ANNEXURE-II
NOTIFICATION NO.22/2018
SCHEME AND SYLLABUS FOR RECRUITMENT TO THE POST OF
JUNIOR LECTURERS IN GOVT. JR. COLLEGES

<table>
<thead>
<tr>
<th>Papers</th>
<th>No.of Questions</th>
<th>Duration (Minutes)</th>
<th>Maximum Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>PART-A: Written ‘Examination (Objective Type)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paper-1: General Studies &amp; Mental Ability (Degree Standard)</td>
<td>150</td>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>Paper-2: Concerned Subject (One only) (P.G. standard)</td>
<td>150</td>
<td>150</td>
<td>300</td>
</tr>
<tr>
<td>PART-B: Interview (Oral Test)</td>
<td></td>
<td></td>
<td>50</td>
</tr>
</tbody>
</table>

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

1. The Candidates have to write Paper-2 examination in the subject (relevant to the Post Code applied) studied at PG Level One from the following:-

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Name of the Subject</th>
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</thead>
<tbody>
<tr>
<td>01</td>
<td>English</td>
</tr>
<tr>
<td>02</td>
<td>Telugu</td>
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<tr>
<td>03</td>
<td>Hindi</td>
</tr>
<tr>
<td>04</td>
<td>Urdu</td>
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<tr>
<td>05</td>
<td>Sanskrit</td>
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<tr>
<td>06</td>
<td>Oriya</td>
</tr>
<tr>
<td>07</td>
<td>Mathematics</td>
</tr>
<tr>
<td>08</td>
<td>Physics</td>
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<table>
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<tr>
<th>Subject Code</th>
<th>Name of the Subject</th>
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</thead>
<tbody>
<tr>
<td>09</td>
<td>Chemistry</td>
</tr>
<tr>
<td>10</td>
<td>Botany</td>
</tr>
<tr>
<td>11</td>
<td>Zoology</td>
</tr>
<tr>
<td>12</td>
<td>Commerce</td>
</tr>
<tr>
<td>13</td>
<td>Economics</td>
</tr>
<tr>
<td>14</td>
<td>Civics</td>
</tr>
<tr>
<td>15</td>
<td>History</td>
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</tbody>
</table>

SYLLABUS

PAPER-1: GENERAL STUDIES AND MENTAL ABILITY

1. Events of national and international importance.
2. Current affairs- international, national and regional.
3. General Science and it applications to the day to day life Contemporary developments in Science & Technology and information Technology
4. Social- economic and political history of modern India with emphasis on Andhra Pradesh.
5. Indian polity and governance: constitutional issues, public policy, reforms and e-governance initiatives with specific reference to Andhra Pradesh.
6. Economic development in India since independence with emphasis on Andhra Pradesh.
7. Physical geography of Indian sub-continent and Andhra Pradesh.
8. Disaster management: vulnerability profile, prevention and mitigation strategies,
   Application of Remote Sensing and GIS in the assessment of Disaster.
9. Sustainable Development and Environmental Protection
10. Logical reasoning, analytical ability and data interpretation.
11. Data Analysis:
   a) Tabulation of data
   b) Visual representation of data
   c) Basic data analysis (Summary Statistics such as mean, median, mode, variance and coefficient of variation) and Interpretation
12. Bifurcation of Andhra Pradesh and its Administrative, Economic, Social,
I. Movements and Concepts
Renaissance, Metaphysical poetry, Neo-classicism, Romanticism, Rise of the novel, Modernism, Postmodernism, Colonialism, Postcolonialism, Diaspora, Psychoanalytical criticism, Myth and archetype, Feminism, Structuralism, Poststructuralism, Deconstruction.

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

III. English Language Teaching
1) ELT in India: (History and status of English in India; English as Second Language, English as Foreign Language, and English as Global Language).
2) Methods and Approaches: (Grammar Translation method, Direct method, Audio-Lingual method; Structural approach, Communicative language teaching)
3) Teaching of Language Skills: (Teaching of Listening, Speaking, Reading, and Writing Skills; Teaching of Grammar and Functional English; Teaching of Vocabulary; Classroom techniques; Use of authentic materials)
4) Testing and Evaluation: (Principles, Types, Objectives of testing and evaluation)
5) Phonetics and Phonology; Syntax and Structure.
1. (2) రెండవ దశ సంవత్సరంలో అధికారం - రెండు - సమాన
ప్రమాణం, ప్రమాణం, శిబిరం (మార్గంలో, సంవత్సరము ప్రతిరోధం, ప్రమాణం
రహదారి), ఆషంలో - ప్రమాణం అధికారం, మార్గం సంవత్సరములో 30 -
సంవత్సరం ప్రమాణం - మార్గం రాజకీయ ప్రతిరోధం - ప్రమాణం - రాజకీయ - ప్రతిరోధం
- ప్రమాణం అధికారం - ప్రమాణం అధికారం, శిబిరం సంవత్సరం - కాలాద్యకరం
అధికారం - రాజకీయ ప్రతిరోధం - మార్గం ప్రమాణం - అధికారం.

(మ) రెండవ సంవత్సరం - శిబిరం ప్రతిరోధం, ప్రమాణం - అడవులు ప్రమాణం ప్రతిరోధం.

2. మరియు ప్రమాణం అధికారం - ప్రమాణం - కాలం - కాలం. అధికారం - మార్గం
ప్రతిరోధం - మార్గం శిబిరం - ప్రమాణం అధికారం - ప్రమాణం ప్రతిరోధం, శిబిరం ప్రమాణం
ప్రతిరోధం - ప్రమాణం - ప్రమాణం - మార్గం ప్రతిరోధం - మార్గం (ప్రమాణం, మార్గం, ప్రమాణం,
ప్రతిరోధం)

3. మరింత మంది - రాజకీయ - ప్రతిరోధం - శిబిరంను - (ప్రమాణం - ప్రతిరోధం
ప్రతిరోధం), శిబిరం - ప్రతిరోధం - ప్రమాణం - మార్గం (ప్రమాణం, ప్రతిరోధం,
ప్రతిరోధం, ప్రమాణం, మార్గం, రాజకీయ - ప్రతిరోధం)

4. ప్రతిరోధం ప్రతిరోధం - ప్రమాణం అధికారం - ప్రమాణం అధికారం - ప్రమాణం -
రాజకీయ ప్రతిరోధం - ప్రమాణం - ప్రమాణం - ప్రమాణం - ప్రమాణం - ప్రమాణం - ప్రమాణం
- ప్రమాణం - ప్రమాణం - ప్రమాణం - ప్రమాణం.

5. మార్గం ప్రతిరోధం, మార్గం ప్రతిరోధం :
మార్గం - మార్గం ప్రతిరోధం (ప్రమ, ప్రమ, ప్రమ, ప్రమ ప్రతిరోధం)
ప్రమాణం ప్రతిరోధం (ప్రమ, ప్రమ, ప్రమ, ప్రమ ప్రతిరోధం)

ప్రతిరోధం - ప్రతిరోధం, ప్రతిరోధం, ప్రతిరోధం
(ప్రమాణం, ప్రమాణం, ప్రమాణం, ప్రమాణం, ప్రమాణం, ప్రమాణం, ప్రమాణం, ప్రమాణం,
ప్రమాణం, ప్రమాణం, ప్రమాణం)
1. உந்து மைத்து முறை நிறுவனம் - (முறையில் நடை கொண்டு விளக்கம்) - செய்முறை
   முறையில் முடிவு - கவிதைக்குறிகள் - நான்முறை.

7. முறை முறை அலையால் - குறுக்கு முறை, உள்ள முறையல் - அடன் முறை : முறை முறை
   முடிவு முறை, விளக்க (முறையில் முடிவு அடக்கம்)

8. உந்து முறை முடிவு - (முறையில் நடை கொண்டு விளக்கம்)

9. முறையில், முறையில் முடிவு (குறுக்கு, முடிவு) அடன் முறையல் முடிவு

10. முறையில் முடிவு, முறைய - முறையில் முடிவு (குறுக்கு முடிவு, முறையில் முடிவு
    முறை, முறையில் முடிவு - முடிவுக்குறிகள், முடிவு முடிவு, முடிவு முடிவு முடிவு.
हिंदी भाषा और उसका विकास

इंग्लिश-1
हिंदी की ऐतिहासिक पृष्ठभूमि : प्राचीन भारतीय आध्यात्मिक और साहित्यिक संस्कृति के अंतर्गत रहने के साथ उसकी विशेषताएं और उनकी विशेषताएं और उनकी विशेषताएं। अंतर्जातिक भारतीय आध्यात्मिक निर्माण - पाण्डु, प्राचीन - श्रीरंजन, अर्याचार्य, माधवी, अयोध्या और उनकी विशेषताएं। आर्युद्ध भारतीय आध्यात्मिक धर्म और उनका विकास।

इंग्लिश-2
हिंदी का भौगोलिक विकास, हिंदी की उपभाषाएँ, प्रत्येक हिंदी, पूर्व हिंदी, विशेषताएँ।

इंग्लिश-3
हिंदी का भाषिक स्वरूप : हिंदी की स्थानिक व्यवस्था - घड़ी, बूढ़े, हिंदी शरीर रचना - उपसना, पत्रांक, समार। स्पर्श - सिंह, ज्ञात, और कारक - तत्त्व रचना के दोनों में हिंदी के संज्ञा, सूचना, विशेषण और शब्दांक। हिंदी एक रचना: ध्वनि और अन्तःध्वनि।

इंग्लिश-4
हिंदी के विविध रूप: संप्रकाश, राजस्थान, राजस्थान के रूप में हिंदी, माध्यम-भाषा, संसार-भाषा। हिंदी की साहित्यिक सन्तान। हिंदी प्रसार के आदेश, प्रमुख व्यक्तियों तथा संस्थाओं के दोनों दिशाओं का योगदान।

इंग्लिश-5
हिंदी साहित्य का इतिहास
हिंदी साहित्य का इतिहास- दर्शन, हिंदी साहित्य के इतिहास-हेतु की पहली राजहंस।
हिंदी साहित्य के प्रमुख इतिहास गंगा, हिंदी के प्रमुख साहित्यिक वेतन, संस्थाएं एवं वत-विषयक, हिंदी साहित्य के इतिहास का काल विभाजन और लाभ सम्बन्ध

3. हिंदी
आदिकाल: हिन्दी साहित्य का आरम्भ क्षण और कैसे? राष्ट्रीय साहित्य आदिकालीन हिन्दी का जैन साहित्य, शिव और तात्पर्य साहित्य, अमर झुकों की हिन्दी कविता, विशारदति और उनकी पद्मावति, आरण्मिक गद्य तथा लोकिक साहित्य।

इतिहास 6

मध्यकाल
अवस्था आनंदोलन के उद्ध के सामाजिक-सांस्कृतिक कारण, प्रमुख निरुपण एवं संग्राम संप्रदाय, दैविक अवस्था की सामाजिक- सांस्कृतिक पुनरुज्जिती, आविवाह राहत, प्रमुख संप्रदाय और आचार, अवस्था आनंदोलन का अविव भारतीय स्वरूप और उसका अन्त: प्राचीन वैश्विरी.

हिन्दी साहित्य काल: साहित्य का तैयारिक आचार, प्रमुख निरुपण सत कविता कविक, तनाव, दादू, रंगस, संस कविता की प्रमुख विशेषतायों, भारतीय धर्मों साधना में संस कवियों का स्थान।

हिन्दी सूची काल: सूची कविता का दैविक आचार, हिन्दी के प्रमुख सूची कवि और कविक – मुलिन दादू (नंदकों), कुलक (कुमारवती), मंडल (मानसवती), गाम्य मुहम्मद जामी (प्रमावत), सूची प्रेमद्वारनारायण के स्वरूप, हिन्दी सूची कविता की प्रमुख विशेषतायों।

हिन्दी कृति काल: विविध संप्रदाय, गलत संप्रदाय, अत्तेपण, प्रमुख कृति भक्ति कवि और कविक, सुदरास (सुभासम), नंदकर (सत पंचावद्यर), काव्यों पतरा, सूती परंपरा और हिन्दी कृति कविता – मोहा और राज्याल।

हिन्दी साहित्य विकास संप्रदाय, राम अवस्था शास्त्र के कविता और कविक, तुलसीदास की प्रमुख कृतियाँ, वाक्य रूप और अन्या महत्व।

रूपत काल: सामाजिक-सांस्कृतिक परिवर्तन, रूपतकाल के मूल स्थल, रूपतकाल की प्रमुख पुनरुज्जिती, रूपतकालीन कविता के आविवाह, रूपतमुक्त कविक, रूपतकाल के प्रमुख कवि, केशवदास, जिताराम, महरू, विनाशराम, देव, धामालय और प्रामान, रूपतकाल में लोककौशÙल।
इकाई 7

आपूर्तिक भाषा: हिन्दी गाथा का उदय और विकास। भारतेन्दु पूर्व हिन्दी गाथा, 1857 की राजनीतिक और सास्त्रिक पुनर्जागरण, भारतेन्दु और उनके मुहावरे, 19वी शताब्दी के उत्तरार्द्ध की हिन्दी प्रक्षेपण।

प्राचीन युग: महाकाव्य प्राचीन प्राचीन और उत्तर युग, हिन्दी शब्दांगणण और सरस्वती,

प्राचीन दिस्तिक गुरुत्व और राज्यी काल्पनिका, राज्यी काल्पनिका के प्रमुख कवि, स्वाध्यायसुधावाट और उसके प्रमुख कवि।

प्राचीन और उसके बाद: प्राचीन काल्पनिका के प्रमुख निर्देशात्मक, घातक काल्पनिका के प्रमुख कवि: प्रमुख, निराला, पंत, और महादेवी, उस्ताद प्राचीन काल्पनिका और उसके प्रमुख कवि, प्राचीन शास्त्रीय कवि और उसके प्रमुख कवि, प्राचीन गाथा और उसके कविता, उसके कविता के कवि, समाजसेवा कविता, समाजसेवी साहित्यिक प्रक्षेपण।

इकाई 8

हिन्दी साहित्य की गाथा विषयाएँ

हिन्दी उपन्यास: प्रेमचंद पुरी उपन्यास, प्रेमचंद और उनका युग, प्रेमचंद के परवती प्रमुख उपन्यासकार: ज्ञानेन्द्र, अंजन, छज्जही प्रसाद दिवेदी, यस्ताचार, अमृतलाल नागर,

प्राचीन प्राचीन युग, भाकुम सहाय, गुप्त सहाय, हिन्दी वरिष्ठ, तरंग मेंढ़ा, सौराष्ट्र जुलूस, साहित्य राज, संरेख रामजी, मलुम, भन्दारी।

हिन्दी कवियों: यूजी कवियों की हिन्दी कविता और प्रमुख कवियों का इतिहास।

हिन्दी गाथा: हिन्दी नाटक और रंगमंच, किताबें के घर और प्रमुख नाटप्रति: अंग्रेज लगां, चंद्रगुप्त, अंधासु, अंधेज, अंधेज सर्ज, हिन्दी एकांकी।

हिन्दी निर्देश: हिन्दी कविता के प्रकाश और प्रमुख निर्देशक: - रामचंद्र जुलूस, हजरतप्रसाद दिवेदी, कुवेरचार राय, विषाणु विषाणु, हरिलाल धर, इकाई 9

काव्य शास्त्र और आलोचना.
वातन के सहारे, शहीदों नेता लक्ष्मी (समस्त), तत्कालीन सदाशिव रामनाथसङ्गमुखी पुनः
कार्यरत (समस्त), वातन स्मरणको कार्यरत (समस्त), रामनाथसङ्गमुखी-प्रतिवेदन: शहीद,
आदर्श (संविधान और लोकतंत्र), स्वर्ग की अपना।
विविध संदर्भ, प्रमुख सिद्धांत-रस, आलेख, रूपड़े-धारी, साहित्यिक और अंदिरा।
रस का स्वयं और साहित्यीकरण।
श्रद्धार्थ की अभिवर्तना।
हिंदी आलोचना - रामचंद्र शुक्ल और उनके आलोचकों ने दर्शण।
सुनिश्चित समीक्षा और संतोष - इसकी प्रमाण दिखाए गए। चन्द्रपुरा वा त्रिशेषपूरी, डॉ.
जीतेंद्र सिंह, डॉ. नीलकंठ सिंह, जिन्होंने नामकरण तथा, समकालीन आलोचना।
उदाहरण और आरोप, जैसे अनुकूल मिथिला तथा अर्द्ध, कालिक और ग्रामीण।
हिंदीयाँ के स्वाभाविक भाषा सिद्धांत।
समाज के विषय-वस्त्र सिद्धांत और कला।
आई.एफ.एफ.एस. - सूची सिद्धांत तथा काल-भाषा सिद्धांत दृष्टि-द्रष्टा - संस्कृतिविद्या का सिद्धांत, श्रुतिकला सह-समाचार, पटरियाँ की
अथवा।
रेयों - रूपचार, नवी साहित्य।
संगठनात्मक, उत्तर संचालनात्मक, विभाग, उत्तर आयुक्तिक, प्रचारक।
प्रमाण 10
मदीरं - हजरत प्रसंग डिब्डे - ढेरा - यदि सं 160-209
तनहरा वैदिक - सं रामचंद्र गुप्त - समस्त विवेचन फाइन।
शुमाली - रामचंद्र बाबु - यदि सं 21 तथा
तुमरीसरस - अपराजित, रामगृहमा - गीता देवी, लोकधर्म प्रसंग - कालकवी - यदि, यदि फाइन।
विश्वास - राम की दशक पुजा, गुलामनाथ
अर्थव्य - आधुनिक, नवी के हीरे
शाहिदांश - अन्ये है।
प्रमाण - गोदान
अनेक - शेखर एक जीवनी, भाग-1
प्रसाद - जयहरुपत
मोहन राकेश - अध्यात-अध्याय

इक्काई 11
प्रयोजनमुलक हिंदी
प्रयोजनमुलक हिंदी : अर्थों, परिभाषा और क्षेत्र, ज्ञान प्रचार, सूचनात्मक और रचनात्मक साहित्य में प्रमुखता भाषा भेद, हिंदी का क्षेत्र, राष्ट्रीय एवं अंतरराष्ट्रीय संदर्भ
हिंदी भाषा-संस्कृत एवं भाषा प्रचार
भारतीय संस्कृति और हिंदी, हिंदी की व्याकरण संस्कृतना
प्रयुक्त का अर्थ और प्रकार
प्रयोजनमुलक हिंदी की विविध प्रमुखतायें
प्रमुख प्रयुक्त क्षेत्र - वैज्ञानिक, तकनीकी, कार्यों, व्यवसायिक आदि
इन क्षेत्रों से सम्बन्धित विभिन्न विभिन्न प्रमुखतायें एवं परीक्षण शास्त्र का सामान्य परिचय
प्रयोजनमुलक हिंदी और अनुवाद

इक्काई 12
हिंदी में कंप्यूटर की सुविधाएं
शब्द संसाधन, हिंदी साफंट और हिंदी में कंप्यूटर अनुवाद और अनुवाद

इक्काई 13
भारतीय साहित्य
भारतीय साहित्य का स्वरूप
भारतीय साहित्य के अवयव की समस्याएँ
भारतीय साहित्य का इतिहास और हिंदी साहित्य के विकास में भारतीय साहित्य की भूमिका
इकाई 14
तेलुगु भाषा और साहित्य का इतिहास
tेलुगु भाषा का उद्गम और विकास
नाद्यनिर्माण तेलुगु साहित्य की मुख्य प्रकृतियाँ और अनुभूति रचनाकार
तेलुगु तीव्र और संत-साहित्य, रंग ज्ञान, कृष्ण भक्ति ज्ञान, अष्ट दिसंत वानि,
दक्षिणांत्र युग-साहित्य, तेलुगु साहित्य का आधुनिक काल- आधुनिक तेलुगु कविता: भाव
वाचिता-अन्युदय वाचिता-दिग्विजय वाचिता-तेलुगु वाचिता की असंतत प्राकृतिक-तेलुगु नया
का विकास-प्राक्तन-कहानी-नाटक-निर्माण और अन्य नया विकास- प्राचीनिक रचनाकार

इकाई 15
पपकारिता और मीडिया-लेखन
हिंदी पपकारिता का इतिहास
हिइंदी में समाचार लेखन कला
संगीतीय लेखन शीर्षक की संरचना, जीडी. इंट्रॉ
पूर्व-सात
साधारण
मीडिया-लेखन
विभिन्न उद्यमों तथा साधनों का स्वरूप, मूल्य, मूल्य, हस्त, इंटरनेट
मीडिया भाषा की प्रकृति, समाचार-लेखन एवं वाचन।
हस्त भाषाओं में भाषा की प्रकृति।
The Syllabus covers all important topics related to Urdu Language and Literature. It deals with the Origin & Development of Urdu Language, Deccan Urdu Literature, Evolution & Development of different Forms of Literature, both in Prose and Poetry with reference to the works of prominent writers and poets, Literature Movements and Criticism.

The Syllabus is detailed as follows:

1. **ORIGIN & DEVELOPMENT OF URDU LANGUAGE**

2. **DECCANIYAT**
   - a) Bahmni Daur : Fakhruddin Nizami (Kadamrao Padamrao).
   - b) Adilshahi Daur : Nusrati (Gulshan-e-Ishq).
   - c) Qutubshahi Daur : Mohammed Quli Qutub Shah (Deewas-e- Mohammed Quli QutubShah), Mulla Wajhi (Sabras & Qutub Mucthari), Ghawwasi (Saiful Mulook-o-Badeej Jamaal), Ibne Nishati (Phool Ban).

3. **DEVELOPMENT OF DIFFERENT FORMS OF LITERATURE**
   a) **POETRY**
      - i. **GAZAL** (Tareef, Tareekh aur Tanqeed) The following Poets: Mir, Dard, Atish, Ghalib, Momin, Iqbal, Fani, Jigar, Firaq, Nasir Kazmi.
      - ii. **QASEEDA** (Tareef, Tareekh aur Tanqeed) The following poets: Sauda and Zauq.
      - iii. **MARSIA** (Tareef, Tareekh aur Tanqeed) The following poets: Mir Anees and Mirza Daber.
      - iv. **RUBAYEE** (Tareef, Tareekh aur Tanqeed) The following Poets: Anees, Akbar, Amjad and Josh.
      - v. **MASNAVI** (Tareef, Tareekh aur Tanqeed) Masnavi Sehrul Bayaan (Mir Hasan), Guzar-e-Naseem (Daya Shanker Naseem), Zehr-e-Ishq (Nawab Mirza Shaqau).
   b) **PROSE**
      - i. **DASTAN** (Tareef, Tareekh aur Tanqeed) : Bagh-o-Bahar, Fasana-e-Ajayeb.
      - ii. **NOVEL** (Tareef, Tareekh aur Tanqeed) Fasana-e-Azad (Ratan Nath Sharshar) Taubatun Nusooch (Deputy Nazeer Ahamed) Umrao Jan Ada (Mirza Hadi Ruswa) Gowdan (Prem Chand) Ek Chadar Maii si (Rajender Singh Bedi), Tedhi Lakeer (Imamth Chughtaye), Aiwan Nazaikhail (Jeeelan Bano).
      - iii. **AFSANA** (Tareef, Tareekh aur Tanqeed) Premchand (Najat), Manto (Tobatek Singh), Krishen Chander (Mahalakshmi ka Pul), Quratul Ayen Hyderabad (Nazaara Darmiyan Hai).
      - iv. **DRAMA** (Tareef, Tareekh aur Tanqeed) : Amaanat (Indra Sabha), Agha Hasrashi Kashimiri (Said-e-Hawas), Imitiyaz Ali Taj (Anarkali), Habeeban Tabar (Agra Bazaaar), Mohammed Hasan (Zahid).

4. **LITERARY CRITICISM**
   a) (Tareef aur Tareekh)
      - ii. **Hali ke Tanqeedi Nazariyat** : Muqaddama-e-Sher-o-Shairi.
      - iii. **Mukhtalif Tanqeedi Dabistaan (Unki Tareef aur Tareekh)** : Taassurati Tanqeed, Jamalatagi Tanqeed, Nafiyaati Tanqeed, Murtazaq Tanqeed aur Soakhitagi Tanqeed.

5. **DIFFERENT LITERARY MOVEMENTS**
   - (Their Contribution)

6. **URDU JOURNALISM, TRANSLATION & MASS – MEDIA, Print and Electronic.**
5. Sanskrit

50% of questions will be set in Sanskrit and the remaining 50% questions will be set in ENGLISH.

In writing Sanskrit Devanagari should be used.

1. General introduction to Vedic literature Four Samhitas, Brahmanas, Aranyakas, Upanishads and Vedangas.

2. The Ramayana and Mahabharata - The age of their composition, Social and Political conditions revealed-Their influence on later literature.

3. Study of the following poets, their works and their age Bhasa-Kalidasa-Bharavi-Naga-Sri Harsha-Bhavabuthi-harsha Vardhama-Visakhata-Bhattanarayana-Dandin Banabhatta, Sudraka.

4. History of classical sanskrit literature-the origin and development of different types of literary compositions - Mahakavya - Laghukavya -Historical Kavya - Lyric Poetry - Diadactic poetry - Fable - Drama (Basic knowledge of Dasarupakas) - Gadya kavya.


7. Conjugations - I, IV, VI and X conjugations in (1) Lat (present tense) (2) Lit (Past perfect), (3) Lit (Second future), Lot (imperative mood) (5) Lang (past perfect), (6) Vidhiling (potential mood).


9. Sandhi’s : 
   a) Ach-sandhi-Guna-Vridhi-Savarnadirgha-Prakrutibhava-Purvarupa-Pararupa- Ayavayava-Yanadesa.
   b) Halsandhi-Schutva-Shtutva-Jastva-Anunasiktva-Chartva-Anuswara.
   c) Visargasandhi.


6. ORIYA

(ওরিয়া সাধারণ ইনস্ট্রকশন)

"র" ইংরেজি (Broken English)

(ওরিয়া সাধারণ ইনস্ট্রকশন)

[*]চিত্র বিশ্লেষণ করুন।

"র" ইংরেজি 

(ওরিয়া সাধারণ ইনস্ট্রকশন)

(*[*]চিত্র বিশ্লেষণ করুন।)
I. Real Analysis
Finite, countable and uncountable sets – Real Number system $\mathbb{R}$ – infimum and supremum of a subset of $\mathbb{R}$ – Bolzano–Weierstrass theorem.
Sequences, convergence, limit superior and limit inferior of sequences, sub sequences, Heine Borel Theorem.
Infinite series – Tests of convergence.
Continuity and uniform continuity of real valued functions of real variable. Monotonic functions and functions of bounded variation.
Differentiability and mean value theorems.
Riemann integrability.
Sequences and Series of functions.

II. Metric Spaces
Metric spaces – completeness, compactness and connectedness – continuity and uniform continuity of functions from one metric space into another.
Topological spaces – base and subbase – continuous function.

III. Elementary Number

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

V. Ring Theory

VI. Vector Spaces

VII. Matrix Theory
Linear transformations – Rank and nullity – change of bases.

VIII. Complex Analysis
Algebra of complex numbers – the complex plane – Complex functions and their Analyticity – Cauchy-Riemann equations – Mobius transformations.
Complex Integration – Cauchy’s theorem – Morera’s Theorem – Cauchy’s integral formula – Liouville’s theorem – Maximum modules principle – Schwarz’s lemma – Taylor’s series – Laurents series.
Calculus of residues and evaluation of integrals.

IX. Ordinary Differential Equation
Ordinary Differential Equation (ODE) of first order and first degree – Different methods of solving them – Exact Differential equations and integrating factors.
ODE of first order and higher degree – equations solvable for $p$, $x$ and $y$ – Clairaut’s equations – Singular Solutions.
Linear differential equations with constant coefficients and variable coefficients – variation of parameters.

X. Partial Differential Equations
Formation of differential equations (PDE) – Lagrange and Charpit methods for solving first order PDE’s – Cauchy problem for first order PDE’s Classification of second order PDE’s – General solution of higher order PDE’s with constant coefficients.
8. PHYSICS

PART-A

I. Mathematical Methods of Physics

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

II. Classical Mechanics

III. Electromagnetic Theory

IV. Quantum Mechanics

V. Thermodynamics and Statistical Physics

VI. Electronics

VII. Atomic & Molecular Physics

VIII. Condensed Matter Physics

IX. Nuclear and Particle Physics

PART-B

I. Mathematical Methods of Physics

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

III. 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.

IV. Quantum Mechanics

V. Thermodynamics and Statistical Physics

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

VII. Nuclear and Particle Physics
9. CHEMISTRY

INORGANIC CHEMISTRY

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


5. Metal complexes - EAN rule – structure and bonding of metal carbonyls of Mn, Fe, Co and Ni – Metal nitrosyls – structure and bonding.


7. Metal clusters – factors favoring M-M bonds – Structure and bonding in Re2Cl82-, Mo6Cl84+, Nb3X122+, Re3Cl9 and Re3Cl123-.


9. Analytical chemistry – chromatography – general principles involved in separations by paper, thin layer and column chromatography – GC and HPLC.

Physical Chemistry

1. Thermodynamics


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

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

4. QUANTUM CHEMISTRY
Black body radiation-Planck’s concept of quantization-Planck’s equation, average energy of an oscillator (derivation not required). Wave particle duality and uncertain principle-significance of these for microscopic entities. Emergence of quantum mechanics. Wave mechanics and Schroedinger wave equation.
Bonding in molecules. Molecular orbital theory-basic ideas. Construction of MOs by LCAO, H2+ ion. The variationan integral for H2+ ion. Detailed calculation of Wave functions and energies for the bonding and antibonding MOs. Physical picture of bonding and antibonding wave functions. Energy diagram. The MO and VB wave functions for H2 molecule and their comparison
5. Chemical Kinetics

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

Complex reactions: Opposing reactions, parallel reactions and consecutive reactions (all first order type).


Effect of structure on reactivity: Linear free energy relationships. Hammett and Taft equations: substituent (σ and σ') and reaction constant (ρ and ρ') with examples.

Factors affecting reaction rates in solution. Diffusion controlled reactions. Influence of dielectric constant and ionic strength on ion-ion, ion-dipole and dipole-dipole reactions.

Primary and secondary salt effects. Kinetic isotope effects: Primary and secondary isotope effects. Solvent isotope effects.

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


6. Photochemistry


Derivation of fluorescence and phosphorescence quantum yields. E-type delayed fluorescence-evaluation of triplet energy splitting (ΔE).

Photophysical processes: photophysical kinetics of unimolecular reactions. Calculation of rate constants of various photophysical processes-problems. State diagrams

Photochemical primary processes. Types of photochemical reactions– electron transfer, photodissociation, addition, abstraction, oxidation and isomerization reactions with examples.


7. Solid state chemistry

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


ORGANIC CHEMISTRY

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


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


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


10. BOTANY

CELL AND MOLECULAR BIOLOGY OF PLANTS

Cell Wall : Structure and functions, biogenesis, growth.

Plasma membrane : Structure, models and functions : Sites for ATPases, Ion carriers, Channels and pumps, Receptors.

Plasmodesmata : Structure, Role in movement of molecules and macromolecules, Comparison with gap junctions.

Chloroplast : Structure, genome organization, gene expression, RNA editing, nucleo-chloroplastic interactions.

Mithochondria : Structure, genome organization, Biogenesis.

Plant Vacuoles : Tonoplast membrane, ATPases, transporters, as storage organelle.

Nucleus : Structure, nuclear pores, nucleosome organization, DNA structure : A, B and Z forms, replication, damage and repair, transcription, Plant promoters and transcription
factors, splicing mRNA transport, nucleolus, rRNA biosynthesis.

Ribosomes: Structure, site of protein synthesis, mechanism of translation, initiation, elongation and termination; structure and role of tRNA.

Protein sorting: Targeting of proteins to organelles.

Cell shape and motility: The cytoskeleton; organization and role of microtubules and microfilaments; motor movements; implications in flagellar and other movements.

Cell cycle and apoptosis: Control mechanisms; role of cyclins and cyclin dependent kinases; retinoblastoma and E2F proteins; cytokinesis and cell plate formation; mechanisms of programmed cell death.

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

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

CYTOLOGY, GENETICS AND CYTOGENETICS

Chromatin organization: Chromosome structure and Packaging of DNA, molecular organization of centromere and telomere; nucleolus and ribosomal RNA genes; euchromatin and heterochromatin; karyotype analysis; banding patterns; specialized types of chromosomes; polytene, lampbrush, B-chromosomes and sex chromosomes; molecular basis of chromosome pairing.

Structural and numerical alterations in chromosomes: Duplication, deficiency, inversion and translocation; autopolyploids; allopolyploids; evolution of major crop plants.

Genetics of prokaryotes and eukaryotic organelles: genetic recombination in phage; genetic transformation, conjugation and transduction in bacteria; genetics of mitochondria and chloroplasts cytoplasmic male sterility.

Gene structure and expression: Genetic fine structure; cis – trans test; Benzer’s experiment; introns and their significance; RNA splicing; regulation of gene expression in prokaryotes and eukaryotes.

Genetic recombination and genetic mapping: Recombination; independent assortment and crossing over; molecular mechanism of recombination; role of RecA and RecBCD enzymes; site-specific recombination; chromosome mapping, linkage groups, genetic markers, construction molecular maps.

Mutations: Spontaneous and induced mutations; physical and chemical mutagens; molecular basis of gene mutations; transposable elements in prokaryotes and eukaryotes; mutations induced transposons; site-directed mutagenesis; DNA damage and repair mechanisms.

Plant Breeding: Principles and methods of plant breeding; Marker assisted breeding.

Biostatistics: Mean, Variance, Standard deviation, Standard error, Student’s t test, chi-square and ANOVA.

Molecular cytogenetic: Nuclear DNA content; C-value paradox; cot curve and its significance; restriction mapping – concept and techniques; multigene families and their evolution.

BIOLOGY AND DIVERSITY OF LOWER PLANTS: CRYPTOGAMS

Microbiological techniques: Pure culture, enrichment and anaerobic culture.

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

Microbial growth: Nutritional requirements of microorganisms and methods to measure growth.

Microbial Ecology: Genetification; phosphorous solubilization; nitrogen fixation.
Phycology: Thallus organization; cell ultrastructure; reproduction (vegetative, sexual, asexual); criteria for classification of algae; pigments, reserve food, flagella; classification, salient features of Chlorophyta, Charophyta, Xanthophyta, Bacillariophyta, Phaeophyta and Rhodophyta; algal blooms, algal biofertilizers; algae as food, feed and uses in industry.

Mycology: General characters of fungi; substrate relationship in fungi; cell ultrastructure; unicellular and multicellular organization; cell wall composition; nutrition (saprobic, biotrophic, symbiotic); reproduction (vegetative, asexual, sexual); heterothallism; heterokaryosis parasexuality; Molecular aspects in classification.

General account of Mastigomycotina, Zygomycotina, Ascomycotina, Basidiomycotina, Deuteromycotina; fungi in industry, medicine and as food; fungal diseases in plants and humans; Mycorrhizae; fungi as biocontrol agents.

Bryophyta: Morphology, structure, reproduction and life history; distribution; classification, general account of Marchantiales, Jungermaniales, Anthocerotales, Sphagnales, Funariatales and Polytriales; economic and ecological importance.

Pteridophyta: Morphology, anatomy and reproduction; classification; evolution of stele; heterosporous origin of seed habit; general account of fossil pteridophyta; introduction to Psilo psida, Lycopsida, Sphenopsida and Pteropsida.

TAXONOMY AND DIVERSITY OF SEED PLANTS

Introduction and classification of Gymnosperms

Structure and reproduction in Cycadales, Ginkgoales, Coniferales, Ephedrales, Welwitschiales and Gnetales.

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

Salient features of the International Code of Botanical nomenclature.

Taxonomic tools: Herbarium; floras; histological, cytological, phytochemical, serological, biochemical and molecular techniques; computers and GIS.

Systems of angiosperm classification: Phenetic versus phylogenetic systems; cladistics in taxonomy; relative merits and demerits of major systems of classification.

Concepts of phytogeography: Endemism, hotspots; plant explorations; invasions and introductions.

PLANT PHYSIOLOGY AND METABOLISM

Energy flow: Principles of thermodynamics, free energy and chemical potential, redox reactions, structure and functions of ATP.

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

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

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

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

Respiration and lipid metabolism: Glycolysis, the TCA cycle, electron transport and ATP synthesis, pentose phosphate pathway, glyoxylate cycle, alternative oxidase system,
structure and function of lipids, fatty acid biosynthesis, synthesis of membrane lipids, structural lipids and storage lipids and their catabolism.

**Nitrogen fixation and metabolism**: Biological nitrogen fixation, nodule formation and nod factors, mechanism of nitrate uptake and reduction, ammonium assimilation.

**Photobiology**: Photochromes and cryptochromes, photophysiology of light – induce responses, cellular localization.

**Plant growth regulators and elicitors**: Physiological effects and mechanism of action of auxins, gibberellins, cytokinins, ethylene, abscisic acid, brassinosteroids, polyamines, jasmonic acid and salicylic acid.

**The flowering process**: Photoperiodism, endogenous clock and its regulation, floral induction and development – genetic and molecular analysis, role of vernalization.

**Stress physiology**: Plant responses to biotic and abiotic stress; mechanisms of biotic and abiotic stress tolerance, HR and SAR, water deficit and drought resistance, salinity stress, metal toxicity, freezing and heat stress, oxidative stress.

**Coping with biotic stress**: Chemical control, Biological control, IPM

**PLANT DEVELOPMENT AND reproDUCTION**

**Shoot development**: Organization of the shoot apical meristem (SAM); control of cell division and cell to cell communication; control of tissue differentiation especially xylem and phloem; secretory ducts and laticifers.

**Phyllotaxy and leaf differentiation**

**Root development**: Organization of root apical meristem (RAM); cell fates and lineages; vascular tissue differentiation; homeotic mutants in Arabidopsis and Antirrhinum, sex determination.

**Male gametophyte**: Structure of anthers; microsporogenesis, role of tapetum; pollen development and gene expression; male sterility; sperm dimorphism and hybrid seed production; pollen germination, pollen tube growth and guidance; pollen storage; pollen allergy, pollen embryos.

**Female gametophyte**: Ovule development; megasporogenesis; organization of the embryo sac, structure of the embryo sac cells.

**Pollination, pollen – pistil interaction and fertilization**: Floral characteristics, pollination mechanisms and vectors; self-incompatibility; double fertilization.

**Seed development and fruit growth**: Endosperm development during early, maturation and desiccation stages; embryogenesis, cell lineages during late embryo development; storage proteins of endosperm and embryo; polyembryony; apomixes; embryo culture; fruit maturation.

**Dormancy**: Seed dormancy; overcoming seed dormancy; bud dormancy.

**Senescence and programmed cell death (PCD)**: Types of cell death, PCD in the life cycle of plants, metabolic changes associated with senescence and its regulation; influence of hormones and environmental factors on senescence.

**PLANT ECOLOGY**

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

**Vegetation organization**: Concepts of community and continuum; analysis of communities (analytical and synthetic characters).

**Ecological succession**: Hydrosere and xerosere.

**Ecosystem organization**: Structure and functions; primary production (methods of measurement, global pattern, controlling factors); energy dynamics (trophic organization,
energy flow Pathways, ecological efficiencies); litter fall and decomposition (mechanism, substrate quality land climatic factors); global biogeochemical cycles of C,N,P and S; mineral cycles (pathways, processes, budgets) in terrestrial and aquatic ecosystems.

**Biological diversity**: Concept and levels; role of biodiversity in ecosystem functions and stability; speciation and extinction; IUCN categories of threat; distribution and global patterns, terrestrial biodiversity hot spots; inventory.

**Air, water and soil pollution**: Kinds, sources, quality parameters; effects on plants ecosystems.

**Climate change**: Green house gases (CO$_2$, CH$_4$, N$_2$O, CFCs: sources, trends and role); ozone layer and ozone hole; consequences of climate change (CO$_2$ fertilization, global warming, sea level rise, UV radiation).

**Ecosystem stability**: Concept (resistance and resilience); ecological perturbations (natural and anthropogenic) and their impact on plants and ecosystems; ecology of plant invasion; environmental impact assessment; ecosystem restoration.

**Ecological management**: Concepts; sustainable development; sustainability indicators.

### PLANT RESOURCE UTILIZATION AND CONSERVATION

**Plant Biodiversity and sustainable development**

*Origin, evolution, botany, cultivation and uses of (i) Food forage and fodder crops (ii) fibre crops (iii) medicinal and aromatic plants and (iv) vegetable oil-yielding crops. Ethnobotany

Important fire-wood and timber – yielding plants and non-wood forest products (NWFPs) such as bamboos, rattans, raw materials for paper-making, gums, tannins, dyes, resins and fruits.

**Green revolution**: Benefits and adverse consequences.

**Plants used as avenue trees** for shade, pollution control and aesthetics.

**Principles of conservation; extinctions; environmental status of plants based on International Union for Conservation of Nature.**

**Strategies for conservation – in situ conservation**: International efforts and Indian initiatives; protected areas in India – sanctuaries, national parks, biosphere reserves, wetlands, mangroves and coral reefs for conservation of wild biodiversity.

**Strategies for conservation – ex situ conservation**: Principles and practices; botanical gardens, field gene banks, seed banks, in vitro repositories, cryobanks; general account of the activities of Botanical Survey of India (BSI), National Bureau of Plant Genetic Resources (NBPGR), Indian Council of Agricultural Research (ICAR), Council of Scientific and Industrial Research (CSIR) and the Department of Biotechnology (DBT) for conservation, non-formal conservation efforts.

### BIOTECHNOLOGY AND GENETIC ENGINEERING OF PLANTS AND MICROBES

**Plant Biotechnology**: Principles, scope and applications.

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

**Organogenesis and adventives embryogenesis**: Morphogenesis; somatic embryogenesis.

**Somatic hybridization**: Protoplast isolation, fusion and culture.

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

**Recombinant DNA technology**: Gene cloning principles and techniques, genomic / 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.
11. ZOOLOGY

General Concepts:

1. Levels of structural organization:
   Unicellular, colonial and multicellular forms. Prokaryotic and Eukaryotic cells. Levels of organization of tissues, organs & systems.

2. Acoelomata, Pseudocoelomata, Coelomata, Proterostomia and Deuterostomia.


Non-Chordata:

1. General characteristics and classification of invertebrates up to class level.


6. Annelida: Excretory system, Coelom formation, coelom and coelomoducts.


8. Mollusca: Respiritation, Torsion and De-torsion, pearl formation and Pearl industry.


CHORDATA:

1. General Characters and classification of chordates up to class, Origin of Chordates, phylogeny and affinities of Hemichordata, Retrogressive metamorphosis.

2. Vertebrate integument and derivatives, Comparative account of Digestive, Respiratory, Circulatory, Excretory and Reproductive systems of Vertebrates.

3. Pisciculture in India, Common edible fishes of Andhra Pradesh.


5. Important Snakes of India, Dinosaurs.


7. Adaptive radiation and Dentition in Mammals.

CELL BIOLOGY:

1. Prokaryotic and Eukaryotic cell, Plasma Membrane-Ultrastructure, Permeability, intercellular communication, Endocytosis, Exocytosis, Phagocytosis, Active transport, membrane pumps.

2. Structure & function of intracellular organelles – Nucleus, Mitochondria, Golgi bodies, lysosomes, endoplasmic reticulum, peroxisomes, plastids, vacuoles, Cell wall, Cytoskeleton and its role in motility.

3. Organization of genes and chromosomes - Operon, unique and repetitive DNA, structure of chromatin and chromosomes, heterochromatin, euchromatin, transposons.


5. DNA replication, repair and recombination - Unit of replication, replication origin and replication fork, Recombinant technology, Transgenic and cloned animals, DNA damage and repair mechanisms.

6. Protein synthesis - initiation, elongation and termination of Genetic code.

7. Regulation of gene expression - Lac operon, Lambda operon.
GENETICS:

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

SYSTEM AND CELL PHYSIOLOGY:

2. Cardiovascular System: Neurogenic, myogenic hearts, cardiac cycle, heart as a pump, neural and chemical regulation of all above.
7. Excretory system: Comparative physiology of excretion, urine formation, micturition.
9. Digestive system: Digestion, absorption, assimilation and egestion.
10. Endocrinology and reproduction – Endocrine glands, basic mechanism of hormone action, hormones and diseases, reproduction in mammals.
11. Chemical bonds (Covalent, Hydrogen and Ionic bonds, Van der waals interactions).

EVOLUTION:

2. Isolation, Speciation, Natural Selection.
3. Hardy weinberg' Law.
4. Population Genetics (Gene pool, Gene frequency), Genetic drift and convergent evolution, Adaptive radiation.
5. Evolution of Man.

DEVELOPMENTAL BIOLOGY:

1. Speamatogenesis, oogenesis.
2. Fertilization, cleavage, gastrulation formation of germ layers, parthenogenesis.
3. Embryogenesis in vertebrates.
4. Formation and function of foetal membranes.
5. Types of Placenta.
6. Regulation, genetic control of development.
7. Development of Frog and chick.
HISTOLOGY:
1. Histology of Mammalian tissues and organs - Epithelial, connective, blood, bone, cartilage, skin, stomach, intestine, liver, pancreas, kidney, Testis and Ovary.

ECOLOGY:
1. Concept of Ecosystem.
2. Biogeochemical cycles (Carbon, Nitrogen and Phosphorous).
3. Influence of environmental factors on animals, energy flow in Ecosystem, food chains, food web and trophic levels.
7. Biodiversity - Economic significance, conservation, hot spots of India.

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


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


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

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

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

13. ECONOMICS

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

2. **Macroeconomic Analysis**

3. **Development and Growth**

4. **Money and Banking**
   Definition and functions of money; empirical definition of money – monetary aggregates; monetarism; demand for money – Fisher, Cambridge, Keynesian, Friedman, Baumol and Tobin; supply of money – determinants; money multiplier. Role and functions of Central bank; NBFIs; instruments of monetary control; stabilization policies; monetary and interest rate targeting. Social responsibility of banks; banking sector reforms, Basel I and II; deregulation, competition and efficiency; NPAs. Specialized financial and investment institutions.
5. **Public Finance**

6. **International Trade and Finance**

7. **Indian Economy**
Basic features of Indian economy; growth and structural changes – composition and trends in National Income. Demography – Demographic features; demographic transition and demographic dividend; rural urban migration and rural urban divide. Planning : Objectives and strategies of planning; and achievements of programmes for poverty alleviation and regional imbalances. Agriculture : Land reforms and New Green Revolution – Role of technology; regional disparaties in indian agriculture; Pricing Policy; Food subsidy and Public distribution system. Industry : Industrial growth and Productivity – New industrial policy; Privatisation, Disinvestment – FDI and role of MNCs. SMEs and industrial development. Public Finance : Composition and growth of public expenditure and debt; Fiscal reforms and rationalization of subsidies; Centre – State financial relations. WTO and its impact on Indian economy; Energy and Environment: Energy Security; Environmental Policy of Government of India, Rationale of Social Forestry.

8. **QUANTITATIVE METHODS**

a. **Statistical Methods**

b. **Econometric Methods**


c. **Time Series Models**
Auto-regressive (AR), moving average (MA) and mixed processes (ARMA, ARIMA). Concepts of unit root, integration and cointegration, random walks.

d. **Mathematical Methods**

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

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

Common Syllabus: Public Policy and Research Methodology

I. (A) Public Policy


c) Public Policy Making: Legislature, Executive Judiciary, Bureaucracy, Political Parties, Pressure Groups, NGOs


I. (B) Research Methodology
a) Methods of Enquiry: Traditional and Scientific Methods, Objectivity in Social Science Research

b) Types of Research Design

c) Hypothesis

d) Methods of Data Collection: Library, Interview, Observation

e) Data Processing, Report Writing.

II. Public Administration
a) Definition, Meaning, Nature, Scope and Importance of Public Administration

b) Evolution of Public Administration Theories: Classical, Human Relations and System Approach

c) Union Government: President, Prime Minister and Council of Ministers, Parliament, Judiciary

d) State Government: Governor, Chief Minister and Council of Ministers, State Legislative, Judiciary (High Court and Subordinate Court)

e) Local Government: Panchayati Raj Institutions, Gram Panchayat, Mandal Parishad, Zilla Parishad

f) Impact of 73rd and 74th Constitutional Amendments on Panchayati Raj Institutions

III. Political Science
a) Definition, Meaning, Nature, Scope and Importance of Political Science

b) State: Essential Elements: Theories of Origin of State

c) Sphere of State Activity: Laissez Fair, Welfare, Fascist, Anarchist, Socialist, Marxist

d) Basic Concepts: Law, Liberty, Equality, Justice and Rights

e) Forms of Government: Unitary, Federal, Presidential and Parliamentary

f) Theory of Separation of Powers

g) India’s Foreign Policy – Determinants and Features, Non-Alignment and U.N.O.
15. HISTORY

Ancient India:

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

Medieval India:

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

Modern India (1757-1947):

14. Historical forces and factors which led to the establishment of the British power in India – Early resistance to the British power in India – Hyder Ali, Tippu Sultan, causes for their failure.
17. Revolt of 1857: Causes, results, significance.
18. Rise and growth of the Indian National Movement: Birth of the Indian National Congress, the national movement from 1885 to 1905; movement from 1905 to 1920. Role of Tilak and Annie Besant; The movement from 1920 to 1947; Emergence of Gandhi; Non-cooperation movement, Salt Satyagraha and theQuit India Movement.

Freedom movement in Andhra Pradesh with special reference to the role of Alluri Sitarama Raju and Tanguturi Prakasam, Revolt against the nizam’s rule in Telangana.
Modern World:

19. Industrial Revolution – Significance and results.


22. National liberation movements in Italy and Germany in the 19th century – Mazzini, Cavour, Garibaldi, Bismarck.

23. World War-I – Causes and effects.

24. The Russian Revolution of 1917 – Causes, results and importance.

25. The World between the two world wars – Nazism in Germany, Fascism in Italy, Turkey under Mustafa Kamal Pasha.


27. World War-II – Causes and effects.