Arts and Literature of India and Telangana
5. General Science; India’s Achievements in Science and Technology
7. Economic and Social Development of India and Telangana.
8. Socio-economic, Political and Cultural History of Telangana with special emphasis on Telangana Statehood Movement and formation of Telangana state.

Section-II: General Abilities
10. Moral Values and Professional Ethics in Education.
11. Teaching Aptitude

Section – III: Basic Proficiency in English

i) School Level English Grammar:
   Articles; Tense; Noun & Pronouns; Adjectives; Adverbs; Verbs; Modals; Subject-Verb Agreement; Non-Finites; Reported Speech; Degrees of Comparison; Active and Passive Voice; Prepositions; Conjunctions; Conditionals.

ii) Vocabulary:
   Synonyms and Antonyms; Phrasal Verbs; Related Pair of Words; Idioms and Phrases; Proverbs.
iii) Words and Sentences:

Use of Words; Choosing Appropriate words and Words often Confused; Sentence Arrangement, Completion, Fillers and Improvement; Transformation of Sentences; Comprehension; Punctuation; Spelling Test; Spotting of Errors.
Main Examination Scheme for the post of Degree Lecturers in Residential Educational Institution Societies

<table>
<thead>
<tr>
<th>Written Examination (Objective Type)</th>
<th>No. of Questions</th>
<th>Duration (Minutes)</th>
<th>Marks</th>
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<tbody>
<tr>
<td>Paper</td>
<td>Subject Discipline Knowledge/ Concerned Subject (P.G. Level)</td>
<td>150</td>
<td>150</td>
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<tr>
<td>Interview/ Demonstration /viva-voce</td>
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<td>Total</td>
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Concerned Subjects are:

1. Telugu
2. English
3. Mathematics
4. Physics
5. Chemistry
6. Botany
7. Zoology
8. Micro biology
9. Bio-Chemistry
10. History
11. Economics
12. Political Science
13. Commerce
14. Computer Science
15. Statistics
16. Genetics
17. Geology
18. Nutrition & Dietetics
19. PHYSICS (with Electronics Specialization)
20. Psychology
22. Sociology
23. Communication and Journalism
24. Business Administration
25. Public Administration.
26. Food Science

**NOTE:**
1. PHYSICS (with Electronics Specialization) syllabus for the post of Electronics.
2. Communication and Journalism syllabus for the Post of Journalism.
Main Examination Syllabus for the post of Degree Lecturers in Residential Educational Institution Societies

1. Paper-Telugu

Paper: తెలుగు
Main Examination Syllabus for the post of Degree Lecturers in Residential Educational Institution Societies

2. Paper: English

I. Genres, Movements, Schools, Concepts.
- Structuralism, Poststructuralism, Feminism, Postcolonialism, Diaspora, Race Gender and Caste.
- English Literary Criticism from Philip Sydney to Matthew Arnold
- New Criticism, Formalism, Archetypal criticism, New Historicism, Psychoanalytical criticism, Reader response criticism.
- Literary Genres: Poetry, Fiction, Prose, Drama (origins and development, elements, forms, types)

II. Writers and Texts
- Christopher Marlowe: Doctor Faustus
- William Shakespeare: Hamlet
- John Milton: Paradise Lost-Book 1
- Robert Browning: “My Last Duchess”, “Andrea del Sarto”
- Thomas Hardy: Tess of the d’Urbervilles
- TS Eliot: The Waste Land
- G.B. Shaw: Saint Joan
- Virginia Woolf: “A Room of One’s Own”
- William Golding: Lord of the Flies
- Walt Whitman: “When Lilacs Last in the Dooryard Bloom’d,” “Crossing Brooklyn Ferry”
- Arthur Miller: Death of a Salesman
- Toni Morrison: Beloved
- Mulk Raj Anand: Untouchable
- Kamala Das: “An Introduction”, “The Old Playhouse”
- Girish Karnad: Hayavadana
- Salman Rushdie: Midnight’s Children
- Chinua Achebe: Things Fall Apart
- Margaret Atwood: Edible Woman
- Derek Walcott: Dream on Monkey Mountain

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) Teaching literature.
4. Testing and Evaluation: (Principles, Types, Objectives of testing and evaluation)
5. Phonetics and Phonology; Syntax and Structure.

IV. Literary comprehension-(Excerpts from poetry and prose for comprehension)
Main Examination Syllabus for the post of Degree Lecturers in Residential Educational Institution Societies

3. Paper: Mathematics

I. Real Analysis

II. Metric Spaces
Metric spaces – Completeness- Compactness- Connectedness – Continuity and Uniform continuity of a function from one metric space into another-Topological Spaces – Bases and Subbases – Continuous functions

III. Elementary Number Theory
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- Homomorphisms-Isomorphism Theorems-Permutation groups- Cyclic groups- Cayley’s theorem. Sylow’s theorems- Their applications

V. Rings and Fields

VI. Vector Spaces

VII. Functional Analysis
Normed Linear Spaces- Banach Spaces -Inner Product Spaces- Hilbert Spaces-Linear Operators- Linear Functionals- Open Mapping Theorem- Closed Graph Theorem- Uniform Boundedness theorem- Hahn–Banach Theorem

VIII. Theory of Matrices

IX. Complex Analysis

X. Ordinary Differential Equations
Ordinary Differential Equations (ODE) of First order and First degree – Different methods of solving them – Exact Differential equations and Integrating factorsODE of First order and Higher degree – Equations solvable for p, x and y – Clairaut’s equations
XI. Partial Differential Equations
Formation of Partial Differential Equations (PDE) – Lagrange and Charpit’s methods for solving first order PDEs – Cauchy problem for first order PDEs – Classification of Second Order PDE’s – General Solution of Higher Order PDEs with Constant Coefficients

XII. Solid Geometry
The Plane- Right line- Sphere- Cones and Cylinders
Main Examination Syllabus for the post of Degree Lecturers in Residential Educational Institution Societies

4. Paper: Physics

I. Mathematical Methods of Physics


II. Classical Mechanics


III. Electromagnetic Theory


IV. Quantum mechanics


V. Thermodynamics and statistical Physics


VI. Electronics

Semiconductor devices (diodes, junctions, transistors, field effect devices, homo- and hetero junction devices), device structure, device characteristics, frequency dependence and applications. Optoelectronic devices (solar cells, photodetectors, LEDs). Rectifiers and power supplies. Feedback amplifiers and their frequency response. Oscillators, Multivibrators. Operational amplifiers and their applications, Digital techniques and applications (Logic circuits, registers,

VII. Atomic & Molecular Physics


VIII. Condensed Matter Physics


IX. Nuclear and Particle Physics


X. Mathematical Methods of Physics


XI. Classical Mechanics

Basic concepts of Dynamical systems, Poisson brackets and canonical transformations. Symmetry, invariance and Noether’s theorem. Hamilton-Jacobi theory.

XII. Electromagnetic Theory

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

XIII. Quantum Mechanics


XIV. Thermodynamics and Statistical Physics


XV. Condensed Matter Physics
Phase contrast microscopy, Thermo gravimetric analysis, Differential scanning calorimetry. Theory and applications of Massbauer effect, Electron Spin Resonance (ESR), Nuclear Magnetic Resonance (NMR), Chemical shift and applications. X-ray diffraction technique, scanning electron microscopy and transmission electron microscopy and their applications.

XVI. Nuclear and Particle Physics

Main Examination Syllabus for the post of Degree Lecturers in Residential Educational Institution Societies

5. Paper: Chemistry

Inorganic chemistry:
I. Atomic structure and chemical bonding – structure and bonding in homo and hetero nuclear molecules. Application of VSEPR, Valence Bond and Molecular orbital theories in explaining the structures of simple molecules.
II. Chemistry of main group (I to VII & Nobel gases) elements.
III. Chemistry of transition elements and inner transition elements.
IV. General principles of metallurgy: Occurrence of metals, Concentration of ores - levigation, magnetic separation, froth flotation, leaching, Extraction of crude metal from concentrated ore - conversion to oxide, reduction of oxide to the metal, Thermodynamic principles of metallurgy - Ellingham diagram, limitations, applications. Extraction of iron, copper and zinc from their oxides, Electrochemical principles of metallurgy, Oxidation and reduction, Refining of crude metal - distillation, liquidation, electrolysis, zone refining and vapour phase refining, Uses of aluminium, copper, zinc and iron. Alloys: Intermetallic compounds
V. Concept of Symmetry in Molecules – Symmetry Operations – Symmetry Elements: Rotational Axis of Symmetry and Types of Rotational Axes, Plane of Symmetry and types of Planes, Improper Rotational Axis of Symmetry, Inversion Center and Identity Element. Molecular Point Groups: Definition and Notation of Point Groups, Classification Molecules in to C1, Cs, Cn, Cnv, Cnh, Dn, Dnh, Dnd, Sn, Td, Oh & Ih.
IX. Metal carboxyls, Nitrosyls and Metalloenes - Structure and bonding.
X. Bio-inorganic chemistry- Metal complexes as oxygen carriers- Hemoglobin and myoglobin - Oxygentransport – Non heme proteins – Hemerythrin and hemocyanin.
XI. Analytical chemistry- Chromatography – General principles involved in separations by Paper, Thin layer, Column Chromatography, GC and HPLC.

Physical Chemistry:
I. Solutions and colligative properties: Types of solutions, Expressing concentration of solutions mass percentage, volume percentage, mass by volume percentage, parts per million, mole fraction, molarity and molality, Solubility: Solubility of a solid in a liquid, solubility of a gas in a liquid, Henry’s law, Vapour pressure of liquid solutions: vapour pressure of liquid-liquid solutions. Raoult’s law as aspecial case of Henry’s law - vapour pressure of solutions of solids in liquids, Ideal and non-ideal solutions, Colligative properties and determination of molar mass - Relative lowering of vapour pressure, elevation of boiling point, Depression of freezing point, Osmosis and osmotic pressure - reverse osmosis and water purification. Abnormal molar masses - van’t Hoff factor. Phase equilibria– Phase rule and its application to one component and two component systems
II. Acids and bases: Acids, bases and salts- Arrhenius, Bronsted-Lowry and Lewis concepts of acids and bases. Ionisation of Acids and Bases –
ionisation constant of water and its ionic product- pH scale
ionisation constant of weak acids and weak bases-relation between
Ka and Kb. Di and poly basic acids and di and poly acidic Bases-Factors
affecting acid strength-
ionization of acids and bases-Hydrolysis of salts and pH of their solutions. Buffer solutions.

III. 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 criteria for equilibrium and spontaneity. Physical significance of A and
G. Driving force for chemical reactions- relative signs of ?H and ?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.

IV. Electrochemistry: Conductance and its applications, Derivation of Nernst
equation. Chemical and concentration cells (with and without
transference). Liquid junction potential – derivation of the expression for L J
P – 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 over potential. Concept of activity and activity coefficients
limiting law. 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.

V. Quantum chemistry: Black body radiation- Planck’s concept of
quantization- Planck’s equation, average energy of an oscillator. Wave
particle duality and uncertainty principle - significance for microscopictities.
Emergence of quantum mechanics. Wave mechanics and
Schrödinger wave equation. Operators - operator algebra: Commutation of operators, linear operators, Complex functions,
Hermitean operators. Operators and Eigen functions and Eigen values.
Degeneracy. Linear combination of Eigen functions 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 Eigen values. Eigen functions of commuting operators -
significance. Simultaneous measurement of properties and the uncertainty
principle. Particle in a box- Particle in one and three dimensional box. Plots
of ?and ?2 discussion, Degeneracy of energy levels. Comparison of
classical and quantum mechanical particles. Calculations using wavefunctions of the particle in a box-orthogonality, measurability of energy, position and momentum, average values and probabilities.

VI. Chemical kinetics: Theories of reaction rates - Collision theory, Transition state theory, Reaction coordinate, activated complex and the transition state. Thermodynamic formulation of transition state theory. Unimolecular reactions and Lindeman’s theory.


IX. Solid state chemistry: General characteristics of solid state. Classification of crystalline solids based on different binding forces, probing the structure of solids: X-ray crystallography, Crystal lattices and unit cells. Bravais lattices - primitive and centred unit cells, Number of atoms in a unit cell (primitive, body centred and face centred cubic unit cell). Close packed structures: Close packing in one dimension, in two dimensions and in three dimensions - tetrahedral and octahedral voids- formula of a compound and number of voids filled - locating tetrahedral and octahedral voids. Packing efficiency in simple cubic, bcc and in hcp, ccp lattice. Calculations involving unit cell dimensions density of the unit cell. Imperfections in solids-types of point defects-stoichiometric and non-stoichiometric defects. Magnetic properties of solids - classification of magnetic materials, Magnetic susceptibility, Langevin diamagnetism, Weiss theory of para magnetism. Magnetic properties of solids - classification of magnetic materials, Magnetic susceptibility, Langevin diamagnetism, Weiss theory of para magnetism


Organic Chemistry:

II. Classification, preparations and properties of alkane, alkenes, alkynes, cycloalkanes, aromatic hydrocarbons, halogen compounds, hydroxy compounds, carbonyl compounds, carboxylic acids and its derivatives.


IV. Introduction to conformational isomerism, Klyne - Prelog terminology for conformers and torsion angles, dihedral angle, Steric strain and the concept of dynamic stereoisomerism. Study of conformations of acyclic compounds like ethane, butane, dihalobutanes, halohydrin, ethylene glycol, butane-2, 3-diol, amino alcohols and 1,1,2,2-tetrahalaobutanes. Study of conformations of cyclic compounds – cyclo pentane, cyclohexane, cyclohexanone, and its derivatives.

V. Nature of bonding in organic molecules and aromaticity, delocalized chemical bonding, conjugation, cross conjugation, resonance, hyperconjugation, tautomerism, Huckel's Rule and the concept of aromaticity - Aromaticity, non-aromaticity and anti aromaticity. Aromaticity of benzenoid and nonbenzenoid compounds, alternating and non-alternant hydrocarbons, Azulenes, Fulvenes and Annulenes. Metallocones- Ferrocene.


VII. Organic reaction mechanism: Mechanism, stereochemistry and energy profile diagram of Addition reactions to polar and non polar double bonds. Substitution reactions: Mechanism, rate law, stereochemistry and factors affecting on aliphatic and aromatic reactions. Elimination reactions-mechanism, rate law, stereochemistry, orientation and factors affecting on E1, E2, E1CB, pyrolytic syn elimination and a-elimination, elimination vs substitution. Detection of reaction mechanism by product isolation, isotopic labelling, chemical trapping and crossover experiments.

VIII. Oxidation- Swern, Cr (VI) oxidants, Oxidative cleavage of 1,2-diols - Periodic acid and Lead tetraacetate.

IX. Reductions - Wilkinson’s catalytic hydrogenation, LiAlH4, NaBH4, BH3, AlH3 and DIBAL.

X. Synthetic strategies: Target selection, terminology, disconnection approach, C-C bond disconnections.

XI. Heterocyclic chemistry: importance as drugs, nomenclature, classification based on size of the ring, number and nature of hetero atoms. Synthesis and reactivity of Pyrrole, furan, Thiophene, pyridine, Indole, Benzothiophene, Quinoline, Isoquinolines.

XII. Alkaloids and Terpenoids- importance 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, special isoprenarule, structure determination of a-Terpeniol and camphor.
XIII. Organic photochemistry: photochemical energy, Frank-Condon principle, Jablonski diagram, Electronic transitions, photosensitization, quenching, quantum efficiency, quantum yield, photochemistry of carbonyl compounds \( n\pi^* \) and \( p\pi^* \) transitions. Norrish type-I and Norrish type-II cleavages. Paterno-Buchi reactions, Photoreduction, photochemistry of enones-hydrogen abstraction, rearrangements of α,β-unsaturated ketones and cyclohexadienones, photochemistry of p-benzoquinones, Dienes -photochemistry of 1,3- butadiene, (2+2) additions, Di-p-methane rearrangement, photochemistry of aromatic compounds, excited states of benzene and its 1,2-, 1,4- additions.

XIV. Pericyclic reactions: Classification, Stereochemistry of pericyclic reactions, Molecular Orbitals and Symmetry of ethylene, 1,3-butadiene, 1,3,5-hexatriene, allylic, 1,3-pentadienyl and 1,3,5- heptatrienylp- systems. Analysis of pericyclic reactions by PMO, FMO and orbital correlation methods.

XV. Basic principles, concepts of UV, IR, H1NMR, C13NMR and Mass spectroscopic methods – structuredetermination of organic compounds by UV, IR, H1NMR, C13NMR and Mass spectroscopic methods.

XVI. Green chemistry: Principles of Green chemistry, and its approaches.
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6. Paper: Botany

I. Phycology, Mycology, Bacteria and Viruses

Phycology: Thallus organization; cell ultrastructure; reproduction (vegetative, sexual, asexual); criteria for classification of algae; pigments, reserve food, flagella; classification, salient features of Chlorophyta, Charophyta, Xanthophyta, Bacillariophyta, Phaeophyta and Rhodophyta; algal blooms and toxic algae, algal biofertilizers; algae as food, and feed and role of algae 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.

Bacteria- ultrastructure and biochemistry of cell wall, nutritional types, reproduction, Plasmids.

Viruses- Characters and ultrastructure of virions and symptomatology and transmission of plant viruses. Mollicutes general characters of spiroplasmas and phytoplasmas.

Importance of microorganisms: Microbes in medicine, agriculture and environment.

II. Bryophyta, Pteridophyta and Gymnosperms

Bryophyta: Morphology, structure, reproduction and life history; distribution; classification, of Marchantiales, Junger maniales, Anthoceratales, Sphagnales, Funariales and Polytales; economic and ecological importance.

Pteridophyta: Morphology, anatomy and reproduction; classification of Psilopsida, Lycopsida, Sphenopsida and Pteropsida; evolution of stele; heterospory and origin of seed habit; general account of fossil pteridophyts.


III. Taxonomy Of Angiosperms

The species concept: Taxonomic hierarchy, species, genus, family and other categories; principles used in asassembling relationship, delimitation of taxa and attribution of rank.

Salient features of the International Code of Botanical nomenclature.

Taxonomic tools: Herbarium; florais; 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.

Study of the following families: Magnoliaceae, Malvaceae, Rutaceae, Apocynaceae, Asclepiadaceae, Lamiaceae, Amaranthaceae and Poaceae.

IV. Plant Anatomy And Embryology

Shoot development: Organization of the shoot apical meristem (SAM); control of cell division and cell tocell 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); vascular tissue differentiation; homeotic mutants in Arabidopsis and Antirrhinum.

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 tubegrowth 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. Embryology related to taxonomy.

V. Plant Resource Utilisation and Conservation

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 – Scope and objectives of 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.

Role of plants in Medicine- morphology, active principles and medicinal value of the following plants- Andrographis, Asparagus, Phyllanthus, Gymnema.

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 genebanks, 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.

VI. Plant Ecology

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

Vegetation organization: Concepts of community; analytical and synthetic characters of community.

Population characters, interactions of species- positive and negative interactions of species.

Ecological succession: types, changes involved in succession, concept of climax.

Biotic and abiotic interactions, habitat and niche, allopatric and sympatric speciation.

Ecosystem organization: Structure and functions; primary production methods of measurement of primary production; energy dynamics (trophic organization, energy flow Pathways, ecological efficiencies); foodchains, wood web and ecological pyramids, global biogeochemical cycles of C, N, in terrestrial and aquatic ecosystems.

Biological diversity: Concept and levels; speciation and extinction; IUCN categories of threat; distribution and global patterns, hot spots; endemism, inventory.

Air, water and soil pollution: Kinds, sources, effects on plants and ecosystems.
Climate change: Greenhouse gases (CO2, CH4, N2O, CFCs: sources, trends and role); ozone layer and ozone depletion; consequences of climate change (CO2 fertilization, global warming, sea level rise, UV radiation).

Ecosystem stability: Concept (resilience and resilience); ecological perturbations (natural and anthropogenic) and their impact on plants and ecosystems; ecology of plant invasion; biogeographical zones of India, Flora of Telangana – vegetational types.

VII. Cell Biology
Ultrastructure and functions of cell organelles. Cell wall, Plasma membrane, Plasmodesmata, Chloroplast, Mitochondria, Plant Vacuoles, Nucleus, Ribosomes, 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. Mitosis and meiosis: its significance

Other cellular organelles: Structure and functions of microbodies, Golgi apparatus, lysosomes, endoplasmic reticulum.

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

VIII. 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, lambrush, 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.

Mutations: Spontaneous and induced mutations; physical and chemical mutagens; molecular basis of genemutations; 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 cytogenetics: Nuclear DNA content; C-value paradox; cot curve and its significance; restriction mapping – concept and techniques; multigene families and their evolution.

IX. Plant Physiology
Energy flow: Principles of thermodynamics, free energy and chemical potential, redox reactions, structure and functioning of ATP.

Fundamentals of enzymology: General aspects, allosteric mechanism, regulatory and active sites, isoenzymes, kinetics of enzymatic catalysis, Michaelis – Menton equation and its significance.

Membrane transport and translocation of water and solutes: Plant water relations, mechanism of water transport through xylem, passive and active solute transport, membrane transport proteins.

Signal transduction: Receptors and G-proteins, phospholipid signaling, role of cyclic nucleotides, calcium-calmodulin cascade, diversity in protein kinases and phosphatases.

Photochemistry and photosynthesis: Photosynthetic pigments and light harvesting complexes, photo oxidation of water, mechanisms of electron and proton transport,
carbon assimilation – the Calvin cycle, photorespiration and its significance, the C4 cycle, the CAM pathway, biosynthesis of starch and sucrose.

Respiration and lipid metabolism: Glycolysis, the TCA cycle, electron transport and ATP synthesis, pentosephosphate 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.


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

X. Biotechnology and Genetic Engineering

Plant Biotechnology – Principles, scope and applications.

Plant cell and tissue culture: General introduction, scope, cellular differentiation, and totipotency.

Organogenesis and adventive embryogenesis: Morphogenesis; somatic embryogenesis.

Somatic hybridization: Protoplast isolation, fusion and culture.

Applications of plant tissue culture: Clonal propagation, artificial seed, production of hybrids and somaclones, production of secondary metabolites / natural products, cryopreservation and germplasm storage.

Recombinant DNA technology: Gene cloning principles and techniques, genomic / cDNA 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.
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7. Paper: Zoology

I. General Concepts:
1. Levels of structural organization - Unicellular, multi cellular and colonial forms, Prokaryotic and Eukaryotic cells, Levels of organization of tissues, Organs & systems.
2. Acoelomata, Pseudocoelomata, Coelomata, Proterostomia and Deuterostomia.

II. Non-Chordata:
1. General characters and classification of invertebrates up to order level.
6. Annelida- Excretory system in Annelida, Coelom formation, Coelom and coelomoducts, Metamerism.
8. Mollusca - Respiration, Torsion and Detorsion, Pearl formation.

III. Chordata:
1. General characters and classification of chordates up to order level, Origin of chordates, Phylogeny and affinities of Hemichordata, Retrogressive metamorphosis.
2. Vertebrate integument and its derivatives, Comparative account of Digestive, Respiratory, Circulatory, Excretory and Reproductive systems of vertebrates.
3. Pisciculture in India, Common edible fishes.
4. Origin and evolution of Amphibia, Neoteny or Paedogenesis.
5. Important snakes of India, Identification of Poisonous and non-Poisonous Snakes, Poisonous Apparatus, Dinosaurs.

IV. Cell Biology:
2. Structure and function of intracellular organelles - Nucleus, Mitochondria, Golgi bodies, Lysosomes, Endoplasmic reticulum, Peroxisomes, Vacuoles, Cytoskeleton and its role in motility.
3. Organization of genes and chromosomes – Operon concept, unique and repetitive DNA, structure of chromatin and chromosomes, Heterochromatin, Euchromatin, transposons.
5. DNA replication, Repair and Recombination – Unit of replication, Replication origin and Replication fork, DNA damage and Repair mechanism, Recombinant DNA technology, Transgenesis & Cloning.
6. Protein synthesis – Genetic code, Initiation, Elongation and termination.
7. Regulation of gene expression – Lac operon.

V. Genetics:
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 crossingover.
4. Mutations - Types (Spontaneous and Induced), Causes and detection, Mutant types (Lethal, Conditionalbiochemical, 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 anamolies (Turner's syndrome, Klinefelter's syndrome, Hermaphroditism).
6. Human genetics - Human karyotyping, Genetic disorders due to mutant genes (Huntington's chorea), Sickle-cell anaemia (SCA), Inborn errors of metabolism-Phenylyketonuria, Alkaptonuria.

VI. System and Cell physiology:
2. Cardiovascular system - Neurogenic, Myogenic heart, Cardiac cycle, Tachycardia and Bradycardia.
5. Muscle - Ultra structure of skeletal muscle, Mechanism of muscle contraction.
6. Sense organs- Eye and Ear.
7. Excretory system - Structure & function of mammalian Kidney and Nephron, Micturition.
8. Osmoregulation - Osmoregulation in Aquatic & Terrestrial animals, Hormonal control of Osmoregulation.
9. Digestive system - Digestion, Absorption, Assimilation and Egestion.
11. Outline classification of organic compounds (Carbohydrates, Proteins and Lipids).
12. Order of protein structure - Primary, Secondary, Tertiary and Quaternary; Ramachandran plot.
13. Glycolysis (EMP), Kreb’s cycle (TCA CYCLE), Electron transport system (Oxidative phosphorylation), Pentose phosphate pathway, Gluconeogenesis.

VII. Evolution:
2. Population genetics (Gene pool, Gene frequency), Herry Weinberg’s law.
4. Isolation and Speciation.
5. Evolution of Horse and Man.

VIII. Developmental biology:
1. Spermatogenesis and Oogenesis.
2. Fertilization, Cleavage, Gastrulation, Formation of germ layers, Parthenogenesis.
3. Formation and Function of Foetal membranes.
5. Types of Placenta.

IX. Histology:
1. Histology of mammalian Tissues and Organs – Epithelial, connective, blood, bone, cartilage, skin, stomach, intestine, liver, pancreas, kidney, testis and ovary.

X. Ecology:
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.
5. Ecological succession.
8. Biodiversity- Economic significance, Conservation, Hot spots of India.

XI. Immunology:
1. Cells of the immune system- Lymphoid cells, Mono nuclear 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. Humoral immunity - Immunoglobulin (fine structure of immunoglobulin and immunoglobulin classes), The complement system, Classical and alternate pathway, Inflammation.
5. Innate (Non-specific immunity) – Anatomical barriers, Phagocytosis, Natural killer cells (NK cells), Interferons.
7. Antigen-antibody interactions- Affinity, Avidity, Cross-reactivity, Precipitation reactions, 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)
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8. Paper: Microbiology

I. General Microbiology


II. Virology

Structure and Classification of bacterial, plant and animal viruses, Methods of cultivation, detection, Propagation and maintenance of viruses. Some important viruses: Influenza virus, Adeno virus, HBV, HIV, T2 phase, TMV. Replication of viruses, Tumor viruses, Interferons and viral interference.

III. Molecular Biology and Microbial Genetics


IV. Biochemistry and Techniques


V. Immunology and chemotherapy

Exploitation of microbes in industry. Screening, strain development. Types of fermentations processes, scaleup of fermentations. Up and Down stream process. Fermentation productions—Ethanol, Beer, Wine and other alcoholic drinks, aminoacids, antibiotics, organic acids, vitamins, enzymes, probiotics, solvents and vaccine. Microbial products from genetically modified (cloned) organisms. QA, QC, GLP, GMP, Patents & IPR

VII. Food Microbiology
Dairy Microbiology and microbial products of milk, Fermented foods, Bacteriological examination of milk, fresh foods and canned foods, Food preservation methods and spoilage. Current and future implications concerning food safety, hazards and risks. Probiotics, Prebiotics and their significance in human beings and animals.

VIII. Environmental and Agriculture Microbiology

IX. Medical Microbiology
Principles of Medical Microbiology, Normal flora of human body. Properties of pathogenic microorganisms, Principles of diagnostic microbiology, Use of lab animals in diagnostic microbiology. Bacterial and viral infections (Air born, water born, food born, insect born, zoonotic and direct contact), Mycosis, Toxins.
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9. Paper: Biochemistry


VI. Molecular methods: Polymerase chain reaction (PCR), Real-time PCR. Fluorescent in situ hybridization (FISH), RFLP, RAPD. DNA finger-printing. DNA microarrays. DNA sequencing. DNA probes. Blotting techniques and their applications.


XI. Bioinformatics: Introduction to Biological databases. Sequence based approach (Pair-wise alignment, multiple-sequence alignments), SNPs in human diseases


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10. Paper: History

I. Ancient India:

2. Pre and Proto History – Stone ages and Chalcolithic Cultures.
6. Mouryan Age: Chandragupta Mourya and Ashoka, Mouryan Polity, Administration, Dhamma, Socio-Economic conditions – Decline.
7. Pre Satavahanas: Sangam Age and Satavahana Age; Political history, Administration, Society, Economy and Culture- Post Satavahana period – Chedi (Kharavela) Ikshvakus, Vakatakas, Abiras, Kshatrapasand Vishnukundis, Kushans (Kanishka).
9. India in the Seventh Century A.D.; Pushyabhusitis (Harsha), Pallavas, Chalukyas and Rashtrakutas – Political History, Society, Economy and Culture.

II. Medieval India:


III. Modern India

15. British paramountcy in India-Policies of Governor Generals, Impact of British policy on Indian Agriculture and Economy.
17. 1857 Revolt; Causes Results and Significance.

IV. Modern World:

19. Industrial Revolution- Significance and Results.
20. American War of Independence – Causes, Results, Significance.
22. National Liberation Movements in Italy and Germany in the 19th Century – Mazzini, Cavour, Garibaldi, Bismarck.
24. The Russian Revolution of 1917 – Causes, Results and Significance.
25. The world between the Two World Wars – Nazism in Germany, Fascism in Italy, Turkey under Mustafa Kamal Pasha.

V. History of Telangana

28. Pre History
30. Telangana from 7th Century to 11th Century- Chalukyas of Badami, Vemulavada, Mudigondi and Kalyana.
31. Age of Kakatiya’s; Origin, Political History, Administration, Socio Economic, Religious conditions, Art and Architecture and Literature and their Subordinates.
32. Padma Nayaka’s and Musunoori.
33. Qutubshahis – Administration, Religion, Art, Architecture and Literature.
34. Asafjahis – Administration, Economy, Culture and Society, British Paramountcy on Hyderabad State.
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11. Paper: Economics

I. Micro Economics

1. Demand Analysis

2. Utility Analysis

3. Production Analysis

4. Market Structure Analysis

5. Oligopoly, Duopoly and Factor Pricing Analysis

II. Macro Economics

1. National Income Analysis

2. Theories of Income and Employment

3. Theories of Investment and Interest Rate
Capital and Investment – Types and Determinants of Investment – Marginal Efficiency of Capital – Ex-Post and Ex-Ante Investment and Savings – Classical, Neo-Classical
and Keynesian Theories of Interest – Simultaneous Determination of Interest and Real Income through IS-LM Framework

4. Supply of Money and Demand for Money

5. Inflation and Trade Cycles

III. Public Finance
1. Introduction to Public Finance

2. Public Revenue and Taxation

3. Public Expenditure and Public Debt

4. Fiscal Policy and Federal Finance

5. Budget
Budget: Concepts, Classification and Types – Revenue Account and Capital Account – Budget Deficits: Concepts, Types and Implications – Fiscal Responsibility and Budget Management (FRBM) – Budgeting in India

IV. International Economics
1. Theories of International Trade

2. Terms of Trade and Barriers to Trade
Concepts of Terms of Trade – Factors Affecting Terms of Trade – Uses and Limitations of Terms of Trade – Secular Deterioration Hypothesis of Terms of Trade: Singer and Prebisch – Gunnar Myrdal Views on Terms of Trade – Tariffs, Quotas and Subsidies: Their Effects – Impact of Tariffs on Partial and General Equilibrium Analyses – Political Economy of Non-Tariff Barriers and Their Implication

3. Balance of Payments
Concepts of Balance of Trade and Balance of Payments – Factors Affecting Balance of Trade – Differences Between Balance of Trade and Balance of Payments –

4. Exchange Rates

Foreign Exchange Market – Exchange Rates: Concept and Types – Relative Merits and Demerits of Fixed and Flexible Exchange Rates – Theories of Exchange Rates Determination: Mint Parity and Purchasing Power Parity (PPP) – An Overview of Different Methods of Exchange Rate Determination in India

5. International Monetary System and International Finance


V. Economics Of Development And Growth

1. Socio-Economic and Institutional Aspects of Economic Development

Concepts of Economic Growth, Development, Underdevelopment and Deprivation – Distinction Between Growth and Development – Objectives of Economic Development – Sustainable Development and Inclusive Growth – Indicators (Measures) of Economic Development

2. Factors of Economic Development


3. Theories of Growth and Development


4. Strategies of Economic Development and Growth


5. Growth Models


VI. Indian Economy

1. Basic Structure and Demographic Features of Indian Economy


2. National Income, Income Inequalities, Poverty and Unemployment

3. Planning and Public Policy


4. Agricultural Sector


5. Industrial and Service Sectors


VII. Telangana Economy

1. Telangana Economy: Human Resources


2. Gross State Domestic Product, Poverty and Unemployment


3. Agricultural Sector


4. Industrial Sector


5. Service and Infrastructural Sectors


VIII. Quantitative Methods For Economic Analysis

1. Mathematical Foundations of Economic Analysis

Need and Importance of Quantitative Methods in Economics – Meaning and Basic Concepts of Mathematics: Constants and Variables – Functions: Linear, Non-Linear
Functions – Equations and Graphs of Linear, Quadratic and Cubic Functions – Concept of Derivative — Rules of Differentiation with respect to Cost, Revenue, Price and Demand Functions — Application of Maxima and Minima in Economic Analysis

2. Introduction to Statistics


3. Measures of Central Tendency and Dispersion

Measures of Central Tendency: Mean, Median, Mode, Geometric Mean and Harmonic Mean – Properties of Good Average – Comparison of Different Averages – Measures of Dispersion – Absolute and Relative Measures of Dispersion: Range, Quartile Deviation, Mean Deviation, Standard Deviation, Coefficient of Variation and Variance

4. Correlation and Regression

Correlation: Meaning and Types – Karl Pearson's Correlation Coefficient – Spearman’s Rank Correlation – Regression: Meaning and Uses of Regression – Estimation and Interpretation of Regression Line

5. Index Numbers and Time Series Analysis


IX . Banking And Economics Of Infrastructure

1. Commercial and Central Banking

Commercial Banks: Concept and Types – Functions and Principles of Commercial Banks – Balance Sheet of Commercial Banks – Process of Credit Creation – Social Responsibility, Importance and Growth of Commercial Banks in India – Central Banking – Functions of Reserve Bank of India – Concept and Objectives of the Monetary Policy – Instruments of Monetary Policy – Financial Sector Reforms in India

2. Financial and Investment Banking


4. Infrastructure and Economic Development


5. Physical Infrastructure

Types of Physical Infrastructure – Concept of Energy – Sources of Energy: Renewable & Non-Renewable and Conventional & Non-Conventional Energy – Sources of

X. Economics Of Environment

1. Introduction to Environmental Economics


2. Resource Allocation


3. Environmental Valuation


4. Sustainable Development

Impact of Environment on GNP – Limits to Growth – Sustainable Development: Concept and Rules – Modern and Neo-Classical Views on Sustainable Development – Peoples Movement for Sustainable Development – Development vs Sustainable Development

5. Environmental Pollution and Policies

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12. Paper: Political Science

I. Political Science – Basic Concepts
- Political Science: Nature and Scope – Inter disciplinary Character.
- Democracy: Meaning and Theories and Democracy, Electoral System.

II. Political Theory
- Political Ideologies: Liberalism, Neoliberalism, Marxism, Socialism and Fascism.
- Role of Ideology and end of Ideology.
- Nationalism and Internationalism.
- Theories of Development: Marxian, Liberal and Gandhian

III. Political Thought
- Greek Political Thought: Plato and Aristotle.
- Medieval Political Thought: Aquinas and St. Augustine.
- Modern Political Thought: Machiavelli and Bodin.
- Contractual Political Thought: Hobbes, Locke and Rousseau
- Indian Political Thought: Manu, Kautilya, Buddha, Gandhi, Phule and Ambedkar

IV. Comparative Politics
- Comparative Politics: Nature, Scope and Approaches.
- Constitutionalism: Western and Non- Western.
- Organs of Government: Legislature, Executive and Judiciary.
- Party Systems and Pressure Groups
- Power, Authority and legitimacy.

V. Political Sociology
- Political Socialization and Political Culture
- Political Development and Political Modernization.
- Political Elite and Theories.
- Political Communication: Changing Role of Media.
- Political Stratification: Caste, Class and Gender.

VI. Indian Government and Politics
- Nationalist Movement and Making of the Constitution.
- Salient Features and Ideological foundations of Indian Constitution.
- Federalism and Centre - State Relations.
- Development Strategies in India: Planning
- Union Executive, Legislature and Judiciary: President, Prime Minister, Council of Ministers, LokSahba and Rajya Sabha, Supreme Court and Judicial Review
- Contemporary Socio- Political Movements: Peasant, Dalit, Tribal Backward, Environmental,Regional and Sub: Regional Movements. Statehood Movements

VII. State and Local Governments
• Frame work for the study of State Politics.
• State Executive & Legislature: Governor, Chief Minister and State Legislature
• Panchayati Raj: Genesis and Development - Structure and Functions, 73rd Amendment of Indian Constitution
• Urban Local Government: Structure and functions, 74th Amendment of Indian Constitution

**VIII. Public Policy and Political Analysis**

• Theories of Public Policy: Group theory, Incrementalism, Elite theory, Decision-making theory.
• Policy making Institutions: Legislature, Executive and Judiciary - Planning Commission
• Policy Process: Role of Media, Political Parties and Pressure Groups.
• Policy Evaluation.

**IX. International Relations**

• Approaches to the study of International Relations.
• Colonization and Decolonization: Rise of Third world, Problems & Prospects
• Elements of National Power.
• International Security: Disarmament, Arms control, Diplomacy, Cold War, war and Conflict Resolution.
• International Organization

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

B. SAARC, ASEAN and EU

• Indian Foreign Policy: Non-Alignment, Relations with neighbors and security concerns and Globalization.
• Contemporary issues in International Relations: Human Rights, Environmental Issues, climate Change and Terrorism
• International Financial Institutional: World Bank, IMG & WTO.
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13. Paper: Commerce


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14. Paper: COMPUTER SCIENCE

Principles of Programming Languages: BNF, Variables, Data Types, Control Structures, Scope and Extent, Data Abstraction, Concurrency concepts, Exception Handling, Functional Programming, and Logic Programming.
Compiler Design: Types of grammar, Phases of compiler, Lexical Analysis, Parsing Techniques, Code generation and Optimization.

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.
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15. Paper: STATISTICS

1. **Probability**: Sample space, events, relations among events, classical and relative frequency definitions of probability, probability as a measure. Basic results on probability of events. Conditional probability and Baye’s theorem. Independence of events.


Convergence of a sequence of events. Borel – Cantelli lemma, Borel 0-1 law and statement of Kolmogorov 0-1 law with applications. Convergence of a sequence of random variables. Convergence in law, in probability, with probability one and in quadratic mean and other inter-relationships. Convergence in law of $X_n + Y_n$, $X_nY_n$ and $X_n/Y_n$. Definition and examples of weak law of large numbers. Khintchene’s theorem and strong law of large numbers.


Stochastic processes with examples. Markov Chains transition probability matrix and classification of states of a Markov chain with examples.

2. **Distribution Theory**: Theoretical distribution – Binomial, Poisson, negative binomial, geometric, hypergeometric, multinominal, rectangular, normal, lognormal, exponential, gamma, beta, Cauchy, weibull and Pareto distributions with properties.

Transformation of random variables. Distribution of Chi – squares, t and F distributions and their properties. Distribution of $\bar{X}$ and $s^2$ for samples coming from normal population. Distribution of order statistics and range. Joint and marginal distribution of order statistics. Distribution of sample quantiles.

Multivariate normal distribution and its marginal and conditional distribution with examples. Simple correlation and lines of regression.


5. **Non – Parametric Tests**: Non – parametric tests for (i) one sample case: sign test, Wilcoxon signed rank test for symmetry, runs test for randomness, Kolmogorov – Smirnov (k-s) test for goodness of fit (ii) two sample case: sign and Wilcoxon tests for


Statement of Cochran’s theorem for quadratic forms, analysis of variance one – way classification model, two – way classification model with one - observation per cell with more than one (equal) observations per cell with interaction. Fisher's least significance difference (LSD) method. Analysis of covariance one-way and two – way classification. Fundamental principles of experimental designs. Analysis of completely randomized design (CRD), Randomized Block Design (RBD), and Latin Square design (LSD). Analysis of RBD and LSD with one and more than one observation missing.

Estimation of main effects, interactions and analysis of 2², 2³, 2⁴, 2ⁿ and 3² factorial experiments. Total and partial confounding of 2², 2³, 2⁴ and 3² factorial designs. Concept of balanced partial confounding. Fractional factorial designs. Split plot design and its analysis.

Balanced incomplete block design (BIBD) - parametric relations, Intra – block analysis and recovery of inter block information. Partially balanced incomplete block design with two associate classes (PBIBD (2)) – parametric relations and intra –block analysis. Youden Square design, Lattice design and intra – block analysis of simple lattice design.

9. Optimization Techniques - I : Meaning and scope of Operations research, formulation of Linear programming problem (LPP), rule of steepest ascent, and θ-rule, optimum solution for Linear programming problem by graphical method and simplex algorithm using artificial variables (Big M/penalty method and two phase simplex methods). Dual of a symmetric Linear programming problem and reading the optimal solution to the dual from the optimum simplex table of primal. Complementary slackness theorem, dual simplex algorithm.

Definition of transportation problem, initial basic feasible solution by North West, matrix minimum methods and VAM. Optimal solution through MODI tableau for balanced and unbalanced transportation problem, degeneracy in transportation problem, transportation problems as a special case of linear programming problem. Assignment
problem as a special case of transportation problem and LPP. Optimal solution using Hungarian method.

Sequencing: Optimal sequence of ‘n’ jobs on two and three machines without passing.

10. **Optimization Techniques - II**: Non-linear programming problem – Formulation, generalized Lagrange multiplier technique, Kuhn - Tucker necessary and sufficient conditions for optimality of an NLPP.

Game theory: 2 person zero sum game, pure strategies with saddle point, principles of dominance and games without saddle point.

Introduction to simulation, generation of random numbers for uniform, Normal, Exponential, Cauchy and Poisson distributions. Estimating the reliability of the random numbers, simulation to queuing and inventory problem.

Queuing Theory: Introduction, essential features of Queuing system, operating Characteristics of Queuing system (transient and steady states). Queue length, General relationships among characteristics. Probability distribution in queuing systems, distribution of Arrival and inter arrival. Distribution of death (departure) process, service time. Classification of Queuing models and solution of Queuing models; M/M/1: ∞/FIFO and M/M/1: N/FIFO.
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16. Paper: GENETICS

Unit-I:
Principles of Genetics - Mendel's Law, Extension to Mendelian Genetics (Epistasis), co dominance, incomplete dominance, penetrance and expressivity. Linkage, Recombination and Gene Mapping in neurospora, tetrad analysis, Mitotic crossing over – Drosophilia. Sex Determination and sex linked inheritance, sex determining mechanism in birds, Drosophilia, plants and man, sex chromatin and inactivation of X chromosomes, sex linked inheritance, holandric genes, incompletely linked genes, sex linked genes, sex limited genes, sex influenced genes, gynandromorphs. Extranuclear inheritance, cytoplasmic inheritance, chloroplast and mitochondrial (genomes) inheritance, their evolutionary significance.

Unit-II:

Unit- III:

Unit- IV:
Genome Organisation and DNA structure - Prokaryotic genome organization. Eukaryotic genome organization, Extrachromosomal genetic elements (plasmids, mitochondrial genome, chloroplast genome), Horizontal gene transfer (transformation, transduction, conjugation. Genome islands),Transposable elements and their implication in genome evolution, Bacteriophages (lambda phage). Double helical structure of DNA (Watson and Crick Model), B-DNA and Z-DNA.

Unit-V:
Gene Replication, Mutation and Repair Mechanism, DNA replication,Bacterial chromosomal replication, Eukaryotic chromosomal replication, Plasmid eplication, Replication of mitochondrial and chloroplast genomes, Regulation of genome replication, Replication associated errors. Whole genome duplication, Segmental duplication, Single nucleotide variations, Homologous recombination, Non-homologous end joining, Site-specific recombination, Transposon and repeats mediated rearrangements, Gene conversion.

Internal and external agents causing DNA damages - DNA damages (Oxidative damages, Depurinations, Depyrimidinations, O6-methylguanines, Cytosine deamination, single and double strand breaks), Mechanisms of DNA damage (transition, transversion, frameshift, nonsense mutations), Repair mechanisms (Photo reactivation, excision repair, mismatch repair, post replication repair, SOS repair).

Unit –VI:
Gene structure, Gene expression and Regulation. Structure of prokaryotic genes,Organization of prokaryotic genes into operons, Structure of eukaryotic genes (introns, exons, UTRs, core and proximal promoters, enhancers). Number of genes in prokaryotes and eukaryotes, RNA coding genes (rRNA, tRNA), Regulatory small RNA coding genes (miRNAs).
Transcription machinery in prokaryotes and eukaryotes, Transcription process (initiation, elongation, termination, processing of transcripts), Translational machinery in prokaryotes and eukaryotes, Translation process (initiation, elongation, termination, folding, processing). Co-ordinated regulation of gene expression in prokaryotes and eukaryotes.

Regulation of transcription (proximal promoter, specific transcription factors, enhancers, multiple promoters, alternate transcription initiation sites, multiple PolyA sites), Post transcriptional regulation of gene expression (pre-mRNA splicing, miRNA based regulation), Alternate transcript formation (Exon skipping, intron inclusion, alternate splice sites, 5' end variations, 3' end variations), Regulation of translation (codon usage/bias, 5'UTR based signals, upstream ORFs, upstream, start codons, alternate splicing in UTRS, 3'-UTR based regulation), Post translational regulation of gene expression.


Unit VII:
Recombinant DNA Technology and Genetic Engineering - Restriction Enzymes and Cloning Vectors- Host controlled restriction modification, Restriction endonucleases, types and classification, Modifying enzymes used in molecular cloning, methylase, polymerase, ligases, kinases, phosphatases and nucleases, Plasmid vectors (PBR322, PUC19, PET ). Lambda phage vectors (Replacement & Insertional vectors ), Cosmid vectors, Yeast vectors, BAC.
Selection of Recombinant Clones - Genetic Selection - insertional inactivation, alpha complementation, Labeling of nucleic acids, Immunological probes, Selection of recombinant clones: Hybridization techniques (Southern, Northern, Western, South-Western and Zoo blot), colony hybridization and library screening, Hybrid arrest and Hybrid release translation, DNA Sequencing methods, Maxam and Gilbert, Sangers and Next Generation Techniques, Applications of rDNA Technology.

Unit VIII:
Immunogenetics and Human diseases - Types of Immunity- Innate immunity and Adaptive immunity - Anatomic barriers, Physiological barriers, Phagocytic barriers, Endocytic barriers, Inflammation, Anti microbial substances, Acquired immunity-Active and passive immunity, Hematopoesis and differentiation, Cells of the Immune System – lymphoid cells (B & T Lymphocytes; T-cell sub-sets; NK cells), Mononuclear phagocytes (Monocytes, macrophages), Granulocytes (neutrophils, eosinophils, basophils, mast cells, dendritic cells).
Organs of the System: Primary lymphoid organs (Bone marrow and Thymus); Secondary lymphoid organs (lymph nodes, spleen and mucosal-associated lymphoid tissue, cutaneous associated lymphoid tissue).


Unit IX:
Plant Genetics and Molecular Biology - Specific Breeding Methods, Breeding for disease resistance. Genetics of pathogenecity; Genetics of disease resistance; Methods of breeding for disease resistance-Breeding for insect resistance: Mechanisms of insect resistance; Breeding methods for pest resistance, Breeding for abiotic stress tolerance, Breeding for drought, salinity, temperature and flood tolerance. Breeding for nutritional improvement, Nutritional quality, Improved protein content and Improved oil quality.
Biotechnological Approaches for Crop Improvement- Plant tissue culture techniques in crop improvement. Introduction to plant cell-tissue culture techniques, Haploids and diploids, Somaclonal variation, Protoplast fusion, Micro propagation, Transgenics in crop improvement: Gene transfer methods in plants; Production of transgenics for biotic and abiotic stress tolerance; Transgenic male-sterility systems and development of hybrids; Cis-genic approaches, Gene silencing: RNAi and its applications for crop improvement. Molecular plant breeding tools, Molecular markers, Marker assisted breeding, Genome mapping – QTL mapping.

Unit-X:


Regulation of bacterial gene expression-General features of regulation, Regulation of Lactose utilization, Regulation of Tryptophan biosynthesis, Translational control of r-proteins.

Unit- XI:
Biostats, Bioinformatics and IPR Sampling and Experimental design - Descriptive analysis of data: Types of variables, Data alignment and representation, Measures of central tendency, Measures of dispersion-Concepts of probability: Axioms of probability, Probability distributions : Binomial, Poisson, Normal distribution, Hypothesis testing: Null and alternate hypothesis, test of significance, Type I and Type II errors, confidence intervals and confidence levels, Estimates and test statistics: Chi-square test (test for goodness of fit, homogeneity test, linkage, test of independence), Z test (for proportions and means), t- test (students t test, paired t test), ANOVA - One way and Two-way Anova (F- test).Correlation and regression (Simple regression, multiple regression, logistic regression).

Genome Databases/Genomics - Primary databases – DDBJ, EMBL, NCBI, DNA and protein sequence formats – Genbank, Fasta, PIR, Gene predictions – Extrinsic and intrinsic, Comparative genomics – map viewer, COGs.


Intellectual Property Rights and patents – Understanding of intellectual property rights, introductoin, history of patent protection, rationale behind patent system, An over view of IPR regime, trademarks, copy rights, industrial designs, trade secrets, Importance of IPR,s in the field of science and technolo, Patenting in India and international patent regimes (America and Europena patent regimes), Procedure of obtaining patents-Rights of patents- infringement issues in patents, Business model patents- e commerce and biotech patents.
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17. Paper: Geology


Field Geology: Toposheet, geological map, field work and sampling, compass, geological mapping procedures. Surveying Principles and methods surveying, chain survey, prismatic survey, plane table survey and theodolite survey. Dumpy’s level.


3. Structural geology and Geotectonics: Stress-strain relationship of elastic, plastic and viscous materials. Principles of geological mapping, measurement of strike and dip, Structural analysis of folds, cleavages, lineation’s, joints, and faults, superposed deformation, mechanism of folding and faulting, Unconformities, structural behavior of igneous rocks, diapirs and salt domes, fundamentals of petrofabric analysis.

Earth and solar system, planetary evolution of earth and its internal structure, Heterogeneity of the earth’s crust, Major tectonic features of the oceanic and continental crust, Continental drift, mid oceanic ridges, deep sea trenches, continental shield areas and mountain chains. Paleomagnetism, seafloor spreading and plate tectonics, Island arcs, oceanic islands and volcanic arcs, isostasy, orogeny, geosynclines, and seismic belts of the earth, seismicity and plate movements, Geodynamics of the Indian plate.


Principles of Stratigraphy, geological time scale, modern methods of stratigraphic correlation, Precambrian Stratigraphy of India, Stratigraphy of the Palaeozoic, Mesozoic and Cenozoic formations of India. Gondwana system and Gondwana land, origin of Himalaya and evolution of Siwalik basin, Deccan traps, Quaternary Stratigraphy, rock record, paleoclimates and paleogeography.

5. Igneous Petrology & Geochemistry: Origin of magmas, phase equilibrium in igneous systems, Bowen's reaction principle, Magmatic evolution and differentiation, Structures and textures of igneous rocks, Classification of igneous rocks, Magmatism and tectonics, Igneous rock suites- Ultramafic rocks, Basic rocks, Intermediate rocks, Acidic rocks and Alkaline rocks.

Geochemistry, Elements, Meteorites, Primary geochemical differentiation of earth, Goldschmidt's geochemical classification of elements, Periodic table, Magmatism as a geochemical process, Major elemental distribution in igneous rocks, Trace element distribution in igneous rocks, Sedimentation as a geochemical process, Metamorphism as a geochemical process, Isotope geochemistry, Atmospheric geochemistry.

6. Metamorphic Petrology & Thermodynamics: Metamorphism, factors and kinds of metamorphism and metamorphic processes; Classification of metamorphic rocks and nomenclature, Structures and textures, zones, grades, and facies of metamorphism, Phase relations and phase diagrams for metamorphic mineral assemblages, processes and products of Contact, Regional, thermal, dynamo-thermal metamorphisms, metasomatism, granitization, typical Indian rocks.

Objectives of thermodynamics, inter-relationship between petrogenetic processes and thermodynamics, Role of thermodynamics in geochemistry, Phase rule, ‘pressure-temperature-depth relations’ among various metamorphic facies and ultra metamorphism, Paired metamorphic belts, Metapelitic and metabasic minerals and mineral assemblages, First law of thermodynamics, Second law of thermodynamics, P-T diagrams, geothermobarometry, pressure(P)-temperature(T)-time(t) paths.
7. **Sedimentology & Petroleum Geology:** Sedimentary environments—fluvial, glacial, eolian and lacustrine environments, transitional environments including deltaic, beach and tidal flats, marine environments including shelf (clastic and non-clastic) and deep sea sedimentary environment, Evolution of sedimentary basins, Tectonic setting of sedimentary basins.

Petroleum Geology, Constitution and Genesis of hydrocarbons, conversion of organic matter to petroleum, variety of petroleum hydrocarbons and gas hydrates, Reservoir rocks, Migration and accumulation of oil, structural traps, stratigraphic traps and combination traps, salt domes, methods of Exploration and exploitation of petroleum, Geographic and stratigraphic distribution of oil and gas, global distribution, petroliferous basins in India.

8. **Ore Genesis, Mineral Deposits and Mineral economics:** Modern concept of ore genesis, principal ore mineral groups, plate tectonics and ore deposits, ore textures, Paragenetic sequences and zoning in metallic ore deposits, ore microscopy, application of geothermobarometry, fluid inclusions in ores, Role and application of stable isotopes in ore genesis, Petrological ore associations with Indian examples, orhomagmatic ores of mafic-ultramafic association, diamonds in kimberlites, REE in carbonatites, chromite in chromitites and basic rocks, PGE in ultramafic and basic rocks, Chemical and clastic sedimentation, stratiform and stratabound ore deposits (Mn, Fe, non-ferrous ores), placer concentrations, Ores related to weathering and weathered surfaces, laterite, bauxite and manganese nodules.

Study of geology, nature of occurrence and the genesis of the following ore deposits with special reference to India- Iron, Chromite, Manganese, Copper, gold, Lead and Zinc, Bauxite, Magnesite, Barites, Mica, Asbestos, decorative stones, *Mineral based Industries*: Iron and steel; *Refractories*: Ceramic, electrical and insulators, glass.


9. **Environmental Geology:** Concepts and principles, Natural hazards, preventive/precautionary measures—floods, landslides, earthquakes, rivers and coastal erosion. Impact assessment of anthropogenic activities such as urbanization, open-cast mining and quarrying, river-valley projects, disposal of industrial radioactive waste, excess withdrawal of groundwater, use of fertilizers, dumping of ores, mine waste and flyash, Organic and inorganic contamination of groundwater and their remedial measures, soil degradation and remedial method, Environmental protection-legislative measures in India, factors for groundwater subsidence.

10. **Engineering Geology** Mechanical properties of rocks and soils, Geological investigations for river-valley projects—dams and reservoirs, tunnels—types, methods and problems, Bridges—types and foundation problems, shoreline engineering, landslides—classification, causes, prevention and rehabilitation, Earthquake resistant structure, Problems of groundwater in engineering projects and Geotechnical case studies of major projects in India.


12. **Hydrogeology:** Origin of water, Hydrological cycle, water table, Rock properties affecting groundwater, Types of aquifers, Porosity, permeability, specific yield and retention, hydraulic conductivity, trasmitssivity, storage and storage coefficient. Water
level fluctuation and causative factors, methods of pumping tests and analyses, evaluation of aquifer parameters, artificial recharge of groundwater, groundwater legislation, groundwater quality and groundwater pollution, arsenic and fluoride problems, quality criteria for groundwater use, salt water intrusion in coastal aquifers and remedial methods, surface geophysical methods-seismic, gravity, geoelectrical and magnetic, subsurface geophysical methods-well logging for delineation of aquifers and estimation of water quality, Watershed management.

13. **Photo Geology, Remote Sensing, GIS and GPS**: Elementary idea about photogeology; electro-magnetic spectrum, types & geometry of aerial photographs; factors affecting aerial photography; Fundamentals of remote sensing; remote sensing systems; remote sensing sensors; signatures of rocks, minerals and soils. Application of remote sensing in geosciences and geomorphological studies, Types of Indian and Foreign Remote Sensing Satellites, Digital image processing; fundamental steps in image processing; elements of pattern recognition and image classification, Geographic Information System (GIS), components of GIS; product generation in GIS; tools for map analysis; integration of GIS with remote sensing. Geographic positioning system (GPS), scope of GPS, advantages and uses of GPS in different fields.

14. **Mining Geology**: Alluvial, open-pit and underground mining methods; mine organization and operation; mine hazards. Sampling techniques, drilling methods, estimation of ore reserves, Cost of mining; future costs and profits; life of mine; present value of mine. Environmental issues with mining.
I. Nutritional Biochemistry & Metabolism

Carbohydrates - Classification, sources, functions and requirements, Digestion and absorption, Transport, utilization and storage, Glycolysis, TCA cycle, Pentose phosphate pathway, Glycogenesis, glycogenolysis, gluconeogenesis, Electron transport chain, alcohol metabolism, Inborn errors of Carbohydrate Metabolism - Glycogen storage diseases, Lactose intolerance, Galactosemia, Fructose intolerance.

Amino Acids - Classification, Functions, Utilization of amino acids, Urinary excretion.

Proteins - Classification, sources and functions, Digestion and absorption, Transport and storage, Deamination, transamination, Decarboxylation, deamidation, Urea cycle, Inborn errors of amino acid metabolism – PKU, Tyrosinemia, Maple syrup urine disease, Homocystinuria, Alkaptonuria.

Nucleic acids - Types (DNA, RNA) and Functions, Components of Nucleic acids, Structure of DNA & RNA, Types of RNA, Protein synthesis, Post transcriptional changes.

Lipids - Classification, sources and functions, Digestion and absorption, Deposition and storage, Role of essential fatty acids, Lipoproteins, Triglycerides, Cholesterol. Oxidation of fatty acids, Synthesis of fatty acids, Biosynthesis of triglycerides and phosphatides, Cholesterol metabolism, Bile pigments, Ketosis, Inborn errors of Lipid Metabolism - Gaucher’s disease, Niemann’s picks disease, Tay-sach’s, Fabry’s disease.

Fat Soluble Vitamins - Physiological action, transport, utilization, storage, sources, functions and deficiency of Vitamins A, D, E, K.

Water Soluble Vitamins - Physiological action, transport, utilization, storage, sources, functions and deficiency of Thiamin, Riboflavin, Niacin, Vitamin B12, Pantothenic acid, Folic Acid, Pyridoxine, Vitamin C.

Minerals, Trace elements - Absorption, utilization, sources, functions and deficiency of calcium, phosphorous, iron, iodine, Flourine, Zinc, Copper, Selenium.

Water - Functions, Distribution, Requirements, Role of solutes (Sodium and Potassium) in maintaining the volume of the fluid compartments.

II. Human Physiology

Digestive and Excretory system - Structure and functions of gastrointestinal tract, liver, Gut flora, role of prebiotics and probiotics in the maintenance of health of digestive system. Structure and functions of kidney, Urine formation, water and electrolyte balance.

Structure and functions of heart and blood vessels, Pulmonary, Systemic and Portal circulation’ Blood pressure, Regulation of Cardiac output, Composition of blood, Plasma proteins; Functions, role in fluid balance, Blood Lipids – Chylomicrons, VLDL, LDL, HDL, Cholesterol, Triglycerides, Blood coagulation.

III. Nutrition during Life Cycle

Principles of Nutrition - Energy value of foods, Estimation of energy value of foods by Bomb Calorimeter and by Benedict's oxy Calorimeter, Factors affecting energy requirements; Factors affecting BMR, SDA, Physical activity, RDA, and derivation of RDA. Reference man, Reference woman. Basic five food groups, Nutritional contribution from each group, Balanced diet, Food Pyramid, Basic principles of meal planning, Steps in meal planning, food cost.

Nutritional requirements of adult man, Nutritional requirements of adult woman

Pregnancy, lactation & Infancy – Pregnancy - Physiological changes, Growth of fetus from conception till term, complications of pregnancy, Increase in Nutritional requirements during pregnancy.

Physiology of lactation, Nutritional component of colostrum and mature milk, Increase in Nutritional requirements during lactation, Growth and development during infancy, milk Breast feeding Vs bottle feeding, Feeding of Low birth weight and premature infants, Weaning, Homemade foods Vs commercial foods.

Preschoolers - Milestones and Growth Chart, Nutritional requirements.

School going children - Nutritional requirements, Packed lunch.

Adolescents - Sequence of developmental changes, Role of hormones on growth, development and maturation, Nutritional requirements during adolescence, eating disorders, teenage pregnancy.

Geriatric - Physiological changes in aging, Nutritional requirements and Dietary modification.

IV. Introduction to Dietetics

Role and responsibilities of Dietitian – Administrative, Community, Hospital, Clinical methods to assess nutritional status - SGA, MNA, MUST, Biochemical method: Serum Albumin, Serum Transferrin, Albumin/ Globulin Ratio. Modification of normal diets, Types of hospital diets – clear fluid, full fluid, soft diet.


Obesity - Definition, types, etiology, assessment and complication, Management of obesity – exercise, diet, behavior modification, pharmacotherapy and surgery

Leanness - Etiology, complications, Dietary management.

Gastrointestinal Disorders:

Etiology, symptoms, diagnosis, treatment and dietary management of Gastritis, Peptic ulcer, Diarrhea, Constipation, Malabsorption syndrome: ulcerative colitis, Crohn’s disease, irritable bowel disease, lactose intolerance and celiac disease, Diverticular diseases.

Fevers - Metabolic changes during fever, Short duration, Intermittent duration, Long duration – Dietary Management.

Surgery - Physiological response, endocrine and metabolic changes, Nutritional care in pre and post operative conditions.

Burns - Severity of burns, Metabolic changes in burns, Nutritional support.

V. Advanced Dietetics

Gall Bladder - Etiology, symptoms, diagnosis and dietary management of Cholecystitis, Cholelithiasis.


Pancreas - Etiology, symptoms, diagnosis and dietary management: Acute & Chronic Pancreatitis.

Diabetes – Classification, metabolic changes, Etiology, symptoms, diagnosis, Complications, Treatment – exercise, hypoglycemic drugs, insulin and diet. Glycemic index, Glycemic load.

Disorders of circulatory system - Dietary management of Hypotension, Hypertension, Dietary management of Cardio Vascular Diseases - Ischemic Heart Disease- Arteriosclerosis, Atherosclerosis, Coronary Artery Disease, Myocardial Infarction, Angina, Heart Failure.

Cancer - Types, Etiology, metabolic changes, treatment (drugs, chemotherapy and radio therapy), Nutritional management of cancer

AIDS - Causes, symptoms, metabolic changes, diagnosis, Treatment and dietary management.

VI. Food Science

Cereals – Structure of the grain, Nutrient composition, Starch: functions and properties, Gelatinization, factors affecting gelatinization, gel formation, retrogradation, syneresis, gluten formation.


Milk - Composition and Nutritive Value, Pasteurization of milk, role in cookery.

Egg - Composition and Nutritive Value of egg, role in cookery.

Meat - Post mortem changes in meat – rigor mortis, curing, ageing and tenderization, Changes during cooking of meat, Poultry - Advantages of white meat, Fish - Classification, Characteristics of fresh fish, Spoilage, Nutritional importance of fish.


VII. Community Nutrition

Assessment of nutritional status – Anthropometry, Clinical Examination, Biochemical Investigations & Diet surveys.

Magnitude of malnutrition in India, Consequences of malnutrition in India, PEM, Anaemia, Iodine Deficiency Disorder and Vitamin A Deficiency, Dental caries, Fluorosis Measures to combat malnutrition - ICDS, Mid-day meal program, SNP, IDDCP, Vitamin A Prophylaxis Programme, Anemia Prophylaxis Programme, Role of National & International organizations in combating malnutrition, Nutrition and Health Policies.

Nutrition and Health Education - Audio aids, Visual aids, Audio-visual aids, Types of approaches - personal, group and mass, advantages and disadvantages.

Food security. Concepts and definitions agriculture and food security. Nutrition and health urbanisation Food security and food systems.

Contribution of national and International organizations for agricultural development.
VIII. Food Microbiology

Microorganisms and their general characteristics - Fungi (molds and yeast), Bacteria, Protozoa, Viruses.
Factors affecting microbial growth – Intrinsic & Extrinsic.
Sources of contamination, Spoilage of cereals and cereal products, Spoilage of milk and milk products, Spoilage of meat and meat products – aerobic and anerobic, Spoilage of fish and other sea foods, poultry and eggs. Spoilage of fresh fruits and vegetables.
Spoilage of canned products – spoilage by spore forming and non spore forming bacteria.
Spoilage of sugar products.
Fermentation – Indian, Oriental foods, Fermented beverages.
Principles and methods of food preservation.
Food Packaging, Labeling, Packages with special features.

IX . Food Safety & Quality Control

Sanitary procedures for preparation, handling and storage of foods
Food poisoning & Food borne diseases – Classification, Mode of transmission, Viral and parasitic infections, Control of food borne illnesses. Preventive methods.
Naturally occurring toxicants in foods - Toxic amino acids, toxic alkaloids, Cyanogenic glycosides, trypsin inhibitors, Haemoglutinins, flatulence factors, mycotoxins
Chemical contaminants in foods - Pesticide residues, Packaging residues, Toxic metals - Pb, Hg, Cd, As.
Food adulteration, Food additives, Preservatives, Coloring agents, Stabilising agents, anti-oxidants, emulsifying agents.

X. Advanced Nutrition

Drug – Nutrient Interaction,
Disaster Management
Nutrigenomics, Nutrition & Immunity,
Protein Quality, Factors affecting bio-availability of vitamins & minerals.
Food Analysis – Principles, techniques and application of colorimetry, spectrophotometry, atomic absorption spectrophotometry, Flourimetry, Flame photometry, Chromatography.
Main Examination Syllabus for the post of Degree Lecturers in Residential Educational Institution Societies

19. Paper: PHYSICS (with Electronics Specialization)
(Syllabus for the post of Electronics)

I- Mathematical Physics and Classical Mechanics
Vector algebra and vector calculus- Linear algebra, matrices, Linear ordinary differential equations of first & second order,
Special Functions: Legendre’s polynomials, Bessel functions, Hermite polynomials.
Laplace equation and wave equation
Integral Transforms: Fourier Transforms and applications, Laplace transforms and applications.
Tensor Analysis: Tensor Algebra, Metric Tensor & Christoffel Symbols

II- Statistical Mechanics and Quantum Mechanics
Quantum Statistics: Postulates of Quantum Statistical Mechanics, Quantum Statistics-Be and F-D Statistics
Principles Of Quantum Mechanics: Birth of Quantum Mechanics, Eigen values and Eigen functions Dirac’s Bra and ket vectors Eigen functions and uncertainty principle.
Schrödinger Equations and Angular Momentum Theory: Schrödinger wave equation, Applications of Schrödinger’s equation to one dimensional problems, Angular momentum, Application of Schrödinger’s equation to three dimensional problems, Hydrogen atom, spin and angular momentum, Addition of angular momenta, Clebsch-Gordan coefficients
Approximation Methods: Time independent perturbation theory, variation method, Time dependent perturbation theory
Relativistic Quantum Mechanics: Klein Gordon relativistic equation and applications, Dirac’s relativistic equation and applications

III- Solid State Physics
Crystalline State and Crystal Structure: Crystalline State and Crystal Structure, non-crystalline state, elements of X-ray diffraction, experimental techniques for structure determination.
Imperfection in Crystals: Imperfection in Crystals, diffusion, dislocations.
Lattice vibrations and thermal properties: Elastic waves in solids, Infra red absorption ionic crystals, and lattice heat capacity.
Dielectrics and ferroelectrics: Macroscopic descriptions of dielectrics, measurement of dielectric constant, ferroelectrics.
Magnetism and Super conductivity: Magnetism, spontaneous magnetization, occurrence of superconductivity, super conductivity-theoretical explanations.

IV- Semiconductor Devices- Analog and Digital Electronics
Semiconductor Diodes, Transistors and Amplifiers: Semiconductor diodes, Transistors, Power supplies, Feed back amplifiers, RC coupled amplifiers and it’s frequency response, Oscillators and Multivibrators

Operational Amplifiers: Operational Amplifier, its characteristics, and its parameters, Operational Amplifier-configurations, Operational Amplifier-Frequency response, Operational Amplifier-Linear applications, Operational Amplifier- non linear applications, Operational Amplifier- Wave form generators.

Digital Electronics: Introduction to Digital electronics and logic gates, Applications of EX-OR gate,De-Morgan's Theorems and Fundamental products,Karnaugh map,Flip-flops,Shift Registers,Counters,Multiplexer and De-multiplexer.

Converters: Digital to Analog Converters, Analog to Digital Converters

V- Nuclear Physics and Analytical Techniques


Nuclear forces and Nuclear Models: Properties of Nucleus-nuclear radius, nuclear mass and binding energy, Angular momentum ,nuclear statistics, parity and Symmetry, Magnetic dipole moment, electric quadruple moment, Nature of nuclear forces, two body problem, bound and spin states of two nucleons, Theory of deuteron, Tensor forces, exchange forces, meson theory of nuclear forces, Nuclear models, liquid drop model, formula for total binding energy of the nucleus, Weizsacher's semi empirical mass formula, values of the empirical coefficients, Shell model-Experimental Evidence, predictions, spin orbit coupling and achievements of the shell-model.

Nuclear Reactions
Types of nuclear reactions, conservation laws, Kinematics of nuclear reactions, Q-value, Nuclear cross section, compound nuleaus,Discrete energy levels of nucleus, Breit-Winger formula, Basic properties of neutrons, classification of neutrons, slowing down of neutrons,logarithmic decrement in energy, moderating ratio, neutron diffusion-neutron current density, neutron leakage current, Fermi age equation,Bohr and wheeler theory of fission, four-factor formula


Resonance Spectroscopy: NMR theory-simple and classical, Relaxation mechanisms-spin-spin and spin-lattice. Bloch equations, complex susceptibility,NMR instrumentation related to absorption and induction techniques, chemical shift,spin-spin coupliling,ethyl and methyl alcoholNMR spectra, Major areas of NMR,Principles of ESR,conditions for resonance,ESR spectrometer, interpretation of spectra, Hyperfine interactions, applications of ESR,Nuclear quadruple Moment, electric field gradients, Nuclear quadruple resonance,energy levelsin differentFGsymmetries,NQRspectrometer,Applications,review on NMR,ESR and NQR

VI- Electromagnetic Theory and Spectroscopy
Electromagnetic Theory: Electrostatic field, Magneto statics, Electro dynamics, EM waves in matter, Electromagnetic radiation, Lienard-Wiechert Potentials, Radiated power.


VII- Memory Devices and Microprocessors

Logic Families: Logic families and their performance characteristics, Emitter Coupled Logic (ECL, PMOs, CMOs Logic and Tri state Logic), Comparisons of Logic families.

Semiconductor memories: Classification and Characteristics of Memories, Memory organization and expression.


Peripheral Devices and Interfacing: I/O Interfacing & Data Transfer Schemes, Intel 8053 Programmable interval Timer, Programmable Peripheral Interface (8255), Priority Interrupt Controller (8259).


Advanced Microprocessors: Architecture of Micro Processors 80286, 80386, 80486, the Pentium Microprocessor.

VIII- Communication Systems


Digital Communication: Sampling theorem, Pulse amplitude modulation (PAM), Natural sampling, Flat-top sampling, Signal recovery through holding, Quantization of signals, Quantization error, Pulse Code Modulation (PCM), Companding, Multiplexing PCM signals, Differential PCM. Digital modulation techniques: Amplitude Shift Keying (ASK), Phase Shift Keying (PSK), Frequency Shift Keying (FSK) and Differential Phase Shift Keying (DPSK) and their generation and detection (qualitative).

Transmission lines: Introduction, Primary line constants, Phase velocity and line wavelength, Characteristic impedance, Propagation coefficient, Phase and group velocities, Standing waves, Lossless line at radio frequencies, VSWR, Slotted-line measurements at radio frequencies, Transmission lines as circuit elements, Smith chart.

Microwave devices: Introduction to rectangular and circular wave guides, Solution of wave equations in cylindrical coordinates, TE and TM modes, Power transmission and loss in circular wave guides, Excitation of modes in circular wave guide, Microwave tunnel diode, Gun effect diode (GaAs), Microwave generation and amplification.
UNIT I.


Sensation: Sensory Thresholds; Characteristics of Sensation; Types of Sensation; Measurement of sensations (Absolute Threshold, Signal detection theory, Difference Threshold, Sensory Adaptation), Attention - Nature and concept of Attention, Different Aspects of Attention – Span, Division, Distraction and Fluctuation, Voluntary and Involuntary Attention, Determinants of Attention – Internal and External Factors.


Learning: Concept of Learning Curve, Theories of learning- Classical and Instrumental Conditioning, Sign learning, Learning by Insight and Observation, Role of Motivation, Reward and Punishment in Learning, Transfer of Learning, Efficient Methods of Learning.

UNIT II.

Memory: Meaning and Significance of Memory, Types of Memory, Methods of Measuring Memory, Information Processing Model of Memory, Forgetting: Curve of Forgetting, Theories of Forgetting: Decay theory and Interference Theory, Methods of Improving Memory.

Thinking: Nature and types of thinking, Theories – Bruner & Sullivan, Reasoning – Deductive Reasoning (Conditional, Syllogistic) and Inductive Reasoning (Causal Inferences, Categorical Inferences); aids and obstacles to reasoning, Problem Solving – Problem cycle, types of problem solving, Impediments to Problem Solving, Problem solving strategies – algorithm, heuristics and biases, Means-End Analysis, Computer simulation, Creativity - Characteristics of Creative People; Stages of Creative Thinking.


Intelligence: Brief history of Testing Movement – contribution of Binet, Theories of Intelligence – Thorndike, Spearman, Thurstone, Sternberg, and Gardener, Measurement of Intelligence- Concept of IQ, Types of Intelligence Tests, Individual differences in Intelligence (Heredity and Environment)

Personality: Concept of Personality, Personality Assessment - Interviews, Projective tests, Behavioural Assessment, and Personality Inventories, Theoretical approaches to personality - Type Theories, Trait theories and Type cumTrait Theories; Psychoanalytic Approach; Humanistic Approach; Cognitive Behavioural Approach, Big Five Factor Theory.

UNIT III.

Statistics in Psychology: Measures of Central Tendency and Dispersion; Characteristics of a Distribution- Skewness and Kurtosis; Meaning of Probability; Normal Distribution-Characteristics and Applications; Methods of Sampling-Probabilistic
and Non Probabilistic sampling; Sampling Distribution; Sampling error and non-sampling error; Hypothesis-meaning and types; Type I and Type II errors; Procedure for testing of Hypothesis; Test of Significance (large sample and small sample) - for single mean and differences of mean; Test of Significance for single proportion and differences of proportion. Analysis of variance (ANOVA) one way ANOVA and two way ANOVA; Linear Correlation – Product moment and Rank correlation. Special correlations – Biserial Correlation, and Point Bi-spatial correlation; Partial correlation and Multiple correlation. Simple Regression and Multiple regression. Interpretation of regression coefficients. Non Parametric Statistics – Chi Square test, Sign test, and Median test. Analysis of Covariance.

UNIT IV.

UNIT V.
Experimental Psychology: Different concepts used in Experimental Psychology (including variables & operational definitions); Psychophysical methods, Lab Report writing as per APA Guidelines (including Citations); Introduction to other Guidelines and style Manuals; Techniques of Experimental Control; Application of Research Designs and interpretation of research problems/studies .

UNIT VI.
Experimental Design: Meaning of Experiment, and Experimental Design; Advantages and disadvantages of experimental designs, Types of Experimental design: Completely randomized design, Randomized Block design, Factorial design, Latin square design; Internal validity and external validity of experimental designs, factors that influence the internal validity and external validity of experimental designs; Meaning of confounding, Types of confounding, Methods of controlling extraneous variables in Experimental design. Concomitant Variation; Single case experimental designs; Ex-post-facto research designs; Non experimental designs; Advantages and Disadvantages of Experimental designs over Non Experimental designs; Types of Non experimental designs – Quasi experimental designs, Co relational designs, Contrast designs, and Case study designs.

UNIT VII.
Abnormal Psychology: Adjustment and Maladjustment - Concept of Adjustment and Maladjustment, Causes of Maladjustment; Conflicts – Types; Stress – Nature; Types of Stress, Sources of Stress; Immune System & Stress; Personality & Stress; Coping with Stress – Types of Coping; Extreme Maladjustment- Dimensions; Classification – DSM V and ICD 10; Anxiety related - Post Traumatic Stress Disorder, Phobias and panic disorder, Generalized Anxiety Disorder, Obsessive Compulsive Disorder, Somatic symptom Disorder, Conversion Disorders, Dissociative Amnesia, Dissociative Identity Disorder, Mood Disorders - Depression – Characteristics and Symptoms, Bipolar Disorder - Characteristics and Symptoms, Schizophrenia – Symptoms- Positive, Negative and Cognitive Deficits; Types

UNIT VIII.
**Approaches and Treatment:** Biological Approaches – Brain Dysfunction, Biochemical Imbalances, Genetic Abnormalities, Drug Therapies, ECT & Brain stimulation techniques, Psychosurgery. Psychological Approaches – Psychodynamic, Behavioural, Cognitive, Humanistic, Family Systems Approach, Sociocultural Approaches – Cross cultural issues; Culturally specific therapies, Prevention Programs; Common elements in Effective treatments, Suicide – Type of attempts, gender differences, Risk factors- Mental disorders, Negative life events, Suicide contagion, Personality and Cognitive factors, Biological factors, Prevention.

**UNIT IX.**

**UNIT X.**

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21. Paper: BIOTECHNOLOGY


III. MOLECULAR BIOLOGY: DNA Structure, replication, repair and recombination, Transcription, regulation and post transcriptional modifications in Prokaryotic and Eukaryotic genomes. Transcriptional and post-transcriptional gene

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


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

V. MICROBIOLOGY: - Discovery of the microbial world; Distinguishing features of prokaryotic and eukaryotic genomes; 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 Ricketsias; Chlamydia and Mycoplasma. Archea; Viruses: structure and replication of viruses; DNA viruses and RNA viruses; Viroids and Prions; Virus and their Genetic System; Bacteriophages; RNA phages; Retroviruses, Biomass and Bioenergy, Biofuels from microbes, biofertilizers and biopesticides.

VI. GENETICS

Mendel’s principles, applications of Mendel’s principles, Chromosome Theory of Heredity (Sutton-Boveri), Inheritance patterns, phenomenon of Dominance, Inheritance patterns in Human (Sex-linked, Autosomal, Mitochondrial, Unifactorial, Multi-factorial). Linkage & Crossing over - Chromosome theory of Linkage, kinds of linkage, linkage groups, types of Crossing over, mechanism of Meiotic Crossing over, kinds of Crossing over, theories about the mechanism of Crossing over, cytological detection of Crossing over, significance of Crossing over. Allelic
Variation & Gene function – Multiple allele, Genetic interaction, Epistatic interactions, Non-Epistatic inter-allelic genetic interactions, Atavism/Reversion, Penetrance (complete & incomplete), Expressivity, Pleiotropism, Non-Mendelian inheritance – Evidences for Cytoplasmic factors, cytoplasmic inheritance, Epigenetics, extranuclear inheritance (mitochondrial, chloroplast), non-chromosomal inheritance, maternal inheritance, uniparental inheritance.

VII. 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 humeral 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, recominant vaccines, subunit vaccines, conjugate vaccines. Vaccine delivery systems.


IX. ENVIRONMENTAL BIOTECHNOLOGY: - Ecological balance, resiliency of ecosystem and sustainable development, environmental pollution and global problems, water, air, soil pollution and their impacts on environment. Biotechnological approaches for management of pollution, waste water treatment:
aerobic and anaerobic processes, bioremediation of contaminated soils and waste land, biotechnological treatment for industrial effluents and solid wastes. GEMS (Genetically Engineered microorganisms) for bioremediation.

**X. 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, gene tagging, Role of gene tagging analysis; Gene Therapy, Gene silencing methods (RNA interference), Biochips and functional genomics.


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22. Paper: SOCIOLOGY

Part I: Sociological Concepts

- Nature and Scope of Sociology, Sociological Perspectives
- Human Society, Individual and Society, Social Group, Community, Association
- Social Structure, Status and Role, Norms, Culture, Socialization and its agencies and theories, Social Institutions, Social Control
- Social Process: Associative and Dissociative Social Process
- Inequality, Social Differentiation, Social Stratification and its theories and dimensions, Social Mobility
- Social Change: Factors and Theories of Social Change, Evolution, Development, Progress

Part II: Sociological Thought and Theory

- Sociological Thought: Nature, Development and Social Context
  Contributions of Auguste Comte, Karl Marx, Herbert Spencer, Emile Durkheim, Max Weber and Vilfredo Pareto
- Sociological theory: Nature and types- Paradigms in Sociology
- Structural Functionalism: Radcliffe Brown, Bonislaw Malinowski, Talcott Parsons and Robert K Merton
- Neo Functionalism: Jeffrey Alexander
- Structuration and Post Modernism: Anthony Giddens, Jacques Derrida and Michel Foucault
- Conflict and Neo Marxism: Karl Marx, Georg Simmel, Lewis Coser, Ralf Dahrendorf, Randal Collins, Jürgen Hebermas, Louis Althuser

Interactionist Perspective:
- Symbolic Interactionism: George Hebert Mead, Charles Horton Cooley, Herbert Blumer
- Phenomenology: Alfred Shultz, Peter Berger, Niklas Luhmann
- Ethnomethodology: Harold Garfinkel, Erving Goffman
- Exchange Theory: George Homans, Peter Blau

Part III: Indian Society

- Composition of Indian Society: Cultural, Religious, Regional and Linguistic Diversity, Unity in Diversity
- Foundations of Indian Society: Hindu View of Life, Purusharthas, Varna Dharma and Ashram Dharma
- Marriage and Family in India: Types and Forms of Hindu Marriage, Hindu Marriage as a Sacrament, Marriage Legislation, Marriage among Muslims and Christians, Types of family, Family in rural and urban setting, Changing trends in marriage and family
- Social change in contemporary India: Sanskritization, Westernization, Modernization and Secularization, Great and Little Tradition, Tradition and Modernity
- Development: Economic development, Human Development, Social Development, Sustainable Development, Nation Building
• Indian experience of development- Five Year Plans- Social consequence of Economic Development- Socio cultural repercussions of Globalization- Social Tensions and Social Resilience

• Contemporary Issues and Debates
  Population Explosion, Poverty, Slums, Displacement, Ecological Degradation, Environmental Pollution, Health Problems and Health Care Delivery, Familial Problems: Gender Inequality, Domestic Violence, Dowry, Divorce and Inter-Generational problems, Crime and Delinquency, White Collar Crime, Corruption, Drug Addiction, Youth Unrest, Suicides, Issues of Migration

Part IV Research Methodology
A. Nature of Social Phenomenon, Scientific Method, Applicability of Scientific Method to Social Phenomenon, Objectivity and Subjectivity, Reliability and Validity, Theory, Fact and Hypothesis
B. Selection of Research Problem, Social Survey, Research Design and its types, Field work, Pre-test, Sample and its types
C. Techniques and Methods data Collection: Observation, Questionnaire, Schedule, Interview, Participant Observation, Case Study, Content Analysis, Life History, Historical Method
D. Techniques of Data Analysis, Classification and Tabulation, Diagrammatic and Graphic Presentation
E. Statistics in Social Research: Measures of Central Tendency, Measures of Dispersion, Correlation Analysis, Measures of Association and Test of Significance
F. Research Report

Part –V: Rural Sociology
• Approaches to the study of Rural Society:
  Rural –Urban differences
  Rurbanism
  Peasant studies

• Agrarian Institutions:
  Land ownership and its types
  Agrarian relations and Mode of production debate
  Jajmani system and Jajmani relations
  Agrarian class structure

• Panchayati Raj System:
  Panchayat before and after 73rd Amendment
  Rural Leadership and Factionalism
  Empowerment of people

• Social Issues and Strategies for Rural Development:
  Bonded and Migrant Labourers
  Pauperization and Depeasantisation
  Agrarian unrest and Peasant movements

• Rural Development and Change:
  Trends of Changes in rural society
  Process of change: Migration – Rural to Urban and Rural to Rural
  Mobility: Social / Economic
  Factors of change

Part-VI: Industry and Society
• Industrial Society in the Classical Sociological Tradition:
  Division of Labour
  Bureaucracy
  Rationality
  Production relations
  Surplus value
  Alienation

• Industry and Society:
Factory as a social System
Formal and informal organization
Impact of Social structure on industry
Impact of industry on society

- **Industrial Relations:**
  - Changing profile of labour
  - Changing labour-management relations
  - Conciliation, adjudication, arbitration
  - Collective bargaining
  - Trade unions
  - Workers’ participation in management (Joint management Councils)
  - Quality circles

- **Industrialization and Social change in India:**
  - Impact of industrialization on family, education and stratification
  - Class and class conflict in industrial society
  - Obstacles to and limitations of industrialization

- **Industrial Planning:**
  - Industrial Policy
  - Labour legislation
  - Human relations in industry

**Part-VII: Sociology of Development**

- **Conceptual Perspectives on Development:**
  - Economic growth
  - Human development
  - Social development
  - Sustainable development

- **Theories of Underdevelopment:**
  - Liberal: Max Weber, Gunnar Myrdal
  - Dependency: Centre-periphery (Frank), Uneven development (Samir Amin), World-System theory (Wallerstein)

- **Paths of Development:**
  - Modernization, Globalisation
  - Socialist
  - Mixed
  - Gandhian

- **Social Structure and Development:**
  - Social Structure as a facilitator/ inhibitor
  - Development and socio-economic disparities
  - Gender and development

- **Culture and Development:**
  - Culture as an aid / impediment
  - Development and displacement of tradition
  - Development and upsurge of ethnic movements

**Part-VIII: Population and Society**

- **Theories of Population Growth:**
  - Malthusian
  - Demographic transition

- **Population Growth and Distribution in India:**
  - Growth of Indian population since 1901
  - Determinants of population

- **Concepts of Fertility, Mortality, Morbidity and Migration:**
  - Age and Sex composition and its consequences
  - Determinants of fertility
  - Determinants of mortality, infant, child and maternal mortality
  - Morbidity rates
  - Determinants and consequences of migration

- **Population and Development:**
  - Population as a constraint on and a resource for development
  - Socio-cultural factors affecting population growth
• **Population Control:**
  Population policy: Problems and perspectives
  Population education
  Measures taken for population control.
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23. Paper: Communication and Journalism
(Syllabus for the Post of Journalism)

Unit-I Communication concepts, models and theories
Communication concepts, theories (-effects, attitude, critical, cultivation, Marxist, normative, agenda setting, framing, diffusion of innovations, uses and gratifications, etc). Communication models. Semiotics.

Unit-II History of Media

Unit-III Reporting
Journalism- basic concepts and terms. Concept of news. editing techniques and practices, Typography, principles of design, headlines, photo editing, basics of photo journalism, printing processes, trends in newspapers and magazines, readership surveys, ownership patterns, media and various social, political and cultural movements. Reporting: Agriculture, poverty, health, environment, science & technology, defence, industry.

Unit-IV International Communication:

Unit-V Broadcasting systems

Unit-VI Communication Research
Types of research, steps in research process, Communication research methodology-proposal writing, content analysis, semiotics, survey, sampling techniques, qualitative methods, case study, experimental research, ratings research; formative, process and summative research, statistical analysis including various tests and report writing. Online research. Research in different areas of communication-print, broadcasting, advertising, PR, and ICTs.

Unit-VII Development Communication
Trends in development communication, experiences and case studies at national and international level, Theories and models of development communication, human development, development indices, sustainable development, traditional folk media, community radio, role of NGOs in development and health communication.

Unit-VIII New Media Technologies.
New media technologies and their impact on various fields in society, digital divide, blogging, podcast, online journalism, pornography and cyber law.

Unit-IX Advertising
Advertising industry in India and world, marketing research; social, economic and cultural impact of advertising on Indians society and Internet advertising.

Unit X Public Relation
Changing trends in public relations, process and models of public relations, experiences and case studies of corporate communications. Corporate communication-principles, practices and trends. Organizational communication, case studies.

Unit-XI Film Theory and Criticism
Origin and growth of film medium. Brief history of Indian cinema. Film theories and criticism, social, political, cultural and gender issues in Indian films. Film genres and trends; and prominent film personalities and their contribution.

Unit-XII Media Law and Ethics
Various provisions relating to media in Indian Constitution. Acts, Ordinances and IPC sections relating to media, Right to Information Act, Press Council and ethics of journalism.

**Unit-XIII Radio Production**
Radio production: Programmes for various audiences, Different Programme formats, creating audio space, sound perspective, voice casting, types of music, use of sound effects. Production crew and their functions: Role of producer. Production planning and execution. Radio studio, acoustics, recording equipment, types and use of microphones, Use of Digital Technology in production.

**Unit-XIV Television Production**
Television technology: broadcasting standards, TV Studio lay out, Production equipment- TV production-studio and field production, TV staff and crew, their functions. Programme formats, Proposal writing, Script writing.TV Production process.TV language and grammar. Classification of shots. Television news production, Editing: Linear and Non-linear, voice over, dubbing, mixing and final mastering.


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25. Paper: PUBLIC ADMINISTRATION

1. Public Administration – Genesis and growth, meaning, nature, scope and significance; Public and Private Administration; New Public Administration-Minnowbrook I, II & III.


6. State Administration – Governor, Chief Minister, Council of Ministers, Secretariat, Chief Secretary, Departments and Directorates.

7. District Administration – Organisation of District Administration, Role of District Collector in Development, Reorganisation of Districts in Telangana State.


9. Personnel Administration – Objectives of personnel administration, classification of services, recruitment, Union Public Service Commission and Telangana State Public Service Commission - Training, Promotion, Discipline, Morale; Staff Associations, Employer - Employee relations.


11. Control over Administration - Legislative, Executive, Judicial control and Citizen control; Good Governance - Transparency and Accountability in Administration – Right to Information Act, Citizen Charter; Public Grievances and Redressal machinery in India – Central Vigilance commission, Central Bureau of Investigation, Lokpal, Lokayukta, Anti-Corruption Bureau and Consumer Protection Mechanism; Administrative Reforms.


14. Research Methodology - Social Science Research - Importance and Objectivity in Social Science Research; Research Methods – Historical, Analytical, Descriptive, Exploratory, Case Study Method; Research Design; Data Collection - Primary and Secondary Sources; Data Analysis, Interpretation and Report Writing.

15. Emerging Trends in Public Administration – Values and Integrity in Public Administration, Citizen driven administration, Public-Private Partnership, Disaster Management.
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26. Paper: FOOD SCIENCE

I. Food Chemistry:

Food chemistry: Carbohydrates - Structure and functional properties of mono, oligo and polysaccharides including starch, cellulose, pectic substances, gums and dietary fibre; Proteins – Classification and structure of proteins in food. Lipids-Classification and structure of lipids, Rancidity of fats. Pigments-Carotenoids, chlorophylls, flavanoids anthocyanins, tannins , haemoglobin and myoglobin. Enzymes- classification and applications Enzymatic and non-enzymatic browning in different foods.

II. Food Biochemistry and Nutrition:

Digestion and absorption of carbohydrates, proteins and fats; metabolism of carbohydrates: glycolysis, TCA cycle, gluconeogenesis, glycogenolysis and glycogenesis.

Lipids: biosynthesis and oxidation of fatty acids; proteins; bio-synthesis, oxidation of amino acids and urea cycle.

Functions of food, Balanced diet, Essential amino acids and essential fatty acids, Water soluble and fat soluble vitamins and minerals: functions and deficiency diseases.

Water, sources, functions and water balance.

III. Food Microbiology:

Characteristics of microorganisms: Morphology, structure and general characteristics of bacteria, yeast, mold and viruses. Microbial growth in food, Intrinsic’ and extrinsic factors affecting growth; Death kinetics, rapid methods for detection of micro organisms.

Food spoilage: Microbial spoilage of milk and milk products, meat and meat products, sea foods, poultry, cereals and their products, vegetable and fruits, eggs, canned foods, sugar and sugar products.

Foodborne diseases: infections and intoxications.

IV. Food Biotechnology:

Need and importance, benefits of fermentation, methods of fermentation, control of fermentation. Fermented foods: traditional and modern fermented foods: Buttermilk, yoghurt, cheese, sausages, alcoholic beverage- wine, beer, whisky ; fermented soya products : tofu, natto ,soya sauce; fermented cereal products: ankak, puto; combination of cereal and pulse products: idly , dosa and vada , Fermented vegetables: sauerkraut , cucumber ,olives and dill pickle.

V. Food Technology:

Cereals and millets:
Composition, nutritive value, processing methods and products ; rice, wheat, maize, barley, oats, minor millets: ragi, jowar, sorghum

Legumes: Composition, nutritive value, processing methods and products : Bengal gram, red gram, green gram, black gram, chick peas.

Nuts and oilseeds: Composition, nutritive value, processing methods and products: Ground nut, soya bean, sunflower & other nuts and oil seeds.

Fruits, vegetables and plantation crops: Extraction, clarification concentration and packaging of fruit juice , Production of jam, jelly, marmalade, squash, candies, and pickles, pectin from fruit waste; processing of tea, coffee, chocolate. Processing of essential oils from spices.

Meat, fish, and poultry: Post mortem changes of meat, freezing, aging, pickling, smoking and tenderization of meat, Drying and canning of fish.

Eggs: Structure, composition, nutritive value and functional properties of eggs and its preservation by different methods, quality evaluation of eggs.
**Milk and milk products:** Milk processing flow sheet, filtration/clarification, storage of milk, standardization, simple problems in standardization, Homogenization, pasteurization- types of pasteurization process. Manufacture of Cream, Butter, Ghee, Milk powder, Cheese.

**VI. Food preservation:**
Need and importance, principles underlying food preservation, methods and mechanisms of food preservation: drying, dehydration, low temperature, refrigeration, freezing and freeze drying. Preservation by sugar and salt, pickling, chemical preservation, irradiation, ultra high temperature pasteurization, canning, concentration and evaporation. Non thermal food processing: high pressure, pulse electric field, hurdle technology, effect of preservation on nutritive value of foods.

**Food additives:**
Definition, classifications, functions and applications: preservatives, anti oxidants, colors, flavors, emulsifying agents, sweeteners, humectants, stabiliser, anti caking agents and anti foaming agents.

**Bakery:**
Principles of baking, role of ingredients in baking, types of bakery products; biscuits, cakes, cookies, bread, muffins.

**Confectionary:** Quality characteristics of confectionery ingredients; Technology for manufacture of Hard Boiled Sweets, candies, chocolate, and special confectionary products; Colour, flavour and texture of confectionary.

**Extrusion technology:**
Definition, methodology, classification of extruders, merits and demerits, uses of extruders, types of extruded foods.

**VII. Food packaging:**
Definitions, need, importance, different packaging materials: wood, paper, glass, metal, plastic and tetra packs, forms and structures, caps and closures. Packaging laws, development of packaging materials, testing methods and techniques, modern and innovative packages, retort packaging, CAP and MAP, bio sensors of food packing, food labelling and nutritional labeling: need, importance and claims.

**VIII. Food Engineering:**
**Fluid mechanics:** Nature of fluids, flow properties of fluids, flow through pipes & fittings, flow measurement, transportation of fluids – pumps, compressors and blowers.

Heat transfer: Heat transfer by conduction, convection, radiation, boiling and condensation, steady & unsteady state heat transfer.

Other unit operations: size reduction, homogenization, filtration, sedimentation, centrifugation, sieving, mixing, extraction, crystallization, evaporation, drying and extrusion. Types of equipment used in each unit operation, their selection, applications in food industry.

**IX. Food Quality & Standards:**

X. Food product development and marketing;
Need and importance, new food product development, definition, classification, characteristics, factors affecting product development, stages of product development, shelf life testing and sensory evaluation, marketing and sales promotion, intellectual property rights.

XI. Waste disposal and sanitation;
Types of food wastes, biological oxygen demand of different wastes, treatment of food industry wastes, bio utilization of food industry wastes from dairy industry, bakery, fruit processing units, meat and other food production units.
ANNEXURE - IV

INSTRUCTIONS TO CANDIDATES:

A) GENERAL INSTRUCTIONS TO CANDIDATES

1) 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.

2) The candidates are not allowed to bring any Electronic devices such as mobile / cellphone, Calculators, tablets, iPad, Bluetooth, pagers, watches to examination centre. 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.

3) The candidates are expected to behave in orderly and disciplined manner while writing the examination. If any candidate takes away Answer Sheet of OMR based examination, the candidature will be rejected and the candidate will be found guilty. The necessary F.I.R. for this incident will be lodged with concerned Police Station, apart from disqualifying his / her candidature.

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


B) INSTRUCTIONS REGARDING OFFLINE OMR BASED EXAMINATION FOR CANDIDATES

1) The candidates have to report 30 minutes before to the examination venue to record their thumb impression on Biometric system.

2) The candidates should go through the instructions given on the cover page of test booklet and carefully write his/her Register Number, Subject / Subject Code, Booklet Series, Name of the Examination Centre etc, in the Answer Sheet, which will be provided to him/her in the examination hall.

3) Since the answer sheets are to be scanned (valued) with Optical Mark Scanner system, the candidates have to USE BALL POINT PEN (BLUE/BLACK) ONLY FOR MARKING THE ANSWERS.

4) The candidates will be supplied OMR Sheet consists of two copies i.e., the Original Copy (Top Sheet) and Duplicate Copy (Bottom Sheet). The candidate is required to use Ball Point Pen (Blue or Black) for filling the relevant blocks in the OMR Sheet including bubbling the answers. After writing the examination the candidate has to handover the original OMR sheet (Top Sheet) to the invigilator in the examination hall, if any candidate takes away the original OMR Sheet (Top Sheet) his/her candidature will be rejected. However the candidate is permitted to take away the duplicate (Bottom Sheet) OMR Sheet for his/her record. The candidates should bring Ball Point Pen (Blue/Black and smooth writing pad) to fill up relevant columns on the Answer Sheet. The candidate must ensure encoding the Register Number, Subject/Subject Code, Booklet Series, Name of the Examination Centre, Signature of the Candidate and Invigilator, etc., on the O.M.R. Answer sheet correctly, failing which the Answer sheet will be rejected and will not be valued. Use of whitener on OMR Sheet will lead to disqualification.

5) The OMR Sheet is to bubble only by Ball Point Pen (Blue/Black). Bubbling by Pencil / Ink Pen / Gel Pen is not permitted in this examination.

6) No candidate should leave the examination hall till expiry of fulltime.

7) The Commission would be analyzing the responses of a candidate with other appeared candidates to detect patterns of similarity. If it is suspected that the responses have been shared and the scores obtained are not genuine/ valid, the Commission reserves the right to cancel his/ her candidature and to invalidate the Answer Sheet.

8) (i) Wherever Written Examination is held, only those candidates who are totally blind are allowed to write the examination with the help of scribe and 10 minutes extra time is permitted to them per hour.

(ii) 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.

(iii) Scribe will be provided to those candidates who do not have both the upper limbs for Orthopedically Handicapped. However, no extra time will be granted to them.

(a) The scribe should be from an academic discipline other than that of the candidate and the academic qualification of the scribe should be one grade lower than the stipulated eligibility criteria.
(b) The candidate as well as the scribe will have to give a suitable undertaking confirming the rules applicable

9) If the candidate noticed any discrepancy printed on Hall ticket as to community, date of birth etc., they may immediately bring to the notice of Commission’s officials/Chief Superintendent in the examination centre and necessary corrections 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) INSTRUCTIONS REGARDING ONLINE EXAMINATION FOR CANDIDATES

1) Candidates shall report at the venue one and half hour (90 minutes) before the Commencement of Examination as the candidates have to undergo certain procedural formalities required for online examination.

2) Date and Time of the Examination as per Hall-Ticket

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

4) 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.

5) Invigilator will announce the password at 09.50 AM and 02.20 PM.

6) 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.

7) 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.

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

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

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

10) 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.

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

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

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

14) 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.

15) 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.

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

17) The SUBMIT button will be activated after 150 Minutes. It will continue for an additional 50 Minutes for PWD candidate eligible for compensatory time. Please keep checking the timer on your screen.

18) 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.

19) 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.

20) 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.

21) Please inform the invigilator in case of any technical issues.

22) Please do not talk to or disturb other candidates.

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

24) You cannot leave exam room before submitting the paper. Please inform the invigilator if you want to use the wash room.
LIST OF SCHEDULED CASTES

1. Adi Andhra
2. Adi Dravida
3. Anamuk
4. Aray Mala
5. Arundhatiya
6. Arwa Mala
7. Bariki
8. Bavuri
9. Beda (Budga) Jangam
10. Bindia
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. Ellamalawar, Yellammalawandlu
22. Ghasi, Haddi, Reelli, Chanchandi
23. Godari
24. Gosangi
25. Holeya
26. Holeya Dasari
27. Jaggali
28. Jambuvulu
29. Kolupulvandlu, Pambada, Pambanda, Pambala
30. Madaşı Kuruva, Madari Kuruva
31. Madiga
32. Madiy Dasu, Mashteen
33. Mahar
34. Mala, Mala Ayawaru
35. Mala Dasari
36. Mala Dasu
37. Mala Hannai
38. Malajangam
39. Mala Masti
40. Mala Sale, Nethani
41. Mala Sanyasi
42. Mang
43. Mang Garodi
44. Manne
45. Mashti
46. Matangi
47. Mehtar
48. Mitha Ayyalvar
49. Mundala
50. Paky, Moti, Thoti
51. Pamidi
52. Panchama, Pariah
53. Reelli
54. Samagara
55. Samban
56. Sapru
57. Sindhollu, Chindollu
58. Yatala
59. Valluvan
LIST OF SCHEDULED TRIBES

1. Andh, Sadhu Andh
2. Bagata
3. Bhil
4. Chenchu
5. Gadabas, Bodo Gadaba, Gutob Gadaba, Kallayi Gadaba, Parangi Gadaba, Kathera Gadaba, Kapu Gadaba
6. Gond, Naikpod, Rajgond, Koltur
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. Kondareddis
16. Kondhs, Kodi, Kodhu, Desaya Kondhs, Dongria Kondhs, Kutiya Kondhs, Tikiria Kondhs, Yenity Kondhs, Kuvinga
17. Kolina, Benthio Oriya, Bartika, Dulia, Holya, Sanrorna, Sidhopaiko
18. Koya, Doli Koya, Gutta Koya, Kamma Koya, Musara Koya, Oddi Koya, Pattidi Koya, Rajah, Rasha Koya, Lingadhari Koya (ordinary), Kottu Koya, Bhine Koya, Rajkoya
19. Kulia
20. Manna Dhora
21. Mukha Dhora, Nooka Dhora
22. Nayaks (in the Agency tracts)
23. Pardhan
24. Porja, Parangiperja
25. Reddi Dhoras
26. Rona, Rena
27. Savaras, Kapu Savaras, Maiya Savaras, Khutto Savaras
28. Sugalis, Lambadis, Banjara
29. Thoti (in Adilabad, Hyderabad, Karimnagar, Khammam, Mahbubnagar, Medak, Nalgonda, Nizamabad and Warangal districts)
30. Yenadis, Chella Yenadi, Kappala Yenadi, Manchi Yenadi, Reddi Yenadi
31. Yerukulas, Koracha, Dabba Yerukula, Kunchapuri Yerukula, Uppu Yerukula
32. Nakkala, Kurvikaran.

LIST OF SOCIALLY AND EDUCATIONALLY BACKWARD CLASSES

As per G.O. Ms. No. 16 Backward Classes Welfare (OP) Department, Dated:11.03.2015 and read with G.O.MS.No. 34, Backward Classes Welfare (OP) Department, Dated: 08/10/2015, G.O. Ms. No. 4 Backward Classes Welfare (OP) Department, Dated: 30/01/2016

STATE LIST OF BCs
(List of Backward Classes of Telangana State)

GROUP-A
(ABORIGINAL TRIBES, VIMUKHTA JATHIS, NOMADIC AND SEMI-NOMADIC TRIBES ETC.)
2. Balasanthu, Bahurupi
3. *Bandara*
4. Budabukkala
5. Rajaka (Chakali, Vannar)
6. Dasari (formerly engaged in Bikshatana i.e., Beggary)
7. Dommara
8. Gangirelavaru
9. Jangam (whose traditional occupation is begging)
10. Jogi
11. Katipapala
12. *Korcha*
13. Lambada or Banjara in Telangana area (deleted and included in ST list vide. G.O.Ms.No.149, SW, Dt.03.05.1978)
14. Medari or Mahendra
15. Mondivaru, Mondibanda, Banda
16. Nayi-Brahmin/Nayee-Brahmin (Mangali), Mangala and Bhajantri
17. Nakkala (deleted vide. G.O.Ms.No.21, BCW (C2) Dept., Dt.20.06.2011, since it is included in the list of Scheduled Tribes at Sl.No.34 vide. Scheduled Castes and Scheduled Tribes Order (Amendment) Act, 2002 (Central Act No.10 of 2003)
18. Vamsha Raj / Pitchiguntla
19. Pamula
20. Pardhi (Nirshikari)
21. Pambala
22 Peddamavandlu, Devaravandlu, Yellammavandlu, Mutyalamavandlu, Dammali / Dammala / Dammula / Damala
23 Veeramustrhi (Nettikutala), Veerabhadreeya
24 Valmiki Boya (Boya, Bedar, Kirataka, Nishadi, Yellapi, Pedda Boya), Talayari, Chunduvallu (Yellapi and Yellapu are one and the same as clarified vide. G.O.Ms.No.61, BCW (M1) Dept., Dt.05.12.1996)
25 Yerukalas in Telangana area (deleted and included at Sl.No.31 in the list of STs)
26 Gudala
27 Kanjara – Bhatta
28 *[Kalinga]
29 Kepmare or Reddika
30 Mondepatta
31 Nokkar
32 Parki Muggula
33 Yata
34 Chopemari
35 Kaikadi
36 Joshinandwalas
37 Odde (Oddilu, Vaddi, Vaddelu), Vadderu, Vaddabhovi, Vadiyaraj, Wadderra
38 Mandula
39 Mehtar (Muslim)
40 Kunapuli
41 Patra
42 *[Kurakula]
43 *[Pondara]
44 *[Samanthula (Samantha/ Sountia / Sauntia)]
45 Pala-Ekari, Ekila, Vyakula, Ektri, Nayanivaru, Palegaru, Tolagari, Kavali (area confined to Hyderabad and Rangareddy Districts only)
46 Rajannalu, Rajannalu (area confined to Karimnagar, Warangal, Nizamabad and Adilabad Districts only)
47 Bukka Ayyavars
48 Gotrala
49 Kasikapadi / Kasikapudi (area confined to Hyderabad, Rangareddy, Nizamabad, Mahaboobnagar and Adilabad Districts only)
50 Siddula
51 Sikligar / Saikalgar
52 Poosala (included vide. G.O.Ms.No.16, BCW(C2) Dept., Dt.19.02.2009 by deleting from Sl.No.24 under Group-D)
53 *[Asadadula / Asadula]
54 *[Keuta / Kevuto / Keviti]
55 Orphan and Destitute Children who have lost their parents before reaching the age of ten and are destitute; and who have nobody else to take care of them either by law or custom; and also who are admitted into any of the schools or orphanages run by the Government or recognised by the Government.

GROUP-B
(Vocational Groups)

1 * [Achukattavandlu]
2 Aryakshatriya, Chittari, Giniyar, Chitrakara, Nakhas
3 Devanga
4 Goud [Ediga, Gouda (Gamalla), Kalalee, Gounda, *[Settibaila of Visakhapatnam, East Godavari, West Godavari and Krishna districts] and Srisayana (Segidi)]
5 Dudekula, Laddaf, Pinjari or Noorbash
6 Gandla, Telikula, Devathilakula
7 Jandra
8 Kummara or Kulala, Salivahana
9 Karikalabhatkulu, Kaikolan or Kaikala (Sengundam or Sengunther)
10 Karnabhatkulu
11 Kuruba or Kuruma
12 *[Nagavaddilu]
13 Neelakanthi
14 Patkar (Khatri)
15 Perika (Perika Balija, Puragiri kshatriya)
16 Nessi or Kumi
17 Padmasali (Sali, Salivan, Pattusali, Senapathulu, Thogata Sali)
18 Srisayana (Segidi) (deleted vide. G.O.Ms.No.63, BCW (M1) Dept., Dt.11.12.1996 and added to Sl.No.4 of Group-B)
19 Swakulasali
20 Thogata, Thogati or Thogataveerakshatriya
21 Viswabrahmin (Ausula, Kamsali, Kammari, Kanchari, Vadla or Vadra or Vadrangi and Silpis), Viswakarma
22 *[Kunchiti / Vakkaliga / Vakkaligara / Kunchitiga]
23 Lodhi/ Lodh/ Lodha (area confined to Hyderabad, Rangareddy, Khammam and Adilabad Districts only)
24 Bondili
25 Are Marathi, Maratha (Non-Brahmins), Arakalies and Surabhi Natakalavallu
26 Neeli (included vide. G.O.Ms.No. 43, BCW (C2) Dept., Dt.07.08.2008 by deleting from Group D at Sl.No.22)
27 Budubunjala / Bhunjwa / Bhadbhunja (area confined to Hyderabad and Rangareddy Districts only)
28 *[Gudia / Gudiya]

GROUP-C
(Harijan Converts)
1 Scheduled Castes converts to Christianity and their progeny

GROUP-D
(Other Classes)
1 *[Agrau]
2 Arekatika, Katika, Are-Suryavamshi
3 *[Atagara]
4 Bhatraju
5 Chippolu (Mera)
6 *[Gavara]
7 *[Godaiba]
8 Hatkar
9 *[Jakkala]
10 Jingar
11 *[Kandra]
12 Koshi
13 Kachi
14 Surya Balija (Kalavanthula), Ganika
15 Krishnabalija (Dasari, Bukka)
16 *[Koppulavelamas]
17 Mathura
18 Mali (Bare, Barai, Marar and Tamboli)
19 Mudiraj, Mutrasi, Tenugollu
20 Munnurukapu
21 *[Nagavasam (Nagavamsa)]
22 Nelli (deleted vide. G.O.Ms.No.43, BCW(C2) Dept., Dt.07.08.2008 and added at Sl.No.26 in Group ‘B’)
23 *[Polinati Velamas of Srikakulam and Visakhapatnam districts]
24 Poosala caste (deleted vide. G.O.Ms.No.16, BCW(C2) Dept., Dt.19.02.2009 and included at S.No.52 under Group-A)
25 Passi
26 Rangarez or Bhavasara Kshatriya
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
30 *[Turupukapus or Gajulakapus]
31 Uppara or Sagara
32 Vanjara (Vanjan)
33 Yadava (Golla)
34 Are, Arevallu and Arollu
35 *[Sadara / Sadaru]
36 *[Arava]
37 Ayyaraka (area confined to Khammam and Warangal Districts only)
38 Nagaralu (area confined to Hyderabad and Rangareddy Districts only)
39 Aghamudian, Aghamudiar, Agamudivelal and Agamudimudalai (including Thuluva Vellalas) (area confined to Hyderabad and Rangareddy Districts only)
40 *[Beri Vysya / Beri Chetty]
41 *[Atirasa]
42 Sondi / Sundi
43 Varala
44 Sistakaranam
45 Lakkamarikapu
46 Veerashaiva Lingayat / Lingaballi
47 Kurmi

GROUP-E
(Socially and Educationally Backward Classes of Muslims)
(Subject to outcome of Civil Appeal No(s).2628-2637/2010 etc., pending before the Hon’ble Supreme Court of India)
1 Achchukattalavandlu, Singali, Singamvallu, Achchupanivallu, Achchukattuvaru, Achukatavandlu
2 Attar Saibulu, Attarollu
3 Dhobi Muslim/ Muslim Dhobi/ Dhobi Musalman, Turka Chakla or Turka Sakala, Turaka Chakali, Tulukka Vannan, Tsakalas, Sakalas or Chakalas, Muslim Rajakas
4 Faqir, Fhakir Budbudki, Ghanti Fhakir, Ghanta Fhakirlu, Turaka Budbudki, Darvesh, Fakeer
5 Garadi Muslim, Garadi Saibulu, Pamulavallu, Kani-Kattuvallu, Garadollu, Gardiga
6 Gosangi Muslim, Phakeer Sayebulu
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.