

# ప్రాచీన తెలుగు కవిత్వం

## డిగ్రీ (జనరల్) / సెమిస్టర్

రచయితలు

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## విజయోస్తు

మమ్మీ అన్న మాటలో మమకారం కన్న  
అమ్మ! అన్న మాటలో మాధుర్యం మిన్న  
అమ్మ నుండి అలవడే అమృత భాష  
ఆత్మీయతను పెంచే ఆంధ్ర భాష

మాధుర్యాన్ని పెంచే మాన్యభాష  
రాగసుధలను రంగరించే రాష్ట్ర భాష  
మమకారాన్ని పంచే మాతృభాష  
తేనెలోలుకు భాష మన తెలుగు భాష

తెలుగు భాషను గౌరవిద్దాం  
తెలుగు భాషలో మాట్లాడుదాం  
తెలుగు జాతికి వన్నెతెద్దాం  
ఇదే తెలుగుతల్లికి మనమిచ్చే నీరాజనాలు

- రచయితలు

## జనరల్ తెలుగు / సెమిస్టర్ - 1

### ప్రాచీన తెలుగు కవిత్వం

ఈ కోర్సు విజయవంతంగా ముగించాక, విద్యార్థులు క్రింది అభ్యసన ఫలితాలను పొందగలరు.

1. ప్రాచీన తెలుగుసాహిత్యం యొక్క ప్రాచీనతను, విశిష్టతను గుర్తిస్తారు. తెలుగు సాహిత్యంలో ఆదికవి సన్నయ కాలంనాటి భాషానమ్కృతులను, ఇతిహాసకాలంనాటి రాజనీతి విషయాలపట్ల పరిజ్ఞానాన్ని సంపాదించగలరు.
2. శివకవుల కాలంనాటి మతపరిస్థితులను, భాషావిశేషాలను గ్రహిస్తారు. తెలుగు సుడికారం, సామెతలు, లోకోక్తులు మొదలైన భాషాంశాల పట్ల పరిజ్ఞానాన్ని పొందగలరు.
3. తిక్కన భారతంనాటి మత, ధార్మిక పరిస్థితులను, తిక్కన కవితాశిల్పాన్ని, నాటకీయతను అవగాహన చేసుకోగలరు.
4. ఎఱ్ఱన సూక్తివైచిత్రిని, ఇతిహాస కవిత్వంలోని విభిన్న రీతులపట్ల అభిరుచిని పొందగలరు. శ్రీనాథుని కాలం నాటి కవితావిశేషాలను, మొల్ల కవితా విశిష్టతను గుర్తించగలరు.
5. తెలుగు పద్యం స్వరూప-స్వభావాలను, సాహిత్యాభిరుచిని పెంపొందించుకుంటారు. ప్రాచీన కావ్యభాషలోని వ్యాకరణాంశాలను అధ్యయనం చేయడం ద్వారా భాషాసామర్థ్యాన్ని, రచనలో మెళకువలను గ్రహించగలరు.

#### పాఠ్య ప్రణాళిక

##### యూనిట్ - I

రాజనీతి - సన్నయ

మహాభారతం - సభాపర్వం - ప్రథమాశ్వాసం - (26-57 పద్యాలు)

##### యూనిట్ - II

దక్షయజ్ఞం - సన్నెచోడుడు

కుమారసంభవం - ద్వితీయాశ్వాసం - (49 - 86 పద్యాలు)

### యూనిట్ - III

ధామ్య ధర్మోపదేశము - తిక్కన

మహాభారతం - విరాటపర్వం - ప్రథమాశ్వాసం - (116 - 146) పద్యాలు

### యూనిట్ - IV

పలనాటి బెబ్బులి - శ్రీనాథుడు (పలనాటి వీరచరిత్ర - ద్విపద కావ్యం పుట 108 - 112 'బాలచంద్రుడు భీమంబగు సంగ్రామం బొనర్చుట.. (108)..

వెఱగంది కుంది' (112) సం. అక్కిరాజు ఉమాకాంతం ముద్రణ. వి. కె. స్వామి, బెజవాడ 1911.

### యూనిట్ - V

సీతారావణ సంవాదం - మొల్ల

రామాయణము - సుందరకాండము - (40 - 87 పద్యాలు)

### వ్యాకరణం

**సంధులు:** ఉత్ప, త్రిక, ద్రుతప్రకృతిక, నుగాగమ, ద్విరుక్తటకారాదేశ, యణాదేశ, వృద్ధి, శ్చుత్వ, జశ్వ, అనునాసిక సంధులు.

**సమాసాలు:** అవ్యయిభావ, తత్పురుష, కర్మధారయ, ద్వంద్వ, ద్విగు, బహువ్రీహి.

**అలంకారాలు:**

**అర్థాలంకారాలు:** ఉపమ, ఉత్పేక్ష, రూపక, స్వభావోక్తి, అర్థాంతరవ్యాస, అతిశయోక్తి.

**శబ్దాలంకారాలు:** అనుప్రాస (వృత్తనుప్రాస, ఛేకామప్రాస లాటానుప్రాస, అంత్యానుప్రాస)

ఛందస్సు

**వృత్తాలు:** ఉత్పలమాల, చంపకమాల, శార్దూలము, మత్తేభము;

**జాతులు:** కందం, ద్విపద; ఉపజాతులు: ఆటవెలది, తేటగీతి, సీసం మరియు ముత్యాలసరాలు

**విషయ సూచిక**  
**ప్రాచీన తెలుగు కవిత్వం**

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**యూనిట్-1: రాజనీతి**

1.1	ఉద్దేశం	1
1.2	కవి పరిచయం	1
1.3	మహాభారత ప్రాశస్త్యము	1
1.4	పాఠ్యభాగం	2
1.5	పాఠ్యభాగ పరిచయం	7
1.6	కఠిన పదాలకు అర్థాలు	7
1.7	ప్రతిపదార్థ : తాత్పర్యాలు	10
1.8	సందర్భ సహిత వ్యాఖ్యలు	17
1.9	పాఠ్యభాగ సారాంశం	19
1.10	ప్రశ్నలు - జవాబులు	22
1.11	సంగ్రహ ప్రశ్నలు	30
1.12	అభ్యాసం	31

**యూనిట్-2: దక్షయజ్ఞం**

2.1	ఉద్దేశం	33
2.2	కవి పరిచయం	33
2.3	పాఠ్యభాగము	34
2.4	పాఠ్యాంశ పరిచయం	39
2.5	ప్రతిపదార్థ - తాత్పర్యాలు	42
2.6	సందర్భ సహిత వ్యాఖ్యలు	49
2.7	పాఠ్యభాగసారాంశము	51

2.8	ప్రశ్నలు - జవాబులు	54
2.9	సంగ్రహ ప్రశ్నలు	63
2.10	అభ్యాసం	64

**యూనిట్-3: ధౌమ్య ధర్మోపదేశం**

3.1	ఉద్దేశం	67
3.2	పరిచయం	67
3.3	పాఠ్యభాగము	68
3.4	పాఠ్యభాగ పరిచయం	73
3.5	కఠిన పదాలకు అర్థాలు	73
3.6	ప్రతిపదార్థ - తాత్పర్యాలు	75
3.7	సందర్భ సహిత వ్యాఖ్యలు	80
3.8	పాఠ్యభాగ సారాంశము	82
3.9	ప్రశ్నలు -సమాధానములు	85
3.10	సంగ్రహ ప్రశ్నలు	91
3.11	అభ్యాసం	93

**యూనిట్-4: పలనాటి బెబ్బులి**

4.1	ఉద్దేశం	95
4.2	పరిచయం	95
4.3	పాఠ్యభాగము	96
4.4	పాఠ్యభాగ పరిచయం	104
4.5	కఠిన పదాలకు అర్థాలు	104
4.6	సందర్భ సహిత వ్యాఖ్యలు	108
4.7	పాఠ్యభాగం సారాంశం	110

4.8	వ్యాసరూప ప్రశ్నలు	113
4.9	సంగ్రహ ప్రశ్నలు	118
4.10	అభ్యాసం	120

**యూనిట్-5: సీతారావణ సంవాదం**

5.0	ఉద్దేశం	121
5.1	కవియిత్రి పరిచయం	121
5.2	పాఠ్యభాగము	121
5.3	పాఠ్యభాగ పరిచయం	130
5.4	కఠిన పదాలకు అర్థాలు	130
5.5	సందర్భ సహిత వ్యాఖ్యలు	137
5.6	పాఠ్యభాగసారాంశం	139
5.7	ప్రశ్నలు సమాధానములు	144
5.8	సంగ్రహరూప ప్రశ్నలు	153
5.9	అభ్యాసం	156

**యూనిట్-6: వ్యాకరణం**

6.1	సంధులు	157
6.2	సమాసములు	162
6.3	అలంకారములు	167
6.4	ఛందస్సు	170



# *A Course in Communication and Soft Skills*

*As per Choice Based Credit System (CBCS)  
For Degree 1-Year/1-sem  
Common to all Branches*



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**Year : 2024**

**Edition : First**

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# *A Course in Communication and Soft Skills*

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## **Learning Outcomes**

*By the end of the course the learner will be able to:*

- Use grammar effectively in writing and speaking.
- Demonstrate the use of good vocabulary
- Demonstrate an understating of writing skills
- Acquire ability to use Soft Skills in professional and daily life.
- Confidently use the tools of communication skills

### **Unit-1: Listening Skills**

- i. Importance of Listening
- ii. Types of Listening
- iii. Barriers to Listening
- iv. Effective Listening

### **Unit-2: Speaking Skills**

- a. Sounds of English: Vowels and Consonants
- b. Word Accent
- c. Intonation

### **Unit-3: Grammar**

- a. Concord
- b. Modals
- c. Tenses (Present/Past/Future)
- d. Articles
- e. Prepositions
- f. Question Tags
- g. Sentence Transformation (Voice, Reported Speech & Degrees of Comparison)
- h. Error Correction

### **Unit-4: Writing**

- i. Punctuation
- ii. Spelling
- iii. Paragraph Writing

### **Unit-5: Soft Skills**

- a. SWOC
- b. Attitude
- c. Emotional Intelligence
- d. Telephone Etiquette
- e. Interpersonal Skills

# Content

## *A Course in Communication and Soft Skills*

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---

### Unit-1: Listening skills

1.0	Objectives	1
1.1	Listening Skills	1
1.2	Importance	2
1.2.1	Importance of Listening Skills	3
1.2.2	Ways to Improve Listening Skill	3
1.3	Techniques to Improve Listening	4
1.3.1	Characteristics associated with the Speaker and Listener	4
1.4	Process or Stages of Listening	5
1.5	Listening Modes	6
1.5.1	Advantages of Listening	7
1.5.2	Poor Listening Habits	8
1.5.3	Good Listening Habits	8
1.6	Types of Listening	9
1.7	Barriers To Listening	12
1.8	Effectiveness of Listening	14
1.8.1	Strategies for Effective Listening	16
1.9	Listening Comprehension	17
1.9.1	Listening to Sounds: Sounds of English Language	18
1.10	Exercises	19
1.11	Check your Progress	21
1.12	Outcomes	21
1.13	Exercise	22
1.14	Practice Exercises	22

### Unit-2: Speaking Skills

2.0	Objectives	25
2.1	Introduction	25
2.2	Essentials Of Effective Speaking Skills	26
2.2.1	Principles of Speaking Skills	27
2.2.2	Improving Speaking Skills	28
2.3	Barriers of Speaking skills	29
2.3.1	Effectiveness of Speaking Skills	30

2.4	Sounds of English	<b>30</b>
2.5	Introduction To Phonetics	<b>31</b>
2.5.1	The Sounds of English	<b>32</b>
2.5.2	Task	<b>33</b>
2.6	Vowels	<b>34</b>
2.6.1	Pure Vowels or Monophthongs	<b>35</b>
2.6.2	Tasks	<b>40</b>
2.6.3	Diphthongs	<b>42</b>
2.6.4	Tasks	<b>47</b>
2.7	Consonants	<b>48</b>
2.7.1	Double Consonant Letters	<b>56</b>
2.7.2	Tasks	<b>58</b>
2.8	Word Accent	<b>60</b>
2.8.1	Importance of Stress	<b>61</b>
2.8.2	Aspects of Word Stress	<b>61</b>
2.8.3	Rules of Word Stress	<b>63</b>
2.8.4	Stress Shift According to Function	<b>67</b>
2.8.4	Stress Shift According to Function	<b>67</b>
2.8.5	Stress in Compound Words	<b>67</b>
2.9	Tasks	<b>68</b>
2.10	Accent/Stress and Rhythm in Connected Speech	<b>69</b>
2.10.1	Rhythm in Connected Speech	<b>70</b>
2.10.2	Strong/Weak Forms and Contracted Forms	<b>71</b>
2.11	Tasks	<b>74</b>
2.12	Intonation	<b>75</b>
2.12.1	Objective Factors	<b>76</b>
2.12.2	Tone Groups	<b>76</b>
2.12.3	Some Important Points to be Remembered	<b>80</b>
2.13	Tasks	<b>81</b>
2.14	Outcomes	<b>81</b>
2.15	Check Out	<b>81</b>
<b>Unit-3: Grammar</b>		
3.0	Objectives	<b>83</b>
3.1	Importance of Grammar	<b>84</b>
3.2	Concord	<b>84</b>
3.2.1	Rules for Concord	<b>85</b>
3.2.2	Concord of Proximity	<b>88</b>

3.2.3	The Basics of Subject-Verb Concord	<b>89</b>
3.2.4	Tasks	<b>90</b>
3.2.5	Check Out	<b>93</b>
3.3	Modals	<b>94</b>
3.3.1	List of Modal Verbs	<b>94</b>
3.3.2	Tasks	<b>99</b>
3.3.3	Check Out	<b>101</b>
3.4	Tenses (Present/ Past/ Future)	<b>102</b>
3.4.1	Present Tense	<b>103</b>
3.4.2	Past Tense	<b>105</b>
3.4.3	Future Tense	<b>106</b>
3.4.4	Tasks	<b>108</b>
3.4.5	Check Out	<b>113</b>
3.5	Articles	<b>121</b>
3.5.1	The Definite Article	<b>122</b>
3.5.2	The Indefinite Article	<b>122</b>
3.5.3	Indefinite articles with Incountable Nouns	<b>123</b>
3.5.4	Uses of Article ‘a’	<b>124</b>
3.5.5	Uses of Article ‘an’	<b>125</b>
3.5.6	Omission of Articles/Zero Article	<b>125</b>
3.5.7	Use of the Definite Article ‘the’	<b>127</b>
3.5.8	Omission of the Article ‘the’	<b>128</b>
3.5.9	Task	<b>129</b>
3.5.10	Check Out	<b>132</b>
3.6	Prepositions	<b>136</b>
3.6.1	Types of Prepositions	<b>136</b>
3.6.2	Unnecessary Prepositions	<b>138</b>
3.6.3	Other Uses of Preposition	<b>138</b>
3.6.4	Task (GATE 2018)	<b>139</b>
3.6.5	Check Out	<b>142</b>
3.7	Question Tags	<b>144</b>
3.7.1	Positive or Negative Question Tags	<b>144</b>
3.7.2	Intonation	<b>146</b>
3.7.3	Tone Groups	<b>148</b>
3.7.4	Some Important Points to be Remembered	<b>150</b>
3.7.5	Tasks	<b>151</b>
3.7.6	Check Out	<b>153</b>

3.8	Reported Speech	155
3.8.1	Direct and Indirect Speech	155
3.8.2	Converting Direct Speech into Indirect Speech	157
3.8.3	Rules for Reported Speech	157
3.8.4	Tasks	166
3.8.5	Check Out	168
3.9	Active and Passive Voice	169
3.9.1	When to use Active and Passive Voice	169
3.9.2	Active to Passive Voice Rules For Conversion of Sentence	170
3.9.3	Tasks	173
3.9.4	Check Out	184
3.10	Degree of Comparison	187
3.10.1	Rules for Changing the Degrees of Comparison	190
3.10.2	Degrees of Comparison are Applicable only to Adjectives and Adverbs	192
3.10.3	Rules for Adjectives and Adverbs in Degrees of Comparison	194
3.10.4	Tasks	198
3.11	Outcomes	200

**Unit-4: Writing**

4.0	Objectives	201
4.1	Introduction	201
4.2	Significance Of Writing	203
4.2.1	Spelling	204
4.3	Tasks (SSC Codes)	207
4.4	Punctuation	212
4.4.1	Task	216
4.5	Paragraph Writing	217
4.5.1	Organising Principles of Paragraph Writing	218
4.5.2	Paragraph Development Techniques and Methods	220
4.5.3	Types of Paragraphs	222
4.5.4	Tasks	223
4.6	Outcomes	224
4.7	Check Out	224

**Unit-5: Soft Skills**

5.0	Objectives	229
5.1	Introduction	229
5.1.1	How it Works	230
5.1.2	Importance	230

5.1.3	Soft Skills List and Examples	231
5.1.4	Improvement of Soft Skills	232
5.1.5	Highlight your Soft Skills	233
5.2	SWOC	234
5.2.1	Personal SWOT Analysis	235
5.2.2	SWOT Questions to Ask Yourself	237
5.2.3	Determining the Outcomes	238
5.2.4	Taking Action	238
5.2.5	Why do A Personal SWOT Analysis?	238
5.2.6	When Should you Perform a Personal SWOT Analysis	241
5.3	Attitude	242
5.3.1	Definition of Attitude	242
5.3.2	Components of Attitude	244
5.3.3	Factors Influencing Attitude	246
5.3.4	Differences between Attitude and Behaviour	247
5.3.5	Differences between Attitude and Behavior	248
5.3.6	Attitude at Workplace	248
5.3.7	Effects of Positive Attitude	249
5.3.8	Effects of Negative Attitude	250
5.4	Emotional Intelligence	251
5.4.1	The 4 Dimensions of Emotional Intelligence (and a Chart)	253
5.4.2	Key Skills in the Emotional Intelligence Framework	254
5.4.3	Emotional Intelligence, IQ, and Personality Are Different	255
5.4.4	Emotional Intelligence Is Linked to Performance	256
5.4.5	Emotional Intelligence Can Be Developed	257
5.5	Telephone Etiquette	259
5.5.1	Essential Rules of Phone Etiquette	261
5.5.2	Customer Service Phone Etiquette	263
5.5.3	Ways to Improve Your Telephone Etiquette	265
5.6	Interpersonal Skills	266
5.6.1	Understanding Interpersonal Skills	266
5.6.2	Importance of Interpersonal Skills	267
5.6.3	How to Improve Interpersonal Skills	268
5.6.4	Highlight Interpersonal Skills when Applying for Jobs	268
5.7	Outcomes	269
5.8	Interview Questions	270



Life Skill Course  
***Human Values and Professional Ethics***  
*As per Choice Based Credit System (CBCS)*  
*Common to all Branches*



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**Year : 2024**

**Edition : First**

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# *Human Values and Professional Ethics*

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## **Learning Outcome**

On completion of this course, the UG students will be able to:

- Understand the significance of value inputs in a classroom and start applying them in their life and profession
- Distinguish between values and skills, happiness and accumulation of physical facilities, the Self and the Body, Intention and Competence of an individual, etc.
- Understand the value of harmonious relationship based on trust and respect in their life and profession
- Understand the role of a human being in ensuring harmony in society and nature.
- Distinguish between ethical and unethical practices, and start working out the strategy to actualize a harmonious environment wherever they work.

### **Unit-1: Introduction - Definition, Importance, Process & Classifications of Value Education**

- Understanding the need, basic guidelines, content and process for Value Education
- Understanding the thought provoking issues; need for Values in our daily life
- Choices making - Choosing, Cherishing & Acting
- Classification of Value Education: understanding Personal Values, Social Values, Moral Values & Spiritual Values.

### **Unit-2: Harmony in the Family - Understanding Values in Human Relationships**

- Understanding harmony in the Family- the basic unit of human interaction
- Understanding the set of proposals to verify the Harmony in the Family;

- Trust (*Vishwas*) and Respect (*Samman*) as the foundational values of relationship
- Present Scenario: Differentiation (Disrespect) in relationships on the basis of body, physical facilities, or beliefs.
- Understanding the Problems faced due to differentiation in Relationships
- Understanding the harmony in the society (society being an extension of family): *Samadhan*, *Samridhi*, *Abhay*, *Sah-astitva* as comprehensive Human Goals
- Visualizing a universal harmonious order in society- Undivided Society (*Akhand Samaj*), Universal Order (*Sarvabhaum Vyawastha* )- from family to world family.

### **Unit-3: Professional Ethics in Education**

- Understanding about Professional Integrity, Respect & Equality, Privacy, Building Trusting Relationships.
- Understanding the concepts; Positive cooperation, Respecting the competence of other professions.
- Understanding about Taking initiative and Promoting the culture of openness.
- Depicting Loyalty towards Goals and objectives.

**Content**  
***Human Values and Professional Ethics***

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---

**Unit-1: Introduction**

1.0	Objectives	1
1.1	Introduction	1
1.2	Value Education	2
1.2.1	Effective Management of Value Education	4
1.2.2	Objectives of Value-Education	6
1.2.3	Significance of Value Education	7
1.2.4	Guidelines for Value Education	7
1.2.5	Importance of Value Education	8
1.3	Introduction to Values	9
1.4	Definition of Values	10
1.5	Classification of Value Education	12
1.5.1	Characteristics of Values	14
1.5.2	Types of Values	15
1.6	Human Values	15
1.6.1	Evolution of Human Values	16
1.6.2	Important Human Values	17
1.6.3	Types of Human Values	17
1.6.4	Universal Values	18
1.6.5	Cultural Values	18
1.6.6	Humanbeing in Bigger Order	19
1.6.7	Fundamental Values	20
1.7	Content of Value Education	20
1.8	Role of Value Education	21
1.9	Need for Value Education	22
1.9.1	Basic Guidelines for Value Education	25
1.10	Content and Process of Value Education	26
1.10.1	Preconditioning	26

1.10.2	Ways to Apply our Personal Core values in Daily Life	27
1.10.3	Ways to Select Choice Making	29
1.11	Prosperity as parts of Value Education	29
1.11.1	Physical Facilities for Animals and Humans	32
1.11.2	Basic Human Aspirations	35
1.11.3	Our State Today in Human Aspiration	36
1.11.4	Need for Right Understanding	37
1.11.5	Why is Happiness so Important to All of Us?	38
1.11.6	Differences between Prosperity and Wealth	38
1.11.7	SVDD, SSDD, SSSS	40
1.12	Outcomes	42
1.13	Review Questions	42
1.14	Multiple Choice Questions	43
<b>Unit-2: Harmony in the Family</b>		
2.0	Objectives	45
2.1	Introduction	45
2.2	Harmony	46
2.2.1	Harmony in Society	47
2.2.2	Extended Relationship from Family to Society	47
2.2.3	Harmony from Family to World Family	48
2.3	Harmony in Nature	48
2.4	Harmony in the family	49
2.4.1	Family is Basic Unit of Human Interaction	50
2.4.2	Family is a Natural Laboratory	50
2.5	Family is Basic Unit of all Interaction	50
2.5.1	Set of Proposals to Verify Harmony in Family	51
2.5.2	Justice (Nyaya)	51
2.5.3	Differentiation (Disrespect) in Relationships	52
2.5.4	Problems Faced Due to Differentiation in Relationships	54
2.6	Values in Relationships	55

2.6.1	Values in Human Relationships	56
2.7	Basics for respect and today's Crisis	57
2.7.1	Trust (Vishwas)	57
2.7.2	Respect (Samman)	59
2.7.3	Affection	60
2.7.4	Care	61
2.7.5	Guidance	61
2.7.6	Reverence	62
2.7.7	Glory	62
2.7.8	Gratitude	62
2.7.9	Love	63
2.7.10	Difference between Belief & Understanding	64
2.8	Comprehensive Human Goal: The Five dimensions of Human Endeavour	64
2.8.1	Comprehensive Human Goal	67
2.8.2	Five Dimensions of Human Endeavour	68
2.8.3	Prosperity in Families	69
2.8.4	Recyclability and Self-regulation in Nature	70
2.9	Universal Human Order	71
2.9.1	Right understanding in the Individuals is the basis for Harmony in the Family	72
2.10	Outcomes	72
2.11	Review Questions	73
2.12	Multiple Choice Questions	74

### Unit-3: Professional Ethics in Education

3.0	Objectives	77
3.1	Introduction	77
3.2	Value Based Life and Profession	78
3.3	Professional Integrity	78
3.3.1	Professional Integrity in Business	79
3.3.2	Equality and Respect	80
3.3.3	Is Professional Integrity is Possible in Actual Working	80

3.3.4	Important of Professional Integrity in the Workplace	<b>80</b>
3.3.5	Tips for Maintaining Integrity	<b>81</b>
3.3.6	Demonstrate of Integrity in the Workplace	<b>83</b>
3.3.7	Examples of Integrity in the Workplace	<b>83</b>
3.4	Respect and Equality	<b>84</b>
3.4.1	Respect	<b>84</b>
3.4.2	Equality	<b>85</b>
3.4.3	Characteristic Features of Equality	<b>85</b>
3.4.4	Kinds of Equality	<b>86</b>
3.5	Privacy	<b>89</b>
3.5.1	Multiple Dimensions or Types of Privacy	<b>89</b>
3.5.2	Chief Contents or Aspects of Privacy	<b>91</b>
3.6	Privacy Law	<b>94</b>
3.6.1	Classification of Privacy Law	<b>94</b>
3.7	Building Trusting Relationship	<b>95</b>
3.7.1	How to Build Good Work Relationships	<b>96</b>
3.8	Positive Cooperation	<b>98</b>
3.8.1	Importance of Cooperation	<b>99</b>
3.8.2	Advantages of Cooperation	<b>100</b>
3.9	Ethical Competence	<b>101</b>
3.9.1	Salient Features of Competence in Professional Ethics	<b>102</b>
3.9.2	Respecting the competence of other professions	<b>103</b>
3.9.3	Fundamental Principles in Competence in Professional Ethics	<b>103</b>
3.10	Openness	<b>104</b>
3.10.1	Drivers of Openness in an Organization	<b>105</b>
3.11	Loyalty	<b>108</b>
3.11.1	Loyalty towards Goals and Objectives	<b>108</b>
3.11.2	Differing Concepts of Loyalty	<b>108</b>
3.12	Outcomes	<b>110</b>
3.13	Review Questions	<b>110</b>
3.14	Multiple Choice Questions	<b>111</b>



Skill Development Course  
***Office Secretaryship***

*As per Choice Based Credit System (CBCS)  
Common to all Branches*



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**Year : 2024**

**Edition : First**

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# *Office Secretaryship*

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## **Learning Outcomes**

By the successful completion of course, the student will be able to;

1. Understand the organizational hierarchy and outlines of functioning.
2. Comprehend the role of office secretaryship in a small and medium organization.
3. Acquire knowledge on office procedures and interpersonal skills.
4. Apply the skills in preparing and presenting notes, letters, statements, reports in different situations.

### **Unit-I: Introduction**

Introduction - Organisational structure of a small and medium organization - Types of offices - Kinds of secretaries - The scope of office secretaryship.

### **Unit-II: Office Secretary**

The role of an office secretary - Duties and responsibilities - Usage of different devices - Flowchart and office manuals - Coordinating different wings of an office/organisation - Arranging common meetings - Operations of banking and financial services - travel and hospitality management services.

### **Unit-III: Office Procedures**

Office procedures - Filing - Circulating files - Preparation of notes, circulars, agenda and minutes of meetings - Issue of press notes - Maintenance of files and records - Inventory, office, human resources, financial and confidential - maintaining public relations.

# Content

## *Office Secretaryship*

---

---

### Unit-1: Introduction

1.0	Objectives	1
1.1	Introduction	1
1.2	Organisation	2
1.2.1	Definitions of Organization and Organizing	2
1.2.2	Elements of Organization	3
1.2.3	Nature of Organization	6
1.2.4	Importance of Organization	7
1.2.5	Advantages of Organizing	7
1.2.6	Principles of Organization	9
1.2.7	Steps in the Process of Organisation	11
1.3	Organizations Structure	12
1.3.1	Significance of Organization Structure	13
1.3.2	Principles of Organization Structure	14
1.4	Types of Organizations	14
1.4.1	Based on Organization Structure	14
1.4.2	Based on Authority	19
1.5	Meaning and Definition of Office	22
1.5.1	Office Work	24
1.5.2	Office Activities	25
1.5.3	Factors Contributing to the Growth of Office Work	26
1.5.4	Types of Office	27
1.6	Secretary	28
1.6.1	Appointment of a Secretary	30

1.6.2	Qualifications and Personal Qualities of a Secretary	31
1.6.3	Remuneration of a Secretary	35
1.6.4	Functions or Duties of a Secretary	35
1.6.5	Rights of a Secretary	36
1.6.6	Powers of a Secretary	36
1.6.7	Liabilities of a Secretary	37
1.6.8	Importance of Secretary	37
1.7	Types of Secretary	38
1.8	Scope of Secretary	40
1.9	Outcomes	43
1.10	Review Questions	43

## Unit-2: Office Secretary

2.0	Objectives	45
2.1	Introduction	45
2.2	Role of an Office Secretary	46
2.3	Duties of Office Secretary	48
2.4	Responsibilities of Secretary	51
2.5	Usage of Different Devices	53
2.5.1	Brief Overview of Office Equipments	54
2.5.2	Brief List of Modern Office Technologies	55
2.5.3	Summary of the Advantages of Office Equipments	56
2.5.4	Meaning and Types of Mail	56
2.5.4.1	Handling of Incoming Mail	57
2.5.4.2	Handling of Outgoing Mail	59
2.5.4.3	Handling of Electronic Mail	62
2.5.4.4	Mail Room Equipment	63

2.6	Flow Chart	<b>65</b>
2.6.1	Straight-Line Flow of Work	<b>66</b>
2.6.2	Problems in Smooth Flow of Work	<b>67</b>
2.7	Office Manuals	<b>68</b>
2.7.1	Definition of Office Manual	<b>68</b>
2.7.2	Need for Office Manuals	<b>69</b>
2.7.3	Types of Office Manuals	<b>69</b>
2.7.4	Principles of Office Manuals	<b>71</b>
2.7.5	Steps in Preparation and Writing of Office Manuals	<b>71</b>
2.7.6	Advantages of Office Manuals	<b>73</b>
2.7.7	Disadvantages of Office Manuals	<b>73</b>
2.7.8	Revision and Distribution of Office Manuals	<b>74</b>
2.7.9	Distribution of Office Manuals	<b>74</b>
2.8	Coordinating Different Wings of an Office/Organisaton	<b>74</b>
2.9	Meeting - Meaning, Importance and Types of Meetings	<b>77</b>
2.9.1	Types of Meetings	<b>77</b>
2.9.2	Requisites of a Valid Meeting	<b>79</b>
2.9.3	Secretarial Duties Relating to Meetings	<b>84</b>
2.9.4	Terms Relating to Meeting	<b>85</b>
2.10	Services Provided by Banks	<b>87</b>
2.10.1	Other Common Facilities Provided by Banks	<b>91</b>
2.10.2	General Utility Services Provided by Banks	<b>92</b>
2.10.3	Terms Used in Banking Transactions	<b>94</b>
2.11	Modes of Travel	<b>99</b>
2.11.1	How to Make Railway Reservation	<b>100</b>

2.11.2	Air Travel	<b>101</b>
2.11.3	E-Ticket and Paper Ticket	<b>103</b>
2.11.4	Travel Agencies	<b>103</b>
2.11.5	Hotel Reservation	<b>104</b>
2.11.6	Itinerary	<b>105</b>
2.11.7	Organizing Travel	<b>105</b>
2.11.8	Tour Advance and Tour Claim	<b>106</b>
2.11.9	Overse as Travel Appangement	<b>106</b>
2.12	Outcomes	<b>108</b>
2.13	Review Questions	<b>109</b>

**Unit-3: Office Procedures**

3.0	Objectives	<b>111</b>
3.1	Introduction	<b>111</b>
3.2	Meaning of Procedure	<b>113</b>
3.2.1	Definition	<b>113</b>
3.2.2	Importance of Systems and Procedures	<b>114</b>
3.2.3	Benefits and Limitations of Systems and Procedures	<b>114</b>
3.3	Filing - Meaning, Importance and Essentials	<b>115</b>
3.3.1	Essentials of a Good Filing System	<b>117</b>
3.3.2	Classification of Filing - Alphabetical, Numerical, Geogr-Aphical, Subject, Chronological	<b>117</b>
3.3.3	Methods of filing- Horizontal and Vertical	<b>122</b>
3.3.4	E-Filing	<b>124</b>
3.3.5	Weeding out or Destruction of Old Records	<b>128</b>
3.3.6	Indexing	<b>128</b>
3.3.7	Filing Procedure	<b>132</b>

3.4	Notice	<b>134</b>
3.5	Circular	<b>137</b>
3.6	Preparation of Notice, Agenda and Minutes of Meeting	<b>139</b>
3.7	Press Note	<b>147</b>
	3.7.1 Press Notes have the Force of Law	<b>147</b>
	3.7.2 Press Notes are Subject to Judicial Review	<b>149</b>
3.8	Maintenance of Files and Records	<b>149</b>
	3.8.1 Improve Records Management in Any Office	<b>153</b>
3.9	Maintenance of Inventory Records	<b>154</b>
	3.9.1 Maintaining Inventory Records	<b>157</b>
3.10	Maintenance of Human Resource	<b>163</b>
	3.10.1 Benefits of Cloud- Based Document Storage	<b>165</b>
	3.10.2 Important Practices for Personnel Files	<b>165</b>
3.11	Maintenance of Financial Record	<b>166</b>
3.12	Confidential Files	<b>169</b>
3.13	Public Relations	<b>170</b>
	3.13.1 Functions of Public Relations Department (Promotion Tools in PR)	<b>171</b>
	3.13.2 Role of Public Relations in an Organisation	<b>173</b>
3.14	Outcomes	<b>175</b>
3.15	Review Questions	<b>175</b>



# Diversity of Microbes & Lower Plants

(Algae and Fungi)

I - B.Sc (Botany)/ I & II- Semester

*As per Choice Based Credit System (CBCS)*



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**Year : 2024**

**Edition : First**

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## Microbial Diversity of Lower Plants

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### UNIT - I

1. Brief account of Archaeobacteria, Actinomycetes.
2. Cyanobacteria: General characters, cell structure, thallus organisation and their significance as biofertilizers with special reference to *Oscillatoria*, *Nostoc* and *Anabaena*.
3. Lichens: Structure and reproduction; ecological and economic importance.

### UNIT- II

4. Viruses: Structure, replication and transmission; plant diseases caused by viruses and their control with reference to Tobacco Mosaic and Rice Tungro.
5. Bacteria: Structure, nutrition, reproduction and economic importance. An outline of plant diseases of important crop plants caused by bacteria and their control with reference to Angular leaf spot of cotton and Bacterial blight of Rice.
6. General account of Mycoplasma with reference to Little leaf of brinjal and Papaya leaf curl

### UNIT-III

7. General characters, structure, reproduction and classification of algae (Fritsch) and thallus organization in algae.
8. Structure and reproduction of the following: Chlorophyceae- *Volvox*, *Oedogonium* and *Chara*.  
Phaeophyceae- *Ectocarpus*  
Rhodophyceae- *Polysiphonia*.
9. Economic importance of algae in Agriculture and Industry.

### UNIT-IV

10. General characters and classification of fungi (Ainsworth).
11. Structure and reproduction of the following:
  - (a) Mastigimycotina- *Albugo*
  - (b) Zygomycotina- *Mucor*
  - (c) Ascomycotina- *Saccharomyces* and *Penicillium*.
  - (d) Basidiomycotina- *Puccinia*
  - (e) Deuteromycotina- *Cercospora*.
12. Economic importance of fungi in relation to mycorrhizae and mushrooms. General account of mushroom cultivation.

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### UNIT- I: MICROBIAL WORLD

1. Discovery of microorganisms, origin of life, spontaneous, biogenesis, Pasteur experiments, germ theory of disease.
2. Classification of microorganisms – R.H. Whittaker's five kingdom concept, Carl Woese's- Domain system.
3. Brief account of special groups of bacteria- Archaeobacteria, Mycoplasma, Chlamydia, Actinomycetes, Rickettsias and Cyanobacteria.

### UNIT- II: VIRUSES

1. Viruses- Discovery, general account, structure & replication of –T4 Phage (Lytic, Lysogenic) and TMV, Viroids, Prions.
2. Plant diseases caused by viruses– Symptoms, transmission and control measures (Brief account only).
3. Study of Tobacco Mosaic, Bendi Vein clearing and Papaya leaf curl diseases.

### UNIT III: BACTERIA

1. Bacteria: Discovery, General characteristics, cell structure and nutrition.
2. Reproduction- Asexual and bacterial recombination (Conjugation, Transformation, Transduction).
3. Economic importance of Bacteria.

### UNIT –IV ALGAE

1. General account - thallus organization and reproduction in Algae.
2. Fritsch classification of Algae (up to classes only) and economic importance.
3. Structure, reproduction and life history of *Oedogonium*, *Ectocarpus* and *Polysiphonia*.

### UNIT V: FUNGI

1. General characteristics and outline classification (Ainsworth).
2. Structure, reproduction and life history of *Rhizopus* (Zygomycota), *Penicillium* (Ascomycota), and *Puccinia* (Basidiomycota).
3. Lichens-Structure and reproduction; ecological and economic importance.

# Diversity of Microbes & Lower Plants

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## Chapter-1

1.0	Aims & Objectives	1
1.1	Introduction	1
1.2	Ancient Theories of Origin of Life	2
1.3	Modern Theories of Origin of Life	2
1.4	Discovery of Microorganisms	5
1.5	Spontaneous Generation of Micro-organisms	5
1.6	Pasteur's Experiments	6
1.7	Germ Theory of Disease	7
1.8	Classification of Organisms	7
1.9	Summary	12
1.10	Review Questions	14
1.11	Objective Type Questions	15

## Chapter-2

2.0	Aims & Objectives	17
2.1	Introduction	17
2.2	Characteristics of Viruses	18
2.3	Structure of Virus	18
2.4	Replication	21
2.5	Transmission of Plant Viruses	24
2.6	Plant Diseases Caused by Viruses	26
2.7	Control of Plant Viral Diseases	29

2.8	Classification of Viruses	30
2.9	Tobacco Mosaic Virus	36
2.10	Tungro Disease of Rice	37
2.11	Bhendi Vein Clearing	37
2.12	Summary	38
2.13	Review Questions	39
2.14	Objective Questions	40

### Chapter-3

3.0	Aims & Objectives	43
3.1	Introduction	43
3.2	Structure of Bacterial Cell	46
3.3	Nutrition in Bacteria	49
3.4	Reproduction	52
3.5	Economic Importance of Bacteria	60
3.6	Bacterial Disease of Crop Plants and Their Control	66
3.7	Classification Of Bacteria	71
3.8	Summary	72
3.9	Review Questions	74
3.10	Objective Type Questions	76

### Chapter-4

4.0	Aims & Objectives	81
4.1	Archaeobacteria	81
4.2	Chlamydiae	84
4.3	Actinomycetes	85
4.4	Mycoplasmas	91

4.5	Rickettsias	95
4.6	Summary	97
4.7	Review Questions	98
4.8	Objective Type Questions	99

### Chapter-5

5.0	Aims & Objectives	103
5.1	Introduction	103
5.2	Occurrence	104
5.3	Thallus Organisation	104
5.4	Cell Structure	105
5.5	Heterocysts	108
5.6	Movement	110
5.7	Reproduction	110
5.8	Economic Importance	111
5.9	Cyanobacteria as Biofertilizers	112
5.10	Oscillatoria	114
5.11	Nostoc	116
5.12	Anabaena	118
5.13	Summary	120
5.14	Review Questions	122
5.15	Objective Questions	123

### Chapter-6

6.0	Aims & Objectives	127
6.1	Introduction	127
6.2	General Characteristics	127

6.3	Occurrence	128
6.4	Thallus Organisation	129
6.5	Cell Structure	135
6.6	Reproduction	142
6.7	Life Cycles	148
6.8	Classification of Algae	151
6.9	Economic Importance of Algae	159
6.10	Summary	164
6.11	Review Questions	167
6.12	Objective Questions	169

### Chapter-7

7.0	Aims & Objectives	175
7.1	Oedogonium	175
7.2	Chara	181
7.3	Ectocarpus	189
7.4	Polysiphonia	194
7.5	Volvox	200
7.6	Summary	204
7.7	Reviews Questions	207
7.8	Objective Type Questions	209

### Chapter-8

8.0	Aims & Objectives	217
8.1	Introduction	217
8.2	General Characteristics of Fungi	218
8.3	Occurrence	218



8.4	Thallus Organisation	219
8.5	Hyphal Structures	221
8.6	Dimorphic Fungi	223
8.7	Structure of a Typical Fungal Cell	223
8.8	Nutrition in Fungi	227
8.9	Growth of Fungi	230
8.10	Reproduction in Fungi	230
8.11	Heterothallism in Fungi	236
8.12	Parasexuality in Fungi	238
8.13	Life Cycles in Fungi	240
8.14	Classification of Fungi	243
8.15	Economic Importance of Fungi	248
8.16	Summary	257
8.17	Review Questions	262
8.18	Objective Type Questions	264

### Chapter-9

9.0	Aims & Objectives	271
9.1	Mastigomycotina	271
9.2	Albugo(cystopus)	271
9.3	Zygomycotina	279
9.4	Mucor	281
9.5	Rhizopus	287
9.6	Ascomycotina	294
9.7	Saccharomyces (Yeast)	300
9.8	Penicillium	306

9.9	Bastidiomycotina	311
9.10	Puccinia	318
9.11	Deuteromycotina	329
9.12	Cercospora	334
9.13	Mushroom Cultivation	336
9.14	Summary	344
9.15	Review Questions	351
9.16	Objective Type Questions	353

## **Chapter-10**

10.0	Aims & Objectives	369
10.1	Introduction	369
10.2	Components of Lichen	369
10.3	Distribution	370
10.4	Biology of Lichen	370
10.5	Growth Forms of Lichens	371
10.6	Internal Structure of Thallus	372
10.7	Special Structures of Lichen Thallus	373
10.8	Reproduction in Lichens	374
10.9	Economic Importance of Lichens	378
10.10	Classification of Lichens	380
10.11	Summary	381
10.12	Review Questions	383
10.13	Objective Type Questions	384

# ***INORGANIC AND ORGANIC CHEMISTRY***

*I-B.Sc(Chemistry) / I - Semester*

*As per Choice Based Credit System (CBCS)*



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**Year : 2024**

**Edition : First**

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# Inorganic and Organic Chemistry

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## INORGANIC CHEMISTRY

### UNIT -I

#### 1. P-block elements-I

Group-13: Synthesis and structure of diborane and higher boranes ( $B_4H_{10}$  and  $B_5H_9$ ), boron-nitrogen compounds ( $B_3N_3H_6$  and BN)

Group - 14: Preparation and applications of silanes and silicones.

Group - 15: Preparation and reactions of hydrazine, hydroxylamine.

### UNIT-II

#### 1. P-block elements -II

Group - 16: Classifications of oxides based on (i) Chemical behaviour and (ii) Oxygen content.

Group-17: Inter halogen compounds and pseudo halogens.

#### 2. Organometallic Chemistry

Definition - classification of Organometallic compounds - nomenclature, preparation, properties and applications of alkyls of Li and Mg.

## ORGANIC CHEMISTRY

### UNIT-III

#### 1. Structural theory in Organic Chemistry

Types of bond fission and organic reagents (Electrophilic, Nucleophilic, and free radical reagents including neutral molecules like  $H_2O$ ,  $NH_3$  &  $AlCl_3$ ).

Bond polarization : Factors influencing the polarization of covalent bonds, electro negativity - inductive effect. Application of inductive effect (a) Basicity of amines (b) Acidity of carboxylic acids (c) Stability of carbonium ions. Resonance or Mesomeric effect, application to (a) acidity of phenol, and (b) acidity of carboxylic acids. Hyper conjugation and its application to stability of carbonium ions, Free radicals and alkenes, carbanions, carbenes and nitrenes.

Types of Organic reactions : Addition - electrophilic, nucleophilic and free radical. Substitution - electrophilic, nucleophilic and free radical. Elimination- Examples.

## UNIT-IV

### 5. Acyclic Hydrocarbons

Alkenes - Preparation of alkenes. Properties: Addition of hydrogen - heat of hydrogenation and stability of alkenes. Addition of halogen and its mechanism. Addition of HX, Markonikov's rule, addition of  $\text{H}_2\text{O}$ , HOX,  $\text{H}_2\text{SO}_4$  with mechanism and addition of HBr in the presence of peroxide (anti - Markonikov's addition). Dienes - Types of dienes, reactions of conjugated dienes - 1,2 and 1,4 addition of HBr to 1,3 - butadiene and Diel's - Alder reaction.

Alkynes - Preparation by dehydrohalogenation of dihalides, dehalogenation of tetrahalides, Properties; Acidity of acetylenic hydrogen (formation of Metal acetylides). Preparation of higher acetylenes, Metal ammonia reductions, Physical properties. Chemical reactivity - electrophilic addition of  $\text{X}_2$ , HX,  $\text{H}_2\text{O}$  (Tautomerism), Oxidation with  $\text{KMnO}_4$ ,  $\text{OsO}_4$ , reduction and Polymerisation reaction of acetylene.

### 6. Alicyclic hydrocarbons (Cycloalkanes)

Nomenclature, Preparation by Freund's method, Wislicenus method. Properties - reactivity of cyclopropane and cyclobutane by comparing with alkanes, Stability of cycloalkanes - Baeyer's strain theory, Sachse and Mohr predictions and Pitzer's strain theory. Conformational structures of cyclobutane, cyclopentane, cyclohexane.

## UNIT-V

### 1. Benzene and its reactivity

Concept of resonance, resonance energy. Heat of hydrogenation, heat of combustion of Benzene, mention of C-C bond lengths and orbital picture of Benzene. Concept of aromaticity - aromaticity (definition), Huckel's rule - application to Benzenoid (Benzene, Naphthalene) and Non - Benzenoid compounds (cyclopropenyl cation, cyclopentadienyl anion and tropylium cation)

Reactions - General mechanism of electrophilic substitution, mechanism of nitration, Friedel Craft's alkylation and acylation. Orientation of aromatic substitution - Definition of ortho, para and meta directing groups. Ring activating and deactivating groups with examples (Electronic interpretation of various groups like  $\text{NO}_2$  and Phenolic). Orientation of (i) Amino, methoxy and methyl groups (ii) Carboxy, nitro, nitrile, carbonyl and sulphonic acid groups (iii) Halogens

(Explanation by taking minimum of one example from each type)

# Detailed Contents

## Inorganic and Organic Chemistry

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### Chapter-1

1.0	Aims and Objectives	1
1.1	Introduction	1
1.2	S-block Elements	3
1.3	Diagonal Relationship between Li and Mg	7
1.4	Diagonal Relationship Between Be & Al	9
1.5	Group-13: Synthesis of Diborane	11
1.6	Group-14: Silanes and Silicones	15
1.7	Group-15:Hydrazine	18
1.8	Preparation and Reaction of Hydroxylamine and Phosphazenes	19
1.9	Summary	20
1.10	Exercise	20
1.11	Objective Type Questions	22

### Chapter-2

2.0	Aims and Objectives	25
2.1	Introduction	25
2.2	Group-16: Classifications of Oxides	26
2.3	Group-17 Interhalogen Compounds and Pseudo Halogens	27
2.4	Definition and classification Organometallic Compo-unds	32
2.5	Nomenclature, Preparation and Properties	34
2.6	Applications of Alkyls of 1, 2 and 13 group Elements	36
2.7	Summary	37
2.8	Exercise	39
2.9	Objective Types Questions	40

### Chapter-3

3.0	Aims and Objectives	45
3.1	Introduction	45
3.2	Types of Bond Fission and Organic Reagents	45
3.3	Bond Polarization	48
3.4	Electronegativity - Inductive Effect	48
3.5	Applications of Inductive Effect	50
3.6	Resonance or Mesomeric Effect	53
3.7	Hyper Conjugation and its application to stability of carboniumions	57
3.8	Free Radicals and Alkanes, Carbanions, CarbinEs, Nitranes	58
3.9	Types of Organic Reactions	59
3.10	Elimination	61
3.11	Summary	62
3.12	Exercise	63
3.13	Objective Type Questions	65

### Chapter-4

4.0	Aims and Objectives	69
4.1	Introduction	69
4.2	Alkanes	70

4.3	Hydrogenation of Alkynes and Alkenes	72
4.4	Chemical Reactivity	74
4.5	Halogenation	75
4.6	Alkenes	75
4.7	Addition of Hydrogen	78
4.8	Addition of Halogen and its Mechanism	80
4.9	Oxidation	84
4.10	Dienes	85
4.11	Alkynes	95
4.12	Acidity of Acetylenic Hydrogen	97
4.13	Higher Acetylene, Metal Ammonia Reductions	97
4.14	Chemical Reactivity	98
4.15	Oxidation	100
4.16	Reduction and Polymerisation Reaction of Acetylene	102
4.17	Summary	102
4.18	Exercise	103
4.19	Objective Type Questions	104
<b>Chapter-5</b>		
5.0	Aims and Objectives	109
5.1	Introduction	109
5.2	Nomenclature	109
5.3	Preparation of cycloalkanes methods	110
5.4	Heating Dicarboxylic Metal Salt	111
5.5	Reactivity of Cyclopropane, Cyclobutane	111
5.6	Stability of Cycloalkanes	112
5.7	Sachse and Mohr Prediction and Pitzer's Strain Theory	114
5.8	Conformational Structures	114
5.9	Summary	116
5.10	Exercise	117
5.11	Objective Type Questions	118
<b>Chapter-6</b>		
6.0	Aims and Objectives	121
6.1	Introduction	121
6.2	Resonance, Resonance Energy	121
6.3	Hydrogenation	122
6.4	Heat of Combustion of Benzene	123
6.5	Mention of C-C Bond Lengths and Orbital Picture of Benzene	123
6.6	Aromaticity	125
6.7	Huckel's rule	125
6.8	General Mechanism of Electrophilic Substitution	130
6.9	Friedel Craft's Alkylation and Acylation	131
6.10	Orientation of Aromatic Substitution	133
6.11	Orientation of Amino, Methoxy and Methyl Groups	134
6.12	Summary	137
6.13	Exercise	137
6.14	Objective Type Questions	139



# ***BIOLOGY OF INVERTEBRATES AND CELL BIOLOGY***

**I - B.Sc(Zoology) / I - Semester**

***As per Choice Based Credit System (CBCS)***



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**Year : 2024**

**Edtion : First**

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# **CONTENTS**

## **UNIT - I**

### **Page No.**

1.0	Introduction	02
1.1	Phylum Protozoa	02
1.1.1	General Characters	02
1.1.2	Outline classification up to classes	04
1.1.3	Type study: <i>Paramecium</i>	05
1.2	Phylum Porifera	13
1.2.1	General characters	13
1.2.2	Outline classification up to classes	14
1.2.3	Type study: <i>Sycon</i> : Canal system in Sponges	15
1.3.	Phylum Coelenterata	26
1.3.1	General Characters	26
1.3.2	Outline classification up to classes	27
1.3.3	Type study: <i>Obelia</i>	27
1.4.	Phylum Platyhelminthes	43
1.4.1	General characters	43
1.4.2	Outline classification up to classes	44
1.4.3	Type study: <i>Fasciola hepatica</i>	45
1.5.	Phylum Nematelminthes	53
1.5.1	General Characters	53
1.5.2	Outline classification up to classes	54
1.5.3	Type study: <i>Ascaris lumbricoides</i>	55
1.6.	Phylum Annelida	65
1.6.1	General Characters	65
1.6.2	Outline classification up to classes	66
1.6.3	Type study: Leech	67
1.7.	Summary	82
1.8.	Review Questions	82
<h2><b>UNIT - II</b></h2>		
2.0	Introduction	84
2.1	Phylum Arthropoda	84
2.1.1	General Characters	85
2.1.2	Outline Classification of Phylum Arthropoda	86
2.1.3	Type study: <i>Prawn</i>	96
2.1.4	Crustacean Larvae	113
2.1.5	Onychophora	116
2.2.	Phylum Mollusca	119
2.2.1	General Characters of Mollusca	120
2.2.2	Outline Classification	121

2.2.3 Type study: <i>Pila Globosa</i>	124
2.2.4 Pearl formation in Molluscs	137
2.3 Phylum Echinodermata	138
2.3.1 General Characters	139
2.3.2 Outline Classification up to classes	140
2.3.3 Type study: <i>Star Fish</i>	143
2.4 Phylum Hemichordata	154
2.4.1 General Characters	154
2.4.2 Outline Classification up to classes.	155
2.4.3 Affinities and Systemic positions of <i>Balanoglossus</i>	157
2.5 Summary	170
2.6 Review Questions	171
<b>UNIT - III</b>	
3.0 Introductions	173
3.1 Cell Theory	174
3.2 Ultra structure of Animal Cell	176
3.3 Structure of Plasma Membrane	179
3.4 Chromosomes	185
3.5 Cell Division	194
3.5.1 Phases of Cell Cycle	195
3.5.1.1 Regulation of Eukaryotic Cell Cycle	197
3.5.1.2 Cell - Cycle check points	197
3.5.1.3 Mitosis	198
3.5.1.4 Meiosis	201
3.5.1.5 Differences between Mitosis and Meiosis	205
3.6 Summary	205
3.7 Review questions	206
<b>UNIT - IV</b>	
4.0 Introduction	208
4.1 Carbohydrates	209
4.1.1 Classification	209
4.1.2 Monosaccharides	211
4.1.2.1 Structure and nomenclature	211
4.1.2.2 Glucose	212
4.1.2.3 Fructose	213
4.1.3 Disaccharides	214
4.1.3.1 Classification	214
4.1.3.2 Lactose	215
4.1.3.3 Sucrose	215
4.1.4 Polysaccharides	216
4.1.4.1 Classification	216

4.1.4.2 Structure	216
4.1.4.3 Different types of Polysaccharides	216
4.1.4.4 Starch	217
4.1.4.5 Glycogen	219
4.1.4.6 Chitin	220
4.2 Proteins	221
4.2.1 Amino Acids	221
4.2.1.1 Nomenclature	222
4.2.1.2 General properties of Amino Acids	222
4.2.1.3 Functions of amino acids	223
4.2.2 Peptide Bond	225
4.2.3 Classification of Proteins	226
4.2.4 Levels of structural organization of proteins	229
4.2.4.1. Primary structure	229
4.2.4.2. Secondary structure	230
4.2.4.3. Tertiary structure	231
4.2.4.4 Quaternary structure	234
4.3 Lipids	234
4.3.0 Introduction	234
4.3.1 Structure of Fatty acids	235
4.3.2 Types of fatty acids	236
4.3.3 Classification of Lipids	237
4.3.4 Triacylglycerols	238
4.3.5 Phospholipids	240
4.3.6 Cephalin	240
4.3.7 Lecithin	241
4.3.8 Steroids	241
4.3.8.1 Cholesterol	242
4.4 Nucleic acids	243
4.4.1 Nucleic acid structure	243
4.4.2. Nucleotides	243
4.4.3 Nucleosides	246
4.4.4 Chargaff's Rule	246
4.4.5 Structure of DNA	246
4.4.6 Watson and crick Model (B form of DNA)	247
4.4.7 Structure of RNA	248
4.4.8 Types of RNAs	248
4.5 Summary	249
4.6 Keywords	250
4.7 Review Questions	250

## **BIOLOGY OF INVERTEBRATES AND CELL BIOLOGY**

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### **1.0 Protozoa to Annelida**

- 1.1. Phylum Protozoa: General characters and outline classification up to classes. Type study: *Paramecium*.
- 1.2. Phylum Porifera : General characters and outline classification up to classes. Type study: *Sycon*; Canal system in Sponges.
- 1.3. Phylum Coelenterata: General characters and outline classification up to classes. Type study: *Obelia*; Polymorphism in Coelenterates; Corals and Coral reef formation.
- 1.4. Phylum Platyhelminthes: General characters and outline classification up to classes. Type study: *Fasciola hepatica*.
- 1.5. Phylum Nematelminthes: General characters and outline classification up to classes. Type study: *Ascaris lumbricoides*.
- 1.6. Phylum Annelida: General characters and outline classification up to classes Type study: Leech; Coelom and coelomoducts in Annelids.

### **2.0 Arthropoda to Hemichordata**

- 2.1. Phylum Arthropoda: General characters and outline classification of up to classes Type study: Prawn; Crustacean larvae; *Peripatus*- Characters and Significance
- 2.2. Phylum Mollusca: General characters and outline classification of up to classes Type study: *Pila*; Pearl formation in Molluscs.
- 2.3. Phylum Echinodermata: General characters and outline classification of up to classes. Type study: Star fish.
- 2.4. General characters of Hemichordata : Structure and affinities of *Balanoglossus*.

### **3.0 Cell Biology**

- 3.1. Cell theory
- 3.2. Ultra structure of Animal cell
- 3.3. Structure of Plasma membrane - Fluid-mosaic model. Transport functions of Plasma membrane- Passive transport, active transport (Antiport, symport and uniport) and bulk transport.
- 3.4. Structure and functions of Endoplasmic reticulum Golgi body, Ribosomes, lysosomes and Mitochondrion.
- 3.5. Chromosomes - nomenclature types and structure. Giant chromosomes – Polytene and Lampbrush chromosomes.
- 3.6. Cell division - Cell-cycle stages ( $G_1$ , S,  $G_2$  and M phases), Cell-cycle check points and regulation. Mitosis; Meiosis - and its significance.

### **4.0 Biomolecules of the Cell**

- 4.1. Carbohydrates
  - 4.1.1. Classification of Carbohydrates
  - 4.1.2. Structure of Monosaccharides (Glucose and Fructose)
  - 4.1.3. Structure of Disaccharides (Lactose and Sucrose)
  - 4.1.4. Structure of Polysaccharides (Starch, Glycogen and Chitin)
- 4.2. Proteins
  - 4.2.1. Amino acids: General properties, nomenclature, classification and structure.
  - 4.2.2. Classification of proteins based on functions, chemical nature and nutrition, peptide bond and structure (Primary, secondary, tertiary and quaternary structures)
- 4.3. Lipids
  - 4.3.1. Classification. Structure of Fatty acids (Saturated and unsaturated).
  - 4.3.2. Triacylglycerols, Phospholipids (Lecithin and cephalin) and Steroids (Cholesterol).
- 4.4. Nucleic Acids
  - 4.4.1. Structure of purines, pyrimidines, ribose and deoxyribose sugars.
  - 4.4.2. Watson and Crick model of DNA- Nucleoside, Nucleotide, Chargaff's rule. Structure of RNA, Types of RNA - rRNA, tRNA and mRNA.

# ఆధునిక తెలుగు సాహిత్యం

డిగ్రీ (జనరల్) / సెమిస్టర్ - II

రచయితలు

డా॥ బి. అశోక్

డా॥ ఎస్. సునీల్ కుమార్

తెలుగు విభాగం

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**Centre for Distance and Online Education**  
**Sri Venkateswara University**

Tirupathi, AP -517 502

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**Tirupathi, AP -517 502**



## జనరల్ తెలుగు / సెమిస్టర్ - II

### ఆధునిక తెలుగు సాహిత్యం

#### అభ్యసన ఫలితాలు

ఈ కోర్సు విజయవంతం ముగించాక, విద్యార్థులు క్రింది అభ్యసన ఫలితాలను పొందగలరు.

1. ఆంగ్లభాష ప్రభావం కారణంగా తెలుగులో వచ్చిన ఆధునిక సాహిత్యాన్ని, అని విశిష్టతను గుర్తిస్తారు.
2. సమకాలీన ఆధునిక సాహిత్య ప్రక్రియలైన వచన కవిత్వం, కథ, నవల, నాటకం, విమర్శ లపై అవగాహన పొందుతారు.
3. భావకవిత, అభ్యుదయ కవితలక్షణాలను గుర్తించిన జాన్సాన్ని పొందుతారు. అస్తిత్వవాద ఉద్యమాలపుట్టుకను, అవశ్యకతను గుర్తిస్తారు.
4. కథాసాహిత్యం ద్వారా సామాజిక చైతన్యాన్ని పొందుతారు. సిద్ధాంతాల ద్వారా కాకుండా, వాస్తవ పరిస్థితులను తెలుసుకోవడం ద్వారా సిద్ధాంతాన్ని సమీక్షించగలరు.
5. ఆధునిక తెలుగు కల్పనాసాహిత్యం ద్వారా సామాజిక, సాంస్కృతిక, రాజకీయ చైతన్యాన్ని పొందుతారు.

#### పాఠ్య ప్రణాళిక

##### యూనిట్- I: ఆధునిక కవిత్వం

1. ఆధునిక కవిత్వం : పరిచయం
2. కొండవీడు : దువూరి రామిరెడ్డి  
(కవికోకిల గ్రంథావళి ఖండకావ్యాలు సక్షత్రమాల సంపుటి నుండి)
3. మాతృసంగీతం : అనిసెట్టి సుబ్బారావు (అగ్నివీణ కవితాసంపుటి నుండి)
4. తాతకో నూలుపోగు : బండరు ప్రసాదమూర్తి (కలనేత కవితాసంపుటి నుండి)

##### యూనిట్ - II: కథానిక

5. తెలుగు కథానిక : పరిచయం
6. భయం (కథ) : కాశీపట్నం రామరావు
7. స్వేదం ఖరీదు....(కథ) : రెంటాల నాగేశ్వరరావు

**యూనిట్ - III: నవల**

8. తెలుగు నవల : పరిచయం
9. రథచక్రాలు (నవల) : మహీధర రామ్మోహన రావు (సంక్షిప్త ఇతివృత్తం మాత్రం)
10. రథచక్రాలు (సమీక్షా వ్యాసం) డా.||యల్లాప్రగడ మల్లికార్జునరావు

**యూనిట్ - IV: నాటకం**

11. తెలుగు నాటకం : పరిచయం
12. యక్షగానము (నాటిక) : ఎం.వి.ఎస్. హరనాథరావు
13. అపురూప కళారూపాల విధ్వంసదశ్యం యక్షగానము (సమీక్షా వ్యాసం) డా.|| కందిమళ్ళ సాంబశివరావు

**యూనిట్- V: విమర్శ**

14. తెలుగు సాహిత్యం విమర్శ: పరిచయం
15. విమర్శ స్వరూప స్వభావాలు ఉత్తమ విమర్శకుడు లక్షణాలు

**విషయ సూచిక**  
**ఆధునిక తెలుగు సాహిత్యం**

**యూనిట్ - 1: ఆధునిక కవిత్వం**

**1. ఆధునిక కవిత్వం - పరిచయం**

1.1	ఉద్దేశ్యం	1
1.2	పాఠ్యభాగం	1
1.3	పాఠ్యభాగ పరిచయం	7
1.4	ప్రశ్నలు - జవాబులు	8
1.5	సంగ్రహ ప్రశ్నలు	12
1.6	విద్యార్థులకు అభ్యాసం	16

**2. కొండవీడు**

2.1	ఉద్దేశం	17
2.2	కవి పరిచయం	17
2.3	పాఠ్యభాగము	17
2.4	పాఠ్యభాగ పరిచయం	21
2.5	అర్థాలు	21
2.6	సందర్భ సహిత వ్యాఖ్యాలు	22
2.7	పాఠ్యభాగ సారాంశము	25
2.8	ప్రశ్న జవాబులు - వ్యాస రూప ప్రశ్నలు	26
2.9	సంగ్రహ ప్రశ్నలు	27
2.10	విద్యార్థులకు అభ్యాసం	28

**3. మాతృసంగీతం**

3.1	ఉద్దేశం	29
3.2	కవి పరిచయం	29
3.3	పాఠ్యాంశం	29
3.4	పాఠ్యభాగ పరిచయం	38
3.5	అర్థాలు	38
3.6	సందర్భ సహిత వ్యాఖ్యలు	39
3.7	పాఠ్యభాగ సారాంశం	39
3.8	ప్రశ్నలు - జవాబులు. వ్యాసరూప ప్రశ్నలు	42
3.9	సంగ్రహ ప్రశ్నలు	44

3.10	విద్యార్థులకు అభ్యాసం	46
3.11	పాఠ్యభాగంలోని వ్యాకారణాంశాలు	46

#### 4. తాతకో నూలు పోగు

4.1	ఉద్దేశం	47
4.2	కవి పరిచయం	47
4.3	పాఠ్యభాగం	48
4.4	పాఠ్యభాగ పరిచయం	50
4.5	అర్థాలు	50
4.6	సందర్భ సహిత వ్యాఖ్యలు	51
4.7	పాఠ్యభాగ సారాంశము	52
4.8	ప్రశ్నలు - జవాబులు వ్యాసరూప ప్రశ్నలు	53
4.9	సంగ్రహ ప్రశ్నలు	54
4.10	విద్యార్థులకు అభ్యాసం	56

#### యూనిట్ - II : కథానిక

#### 5. తెలుగు కథానిక - పరిచయం

5.1	ఉద్దేశ్యం	58
5.2	పాఠ్యభాగ సారాంశం	58
5.3	వ్యాసరూప ప్రశ్నలు - జవాబులు	62
5.4	వ్యాసరూప ప్రశ్నలు - జవాబులు	65

#### 6. భయం (కథ)

6.1	ఉద్దేశం	67
6.2	రచయిత గురించి	67
6.3	పాఠ్యభాగం	68
6.4	పాఠ్యభాగ పరిచయం	85
6.5	పాఠ్యభాగ సారాంశం	85
6.6	ప్రశ్న జవాబులు : వ్యాసరూప ప్రశ్నలు	88
6.7	సంగ్రహ ప్రశ్నలు	90
6.8	విద్యార్థులకు అభ్యాసం	92

#### 7. స్వేదం ఖరీదు

7.1	ఉద్దేశం	93
7.2	కవి పరిచయం	93
7.3	పాఠ్యభాగం	93
7.4	పాఠ్యభాగ పరిచయం	99

7.5	పాఠ్యభాగం సారాంశం	99
7.6	వ్యాసరూప ప్రశ్నలు	101
7.7	సంగ్రహ ప్రశ్నలు	103
7.8	విద్యార్థులకు అభ్యాసం	104

### యూనిట్ - III: నవల

#### 8. తెలుగు నవల - పరిచయం

8.1	ఉద్దేశ్యం	107
8.2	పాఠ్యభాగం	107
8.3	పాఠ్యభాగ పరిచయం	112
8.4	పాఠ్యభాగ సారాంశం	113
8.5	వ్యాసరూప ప్రశ్నలు	113
8.6	సంగ్రహ ప్రశ్నలు	119
8.7	విద్యార్థులకు అభ్యాసం	120

#### 9. రథ చక్రాలు (నవల)

9.1	ఉద్దేశ్యం	121
9.2	రచయిత పరిచయం	121
9.3	పాఠ్యభాగం	122
9.4	పాఠ్యభాగ పరిచయం	223
9.5	వ్యాసరూప ప్రశ్నలు	223

#### 10. రథచక్రాలు - సమీక్ష

10.1	ఉద్దేశ్యం	253
10.2	పాఠ్యభాగ సారాంశం	253
10.3	పాఠ్యభాగ పరిచయం	258
10.4	వ్యాసరూప ప్రశ్నలు - జవాబులు	258
10.5	సంగ్రహ ప్రశ్నలు - జవాబులు	261

### యూనిట్ - IV: నాటకం

#### 11. తెలుగు నాటకం - పరిచయం

11.1	ఉద్దేశ్యం	265
11.2	పాఠ్యభాగం	265
11.3	పాఠ్యభాగ పరిచయం	268
11.4	వ్యాసరూప ప్రశ్నలు	269
11.5	సంగ్రహ ప్రశ్నలు	272

## 12. యక్షగానం (నాటిక )

12.1 ఉద్దేశం	273
12.2 కవి పరిచయం	273
12.3 పాఠ్యభాగం	274
12.4 పాఠ్యభాగ పరిచయం	298
12.5 పాఠ్యభాగ సారాంశం	299
12.6 వ్యాసరూప ప్రశ్నలు ప్రశ్నలు - జవాబులు	300
12.7 సంగ్రహ ప్రశ్నలు	311
12.8 విద్యార్థులకు అభ్యాసం	314

## 13. అపూర్వాప కళారూపాల విధ్వంస దృశ్యం యక్షగానం

13.1 ఉద్దేశ్యం	315
13.2 పాఠ్యభాగం	315
13.3 పాఠ్యభాగ పరిచయం	320
13.4 పాఠ్యభాగ సారాంశం	320
13.5 వ్యాసరూప ప్రశ్నలు - జవాబులు	322
13.6 విద్యార్థులకు అభ్యాసం	326

## యూనిట్ - V: విమర్శ

### 14. తెలుగు సాహిత్య విమర్శ - పరిచయం

14.1 ఉద్దేశ్యం	329
14.2 పాఠ్యభాగం	329
14.3 పాఠ్యభాగ పరిచయం	334
14.4 పాఠ్యభాగ సారాంశం	334
14.5 ప్రశ్నలు - జవాబులు ( వ్యాసరూప ప్రశ్నలు)	334
14.6 సంగ్రహ ప్రశ్నలు	339
14.7 విద్యార్థులకు అభ్యాసం	342

### 15. విమర్శ - స్వరూప స్వభావాలు

15.1 ఉద్దేశ్యం	343
15.2 పాఠ్యభాగం	343
15.3 పాఠ్యభాగ పరిచయం	346
15.4 పాఠ్యభాగ సారాంశం	346
15.5 వ్యాసరూప ప్రశ్నలు	347
15.6 సంగ్రహ ప్రశ్నలు	350
15.7 విద్యార్థులకు అభ్యాసం	352

# *A Course in Reading & Writing Skills*

*As per Choice Based Credit System (CBCS)  
For Degree I-year / II-sem  
Common to all Branches*



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**Year : 2024**

**Edtion : First**

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by



*(An ISO 9001 : 2015 Certified Publishers)*

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# *A Course in Reading & Writing Skills*

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## **Learning Outcomes**

**By the end of the course the learner will be able to:**

- Use reading skills effectively
- Comprehend different texts
- Interpret different types of texts
- Analyse what is being read
- Build up a repository of active vocabulary
- Use good writing strategies
- Write well for any purpose
- Improve writing skills independently for future needs

### **Unit-1**

**Prose** : 1. How to Avoid Foolish Opinions Bertrand Russell

**Skills** : 2. Vocabulary: Conversion of Words

: 3. One Word Substitutes

: 4. Collocations

### **Unit-2**

**Prose** : 1. The Doll's House

Katherine Mansfield

**Poetry** : 2. Ode to the West Wind

P B Shelley

**Non-Detailed Text** : 3. Florence Nightingale

Abrar Mohsin

**Skills** : 4. Skimming and Scanning

### **Unit-3**

**Prose** : 1. The Night Train at Deoli Ruskin Bond

**Poetry** : 2. Upagupta Rabindranath Tagore

**Skills** : 3. Reading Comprehension

: 4. Note Making/Taking

**Unit-4**

**Poetry** : 1. Coromandel Fishers Sarojini Naidu

**Skills** : 2. Expansion of Ideas

: 3. Notices, Agendas and Minutes

**Unit-5**

**Non-Detailed Text** : 1. An Astrologer's Day R K Narayan

**Skills** : 2. Curriculum Vitae and Resume

: 3. Letters

: 4. E-Correspondence

# Content

## *A Course in Reading & Writing Skills*

---

---

### Unit-1

1.0	Objective	2
1.1	How to Avoid Foolish Opinions	2
1.2	Conversion	4
1.2.1	Exercises	7
1.2.2	Practice Exercises	9
1.3	Collocation	11
1.3.1	Types of Collocations	12
1.3.2	Exercises	15
1.3.3	Practice Exercises	18
1.4	One-Word Substitutes	21
1.4.1	Exercises	33
1.4.2	Practice Exercises	36
1.5	Outcomes	40

### Unit-2

2.0	Objective	42
2.1	The Doll's House Katherine Mansfield	42
2.2	Ode to the West Wind	48
2.3	Florence Nightingale Abrar Mohsin	53
2.4	Skimming and Scanning	59
2.4.1	Skimming Reading for the Gist of a Text	59
2.4.2	Practice Exercises	62
2.4.3	Scanning	69
2.4.4	Practice Exercises	71
2.5	Outcomes	74

### Unit-3

3.0	Objective	76
3.1	The Night Train at Deoli Ruskin Bond	76
3.2	Upagupta Rabindranath Tagore	82

3.3	Reading	<b>88</b>
3.3.1	Practice Exercises	<b>95</b>
3.4	Note Making/Taking	<b>111</b>
3.4.1	Note Making Format	<b>112</b>
3.4.1.1	The Procedure of Note Making	<b>112</b>
3.4.1.2	Points to Remember for Note Making Format	<b>113</b>
3.4.2	Importance of Note Taking	<b>113</b>
3.4.3	Purposes of Note Taking	<b>113</b>
3.4.4	Note Making vs Note Taking	<b>114</b>
3.5	Methods of Note Taking	<b>114</b>
3.5.1	Note Taking Methods	<b>115</b>
3.5.2	Outline Method	<b>116</b>
3.5.3	Cornell Method	<b>117</b>
3.5.4	Boxing/sentence Method	<b>119</b>
3.5.5	Charting Method	<b>119</b>
3.5.6	Mapping Method	<b>120</b>
3.5.7	Steps for Effective Notetaking	<b>121</b>
3.6	Effective Note Taking for Listening to Lectures	<b>124</b>
3.6.1	Suggestions for Efficient Notetaking	<b>124</b>
3.6.2	Steps for Effective Note Making	<b>127</b>
3.6.3	Methods of Note Making	<b>128</b>
3.6.3.1	Sequential or Linear Note-Making	<b>128</b>
3.6.3.2	Pattern of Note-Making or Mind-Mapping	<b>129</b>
3.6.3.3	Fishbone Diagram	<b>129</b>
3.6.4	Other Systems of Notemaking	<b>130</b>
3.6	Review Questions	<b>131</b>
3.7	Outcomes	<b>132</b>
<b>Unit-4</b>		
4.0	Objective	<b>134</b>
4.1	Introduction	<b>134</b>
4.2	Coromandel Fishers	<b>134</b>
4.3	Expansion of Ideas / Proverb Expansion	<b>137</b>

4.3.1	How to Write a Proverb Expansion or Expansion of an idea	137
4.3.2	Expansion of Ideas of some Famous proverbs and Idioms	139
4.3.3	Practice Exercises	142
4.4	Notices, Agendas and Minutes	143
4.4.1	Notice	143
4.4.1.1	Notice of a Meeting	143
4.4.1.2	Important Tips and Guidelines	144
4.4.1.3	Format / Template of Notice Writing	144
4.4.1.4	Specimen Notice	145
4.4.2	Agenda	146
4.4.2.1	Some Guidelines for Listing the Items below	147
4.4.2.2	Importance / Necessity of Agenda	148
4.4.2.3	Specimen Agendas	149
4.4.3	Minutes of the Meeting	149
4.4.3.1	Tips for Writing Minutes	150
4.4.3.2	Format of Meeting Minutes	151
4.4.3.3	Specimen of Minutes	153
4.4.4	Difference between Agenda and Minutes	155
4.5	Sample Meeting Notice, Agenda, and Minutes	155
4.6	Outcomes	157
4.7	Review Questions	158
<b>Unit-5</b>		
5.0	Objective	160
5.1	Introduction	160
5.1.1	Characterisation Notes	166
5.1.2	Narrative Techniques	167
5.1.3	Figurative Language	167
5.1.4	Societal Satire	168
5.1.5	Astrology as a Profession	168
5.2	Resume Writing	168
5.2.1	Resume Contents	168
5.2.2	The Difference between C.V and Resume	169

5.2.3	Steps in Preparation of Resume	170
5.2.4	Hard vs. Soft Skills: What's the Difference?	175
5.3	Letter Writing	181
5.3.1	Types of Letters	183
5.3.2	Essentials of Effective Letter Writing	188
5.3.3	Types of Letter Format	190
5.3.4	Types of Business Letters	196
5.3.5	Writing a Complaint Letter	200
5.3.6	Writing an Apology Letter	202
5.3.7	Writing a Letter of Appeal	203
5.3.8	Writing an Invitation Letter	204
5.3.9	Writing a Resignation Letter	205
5.3.10	Writing a Letter of Recommendation	207
5.3.11	Exercises	208
5.3.12	Practice Exercises	213
5.4	Email Writing	214
5.4.1	Significance of Email	215
5.4.2	Elements of E-mails	216
5.4.3	Technique for Writing an E-mail	216
5.4.4	Types of Emails	217
5.4.5	Advantages of Email	220
5.4.6	Disadvantages of E-mail	221
5.4.7	Exercises	222
5.5	Review Questions	223
5.6	Outcomes	224

Life Skill Course  
***Indian Culture & Science***

*As per Choice Based Credit System (CBCS)  
Common to all Branches*



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**Year : 2024**

**Edition : First**

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# *Indian Culture & Science*

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## **Learning Outcomes**

By successful completion of the course, students will be able to:

1. Understand the evolution of India's culture.
2. Analyze the process of modernization of Indian society and culture from past to future.
3. Comprehend objective education and evaluate scientific development of India in various spheres.
4. Inculcate nationalist and moral fervor and scientific temper.

### **Unit-I: Unity in Diversity in India**

Coexistence of various religions since ancient times - Hinduism, Buddhism, Jainism and Atheism, and later Sikhism, Islam and Christianity

The Bhakti (Vishnavite and Saivaite) and Sufi Movements

The concepts of seela, karuna, kshama, maitri, vinaya, santhi and ahimsa Achievements in Literature, Music, Dance, Sculpture and Painting - Craftsmanship in cloth, wood, clay, metal and ornaments

Cultural diversity, Monogamy, Family system, Important seasonal festivals

### **Unit-II: Social Reforms and Modern Society**

Reforms by Basaveswara - Raja Rama Mohan Roy - Dayananda Saraswathi - Swamy Vivekananda - Mahatma Gandhi - B. R. Ambedkar - Reforms in Andhra by Vemana, Veerabrahmam, Gurajada, Veeresalingam and GurrarnJashua (only reforms in brief, biographies not needed)

**Modern Society:** Family unity, Community service, Social Harmony, Civic Sense, Gender Sensitivity, Equality, National Fervor

### **Unit-III: Science and Technology**

Objectivity and Scientific Temper - Education on Scientific lines (Bloom's Taxonomy) - Online Education

Developments in Industry, Agriculture, Medicine, Space, Alternate Energy, Communications, Media through ages

## **Co-curricular Activities Suggested**

1. Assignments, Group discussions, Quiz etc
2. Invited Lecture by a local expert
3. Visit to a scientific institutions, local heritage sites, museums, industries etc

# Content

## *Indian Culture & Science*

---

---

### Unit-1: Indian Culture & Science

1.0	Objectives	1
1.1	Introduction	1
1.2	Indian Culture	2
1.3	Coexistence of Various Religions Since Ancient Times	3
1.3.1	Hinduism	3
1.3.2	Buddhism	8
1.3.3	Jainism	14
1.3.4	Atheism	24
1.3.5	Sikhism	26
	1.3.5.1 History and Beliefs	26
	1.3.5.2 The Sikh Identity	26
	1.3.5.3 The Sikh Scripture	27
	1.3.5.4 The Gurdwara	27
	1.3.5.5 The Sikh Way of Life	28
	1.3.5.6 Women	28
	1.3.5.7 Dietary Restrictions	29
	1.3.5.8 Other Religions	29
1.3.6	Islam	29
1.3.7	Christianity	39
1.4	The Bhakti	44
1.4.1	Types of Bhakti Cultures	47
1.4.2	Bhakti Saints	49
1.4.3	Impact of Bhakti Movement on Indian Society	50
1.5	Sufi Movements	51
1.5.1	Roots of Sufism	51
1.5.2	Origin of Sufism	52
1.5.3	Development of Sufism	52
1.5.4	Sufism in India	53
1.5.5	Orders of Sufism	54

1.5.6	Interaction between Hindu and Muslim Saints	58
1.5.7	Differences between Bhakti and Sufi Movements	58
1.6	The concepts	59
1.7	Achievements in Literature	62
1.8	Music	64
1.8.1	Treatises	65
1.9	Dance	65
1.9.1	Early Texts on Classical Dance	66
1.9.2	Basic Techniques in Classical Dance	68
1.10	Sculpture	70
1.11	Painting	76
1.12	Crafts Traditions	77
1.13	Cultural Diversity	79
1.14	Monogamy	81
1.15	Family	81
1.15.1	Advantages of Joint Family	82
1.15.2	Imbibing Values	83
1.16	Seasonal Festivals in India	83
1.17	Outcomes	86
1.18	Review Questions	86
1.19	Multiple Choice Questions	86
<b>Unit-2: Social Reforms and Modern Society</b>		
2.0	Objectives	89
2.1	Introduction	89
2.2	Reforms by Basaveswara	90
2.3	Raja Rammohan Roy	94
2.3.1	Contributions	95
2.3.2	Economic and Political Reforms	96
2.3.3	Religious Reforms	97
2.3.4	Brahmo Samaj	97
2.3.5	Synthetic Approach	97
2.3.6	Regeneration of Women	98
2.4	Dayananda Saraswathi	98
2.4.1	Religious Reforms	98

2.4.2	Opposition to Caste System and Untouchability	<b>99</b>
2.4.3	Sudhi Movement	<b>99</b>
2.4.4	Status of Women	<b>99</b>
2.4.5	Educational Reforms	<b>100</b>
2.4.6	Dayanand and Nationalism	<b>100</b>
2.4.7	Believer of Democracy	<b>100</b>
2.4.8	Importance of Village Administration	<b>101</b>
2.4.9	Nation Building Through Language	<b>101</b>
2.4.10	Dayanand Saraswati & Arya Samaj	<b>101</b>
2.5	Swami Vivekananda	<b>102</b>
2.5.1	Reforms	<b>103</b>
2.6	Mahatma Gandhi	<b>106</b>
2.6.1	Unconventional Techniques	<b>107</b>
2.6.2	Daridranarayan	<b>107</b>
2.6.3	Strain-free Nationalism	<b>108</b>
2.6.4	Abolition of Untouchability	<b>108</b>
2.6.5	Accepting Varnas and Denouncing Caste System	<b>109</b>
2.6.6	Reservation	<b>109</b>
2.6.7	Participation of Women	<b>110</b>
2.7	B. R. Ambedkar	<b>110</b>
2.7.1	Main Architect of Indian Constitution	<b>110</b>
2.7.2	Constitutional Morality	<b>111</b>
2.7.3	Democracy	<b>111</b>
2.7.4	Social Reforms	<b>111</b>
2.7.5	Factsheet	<b>112</b>
2.7.6	Methods Adopted to Remove Untouchability	<b>113</b>
2.7.7	Relevance of Ambedkar in Present Times	<b>113</b>
2.8	Reforms in Andhra by Vemana	<b>114</b>
2.9	Veerabrahmam	<b>115</b>
2.10	Gurajada Appa Rao	<b>115</b>
2.11	Kandukuri Veeresalingam	<b>116</b>
2.12	Gurram Jashuva	<b>117</b>
2.13	Modern Society	<b>118</b>
2.13.1	Characteristics of Modern Society	<b>118</b>

2.14	Family Unity	119
2.14.1	The Right to Family Unity	119
2.14.2	Different Kinds of Families and the Right to Unity	120
2.15	Community Service	121
2.15.1	Community Service Has a Number of Important Benefits	122
2.16	Social Harmony	122
2.16.1	Elements of Social Harmony	123
2.16.2	Importance of Social Harmony	124
2.17	Civic Sense	124
2.17.1	Importance of Civic Sense	125
2.17.2	Teaching about Civic Sense	126
2.18	Gender Sensitivity	126
2.18.1	Gender Stereotypes	127
2.18.2	Gender Roles	127
2.18.3	Gender Equality	127
2.18.4	Equal Treatment	127
2.18.5	Gender Mainstreaming	128
2.19	Equality	128
2.19.1	Features	129
2.19.2	Types of Equality	129
2.20	National Fervor	130
2.21	Outcomes	130
2.22	Review Questions	131
2.23	Multiple Choice Questions	131
<b>Unit-3: Science and Technology</b>		
3.0	Objectives	135
3.1	Introduction	135
3.2	Scientific Objectivity	136
3.2.1	Objectivity as Faithfulness to Facts	137
3.2.2	The View from Nowhere	137
3.3	Scientific Temper	138
3.4	Education on Scientific Lines (Bloom's Taxonomy)	139
3.4.1	Online Learning	141
3.5	Developments of Technology	144

3.5.1	Scientific and Technological Developments in Ancient India	145
3.5.2	Scientific and Technological Developments in Medieval India	146
3.5.3	Advancement of Science and Technology is Observed in following Areas in Modern Time	147
3.6	Industry	148
3.6.1	Benefits of Increased R&D Spending	148
3.6.2	New Trends in Manufacturing	149
3.7	Agriculture	149
3.7.1	Objectives	153
3.7.2	Challenges faced by Technology in Modern Era	154
3.7.3	Impact of Science and Technology in Agricultural Sector	154
3.7.4	The Recent Innovations and Technologies in Agriculture	155
3.7.5	A new Era of Scientific Farming	157
3.7.6	G-tech to Propel Economy's Growth Trajectory	157
3.8	Medicine	158
3.8.1	New Advancements in Medical Research in India	160
3.8.2	Greatest Medical Achievements in India	161
3.9	Space	163
3.9.1	X-ray Astronomy	164
3.10	Alternate Energy	165
3.10.1	Current Scenario of Renewable Energy in India	166
3.11	Communication	167
3.12	Media through ages	170
3.12.1	The Rise of the Social Network	170
3.12.2	Social Media in Indian Politics	171
3.12.3	Social Media and Business	171
3.12.4	Social Media and Recruitment in India	172
3.12.5	Social Media and IPL	172
3.12.6	Limitations of Social Media in India	172
3.13	Outcomes	173
3.14	Review Questions	173
3.15	Multiple Choice Questions	174

Skill Development Course

# *Advertising*

*As per Choice Based Credit System (CBCS)*

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**Year : 2024**

**Edition : First**

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# *Advertising*

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## **Learning Outcomes**

After Successful completion of this course, the students are able to;

1. Understand the field of Advertising
2. Comprehend opportunities and challenges in Advertising sector
3. Prepare a primary advertising model
4. Understand applying of related skills
5. Examine the scope for making advertising a future career

### **Unit-1**

Introduction of advertising concepts- functions - Types of advertising - Creative advertising messages - Factors determining opportunities of a product/service/Idea

### **Unit-2**

Role of advertising agencies and their responsibilities - scope of their work and functions - Ethical issues - Identifying target groups -Laws in advertising. Advertising Statutory Bodies in India - Role of AAAI (Advertising Agencies Association of India), ASCI (Advertising Standard Council of India)

### **Unit-3**

Types of advertising - Basic characteristics of a typical advertisement - Reaching target groups - Local advertising - Feedback on impact of advertisement - Business promotion.

# Content

## *Advertising*

---

---

### Unit-1

1.0	Objectives	1
1.1	Introduction	1
1.2	Advertising	2
1.2.1	Meaning	2
1.2.2	Facts of Advertising	3
1.2.3	Definition	4
1.3	Characteristics of Advertising	5
1.3.1	Objectives of Advertising	6
1.3.2	Importance of Advertising	7
1.3.3	Purpose of Advertising	8
1.4	Functions of Advertising	9
1.4.1	Five M's of Advertising	10
1.5	Types of Advertising	13
1.5.1	Qualities of Advertising	19
1.5.2	Media of Advertising	19
1.5.3	Benefits of Advertising	20
1.5.4	Limitations of Advertising	22
1.6	Creative Advertising	23
1.6.1	Importance of Creative Advertising	24
1.6.2	Tools for Creative Advertisement	26
1.7	Factors determining opportunities of a product/service/Idea	26
1.7.1	New Product Design Process	27
1.7.2	Steps in Tapping Opportunities	31
1.8	Outcomes	33
1.9	Review Questions	33
1.10	Multiple Choice Questions	34

## Unit - 2

2.0	Objectives	37
2.1	Introduction	37
2.2	Advertising Agency	38
2.2.1	Characteristics of Advertising agency	38
2.2.2	Importance of Advertising Agency	39
2.2.3	Nature of Advertising Agency	40
2.2.4	Scope of Advertising Agencies	41
2.2.5	Types of Advertising Agency	42
2.2.6	Structure of Advertising Agency	43
2.3	Role and Responsibility of Advertising Agency	44
2.4	Scope of Work	46
2.4.1	Functions of Advertising Agencies	46
2.5	Ethical issues in Advertising	48
2.6	Identifying Target Groups	50
2.7	Laws in Advertising	51
2.8	Advertising Statutory Bodies operating Globally	53
2.9	Role of AAAI	56
2.10	Advertising Standatds Council of India (ASCI)	57
2.11	Outcomes	61
2.12	Review Questions	61
2.13	Multiple Choice Questions	62

## Unit - 3

3.0	Objectives	65
3.1	Introduction	65
3.2	Types of Advertising	66
3.3	Basic Characteristics of a Typical Advertisement	70
3.4	Reaching Target Groups	73
3.5	Local Advertising	75
3.5.1	Types of Local Advertising	76
3.5.2	Advantages of Local Advertising	77
3.5.3	The process of Local Advertising	78

3.6	Feed-back on impact of Advertisement	<b>79</b>
3.6.2	The Positive Effects of Advertisement	<b>80</b>
3.6.3	The Negative Effects of Advertisement	<b>80</b>
3.7	Promotion	<b>81</b>
3.7.1	Characteristics of Promotion	<b>81</b>
3.7.2	Objectives of Promotion	<b>82</b>
3.7.3	Types of Promotion	<b>84</b>
3.7.4	Nature of Promotion	<b>84</b>
3.8	Marketing Communication	<b>85</b>
3.8.1	Importance of Marketing Communication	<b>86</b>
3.8.2	Elements of Marketing Communication	<b>88</b>
3.8.3	Promotional Activities	<b>91</b>
3.9	Promotion Mix	<b>93</b>
3.9.1	Objectives	<b>93</b>
3.9.2	Elements of Promotion Mix	<b>94</b>
3.9.3	Factors Affecting Marketing Promotion Mix	<b>95</b>
3.9.4	Role of Advertisement in Business Promotion	<b>99</b>
3.10	Outcomes	<b>100</b>
3.11	Review Questions	<b>100</b>
3.12	Multiple Choice Questions	<b>101</b>

Skill Development Course  
***Logistics and Supply Chain Management***

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Common to all Branches*



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**Edition : First**

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# *Logistics and Supply Chain Management*

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## **Learning Outcomes**

At the successful completion of the course, the student will be able to;

1. Summarize relationship between marketing and Logistic Management
2. Understand the concepts of Supply Chain Management in connection with products.
3. Understanding various types of seller and suppliers
4. Evaluate best logistic method among all means of transport operations
5. Analysis of different distribution strategies - online and physical distribution
6. Compare the Logistics in National and International Scenario.
7. Design and develop new methods and models of Logistics in SCM

### **Unit-1: Introduction to Logistics and Supply Chain Management (SCM)**

Functions of Logistics - Structure of logistics - Logistics Costs - Modes of Logistics - Logistics in 21st Century - Role of Supply Chain Management - Design and Development of Supply Chain Network - Different types of Supply Chain Networks

### **Unit-II: Logistics**

Customer Selection - Process - Customer Service and Customer Retention - Relationship Management - Integrating Logistics and Customer Relationship Management

### **Unit-III: Supply Chain Management**

Managing and Estimating Supply Chain Demand - Forecasting Techniques - Supplier Networks – Skills to Manage SCM - Recent Trends in SCM

# Content

## *Logistics and Supply Chain Management*

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### UNIT -1

1.0	Objectives	1
1.1	Introduction	1
1.2	Definition and Concept of Logistics	2
1.2.1	Logistics in the World of Business	3
1.2.2	Origin of Logistics	3
1.3	Components of Logistics	4
1.3.1	Importance of Logistics	4
1.3.2	Functions of Logistics	5
1.4	Logistics Management	9
1.4.1	Types of Logistics Management	9
1.4.2	Nature and Scope of Logistics Management	10
1.4.3	Objectives of Logistics Management	11
1.4.4	Importance of Logistic Management	12
1.5	Structure of Logistics	12
1.5.1	Linkages and Relationships between Purchasing and Logistics	12
1.5.2	Types of Information Flow in Logistics Sector	15
1.6	Logistics Cost	16
1.7	Modes of Logistics	17
1.8	Logistics in 21st Century	19
1.9	Role of Supply Chain Management	21
1.10	Design and Development of Supply Chain Network	22
1.10.1	Factors that Influence Supply Chain Network Design Decisions	29
1.10.2	Benefits of Supply Chain Network Design	29
1.10.3	Role of Network Design in Supply Chain	30
1.10.4	Global Supply Chain Network Design Models	30
1.11	Different Types of Supply Chain Networks	30
1.11.1	Differences between Logistics and Supply Chain	31
1.12	Outcomes	33



1.13	Review Questions	<b>33</b>
1.14	Multiple Choice Questions	<b>34</b>
<b>Unit -2</b>		
2.0	Objectives	<b>37</b>
2.1	Introduction	<b>37</b>
2.2	Customers Selection	<b>38</b>
	2.2.1 Phases of Customer Development	<b>40</b>
2.3	Logistics Process	<b>41</b>
2.4	Customer Service in Logistics	<b>44</b>
	2.4.1. Elements of Customer Service	<b>45</b>
	2.4.2 Factors Why Customer Service in Logistics is of Utmost Importance	<b>48</b>
	2.4.3 Importance of customer-service in Logistics	<b>50</b>
2.5	Customer Retention	<b>55</b>
	2.5.1 Strategies to Improve Customer Retention	<b>56</b>
	2.5.2 Methods and Tools for Customer Retention	<b>58</b>
	2.5.3 Benefits of customer retention	<b>59</b>
	2.5.4 CRM and Customer Retention	<b>60</b>
	2.5.5 Reasons for Terminating Customer Relationship	<b>61</b>
2.6	Customer Relationship Management	<b>61</b>
	2.6.1 Importance of CRM	<b>63</b>
	2.6.2 Steps in implementing CRM	<b>64</b>
	2.6.3 Benefits of CRM	<b>66</b>
	2.6.4 CRM System can help your Business Today	<b>67</b>
	2.6.5 Components of CRM	<b>68</b>
	2.6.6 Types of CRM Technology	<b>69</b>
	2.6.7 CRM Examples in Practice	<b>70</b>
2.7	Different types of Logistics and Supply chain Relations	<b>71</b>
	2.7.1 Importance of Integrating CRM with SCM	<b>73</b>
	2.7.2 Requirements for Achieving Harmonious Relations in Logistics and Supply Chain	<b>74</b>
2.8	Outcomes	<b>76</b>
2.9	Review Questions	<b>76</b>
2.10	Multiple Choice Questions	<b>77</b>

## UNIT-3

3.0	Objectives	85
3.1	Introduction	85
3.2	Supply Chain	86
	3.2.1 Supply Chain Model	87
3.3	Supply Chain Management	88
	3.3.1 Features of Supply chain Management	89
	3.3.2 Components of Supply Chain Management	89
	3.3.3 Efficient Functioning of Supply Chain	90
	3.3.4 Principles of Supply Chain Management	91
	3.3.5 Nature and Objectives of Supply Chain Management	91
	3.3.6 Decision Areas in Supply Chain Management	94
	3.3.7 Importance of Supply Chain Management	94
	3.3.8 Process of Supply Chain Management	95
	3.3.9 Goals of Supply Chain Management	96
	3.3.10 Focus Areas in SCM	97
3.4	Demand Forecasting	100
	3.4.1 Importance of Demand Forecasting	100
	3.4.2 Main Roles of Forecasting in Supply Chain Management	101
	3.4.3 Advantages of Demand Forecasting	101
3.5	Managing and Estimating supply Chain Demand	102
	3.5.1 Importance of Demand Forecasting in Supply Chain	103
3.6	Forecasting Techniques	104
3.7	Suppliers Network	107
	3.7.1 Supply Chain Networks	108
	3.7.2 Benefits of Supplier Management	110
	3.7.3 Key Factors Driving Supplier Management	111
	3.7.4 Supplier Management Process	112
3.8	Skills to Manage SCM	113
	3.8.1 Core Competencies a Supply chain Manager	118
3.9	Recent Trends in Supply Chain Management	120
3.10	Outcomes	124
3.11	Review Questions	124
3.12	Multiple Choice Questions	125

# Diversity of Microbes & Lower Plants

(Algae and Fungi)

I - B.Sc (Botany)/ I & II- Semester

*As per Choice Based Credit System (CBCS)*



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**Year : 2024**

**Edition : First**

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## Microbial Diversity of Lower Plants

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### UNIT - I

1. Brief account of Archaeobacteria, Actinomycetes.
2. Cyanobacteria: General characters, cell structure, thallus organisation and their significance as biofertilizers with special reference to *Oscillatoria*, *Nostoc* and *Anabaena*.
3. Lichens: Structure and reproduction; ecological and economic importance.

### UNIT- II

4. Viruses: Structure, replication and transmission; plant diseases caused by viruses and their control with reference to Tobacco Mosaic and Rice Tungro.
5. Bacteria: Structure, nutrition, reproduction and economic importance. An outline of plant diseases of important crop plants caused by bacteria and their control with reference to Angular leaf spot of cotton and Bacterial blight of Rice.
6. General account of Mycoplasma with reference to Little leaf of brinjal and Papaya leaf curl

### UNIT-III

7. General characters, structure, reproduction and classification of algae (Fritsch) and thallus organization in algae.
8. Structure and reproduction of the following: Chlorophyceae- *Volvox*, *Oedogonium* and *Chara*.  
Phaeophyceae- *Ectocarpus*  
Rhodophyceae- *Polysiphonia*.
9. Economic importance of algae in Agriculture and Industry.

### UNIT-IV

10. General characters and classification of fungi (Ainsworth).
11. Structure and reproduction of the following:
  - (a) Mastigomycotina- *Albugo*
  - (b) Zygomycotina- *Mucor*
  - (c) Ascomycotina- *Saccharomyces* and *Penicillium*.
  - (d) Basidiomycotina- *Puccinia*
  - (e) Deuteromycotina- *Cercospora*.
12. Economic importance of fungi in relation to mycorrhizae and mushrooms. General account of mushroom cultivation.

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### UNIT- I: MICROBIAL WORLD

1. Discovery of microorganisms, origin of life, spontaneous, biogenesis, Pasteur experiments, germ theory of disease.
2. Classification of microorganisms – R.H. Whittaker's five kingdom concept, Carl Woese's- Domain system.
3. Brief account of special groups of bacteria- Archaeobacteria, Mycoplasma, Chlamydia, Actinomycetes, Rickettsias and Cyanobacteria.

### UNIT- II: VIRUSES

1. Viruses- Discovery, general account, structure & replication of –T4 Phage (Lytic, Lysogenic) and TMV, Viroids, Prions.
2. Plant diseases caused by viruses– Symptoms, transmission and control measures (Brief account only).
3. Study of Tobacco Mosaic, Bendi Vein clearing and Papaya leaf curl diseases.

### UNIT III: BACTERIA

1. Bacteria: Discovery, General characteristics, cell structure and nutrition.
2. Reproduction- Asexual and bacterial recombination (Conjugation, Transformation, Transduction).
3. Economic importance of Bacteria.

### UNIT –IV ALGAE

1. General account - thallus organization and reproduction in Algae.
2. Fritsch classification of Algae (up to classes only) and economic importance.
3. Structure, reproduction and life history of *Oedogonium*, *Ectocarpus* and *Polysiphonia*.

### UNIT V: FUNGI

1. General characteristics and outline classification (Ainsworth).
2. Structure, reproduction and life history of *Rhizopus* (Zygomycota), *Penicillium* (Ascomycota), and *Puccinia* (Basidiomycota).
3. Lichens-Structure and reproduction; ecological and economic importance.

# Diversity of Microbes & Lower Plants

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---

## Chapter-1

1.0	Aims & Objectives	1
1.1	Introduction	1
1.2	Ancient Theories of Origin of Life	2
1.3	Modern Theories of Origin of Life	2
1.4	Discovery of Microorganisms	5
1.5	Spontaneous Generation of Micro-organisms	5
1.6	Pasteur's Experiments	6
1.7	Germ Theory of Disease	7
1.8	Classification of Organisms	7
1.9	Summary	12
1.10	Review Questions	14
1.11	Objective Type Questions	15

## Chapter-2

2.0	Aims & Objectives	17
2.1	Introduction	17
2.2	Characteristics of Viruses	18
2.3	Structure of Virus	18
2.4	Replication	21
2.5	Transmission of Plant Viruses	24
2.6	Plant Diseases Caused by Viruses	26
2.7	Control of Plant Viral Diseases	29

2.8	Classification of Viruses	30
2.9	Tobacco Mosaic Virus	36
2.10	Tungro Disease of Rice	37
2.11	Bhendi Vein Clearing	37
2.12	Summary	38
2.13	Review Questions	39
2.14	Objective Questions	40

### Chapter-3

3.0	Aims & Objectives	43
3.1	Introduction	43
3.2	Structure of Bacterial Cell	46
3.3	Nutrition in Bacteria	49
3.4	Reproduction	52
3.5	Economic Importance of Bacteria	60
3.6	Bacterial Disease of Crop Plants and Their Control	66
3.7	Classification Of Bacteria	71
3.8	Summary	72
3.9	Review Questions	74
3.10	Objective Type Questions	76

### Chapter-4

4.0	Aims & Objectives	81
4.1	Archaeobacteria	81
4.2	Chlamydiae	84
4.3	Actinomycetes	85
4.4	Mycoplasmas	91



4.5	Rickettsias	95
4.6	Summary	97
4.7	Review Questions	98
4.8	Objective Type Questions	99

### Chapter-5

5.0	Aims & Objectives	103
5.1	Introduction	103
5.2	Occurrence	104
5.3	Thallus Organisation	104
5.4	Cell Structure	105
5.5	Heterocysts	108
5.6	Movement	110
5.7	Reproduction	110
5.8	Economic Importance	111
5.9	Cyanobacteria as Biofertilizers	112
5.10	Oscillatoria	114
5.11	Nostoc	116
5.12	Anabaena	118
5.13	Summary	120
5.14	Review Questions	122
5.15	Objective Questions	123

### Chapter-6

6.0	Aims & Objectives	127
6.1	Introduction	127
6.2	General Characteristics	127

6.3	Occurrence	128
6.4	Thallus Organisation	129
6.5	Cell Structure	135
6.6	Reproduction	142
6.7	Life Cycles	148
6.8	Classification of Algae	151
6.9	Economic Importance of Algae	159
6.10	Summary	164
6.11	Review Questions	167
6.12	Objective Questions	169

### Chapter-7

7.0	Aims & Objectives	175
7.1	Oedogonium	175
7.2	Chara	181
7.3	Ectocarpus	189
7.4	Polysiphonia	194
7.5	Volvox	200
7.6	Summary	204
7.7	Reviews Questions	207
7.8	Objective Type Questions	209

### Chapter-8

8.0	Aims & Objectives	217
8.1	Introduction	217
8.2	General Characteristics of Fungi	218
8.3	Occurrence	218

8.4	Thallus Organisation	219
8.5	Hyphal Structures	221
8.6	Dimorphic Fungi	223
8.7	Structure of a Typical Fungal Cell	223
8.8	Nutrition in Fungi	227
8.9	Growth of Fungi	230
8.10	Reproduction in Fungi	230
8.11	Heterothallism in Fungi	236
8.12	Parasexuality in Fungi	238
8.13	Life Cycles in Fungi	240
8.14	Classification of Fungi	243
8.15	Economic Importance of Fungi	248
8.16	Summary	257
8.17	Review Questions	262
8.18	Objective Type Questions	264

### Chapter-9

9.0	Aims & Objectives	271
9.1	Mastigomycotina	271
9.2	Albugo(cystopus)	271
9.3	Zygomycotina	279
9.4	Mucor	281
9.5	Rhizopus	287
9.6	Ascomycotina	294
9.7	Saccharomyces (Yeast)	300
9.8	Penicillium	306

9.9	Bastidiomycotina	311
9.10	Puccinia	318
9.11	Deuteromycotina	329
9.12	Cercospora	334
9.13	Mushroom Cultivation	336
9.14	Summary	344
9.15	Review Questions	351
9.16	Objective Type Questions	353

### Chapter-10

10.0	Aims & Objectives	369
10.1	Introduction	369
10.2	Components of Lichen	369
10.3	Distribution	370
10.4	Biology of Lichen	370
10.5	Growth Forms of Lichens	371
10.6	Internal Structure of Thallus	372
10.7	Special Structures of Lichen Thallus	373
10.8	Reproduction in Lichens	374
10.9	Economic Importance of Lichens	378
10.10	Classification of Lichens	380
10.11	Summary	381
10.12	Review Questions	383
10.13	Objective Type Questions	384

# ***PHYSICAL AND GENERAL CHEMISTRY***

***I- B.Sc(Chemistry)/ II - Semester***

*As per Choice Based Credit System (CBCS)*



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**Year : 2024**

**Edtion : First**

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# Physical and General Chemistry

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## PHYSICAL CHEMISTRY

### UNIT-I

1. **Solidstate:** Symmetry in crystals. Law of constancy of interfacial angles. The law of rationality of indices. The law of symmetry. Definition of lattice point, space lattice, unit cell. Bravais lattices and crystal systems. X-ray diffraction and crystal structure. Bragg's law. Defects in crystals. Stoichiometric and non-stoichiometric defects.

### UNIT-II

1. **Gaseous State:** Compression factors, deviation of real gases from ideal behavior. Vander Waal's equation of state. P-V Isotherms of real gases, Andrew's isotherms of carbon dioxide, continuity of state. Critical phenomena. The vander Waal's equation and the critical state. Law of corresponding states. Relationship between critical constants and vander Waal's constants. Joule Thomson effect.
2. **Liquid State:** Structural differences between solids, liquids and gases. Liquid crystals, the mesomorphic state. Classification of liquid crystals into Smectic and Nematic. Differences between liquid crystal and solid/liquid. Application of liquid crystals as LCD devices.

### UNIT-III

3. **Solutions:** Liquid-liquid - ideal solutions, Raoult's law. Ideally dilute solutions, Henry's law. Non-ideal solutions. Vapour pressure - composition and vapour pressure- temperature curves. Azeotropes-HCl-H<sub>2</sub>O, ethanol-water systems and fractional distillation. Partially miscible liquids-phenol-water, trimethylamine-water, nicotine-water systems. Effect of impurity on consolute temperature. Immiscible liquids and steam distillation. Nernst distribution law. Calculation of the partition coefficient. Applications of distribution law.

## GENERAL CHEMISTRY

### UNIT-IV

1. **Surface Chemistry:** Definition of colloids. Solids in liquids (sols), preparation, purification, properties - kinetic, optical, electrical. Stability of colloids, Hardy-Schulze law, protective colloid. Liquids in liquids (emulsions) preparation, properties, uses. Liquids in solids (gels) preparation, uses. Adsorption: Physical adsorption, chemisorption. Freundlich, Langmuir adsorption isotherms. Applications of adsorption
2. **Chemical Bonding:** Valence bond theory, hybridization, VB theory as applied to ClF<sub>3</sub>, Ni(CO)<sub>4</sub>, Molecular orbital theory - LCAO method, construction of M.O. diagrams for homo-nuclear and hetero-nuclear diatomic molecules (N<sub>2</sub>, O<sub>2</sub>, CO and NO).

### UNIT-V

1. **Stereochemistry of Carbon Compounds:** Molecular representations- Wedge, Fischer, Newman and Saw-Horse formulae. Optical isomerism: Optical activity- wave nature of light, plane polarised light, optical rotation and specific rotation. Chiral molecules- definition and criteria (Symmetry elements)- Definition of enantiomers and diastereomers - Explanation of optical isomerism with examples Glyceraldehyde, Lactic acid, Alanine, Tartaric acid, 2,3-dibromopentane. D,L and R,S configuration methods and E,Z- configuration with examples.

# Detailed Contents

## Physical and General Chemistry

---

---

### Chapter-1

1.0	Aims and Objectives	1
1.1	Introduction	1
1.2	Symmetry in Crystals	2
1.3	Laws of Crystallography	4
1.4	Lattice Point, Space Lattice and Unit Cell	4
1.5	Bravis Lattices and Crystal Systems	5
1.6	X- ray Diffraction and Crystal Structure	10
1.7	Bragg's law	11
1.7.1	Determination of Crystal Structure by Bragg's Method	12
1.7.2	Determination of Crystal Structure by Powder Method	12
1.8	Indexing of Planes and Structures NaCl and NaCl Crystals	15
1.9	Defects in Crystals, Stoichiometric and Non-stoichiometric	16
1.10	Valence Band Theory of Semiconductors	22
1.11	Summary	29
1.12	Exercise	30
1.13	Objective Type Questions	32

### Chapter-2

2.0	Aims and Objectives	33
2.1	Introduction	33
2.2	Real Gases from Ideal Behavior	35
2.3	Vander Waal's Equation of State	36
2.4	P-V Isotherms of Real Gases	38
2.4.1	Andrew's Isotherms of Carbon-dioxide, Continuity of State	40
2.5	Critical Phenomena, the Vander Waal's equation and the Critical State	41
2.5.1	Relationship between Critical Constants and Vander Waal's Constants	43
2.6	The Law of Corresponding States and Reduced Equation States	46
2.7	Joule Thomson Effect	48
2.8	Liquefaction of Gases: Linde's and Claude's Methods	50
2.9	Summary	51
2.10	Exercise	52
2.11	Objective Type Questions	53



### Chapter-3

3.0	Aims and Objectives	55
3.1	Introduction	55
3.2	Intermolecular Forces	56
	3.2.1 Structure of Liquids	58
3.3	Solids, Liquids and Gases	59
3.4	Liquid Crystals and The Mesomorphic State	61
3.5	Classification of Liquid Crystals	62
3.6	Liquid Crystal and Solid/liquid	62
3.7	Liquid Crystals as LCD Devices	63
3.8	Summary	63
3.9	Exercise	64
3.10	Objective Type Questions	64

### Chapter-4

4.0	Aims and Objectives	67
4.1	Introduction	67
4.2	Liquid-liquid Solutions	68
4.3	Ideal and non Ideal Solutions	69
4.4	Raoult's Law	70
4.5	Ideally Dilute Solutions	71
4.6	Henry's Law	72
4.7	Vapour Pressure Composition and Vapour Pressure Temperature Curve	77
4.8	Azeotropes- HCl – H <sub>2</sub> O	78
4.9	Ethanol-water System and Fractional Distillation	79
4.10	Partially Miscible Liquids Systems	81
4.11	Effect of Impurity on Consulated Temperature	83
4.12	Immiscible Liquids and Steam Distillation	84
4.13	Nernst Distribution Law	85
4.14	Summary	88
4.15	Exercise	89
4.16	Objective Type Questions	91

### Chapter-5

5.0	Aims and Objectives	95
5.1	Introduction	95
5.2	Definition of Colloids	97
5.3	Solids in Liquids (sols)	97
5.4	Different Properties of Colloids	101
5.5	Stability of Colloids, Hardy - Schulze Law	103
5.6	Protective Colloid	104

5.7	Liquid-liquid (emulsions)	105
5.8	Liquids in Solids(gels)	106
5.9	Adsorption	106
5.10	Freundlich, Langmuir Adsorption	108
5.11	Summary	110
5.12	Exercise	111
5.13	Objective Type Questions	112
<b>Chapter-6</b>		
6.0	Aims and Objectives	115
6.1	Introduction	115
6.2	Valence Bond Theory	116
6.3	Hybridization	120
6.4	VB Theory as Applied to $\text{ClF}_3$ , $\text{BrF}_5$ , $\text{Ni}(\text{CO})_4$ , $\text{XeF}_2$	122
6.5	Dipole Moment Electric Field	123
	6.5.1 Dipole Moment, Induced Dipole Moment	125
6.6	Molecular Orbital Theory LCAO Method	126
6.7	Summary	127
6.8	Exercise	128
6.9	Objective Type Questions	129
<b>Chapter-7</b>		
7.0	Aims and Objectives	131
7.1	Introduction	131
7.2	Molecular Representations and Different Formula	133
7.3	Stereoisomerism	139
7.4	Conformational and Configurational Isomerisms	141
7.5	Enantiomers	143
7.6	Chiral Molecules	146
	7.6.1 Asymmetric and Diastereomeric Molecules	147
7.7	Chiral Centers	149
7.8	Mesomers (2, 3-dichloropentane)	150
7.9	Number of Enantiomers and Mesomers Calculation	152
7.10	D.L and R.S Configuration for Asymmetric and Disymmetric Molecules	154
7.11	Cahn-Ingold-prelog Rule	156
7.12	Racemic Mixture, Racemisation and Resolution Techniques	158
7.13	Diastereomers	160
7.14	E-Z Configuration	162
7.15	Summary	163
7.16	Exercise	163
7.17	Objective Type Questions	165

# **BIOLOGY OF CHORDATES, EMBRYOLOGY, ECOLOGY AND ZOOGEOGRAPHY**

**I - B.Sc(Zoology) / II - Semester**

*As per Choice Based Credit System (CBCS)*



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**Year : 2024**

**Edtion : First**

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## **CONTENTS**

		<b>Page No.</b>
<b>Unit-I</b>	<b>Protochordata to Amphibia</b>	<b>1-74</b>
<b>Unit-II</b>	<b>Reptilia To Mammalia</b>	<b>75-126</b>
<b>Unit-III</b>	<b>Embryology</b>	<b>127-162</b>
<b>Unit-IV</b>	<b>Ecology</b>	<b>163-220</b>

## **UNIT I**

### **Protochordata to Amphibia**

Protochordates: Salient features of Urochordata and Cephalochordata Structure and life-history of Herdmania, Significance of retrogressive Metamorphosis-General organization of Chordates-General characters of Cyclostomes-General characters of fishes, classification up to sub-class level with examples-Type study - Scoliodon : Morphology, respiratory system, circulatory system, excretory system, nervous system and sense organs- Migration in fishes and types of scales-General characters and classification of Amphibia up to order level- Type study - Rana : Morphology, digestive system, respiratory system, circulatory system, excretory system, nervous system and reproductive system. Parental care in amphibians

## **UNIT II**

### **Reptilia to Mammalia**

General characters and classification of Reptilia up to order level. Type study – Calotes : Morphology, digestive system, respiratory system, circulatory system, urinogenital system and nervous system. General characters and classification of Aves up to order level with examples. Type study - Pigeon (*Columba livia*) : Exoskeleton, respiratory system, circulatory system and excretory system. Significance of migration in birds. Flight adaptation in birds-General characters and classification of Mammalia up to order level with examples. Dentition in Mammals.

## **UNIT III**

### **Embryology**

Spermatogenesis, Oogenesis and Fertilization. Types of eggs, Types of cleavages, Development of frog up to gastrulation and formation of primary germ layers, Foetal membranes and their significance, Placenta : types and functions, Regeneration with reference to Turbellarians and Lizards

## **UNIT IV**

### **Ecology**

Biogeochemical cycles or nutrient cycles - Gaseous cycles of Nitrogen and Carbon; Sedimentary cycle- phosphorus. Definition of Community- Habitat and ecological niche Community interactions: Brief account on Competition, predation, mutualism, commensalism and parasitism. Ecological succession: Primary and secondary, seral stages, climax community with examples. Population ecology : Density and dispersions of animal populations - Growth curves and growth of animal populations- r-selected and k-selected species -Population regulation mechanisms – both biotic and abiotic-Growth of human population and its control -Future of human population

# సృజనాత్మక రచన

డిగ్రీ (జనరల్) / సెమిస్టర్ - III

రచయితలు

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**Centre for Distance and Online Education**  
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**Tirupathi, AP -517 502**



## సృజనాత్మక రచన

### అభ్యసన ఫలితాలు

ఈ కోర్సు విజయవంతం ముగించాక, విద్యార్థులు క్రింది అభ్యసన ఫలితాలను పొందగలరు.

1. తెలుగు సాహిత్య అభ్యసన ద్వారా నేర్చుకున్న నైపుణ్యాలను, సృజనాత్మక నైపుణ్యాలుగా మార్చుకోగలరు.
2. విద్యార్థులు భాషాతత్వాన్ని, భాష యొక్క ఆవశ్యకతను, భాష యొక్క ప్రాధాన్యాన్ని గుర్తిస్తారు. మనిషి వ్యక్తిగత జీవనానికి, సామాజిక వ్యవస్థ పటిష్ఠతకు భాష ప్రధానమని తెలుసుకుంటారు.

తెలుగుభాషలోని కీలకాంశాలైన 'వర్ణం-పదం-వాక్యాల ప్రాధాన్యాన్ని గుర్తిస్తూ, వాగ్రూప- లిఖితరూప వ్యక్తీకరణ ద్వారా భాషానైపుణ్యాలను మొరుగుపరచుకోగలరు.

3. భాషానైపుణ్యాలను అలవరుచుకోవడంతోపాటు వినియోగించడం నేర్చుకుంటారు. రచనా, భాషానైపుణ్యాలను సృజనాత్మక రూపంలో వ్యక్తీకరించగలరు.
4. ప్రాచీన పద్యరచనతో పాటు ఆధునిక కవిత, కథ, వ్యాసం మొదలైన సాహిత్యప్రక్రియల నిర్మాణాలకు సంబంధించిన సిద్ధాంతవిషయాలను నేర్పడంతో పాటు వారిలో రచనా నైపుణ్యాలను పెంపొందించుకోగలరు.
5. సృజన రంగర, ప్రసారమాధ్యమ రంగాల్లో ఉపాధి అవకాశాలను అందిపుచ్చుకోగలరు.
6. అనువాద రంగంలో నైపుణ్యం సంపాదించగలరు.

### పాఠ్య ప్రణాళిక

#### యూనిట్ - 1: వ్యక్తీకరణ నైపుణ్యం

1. భాషా ప్రాథమిక అంశాలు : (భాష- నిర్వచనం, లక్షణాలు, ఆవశ్యకత ప్రయోజనాలు)
2. వర్ణం, పదం, వాక్యం : (లక్షణాలు, సామాన్య- సంయుక్త- సంశ్లిష్ట వాక్యాలు)
3. భాషా నిర్మాణంలో వర్ణం, పదం, వాక్యం

#### యూనిట్ - II : సృజనాత్మక రచనలు

4. కవితా రచన : ఉత్తమ కవితా - లక్షణాలు
5. కథారచన : ఉత్తమ కథ - లక్షణాలు
6. వ్యాస రచన : ఉత్తమ వ్యాసం లక్షణాలు

**యూనిట్ - III: అనువాద రచన**

7. అనువాదం- నిర్వచనం, అనువాద పద్ధతులు
8. అనువాద సమస్యలు - భౌగోళిక, భాషా, సంస్కృతిక సమస్యలు, పరిష్కారాలు
9. అభ్యాసం - ఆంగ్లం నుండి తెలుగుకు, తెలుగు నుండి ఆంగ్లానికి ఒక పేరును అనువదించడం

**యూనిట్ - IV: మాధ్యమాలకు రచన - 1 (ముద్రణామాధ్యమం/ ప్రింట్ మీడియా)**

10. ముద్రణామాధ్యమం: పరిచయం - పరిధి - వికాసం
11. వివిధ రకాల పత్రికలు , పరిశీలన - పత్రికా భాష - శైలి - వైవిధ్యం
12. పత్రికా రచన : (వార్తా రచన, సంపాదకీయాలు, సమీక్షలు - అవగాహన)

**యూనిట్ - V: మాధ్యమాల రచన - 2 (ప్రసార మాధ్యమం/ ఎలక్ట్రానిక్ మీడియా)**

13. ప్రసార మాధ్యమాలు : (నిర్వచనం, రకాలు, విస్తృతి ప్రయోజనాలు)
14. శ్రవణ మాధ్యమాలు : (రచన, రేడియో రచన, ప్రసంగాలు, నాటికలు, ప్రసార సమాచారం)
15. దృశ్య మాధ్యమాలు : (రచన, వ్యాఖ్యానం(యాంకరింగ్), టెలివిజన్ రచన)

# విషయ సూచిక సృజనాత్మక రచన

## యూనిట్ - 1: వ్యక్తికరణ నైపుణ్యం

### 1. భాషా ప్రాథమిక అంశాలు

1.1	ఉద్దేశ్యం	3
1.2	పాఠ్యభాగం	3
1.3	పాఠ్యభాగ పరిచయం	10
1.4	పాఠ్యభాగ సారాంశము	10
1.5	వ్యాసరూప ప్రశ్నలు	12
1.6	సంగ్రహ ప్రశ్నలు	14

### 2. వర్ణం, పదం, వాక్యం

2.1	ఉద్దేశ్యం	17
2.2	పాఠ్యభాగం	17
2.3	పాఠ్యభాగ పరిచయం	21
2.4	పాఠ్యభాగ సారాంశము	21
2.5	వ్యాసరూప ప్రశ్నలు	21
2.6	సంగ్రహ ప్రశ్నలు	23

### 3. భాషా నిర్మాణంలో వర్ణం, పదం, వాక్యం

3.1	ఉద్దేశ్యం	25
3.2	పాఠ్యభాగం	25
3.3	పాఠ్యభాగ పరిచయం	32
3.4	పాఠ్యభాగ సారాంశము	32
3.5	వ్యాసరూప ప్రశ్నలు	32
3.6	సంగ్రహ ప్రశ్నలు	38
3.7	విద్యార్థులకు అభ్యాసం	42

## యూనిట్ - II : సృజనాత్మక రచనలు

### 4. కవితా రచన

4.1	ఉద్దేశ్యం	45
4.2	పాఠ్యభాగం	45
4.3	పాఠ్యభాగ పరిచయం	48

4.4	పాఠ్యభాగ సారాంశము	48
4.5	వ్యాసరూప ప్రశ్నలు	49
4.6	సంగ్రహ ప్రశ్నలు	52

### 5. కథారచన

5.1	ఉద్దేశ్యం	55
5.2	పాఠ్యభాగం	55
5.3	పాఠ్యభాగ పరిచయం	60
5.4	పాఠ్యభాగ సారాంశము	61
5.5	వ్యాసరూప ప్రశ్నలు	61
5.6	సంగ్రహ ప్రశ్నలు	66
5.7	విద్యార్థులకు అభ్యాసం	70

### 6. వ్యాస రచన

6.1	ఉద్దేశ్యం	55
6.2	పాఠ్యభాగం	55
6.3	పాఠ్యభాగ పరిచయం	60
6.4	పాఠ్యభాగ సారాంశము	61
6.5	వ్యాసరూప ప్రశ్నలు	61
6.6	సంగ్రహ ప్రశ్నలు	66
6.7	విద్యార్థులకు అభ్యాసం	70
6.8	ప్రాజెక్టు వర్క్	80

### యూనిట్ - III: అనువాద రచన

#### 7. అనువాదం

7.1	ఉద్దేశ్యం	83
7.2	పాఠ్యభాగం	83
7.3	పాఠ్యభాగ పరిచయం	86
7.4	పాఠ్యభాగ సారాంశము	86
7.5	వ్యాసరూప ప్రశ్నలు	86
7.6	సంగ్రహ ప్రశ్నలు	91
7.7	విద్యార్థులకు అభ్యాసం	92

#### 8. అనువాద సమస్యలు

8.1	ఉద్దేశ్యం	93
8.2	పాఠ్యభాగం	93

8.3	పాఠ్యభాగ పరిచయం	104
8.4	పాఠ్యభాగ సారాంశము	104
8.5	వ్యాసరూప ప్రశ్నలు	104
8.6	సంగ్రహ ప్రశ్నలు	117
8.7	విద్యార్థులకు అభ్యాసం	118

### 9. అభ్యాసం

9.1	ఉద్దేశం	119
9.2	ఆంగ్లం నుండి తెలుగుకు అనువాదం చేయుట	119
9.3	తెలుగు నుండి ఆంగ్లంకు అనువాదం చేయుట	120
9.4	విద్యార్థులకు అభ్యాసం	120

యూనిట్ - IV: మాధ్యమాలకు రచన - 1 (ముద్రణామాధ్యమం/ ప్రింట్ మీడియా)

### 10. ముద్రణామాధ్యమం

10.1	ఉద్దేశ్యం	123
10.2	పాఠ్యభాగం	123
10.3	పాఠ్యభాగ పరిచయం	126
10.4	పాఠ్యభాగ సారాంశము	126
10.5	వ్యాసరూప ప్రశ్నలు	127
10.6	సంగ్రహ ప్రశ్నలు	129
10.7	విద్యార్థులకు అభ్యాసం	130

### 11. వివిధ రకాల పత్రికలు

11.1	ఉద్దేశ్యం	131
11.2	పాఠ్యభాగం	131
11.3	పాఠ్యభాగ పరిచయం	137
11.4	పాఠ్యభాగ సారాంశము	138
11.5	వ్యాసరూప ప్రశ్నలు	138
11.6	సంగ్రహ ప్రశ్నలు	142
11.7	విద్యార్థులకు అభ్యాసం	144

### 12. పత్రికా రచన

12.1	ఉద్దేశ్యం	145
12.2	పాఠ్యభాగం	145
12.3	పాఠ్యభాగ పరిచయం	149

12.4	పాఠ్యభాగ సారాంశము	149
12.5	వ్యాసరూప ప్రశ్నలు	150
12.6	సంగ్రహ ప్రశ్నలు	152
12.7	విద్యార్థులకు అభ్యాసం	154

**యూనిట్ - V: మాధ్యమాల రచన - 2 (ప్రసార మాధ్యమం/ ఎలక్ట్రానిక్ మీడియా)**

**13. ప్రసార మాధ్యమాలు**

13.1	ఉద్దేశ్యం	157
13.2	పాఠ్యభాగం	157
13.3	పాఠ్యభాగ పరిచయం	159
13.4	పాఠ్యభాగ సారాంశము	159
13.5	వ్యాసరూప ప్రశ్నలు	159
13.6	సంగ్రహ ప్రశ్నలు	161
13.7	విద్యార్థులకు అభ్యాసం	162

**14. శ్రవణ మాధ్యమాలు**

14.1	ఉద్దేశ్యం	163
14.2	పాఠ్యభాగం	163
14.3	పాఠ్యభాగ పరిచయం	170
14.4	పాఠ్యభాగ సారాంశం	170
14.5	వ్యాసరూప ప్రశ్నలు	170
14.6	సంగ్రహ ప్రశ్నలు	175
14.7	విద్యార్థులకు అభ్యాసం	176

**15. దృశ్య మాధ్యమాలు**

15.1	ఉద్దేశ్యం	177
15.2	పాఠ్యభాగం	177
15.3	యాంకరకు ఉండాల్సిన లక్షణాలు	182
15.4	పాఠ్యభాగ పరిచయం	184
15.5	పాఠ్యభాగ సారాంశం	184
15.6	వ్యాసరూప ప్రశ్నలు	184
15.7	సంగ్రహ ప్రశ్నలు	191
15.8	విద్యార్థులకు అభ్యాసం	192

*A Course in*  
***Conversational Skills***

*As per Choice Based Credit System (CBCS)  
For Degree I - Year / III - Semester  
Common to all Branches*



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**Year : 2024**

**Edition : First**

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# *A Course in Conversational Skills*

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## **Learning Outcomes**

By the end of the course the learner will be able to:

- Speak fluently in English
- Participate confidently in any social interaction
- Face any professional discourse
- Demonstrate critical thinking
- Enhance conversational skills by observing the professional interviews

### **Unit-I**

**Speech:** 1. Tryst with Destiny Jawaharlal Nehru

**Skills:** 2. Greetings

3. Introductions

### **Unit-II**

**Speech:** 1. Yes, We Can Barack Obama

**Interview:** 2. A Leader Should Know How to Manage Failure Dr.A.P.J.Abdul Kalam/ India  
Knowledge at Wharton

**Skills:** 3. Requests

### **Unit-III**

**Interview:** 1. Nelson Mandela's Interview With Larry King

**Skills:** 2. Asking and Giving Information

3. Agreeing and Disagreeing

### **Unit-IV**

**Interview:** 1. JRD Tata's Interview With T.N.Ninan

**Skills:** 2. Dialogue Building

3. Giving Instructions/Directions

### **Unit-V**

**Speech:** 1. You've Got to Find What You Love Steve Jobs

**Skills:** 2. Debates

3. Descriptions

4. Role Play

# Content

## *A Course in Conversational Skills*

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---

### Unit-1

1.0	Objectives	2
1.1	Introduction	2
1.2	Speech: Tryst with Destiny Jawaharlal Nehru	2
1.3	Vacabulary	8
1.3.1	In Depth Reading Comprehension	25
1.3.2	Topics for Speech	25
1.4	Greetings	26
1.5	Introduction	31
1.5.1	Introducing Oneself and Others	32
1.5.2	Examples	33
1.5.3	Practice Exercises	36
1.5.4	Asking Questions and Giving Reply	38
1.5.4.1	Practice Exercises	40

### Unit-2

2.0	Objectives	44
2.1	Introduction	44
2.2	Speech: Yes, we can Barack Obama	45
2.3	Vocabulary	49
2.4	A Leader should know how to Manage Failure	49
2.5	Requests	55

### Unit-3

3.0	Objectives	64
3.1	Introduction	64

3.2	Nelson Mandela's Interview with Larry King	65
3.3	Asking and Giving Information	83
3.2.1	Practice Exercises	85
3.4	Agreeing and Disagreeing	87

#### Unit-4

4.0	Objectives	96
4.1	Introduction	96
4.2	JRD Tata's Interview with T.N.Ninan	96
4.3	Dialogue Building	101
4.3.1	Rules for Writing Dialogue	103
4.3.2	Activities	103
4.4	Giving Instructions/ Directions	107
4.4.1	Practice Exercises	113
4.4.2	Asking For and Giving Instructions	114
4.4.3	Practice Exercises	116

#### Unit-5

5.0	Objectives	118
5.1	Introduction	118
5.2	'You've got to find what you Love,'	118
5.3	Debae	124
5.3.1	Necessity of Debate	124
5.3.2	The Basic Debating Skills	124
5.3.3	Essentials of a Good Debate	125
5.3.4	Structure for Debate	127
5.3.5	Debate Vocabulary and Phrases	128
5.3.6	Exercises	129

5.4	Descriptions	<b>133</b>
5.4.1	Qualities of a Descriptive Essay	<b>134</b>
5.4.2	Format	<b>134</b>
5.4.3	Describing Places	<b>134</b>
5.4.4	Describing People	<b>134</b>
5.4.5	Describing Events	<b>135</b>
5.5	Role Plays	<b>136</b>
5.5.1	Examples	<b>140</b>
5.5.2	Practice Exercises	<b>144</b>

Life Skill Course

# *Environmental Education*

*As per Choice Based Credit System (CBCS)  
Common to all Branches*



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**Year : 2024**

**Edtion : First**

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# *Environmental Education*

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## **Learning outcomes**

On completion of this course the students will be able to .....

1. Understand the nature, components of an ecosystem and that humans are an integral part of nature.
2. Realize the importance of environment, the goods and services of a healthy biodiversity, dependence of humans on environment.
3. Evaluate the ways and ill effects of destruction of environment, population explosion on ecosystems and global problems consequent to anthropogenic activities.
4. Discuss the laws/ acts made by government to prevent pollution, to protect biodiversity and environment as a whole.
5. Acquaint with international agreements and national movements, and realize citizen's role in protecting environment and nature.

### **Unit-1: Environment and Natural Resources**

1. Multidisciplinary nature of environmental education; scope and importance.
2. Man as an integral product and part of the Nature.
3. A brief account of land, forest and water resources in India and their importance.
4. Biodiversity: Definition; importance of Biodiversity - ecological, consumptive, productive, social, ethical and moral, aesthetic, and option value.
5. Levels of Biodiversity: Genetic, species and ecosystem diversity.

### **Unit-2: Environmental Degradation and Impacts**

1. Human population growth and its impacts on environment; land use change, land degradation, soil erosion and desertification.
2. Use and over-exploitation of surface and ground water, construction of dams, floods, conflicts over water (within India).
3. **Deforestation:** Causes and effects due to expansion of agriculture, firewood, mining, forest fires and building of new habitats.
4. Non-renewable energy resources, their utilization and influences.
5. A brief account of air, water, soil and noise pollutions; Biological, industrial and solid wastes in urban areas. Human health and economic risks.
6. Green house effect - global warming; ocean acidification, ozone layer depletion, acid rains and impacts on human communities and agriculture.

7. **Threats to biodiversity:** Natural calamities, habitat destruction and fragmentation, over exploitation, hunting and poaching, introduction of exotic species, pollution, predator and pest control.

### Unit-3: Conservation of Environment

1. Concept of sustainability and sustainable development with judicious use of land, water and forest resources; afforestation.
2. Control measures for various types of pollution; use of renewable and alternate sources of energy.
3. **Solid waste management:** Control measures of urban and industrial waste.
4. **Conservation of biodiversity:** In-situ and ex-situ conservation of biodiversity.
5. **Environment Laws:** Environment Protection Act; Act; Wildlife Protection Act; Forest Conservation Act.
6. **International agreements:** Montreal and Kyoto protocols; Environmental movements: Bishnois of Rajasthan, Chipko, Silent valley.



# Content

## *Environmental Education*

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---

### Unit-1: Environment and Natural Resources

1.0	Objectives	1
1.1	Introduction	1
1.2	Definitions of Environment	2
1.2.1	Classification of Environment	3
1.2.2	Components of Environment	3
1.2.3	Environmental Studies	5
1.2.4	Objectives of Environmental Education	6
1.2.5	Importance of the Environmental Studies	7
1.2.6	Scope of Environmental Education	8
1.2.7	Multidisciplinary Nature	9
1.2.8	Need for Public Awareness	11
1.3	Man as an Integral Product and Part of Nature	12
1.4	Land Resources	13
1.4.1	Land as a Resource	14
1.4.2	Land Degradation	14
1.4.3	Physical Properties of Soil	15
1.4.4	Landslides	16
1.4.5	Soil Erosion	17
1.4.6	Desertification	18
1.4.7	Environmental Impacts of Overgrazing	19
1.5	Forest Resources	20
1.5.1	Use of Forests	20
1.5.2	Importance of Forests	21
1.5.3	Over-exploitation of Forests	22
1.5.4	Forest Areas in India	22
1.5.5	Deforestation	24
1.5.6	Major Causes of Deforestation	24
1.5.7	Effects of Deforestation Environment and Tribal People	25
1.5.8	Afforestation Programmes	26
1.5.9	Timber Extraction	26

1.5.10	Effects of Mining Operations on a Forest and Tribal People	27
1.6	Water Resources	29
1.6.1	Uses of Water	30
1.6.2	Effects of Over-utilisation of Surface & Ground Water	30
1.6.3	Effects of Overutilisation of Ground Water	31
1.6.4	Conflicts Over Water	31
1.7	Biodiversity	32
1.7.1	Definitions	33
1.7.2	Types of Biodiversity	33
1.7.3	Importance of Biodiversity	35
1.7.4	Uses of Biodiversity	40
1.7.5	Values of Biodiversity	42
1.8	Levels of Biodiversity	43
1.9	Outcomes	46
1.10	Review Questions	46
1.11	Multiple Choice Questions	47
<b>Unit-2: Environmental Degradation and Impacts</b>		
2.0	Objectives	49
2.1	Introduction	49
2.2	Population Growth	50
2.2.1	Population Explosion	50
2.2.2	Impact on Environment	52
2.3	Land use Change	53
2.3.1	Direct Land use Change	54
2.3.2	Indirect Land use Change	55
2.3.3	Limitations of the Indirect Land use Change Concept	55
2.4	Land Degradation	56
2.4.1	Causes of Land Degradation	56
2.4.2	Prevention and Control Measures for Land Degradation	57
2.4.3	Soil Erosion	57
2.4.4	Desertification	59
2.5	Water Resources	59
2.5.1	Uses of Water	60
2.5.2	Effects of Over-utilisation of Surface & Ground Water	61
2.5.3	Construction of Dams	62

2.5.4	Floods	<b>65</b>
2.5.5	Drought	<b>66</b>
2.5.6	Conflicts Over Water	<b>67</b>
2.6	Deforestation	<b>70</b>
2.6.1	Major Causes of Deforestation	<b>71</b>
2.6.2	Effects of Deforestation Environment and Tribal People	<b>72</b>
2.6.3	Causes	<b>73</b>
2.6.4	Effects	<b>74</b>
2.7	Resources	<b>74</b>
2.7.1	Differences between Renewable and Non-renewable Resources	<b>75</b>
2.7.2	Non-Renewable Energy Resources	<b>76</b>
2.8	Pollution	<b>78</b>
2.8.1	Air Pollution	<b>79</b>
2.8.2	Water Pollution	<b>85</b>
2.8.3	Soil Pollution	<b>89</b>
2.8.4	Noise Pollution	<b>91</b>
2.8.5	Solid Waste	<b>95</b>
2.8.6	Human health and Economic Risks	<b>97</b>
2.9	Green House effect	<b>97</b>
2.9.1	Global Warming and Green House Effects	<b>98</b>
2.9.3	Ocean Acidification	<b>101</b>
2.9.4	Ozone Layer Depletion	<b>102</b>
2.9.5	Acid Rain (Acid Precipitation)	<b>106</b>
2.10	Threats to Biodiversity	<b>109</b>
2.11	Outcomes	<b>110</b>
2.12	Review Questions	<b>111</b>
2.13	Multiple Choice Questions	<b>112</b>
<b>Unit-3: Conservation of Environment</b>		
3.0	Objectives	<b>117</b>
3.1	Introduction	<b>117</b>
3.2	Sustainability	<b>118</b>
3.2.1	Issues of Environmental Sustainability	<b>118</b>
3.3	Sustainable development	<b>119</b>
3.3.1	Goals of Sustainable Development	<b>122</b>
3.3.2	Threats to Sustainability	<b>122</b>

3.3.3	Sustainable Development with Judicious use of Land	<b>125</b>
3.3.4	Sustainable Development with Judicious use of Water	<b>124</b>
3.3.5	Sustainable Development with Judicious use of Forest Resources	<b>125</b>
3.3.6	Aforestration	<b>126</b>
3.4	Control Measures for Various Types of Pollution	<b>128</b>
3.4.1	Control of Air Pollution	<b>128</b>
3.4.2	Control of Automobile Pollution	<b>128</b>
3.4.3	Control of Water Pollution	<b>129</b>
3.4.4	Control of Soil Pollution	<b>129</b>
3.4.5	Control of Noise Pollution	<b>130</b>
3.4.6	Control of Thermal Pollution	<b>130</b>
3.5	Energy Resources	<b>131</b>
3.5.1	Growing Energy Needs	<b>131</b>
3.5.2	Types of Natural Resources	<b>132</b>
3.5.3	Use of Alternate Energy Sources	<b>134</b>
3.6	Solid Waste management	<b>135</b>
3.6.1	Increasing Industrialization and Rapid Urbanisation	<b>136</b>
3.6.2	Effects of Solid Waste Pollution	<b>138</b>
3.6.3	Measures for Safe Urban and Industrial Waste Disposal	<b>138</b>
3.7	Conservation of Biodiversity	<b>140</b>
3.8	Environment Laws	<b>145</b>
3.8.1	The Environment (Protection) Act, 1986	<b>145</b>
3.8.2	Wildlife Protection Act	<b>146</b>
3.8.3	Forest Conservation Act, 1980	<b>148</b>
3.9	International Agreements	<b>150</b>
3.9.1	Kyoto Protocol	<b>150</b>
3.9.2	Motreal Protocol	<b>151</b>
3.10	Environmental Movement	<b>151</b>
3.10.1	Bishnois of Rajasthan	<b>152</b>
3.10.2	Chipko Movement	<b>153</b>
3.10.3	Silent Valley	<b>154</b>
3.11	Outcomes	<b>155</b>
3.12	Review Questions	<b>155</b>
3.13	Multiple Choice Questions	<b>156</b>

Life Skill Course

# *Personality Enhancement & Leadership*

*As per Choice Based Credit System (CBCS)  
Common to all Branches*



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# *Personality Enhancement & Leadership*

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## **Learning Outcomes**

By successful completion of the course, students will be able to:

- Develop comprehensive understanding of personality
- Know how to assess and enhance one's own personality
- Comprehend leadership qualities and their importance
- Understand how to develop leadership qualities

### **Unit-I**

Meaning of Personality – Explanations of Human Personality – Psychodynamic Explanations – Social Cognitive Explanation – Big Five traits of Personality

### **Unit-II**

Assessment of Personality - Projective & Self Report Techniques - Building Self-Confidence – Enhancing Personality Skills

### **Unit-III**

Leadership Characteristics – Types of Leaders – Importance of Leadership – Leadership Skills – Building and Leading Efficient Teams – Leadership Qualities of Abraham Lincoln, Mahatma Gandhi, Prakasam Pantulu, Dr. B. R. Ambedkar & J.R.D. Tata

# Content

## *Personality Enhancement & Leadership*

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---

### Unit-1

1.0	Objectives	1
1.1	Introduction	1
1.2	Personality	2
1.2.1	Nature of Personality	3
1.2.2	Characteristics of Personality	4
1.2.3	Foundations of Personality	4
1.2.4	Stages of Personality	5
1.2.5	Determinants of Personality	6
1.3	Personality Structure	8
1.4	Theories of Personality	9
1.5	Psychodynamics	13
1.5.1	Psychosexual Stages of Development	16
1.5.2	Freudian Psychodynamics	17
1.5.3	Jungian Psychodynamics	17
1.5.4	Positive Psychology	18
1.5.5	Psychoanalysis	19
1.5.5.1	Key Terms of Psychoanalytical Theory	19
1.5.5.2	Strengths of Psychoanalysis	20
1.5.5.3	Criticisms of Psychoanalysis	20
1.6	Psychodynamic Theory of Personality	20
1.6.1	Psychodynamic Treatment	22
1.6.2	Other Psychodynamic Theorists	22
1.6.3	Erickson Psychodynamic Theory of Personality	23
1.6.3.1	The Ego Psychology	23
1.6.3.2	The Epigenetic Principle	23
1.7	Social Cognitive Explanation	26
1.7.1	Main Tenets of Social Cognitive Theory	26
1.7.2	Albert Bandura's Social Learning Theory	26
1.7.3	Evaluation of Bandura's Theory	32



1.8	Definition of the Big Five Factors	32
1.8.1	Discovery of the Big Five in Cattell's Variable List	33
1.8.2	The Big Five Theory	34
1.8.3	Measurement of the Big Five Inventory (BFI)	36
1.9	Outcomes	39
1.10	Review Questions	40
<b>Unit-2</b>		
2.0	Objectives	41
2.1	Introduction	41
2.2	Assessment of Personality	41
2.2.1	Need of Assessment	42
2.2.2	Purpose of Personality Assessment	43
2.3	Methods of Personality Assessment	43
2.3.1.	Personality Inventories	44
2.3.1.1	History of Personality Assessment	45
2.3.2	Projective Methods	48
2.3.2.1	History of Projective Methods	48
2.3.2.2	Types of Projective Tests	49
2.3.2.3	Evaluation of Projective Tests	51
2.3.3	Observational Methods	52
2.3.4	Self-Report Tests	52
2.3.5	Self Report Personality Test (Inventory)	55
2.3.5.1	Single-Traits Tests	57
2.3.5.2	Multidimensional Tests	57
2.3.5.3	Strength and Weakness of Self-Report Tests	57
2.3.5.4	Faking in Personality Inventories	58
2.3.5.5	Measures to Avoid Faking	58
2.3.5.6	Methods to Overcome Weaknesses in Self-Report Tests	59
2.4	Building Self confidence	60
2.4.1	Techniques of Self Confidence	61
2.5	Enhancing Personality skills	63
2.5.1	Importance of Personality Skills	64
2.5.2	Enhancing Personality Skills	64

2.5.3	Steps to Improve Personal Development Skills	<b>65</b>
2.5.4	Personal Development Skills in the Workplace	<b>66</b>
2.6	Outcomes	<b>67</b>
2.7	Review Questions	<b>67</b>
<b>Unit-3</b>		
3.2	Definition	<b>70</b>
3.2.1	Characteristics of Leadership	<b>70</b>
3.2.2	Nature of Leadership	<b>71</b>
3.2.3	Importance of Leadership	<b>72</b>
3.2.4	Need of Leadership	<b>73</b>
3.3	Leadership Types	<b>73</b>
3.4	Styles of Leadership	<b>75</b>
3.5	Leadership skills	<b>79</b>
3.5.1	Functions of Leader	<b>80</b>
3.5.2	Qualities of an Effective Leader	<b>81</b>
3.5.3	Leadership Skills	<b>82</b>
3.5.4	Qualities of Leadership	<b>83</b>
3.6	Building and Leading Efficient Teams	<b>83</b>
3.6.1	Team Development Stages	<b>84</b>
3.6.2	Different Types of Teams	<b>84</b>
3.6.3	Team Building	<b>85</b>
3.6.4	Importance of Building Strong Teams	<b>86</b>
3.6.5	Steps in Building Strong Teams	<b>87</b>
3.6.6	Team Activities	<b>89</b>
3.7	Leadership Qualities of Abraham Lincoln	<b>90</b>
3.8	Leadership Qualities of Mahatma Gandhi	<b>91</b>
3.9	Leadership Qualities of Prakasham Pantulu	<b>92</b>
3.10	Leadership Qualities of B.R. Ambdkar	<b>93</b>
3.11	Leadership Qualities of J.R.D. Tata	<b>93</b>
3.11.1	Leadership Skills	<b>95</b>
3.12	Outcomes	<b>95</b>
3.13	Review Questions	<b>96</b>

Skill Development Course  
***Disaster Management***

*As per Choice Based Credit System (CBCS)*

*Common to all Branches*



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**Year : 2024**

**Edtion : First**

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# *Disaster Management*

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## **Learning Outcomes**

After successful completion of the course, the students are able to;

1. Understand the nature, cause and effects of disasters
2. Comprehend the importance of Disaster Management and the need of awareness
3. Acquire knowledge on disaster preparedness, recovery remedial measures and personal precautions
4. Volunteer in pre and post disaster management service activities

### **Unit-I**

Introduction of Disaster - Different types of disasters- Natural- (flood, cyclone, earthquake, Famine and pandemic) - Accidental- (Fire, Blasting, Chemical leakage, Rail, Aviation, Road boat tragedies and nuclear pollution) - Disaster Management Act 2005

### **Unit-II**

Causes and immediate effects of Disasters - Preparedness of disasters –Precautions – Dissemination of information - Nature and concepts - Role of National Disaster Management Authority and Role of Government and non governmental organizations in protecting human livestock and natural resources.-Use of technology -Role of Citizens and Youth in the prevention.

### **Unit-III**

Post disaster effects - short term - Procedures for Rehabilitation and Recovery - Role of volunteers and Safety Precautions - Long term remedial and preventive measures – Collection, filing and storage of information - Case studies.

# Content

## *Disaster Management*

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### Unit-1

1.0	Objectives	1
1.1	Introduction	1
1.2	Disaster	1
1.3	Types of Disasters	2
1.3.1	Earthquakes	3
1.3.2	Tunami	5
1.3.3	Cyclones	7
1.3.4	Floods	10
1.3.5	Droughts	12
1.3.6	Landslides	14
1.3.7	Forest Fires	16
1.3.8	Famine	18
1.3.9	Pandemic	20
1.4	Man-made Disasters	28
1.5	Accidental Disaster	29
1.5.1	Fire Accidents	29
1.5.1.1	Fire Safety Precautions	30
1.5.2	Blasting	32
1.5.3	Rail Accidents	33
1.5.4	Aviation Accidents	34
1.5.5	Road Accidents	36
1.5.6	Boat Tragedies	37
1.6	Nuclear Pollution	39
1.6.1	Causes of Nuclear Pollution	39
1.6.2	Effects of Nuclear Pollution	40
1.6.3	Prevention of Nuclear Pollution	41
1.7	Disaster Management Act 2005	41

1.7.1	Scope and Objective	42
1.7.2	Criticism of the Disaster Management Act	43
1.8	Outcomes	43
1.9	Review Questions	43
<b>Unit-2</b>		
2.0	Objectives	45
2.1	Induction	45
2.2	Causes and Immediate Effects of Disasters	46
2.2.1	Causes of Disasters	46
2.2.2	Effects of Disasters	48
2.3	Preparedness of Disasters	50
2.3.1	Measures of Disaster Preparedness	50
2.4	Precautions or Steps for Preparedness of Disaster Strikes by Communities	53
2.5	Dissemination of Information	54
2.5.1	Importance of Information	55
2.5.2	Nature of Dissemination of Information	55
2.5.3	Concepts of Dissemination	56
2.5.4	Channels for Disseminating Information	57
2.6	Role of National Disaster Management Authority	58
2.6.1	Evolution of NDMA	58
2.6.2	Functions and Responsibilities of NDMA	58
2.6.3	Institutional Framework for Disaster Management in India	59
2.6.4	Role & Responsibility of SDMA	59
2.6.5	Role & Responsibility of SEC	60
2.6.6	Role & Responsibility of DDMA	61
2.7	Role of Government and non Governmental Organizations in Protecting Human Livestock and Natural Resources	61
2.8	Use of Technology in Disaster Management	62
2.9	Role of Citizen in Prevention of Disaster	64
2.10	Role of Youth	65
2.11	Outcomes	66
2.12	Review Questions	66

### Unit-3

3.0	Objectives	67
3.1	Introduction	67
3.2	Post Disaster Effects	68
3.3	Disaster Management Cycle	69
3.4	Procedures for Rehabilitation and Recovery	71
3.4.1	Rehabilitation	71
3.4.2	Types of Rehabilitation	72
3.4.3	Procedure for Rehabilitation	72
3.4.4	Procedure for Recovery	73
3.4.4.1	Disaster Recovery Plan	73
3.4.4.2	Disaster Plan	74
3.4.4.3	Benefits of Disaster Recovery Plan	75
3.4.4.4	Strategies and Tools for Disaster Recovery Plan	75
3.4.4.5	Steps of a Disaster Recovery Plan	76
3.5	Role of Volunteers in Disasters	77
3.6	Role of Safety Precautions	80
3.7	Preventive measures of Disaster	81
3.8	Collection- Filling-Storing of Information	83
3.8.1	Data Collection	83
3.8.2	Filling of Data	84
3.8.3	Storage of Information	85
3.8.3.1	Storage Management and Disaster Recovery	85
3.9	Case study	86
3.10	Outcomes	88
3.11	Review Questions	88



# *Plant Physiology and Metabolism*

**II- B.Sc(Botany)/ III- Semester**

*As per Choice Based Credit System (CBCS)*



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**Year : 2024**

**Edition : First**

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# Plant Physiology and Metabolism

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## UNIT – I: Plant – Water Relations

1. Physical properties of water, Importance of water to plant life.
2. Diffusion, imbibition and osmosis; concept & components of Water potential.
3. Absorption and transport of water and ascent of sap.
4. Transpiration –Definition, types of transpiration, structure and opening and closing mechanism of stomata.

## UNIT –II: Mineral Nutrition & Enzymes

1. Mineral Nutrition: Essential elements (macro and micronutrients) and their role in plant metabolism, deficiency symptoms.
2. Mineral ion uptake (active and passive transport).
3. Nitrogen metabolism- biological nitrogen fixation in *Rhizobium*, outlines of protein synthesis (transcription and translation).
4. Enzymes: General characteristics, mechanism of enzyme action and factors regulating enzyme action.

## UNIT –III: Photosynthesis

1. Photosynthesis: Photosynthetic pigments, photosynthetic light reactions, photophosphorylation, carbon assimilation pathways: C<sub>3</sub>, C<sub>4</sub>, and CAM (brief account)
2. Photorespiration and its significance.
3. Translocation of organic solutes: mechanism of phloem transport, source-sink relationships.

#### **UNIT – IV: Plant Metabolism**

1. Respiration: Glycolysis, anaerobic respiration, TCA cycle, electron transport system. Mechanism of oxidative phosphorylation.
2. Lipid Metabolism: Types of lipids, Beta-oxidation.

#### **UNIT –V: Growth and Development**

1. Growth and development: definition, phases and kinetics of growth.
2. Physiological effects of phytohormones - Auxins, Gibberellins, Cytokinins, ABA, Ethylene and Brassinosteroids.
3. Physiology of flowering -photoperiodism, role of phytochrome in flowering; Vernalization.
4. Physiology of Senescence and Ageing.

## Detailed Contents

# Plant Physiology and Metabolism

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### Unit-I

1.0	Aims and Objectives	1
1.1	Introduction	1
1.2	Physical and Chemical Properties of Water	2
1.3	Diffusion	3
1.4	Imbibition	4
1.5	Osmosis	4
1.6	Osmotic Potential, Water Potential and Pressure Potential	5
1.7	Absorption of Water	6
1.8	Transport of Water	8
1.9	Ascent of Sap	11
1.10	Transpiration	11
1.10	Antitranspirants	18
1.11	Summary	18
1.12	Review Questions	19

### Unit-II

2.0	Aims and Objectives	21
2.1	Introduction	22
2.2	Criteria of Essentiality	23
2.3	General Functions of Essential Elements	23
2.4	Nutritional Deficiency Symptoms	23
2.5	Role of Macro Elements and the Deficiency Symptoms	24

2.6	Role of Micronutrients and the Deficiency Symptoms	28
2.7	Sand Culture, Solution Culture and Hydroponics	32
2.8	Absorption of Mineral Ions	34
2.9	Importance of Nitrogen	39
2.10	Sources of Nitrogen	39
2.11	Nitrate Reduction	40
2.12	Biological Nitrogen Fixation	41
2.13	Asymbiotic Biological Nitrogen Fixation	41
2.14	Symbiotic Biological Nitrogen Fixation	42
2.15	Sites of N <sub>2</sub> Fixation	43
2.16	Physiology Root Nodule Formation in Leguminous Plants	43
2.16	Mechanism of N <sub>2</sub> Fixation (Asymbiotic)	44
2.17	Nitrogen Cycle	45
2.18	Synthesis of Amino Acids	46
2.19	Protein Synthesis	48
2.20	Structure of Enzymes	56
2.21	Properties of Enzymes	56
2.22	Nomenclature and Classification of Enzymes	58
2.23	Mechanism of Enzyme Action	60
2.24	Enzyme Kinetics	61
2.25	Regulation of Enzyme Activity	64
2.26	Substrate Concentration	64
2.27	Summary	66
2.28	Review Questions	67

### Unit-III

3.1 Objectives	71
3.2 Introduction	71
3.3 Historical Background	72
3.4 Ultra Structure of Chloroplast	73
3.5 Absorption Spectrum and Action Spectrum	76
3.6 Red Drop and Emerson Enhancement Effect	77
3.7 Concept of Pigment Systems	77
3.8 Mechanism of Photosynthetic Electron Transport, Electron carries in Electron Transport	78
3.9 Dark Reaction and its Importance	86
3.10 Tracer Techniques	86
3.11 Calvin Cycle ( $C_3$ cycle) Mechanism & Regulation	86
3.12 $C_4$ Cycle	92
3.13 The CAM Pathway (Crassulacean Acid Metabolism)	96
3.14 Photo Respiration (or) Glycolate Metabolism (or) $C_2$ Cycle	97
3.15 Concepts of Limiting Factors	100
3.16 Factors affecting rate of Photosynthesis	101
3.17 Direction of Translocation	103
3.18 Evidences in Support of Phloem	103
3.19 Structure of Phloem	104
3.20 Mechanism of Translocation	105
3.21 Factors Affecting Translocation	108
3.22 Summary	109
3.23 Review Questions	110

#### **Unit-IV**

4.1	Objectives	<b>113</b>
4.2	Introduction	<b>113</b>
4.3	Types of Respiration	<b>114</b>
4.4	Obic Respiration	<b>126</b>
4.5	Pentose Phosphate Pathway	<b>128</b>
4.6	Respiratory Quotient (RQ)	<b>131</b>
4.7	Summary	<b>132</b>
4.8	Review Questions	<b>133</b>

#### **Unit-V**

5.1	Objectives	<b>135</b>
5.2	Introduction	<b>136</b>
5.3	Kinetics of growth	<b>136</b>
5.4	Phases of growth	<b>137</b>
5.5	Factors influencing the growth	<b>138</b>
5.6	Phytohormones	<b>140</b>
5.7	Physiology of Flowering	<b>160</b>
5.8	Summary	<b>167</b>
5.9	Review Questions	<b>167</b>



# ***IN-ORGANIC, PHYSICAL, ORGANIC CHEMISTRY***

## **II- B.Sc(Chemistry)/ III - Semester**

*As per Choice Based Credit System (CBCS)*



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**Year : 2024**

**Edition : First**

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# CONTENTS

## Unit - I

<b>I. Coordination Chemistry</b>	
1.0 Aims and Objectives	1.1
1.1 Introduction	1.1
1.2 IUPAC Nomenclature	1.4
1.3 Bonding Theories, Review of Werner's Theory	1.6
1.3.1 Sidgwick's Concept of Coordination	1.7
1.4 Valence Bond Theory	1.8
1.5 Geometries of Coordination Numbers	1.8
1.6 Crystal Field Theory	1.10
1.7 Splitting of d- orbitals	1.11
1.8 Low and High Spin Complexes	1.12
1.9 Factors Effecting Crystal-field Splitting Energy	1.12
1.10 Merits and Demerits of Crystal-field Theory	1.13
1.11 Structural Isomerism and Stereo Isomerism	1.13
1.12 Stereochemistry of Complexes	1.18
1.13 Summary	1.20
1.14 Exercise	1.21
<b>II. Spectral and Magnetic properties of Metal Complexes</b>	
2.0 Aims and Objectives	2.23
2.1 Introduction	2.23
2.2 Electronic Absorption Spectrum of $[\text{Ti}(\text{H}_2\text{O})_6]^{+3}$ ion	2.24
2.3 Types of Electromagnetic Behavior	2.26
2.3.1 Spin only Formula	2.26
2.4 Calculation of Magnetic Moments	2.26
2.5 Magnetic Susceptibility	2.28
2.6 Gouy Method	2.28
2.7 Summary	2.30
2.8 Exercise	2.30
<b>III. Reactivity of Metal Complexes</b>	
3.0 Aims and Objectives	3.31
3.1 Introduction	3.31
3.2 Labile and Inert Complexes	3.32
3.3 Ligand Substitution Reactions- $\text{S}_{\text{N}}1$ and $\text{S}_{\text{N}}2$	3.33
3.4 Substitution Reaction of Square Planar Complexes	3.35
3.5 Trans Effect	3.35
3.6 Summary	3.37
3.7 Exercise	3.37
<b>IV. Stability of Metal Complexes</b>	
4.0 Aims and Objectives	4.39
4.1 Introduction	4.39

4.2	Thermodynamic and Kinetic Stabilities	4.40
4.3	Factors Affecting the Stability of Metal Complexes	4.41
4.4	Chelate Effect	4.42
4.5	Composition of Complex by Job's Method	4.42
4.6	Composition of Complex by Mole Ratio Method	4.44
4.7	Stability of Metal Complexes	4.44
4.8	Summary	4.45
4.9	Exercise	4.45
<b>V .Hard and soft acids bases (HSAB)</b>		
5.0	Aims and Objectives	5.47
5.1	Introduction	5.47
5.2	Concept of Hardness and Softness	5.48
5.3	Pearson's concept and HSAB principle	5.48
5.4	Applications of HSAB Principle	5.49
5.5	Stability of Compounds/Complexes	5.49
5.6	Predicting the Feasibility of a Reaction	5.50
5.7	Summary	5.50
5.8	Exercise	5.50
<b>VI. Bioinorganic Chemistry</b>		
6.0	Aims and Objectives	6.51
6.1	Introduction	6.51
6.2	Essential and Trace Elements	6.51
6.3	Biological Significance	6.53
6.4	Metalloporphyrins	6.58
6.5	Hemoglobin Structure and Function	6.60
6.6	Chlorophyll, Structure and Role in Photosynthesis	6.62
6.7	Summary	6.65
6.8	Exercise	6.66

<b>Unit - II</b>
------------------

### **I. Nitrogen Compounds**

7.0	Aims and Objectives	7.69
7.1	Introduction	7.70
7.2	Nitrohydrocarbons	7.70
7.3	Tautomerism of Nitroalkanes	7.70
7.4	Preparation of Nitroalkanes	7.71
	7.4.1 Reactivity and Hologenation, Reaction with HONO( nitrous acid)	7.72
7.5	Nef and Mannich Reactions	7.74
7.6	Amines	7.76
7.7	Ammonolysis of Alkyl Halides	7.78
	7.7.1 Gabriel Synthesis	7.78
	7.7.2 Hoffman's Bromamide Reaction	7.79
	7.7.3 Reduction of Amides(Schmidt Reaction)	7.79
7.8	Physical Properties and Basic Characteristic	7.80
	7.8.1 Comparative Basic Strength of Ammonia	7.80

7.8.2 Comparative Basic Strength of Aniline	7.81
7.9 Steric Effect and Substituent Effects	7.81
7.10 Chemical Properties	7.82
7.11 Electrophilic Substitution Reaction of Aromatic Amines	7.83
7.12 Oxidation of Aryl and 3 <sup>o</sup> amines Diazotization	7.86
7.13 Cyanides and Isocyanides	7.87
7.14 Preparation of Isocyanides	7.88
7.15 Properties of Cyanides and Isocyanides	7.89
7.16 Summary	7.90
7.17 Exercise	7.90
<b>II. Heterocyclic Compounds</b>	
8.0 Aims and Objectives	8.95
8.1 Introduction	8.95
8.2 Classification of heterocyclic compounds	8.96
8.3 Hemoglobin and chlrophyll	8.97
8.4 Numbering the Ring Systems	8.98
8.5 Aromatic Character-6-electron System	8.99
8.6 Tendency to Undergo Substitution Reactions	8.100
8.7 Resonance Structures	8.101
8.8 Explanation of Feebly Acidic Character of Pyrrole	8.101
8.9 Electrophilic Substitution	8.103
8.10 Reactivity of Furan as 1,3-diene, Diels Alder reactions	8.103
8.11 Preparation of Furan Thiophene and pyrrole	8.104
8.12 Paul-knorr Synthesis	8.105
8.13 Structure of pyridine, basicity, aromaticity comparision	8.105
8.14 Nucleophilic Substitution Reaction	8.106
8.15 Summary	8.107
8.15 Exercise	8.108
<b>III. Carbohydrates</b>	
9.0 Aims and Objectives	9.111
9.1 Introduction	9.111
9.2 Nomenclature and classification	9.112
9.3 Chemical Properties and Structural Elucidation	9.113
9.4 Optically Active Isomers	9.115
9.5 Configuration of Glucose	9.116
9.6 Evidence for cyclic structure of glucose	9.117
9.7 Decomposition of Cyclic Structure	9.118
9.8 Proof for the Ring Size	9.119
9.9 Osazone Formation from Glucose and Fructose	9.119
9.10 Hydrogen Bonding in Osazones	9.120
9.11 Interconversion of Monosaccharides	9.122
9.12 Epimerisation	9.123
9.13 Lobry de van Ekenstein Rerrangement	9.124
9.14 Aldohexose to aldopentose	9.125
9.15 Aldohexose to ketohexose	9.125

9.16	Ketohexose to aldohexose	9.126
9.17	Summary	9.126
9.18	Exercise	9.127
<b>IV Amino Acids and Proteins</b>		
10.0	Aims and Objectives	10.131
10.1	Introduction	10.131
10.2	Amino Acids	10.132
10.3	Natural and Essential Amino Acids	10.133
10.4	Synthesis of Amino Acids	10.133
10.5	Different Methods of Synthesis	10.134
10.6	Physical properties of Amino Acids	10.136
10.7	Zwitterion Structure	10.137
10.8	Chemical Properties of Amino Acids	10.139
10.9	Lactams from Gamma and Delta amino acids	10.140
10.10	Peptides and Proteins	10.140
10.11	Summary	10.142
10.12	Exercise	10.142
<b>V Mass Spectrometry</b>		
11.0	Aims and Objectives	11.145
11.1	Introduction	11.145
11.2	Basic Principles	11.146
11.2.1	Molecular ion/Parent ion	11.146
11.2.2	Fragment ions /daughter ion	11.146
11.3	Formation of Parent Ions	11.147
11.4	Representation of Mass Spectrum	11.148
11.5	Identification of parent ion	11.149
11.6	Determination of Molecular Formula	11.149
11.7	Mass Spectrum	11.150
11.8	Summary	11.152
11.9	Exercise	11.152

<b>Unit - III</b>
-------------------

**(physical chemistry-III)**

<b>I. Chemical Kinetics</b>		
12.0	Aims and Objectives	12.153
12.1	Introduction	12.153
12.2	Rate of reaction	12.154
12.2.1	Factors Effecting the rate of reaction	12.155
12.3	Experimental Methods	12.156
12.4	Order of Molecularity	12.157
12.5	Order of reaction	12.159
12.6	Methods to Determine the Order of Reactions	12.163
12.7	Kinetics of complex reactions	12.165

12.8	Effect of Temperature on Rate of Reaction	12.171
12.9	Arrhenius Equation	12.172
12.10	Theories of reaction rates	12.174
12.11	The Transition State Theory	12.178
12.12	Summary	12.179
12.13	Exercise	12.179
<b>II PhotoChemistry</b>		
13.0	Aims and Objectives	13.183
13.1	Introduction	13.183
13.2	Thermochemical Reactions	13.184
13.3	Laws of Photochemistry	13.184
13.4	Quantum Yield and Ferrioxalate Atoinometry	13.186
13.5	Photochemical Reactions	13.187
13.6	Jablonski Diagram	13.189
13.7	Qualitative description of different process	13.190
13.8	Photosensitization	13.190
13.9	Summary	13.191
13.10	Exercise	13.192
<b>III Thermodynamics</b>		
14.0	Aims and Objectives	14.195
14.1	Introduction	14.195
14.2	The First Law of Thermodynamic	14.196
14.3	Internal Energy and Enthalpy	14.198
14.4	Joule's Law and Joule-thomson Coefficient	14.199
14.5	Calculation of w, q, dU and dH for the perfect gas	14.201
14.5.1	State function and Kirchoff's equations	14.202
14.6	Second Law of Thermodynamics	14.204
14.7	Carnot Cycle and its Efficiency	14.205
14.8	Thermodynamic Scale of Temperature	14.208
14.9	Concept of Entropy	14.209
14.9.1	Entropy changes in different phases	14.211
14.9.2	Calculation of entropy changes	14.212
14.9.3	Entropy of mixing inert perfect gases	14.214
14.10	Gibbs-Hlmholtz Equations	14.215
14.11	Gibbs equation and Maxwell realtions	14.224
14.12	Summary	14.226
14.13	Exercise	14.227

## **Unit – I (Inorganic Chemistry-III)**

### **1. Coordination Chemistry**

IUPAC nomenclature, bonding theories – review of Werner's theory and Sidgwick's concept of coordination, Valence bond theory, geometries of coordination numbers 4-tetrahedral and square planar and 6-octahedral and its limitations, crystal field theory, splitting of d-orbitals in octahedral, tetrahedral and square-planar complexes – low spin and high spin complexes – factors affecting crystal-field splitting energy, merits and demerits of crystal-field theory. Isomerism in coordination compounds – structural isomerism and stereo isomerism, stereochemistry of complexes with 4 and 6 coordination numbers.

### **2. Spectral and Magnetic properties of Metal Complexes**

Electronic absorption spectrum of  $[\text{Ti}(\text{H}_2\text{O})_6]^{3+}$  ion. Types of magnetic behavior, spin-only formula, calculation of magnetic moments, experimental determination of magnetic susceptibility Gouy method.

### **3. Reactivity of Metal Complexes**

Labile and inert complexes, ligand substitution reactions  $\text{S}_{\text{N}}1$  and  $\text{S}_{\text{N}}2$ , substitution reactions of square planar complexes Trans effect and applications of trans effect.

### **4. Stability of Metal Complexes**

Thermodynamic stability and kinetic stability, factors affecting the stability of metal complexes, chelate effect, determination of composition of complex by Job's method and mole ratio method.

### **5. Hard and soft acids bases (HSAB)**

Classification, Pearson's concept of hardness and softness, application of HSAB principles Stability of compounds / complexes, predicting the feasibility of a reaction.

### **6. Bioinorganic Chemistry**

Essential elements, biological significance of Na, K, Mg, Ca, Fe, Co, Ni, Cu, Zn and chloride (Cl). Metalloporphyrins hemoglobin, structure and function, Chlorophyll, structure and role in photosynthesis.

## **UNIT – II (Organic Chemistry – III)**

### **1. Nitrogen Compounds**

**Nitro hydrocarbons:** Nomenclature and classification nitro hydrocarbons structure. Tautomerism of nitroalkanes leading to aci and keto form. Preparation of Nitroalkanes. Reactivity halogenation, reaction with HONO (Nitrous acid), Nef reaction and Mannich reaction leading to Michael addition and reduction.

**Amines (Aliphatic and Aromatic):** Nomenclature, Classification into 1<sup>o</sup>, 2<sup>o</sup>, 3<sup>o</sup> Amines and Quarternary ammonium compounds. Preparative methods -1. Ammonolysis of alkyl halides 2. Gabriel synthesis 3. Hoffman's bromamide reaction (mechanism).

**Reduction of Amides and Schmidt reaction.** Physical properties and basic character – Comparative basic strength of Ammonia, methyl amine, dimethyl amine, trimethyl amine and aniline – comparative basic strength of aniline, N-methylaniline and N,N-



dimethyl aniline (in aqueous and non-aqueous medium), steric effects and substituent effects. Use of amine salts as phase transfer catalysts. Chemical properties: a) Alkylation b) Acylation c) Carbylamine reaction d) Hinsberg separation e) Reaction with Nitrous acid of 1<sup>o</sup>, 2<sup>o</sup>, 3<sup>o</sup> (Aliphatic and aromatic amines). Electrophilic substitutions of Aromatic amines – Bromination and Nitration. oxidation of aryl and 3<sup>o</sup> Amines. Diazotization

**Cyanides and isocyanides:** Nomenclature (aliphatic and aromatic) structure. Preparation of cyanides from a) Alkyl halides b) from amides c) from aldoximes. Preparation of isocyanides from Alkyl halides and Amines. Properties of cyanides and isocyanides, a) hydrolysis b) addition of Grignard reagent iii) reduction iv) oxidation.

## 2. Heterocyclic Compounds

**Introduction and definition:** Simple 5 membered ring compounds with one hetero atom Ex. Furan. Thiophene and pyrrole. Importance of ring system presence in important natural products like hemoglobin and chlorophyll. Numbering the ring systems as per Greek letter and Numbers. Aromatic character 6- electron system (four-electrons from two double bonds and a pair of non-bonded electrons from the hetero atom). Tendency to undergo substitution reactions.

**Resonance structures:** Indicating electron surplus carbons and electron deficient hetero atom. Explanation of feebly acidic character of pyrrole, electrophilic substitution at 2 or 5 position, Halogenation, Nitration and Sulphonation under mild conditions. Reactivity of furan as 1,3-diene, Diels Alder reactions (one example). Sulphonation of thiophene purification of Benzene obtained from coal tar). Preparation of furan, Pyrrole and thiophene from 1,4,- dicarbonyl compounds only, Paul-Knorr synthesis, structure of pyridine, Basicity Aromaticity Comparison with pyrrole one method of preparation and properties Reactivity towards Nucleophilic substitution reaction chichibabin reaction.

## 3. Carbohydrates

**Monosaccharides:** All discussion to be confined to (+) glucose as an example of aldo hexoses and (-) fructose as example of ketohexoses. Chemical properties and structural elucidation: Evidences for straight chain pentahydroxy aldehyde structure (Acetylation, reduction to n-hexane, cyanohydrin formation, reduction of Tollen's and Fehling's reagents and oxidation to gluconic and saccharic acid). Number of optically active isomers possible for the structure, configuration of glucose based on D-glyceraldehyde as primary standard (no proof for configuration is required). Evidence for cyclic structure of glucose (some negative aldehydes tests and mutarotation). Cyclic structure of glucose. Decomposition of cyclic structure (Pyranose structure, anomeric Carbon and anomers). Proof for the ring size (methylation, hydrolysis and oxidation reactions). Different ways of writing pyranose structure (Haworth formula and chair conformational formula). Structure of fructose: Evidence of 2 – ketohexose structure (formation of penta acetate, formation of cyanohydrin its hydrolysis and reduction by HI to give 2-Carboxy-n-hexane). Same osazone formation from glucose and fructose, Hydrogen bonding in osazones, cyclic structure for fructose (Furanose structure and Haworth formula).

**Interconversion of Monosaccharides:** Aldopentose to aldo hexose eg: Arabinose to D-Glucose, D-Mannose (Kiliani Fischer method). Epimers, Epimerisation Lobry de bruyn van Ekenstein rearrangement. Aldohexose to Aldopentose eg: D-glucose to D-arabinose by Ruff's degradation. Aldohexose (+) (glucose) to ketohexose (-) (Fructose) and Ketohexose (fructose) to aldohexose (Glucose)

## 4. Amino Acids and Proteins

**Introduction:** Definition of Amino acids, classification of Amino acids into alpha, beta,

and gamma amino acids. Natural and essential amino acids – definition and examples, classification of alpha amino acids into acidic, basic and neutral amino acids with examples. Methods of synthesis: General methods of synthesis of alpha amino acids (specific examples Glycine, Alanine, valine and leucine) by following methods: a) from halogenated carboxylic acid b) Malonic ester synthesis c) strecker's synthesis.

**Physical properties:** Optical activity of naturally occurring amino acids: L-configuration, irrespective of sign rotation, Zwitterion structure – salt like character - solubility, melting points, amphoteric character, definition of isoelectric point.

**Chemical properties:** General reactions due to amino and carboxyl groups – lactams from gamma and delta amino acids by heating peptide bond (amide linkage). Structure and nomenclature of peptides and proteins.

## 5. Mass Spectrometry

Basic principles Molecular ion / parent ion, fragment ions / daughter ions. Theory formation of parent ions. Representation of mass spectrum. Identification of parent ion, (M+1), (M+2), base peaks (relative abundance 100%) Determination of molecular formula – Mass spectra of ethylbenzene, acetophenone, n-butyl amine and 1-propanol.

## Unit-III (physical chemistry-III)

### 1. Chemical Kinetics

Rate of reaction, factors influencing the rate of a reaction-concentration, temperature, pressure, solvent, light, catalyst. Experimental methods to determine the rate of reaction. Definition of order and molecularity. Derivation of rate constants for first, second, third and zero order reactions and examples. Derivation for time half change. Methods to determine the order of reactions. Kinetics of complex reactions (first order only): opposing reactions, parallel reactions, consecutive reactions and chain reactions. Effect of temperature on rate of reaction, Arrhenius equation, concept of activation energy. Theories of reaction rates- collision theory-derivation of rate constant for bimolecular reaction. The transition state theory (elementary treatment).

### 2. Photochemistry

Difference between thermal and photochemical processes. Laws of photochemistry-Grothus-Draper's law and Stark-Einstein's law of photochemical equivalence. Quantum yield. Ferrioxalate actinometry. Photochemical hydrogen-chlorine, hydrogen-bromine reaction. Jablonski diagram depicting various processes occurring in the excited state, qualitative description of fluorescence, phosphorescence, non-radiative processes (internal conversion, intersystem crossing). Photosensitized reactions- energy transfer processes (simple example)

### 3. Thermodynamics

The first law of thermodynamics-statement, definition of internal energy and enthalpy. Heat capacities and their relationship. Joule's law-Joule-Thomson coefficient. Calculation of w, q, dU and dH for the expansion of perfect gas under isothermal and adiabatic conditions for reversible processes. State function.

Temperature dependence of enthalpy of formation-Kirchoff's equation. Second law of thermodynamics. Different Statements of the law. Carnot cycle and its efficiency. Carnot theorem. Thermodynamic scale of temperature. Concept of entropy, entropy as a state function, entropy changes in cyclic, reversible, and irreversible processes and reversible phase change. Calculation of entropy changes with changes in V & T and P&T. Entropy of mixing inert perfect gases. Entropy changes in spontaneous and equilibrium processes.

The Gibbs (G) and Hlmholtz (A) energies. A & G as criteria for thermodynamic equilibrium and spontaneity-advantage over entropy change. Gibbs equations and the Maxwell relations. Variation of G with P, V and T.

# **ANIMAL PHYSIOLOGY, GENETICS & EVOLUTION**

**II - B.Sc(Zoology) / III - Semester**

*As per Choice Based Credit System (CBCS)*



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**Year : 2024**

**Edtion : First**

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# **CONTENTS**

## **UNIT-I**

	<b>Page No.</b>
1.0 Introduction to Physiology Digestion	3
1.1 Definition	3
1.1.1 Types of Digestion	4
1.2 Digestion of Carbohydrates	5
1.2.1 Absorption of Carbohydrates	7
1.3 Digestion of Proteins	8
1.3.1 Digestion of Proteins in Stomach	8
1.3.2 Digestion of Proteins in Small Intestine	9
1.3.3 Absorption of Amino Acids	10
1.3.4 Absorption of Peptides	10
1.4 Lipid digestion	10
1.4.1 Absorption of Fats	11
1.5 Cellulose Digestion in Humans	13
1.5.1 Cellulose Fermentation in Termites	13
1.5.2 Cellulose Digestion in Mammals	13
1.5.3 Cellulose Digestion in Ruminants	14
1.5.4 Cellulose Digestion in Non-ruminants	15
1.5.5 Pseudo Ruminants	16
1.6 Gastrointestinal Hormones	17
1.6.1 Types of Gastrointestinal Harmones	17
1.7 Physiology of Respiration	21
1.8 Types of Respiration	22
1.9 Structure of Mammalian Lungs	24
1.10 Mechanism of Breathing	25
1.11 Gaseous Exchange	26
1.11.1 Transport of Oxygen	26
1.11.2 Transport of CO <sub>2</sub>	37

1.11.3 Chloride Shift or Hamburger's Phenomenon	38
1.11.4 Bohr Effect	39
1.12 Cellular Respiration	40
1.12.1 Glycolysis	41
1.12.2 Citric Acid Cycle	43
1.13 Electron Transport Chain	49
1.13.1 Chemiosmotic Theory	55
1.14 Physiology of Circulation	57
1.15 Types of Circulatory System	57
1.15.1 Open Type	57
1.15.2 Closed Type	58
1.16 Functions of the Circulatory System	59
1.17 Structure of Heart	59
1.18 Course of Blood Circulation	63
1.19 Functioning of Heart	63
1.19.1 Heartbeat	63
1.19.2 Cardiac Cycle	65
1.20 Types of Hearts	67
1.20.1 Myogenic Heart	67
1.20.2 Neurogenic Heart	67
1.21 Regulation of Heart Rate	68
1.22 Tachycardia	70
1.23 Bradycardia	73
1.24 Physiology of Excretion	74
1.24.1 Definition	74
1.25 Forms of Nitrogen Wastes	74
1.25.1 Formation of Nitrogen Wastes	75
1.25.2 Classification of Animals on the basis of Excretory Products	77
1.26 Organization of Mammalian Excretory System and Structure of Kidney	79
1.26.1 Mammalian Excretory System	79
1.26.2 Structure of Kidney	81

1.27	The Structure and Function of a Kidney Nephron	83
1.27.1	Structure of a Nephron	83
1.27.2	Function of a Nephron and Urine Formation	85
1.27.3	Counter Current Mechanism	87
1.28	Summary	89
1.29	Review Questions	90

## UNIT-II

2.0	Introduction to Physiology of Muscle Contraction	92
2.1	General Structure of Muscle and its Types	93
2.1.1	General Structure of Muscle	93
2.1.2	Types of Muscles	95
2.2	Ultra structure of Skeletal Muscle	98
2.3	Sliding Filament Mechanism of Muscle Contraction	100
2.3.1	Mechanism of Muscle Movement	101
2.3.2	The Energy for the Muscular Contraction	102
2.4	Biochemical Changes During Muscle Contraction	103
2.4.1	ATP Utilization and its Replenishment	103
2.4.2	Role of $Ca^{+2}$ in Muscle Contraction	104
2.5	Physiology of Nerve Impulse	105
2.6	Structure of Nerve Cell	105
2.7	Classification of Neurons	107
2.7.1	Functions of Nerve Tissue	108
2.8	Nature and properties of Nerve Impulse	109
2.8.1	Nature of Nerve Impulse	109
2.8.1.1	Resting Potential	109
2.8.1.2	Action Potential	113
2.8.2	Properties of Nerve Impulse	115
2.8.2.1	Threshold Value	115
2.8.2.2	Refractory Period	116
2.8.2.3	All or none Response	117
2.9	Conduction of the Nerve Impulse in an Axon	117

2.9.1	Local Circuit Theory	117
2.9.2	Saltatory Conduction Theory	118
2.10	Structure of Synapse and Mechanism of Synaptic Transmission	120
2.10.1	Structure of Synapse	120
2.10.2	Mechanism of Synaptic Transmission	121
2.10.2.1	Electrical Transmission Theory	121
2.10.2.2	Chemical Transmission Theory	123
2.11	Physiology of Endocrine System	127
2.12	Relation between Hypothalamus and Pituitary Gland	129
2.13	Hypothalamus	130
2.13.1	Hormones of Hypothalamus	130
2.14	Pituitary Gland	131
2.14.1	Hormones of Adenohypophysis (Anterior Pituitary Gland)	130
2.14.2	Hormones of Neurohypophysis (Posterior Pituitary Gland)	136
2.15	Hormones of Pineal Glands, Thyroid Gland, Parathyroid, Thymus, Adrenal and Pancreas	138
2.15.1	Pineal Gland	138
2.15.2	Thyroid Gland	139
2.15.3	Parathyroid Gland	144
2.15.4	Thymus	145
2.15.5	Adrenal Gland and its Hormones	146
2.15.6	Pancreas	152
2.16	Endocrine Control of Mammalian Reproduction:	156
2.16.1	Male & Female Hormones	156
2.16.2	Harmonal Control of Menstrual Cycle	161
2.17	Homeostasis	165
2.17.1	Concept of Homeostasis and its basic working mechanism	165
2.18	Mechanism of Homeostasis	168
2.18.1	Mechanisms of Blood Sugar Regulation	168
2.18.2	Water and Ionic Regulation by Fresh Water and Marine Animals	171
2.18.3	Temperature Regulation in Man	174



2.19	Summary	178
2.20	Review Questions	179

### UNIT-III

3.0	Introduction to Genetics	183
3.1	Mendel Law's	183
3.1.1	Law of Dominance and Recessiveness	184
3.1.2	Law of Segregation	184
3.1.3	Law of Independent Assortment	185
3.1.4	Gene Interaction	187
3.1.4.1	Allelic or Intra-genic Interaction	188
3.1.4.1.1	Incomplete Dominance	188
3.1.4.1.2	Codominance	188
3.1.4.2	Non-allelic or Inter-genic Gene Interactions	189
3.1.4.2.1	Complementary Interaction	189
3.1.4.2.2	Epistasis G70	189
3.2	Identification of DNA as a Genetic Material	192
3.2.1	Griffith Experiment	192
3.2.2	Hershey-Chase Experiments	193
3.2.2.1	Hypotheses	193
3.2.2.2	Methods and Results	193
3.2.2.3	Experiment and Conclusions	194
3.3	Central Dogma of Molecular Biology	195
3.3.1	DNA Replication	195
3.3.1.1	Hypothesis for DNA Replication	196
3.3.1.2	Semi Discontinuous Replication	196
3.3.1.3	Experimental Proof for Semi-Conservative DNA Replication	197
3.3.2	DNA Replication in Prokaryotes	197
3.3.2.1	Enzymes and Proteins Involved in DNA Replication	198
3.3.2.1.1	Polymerases	198
3.3.2.2	Mechanism of DNA Replication in Prokaryotes	199
3.3.3	DNA Replication in Eukaryotes	201

3.3.3.1 Post-Transcriptional Modifications	202
3.3.4 Replication Fork	203
3.3.4.1 Leading Strand	204
3.3.4.2 Lagging Strand	204
3.3.5 Transcription	205
3.3.5.1 DNA Template and Transcriptional Unit	205
3.3.5.1.1 Template	205
3.3.5.1.2 Transcriptional Unit	205
3.3.5.2 Substrates for Transcription	206
3.3.5.3 Transcription Apparatus	206
3.3.5.3.1 Bacterial RNA Polymerase	206
3.3.5.3.2 Protein Factors	207
3.3.5.4 Mechanism of Bacterial Transcription	207
3.3.5.5 Eukaryotic Transcription	209
3.3.5.5.1 Enzymes	210
3.3.5.5.1.1 RNA Polymerase I	210
3.3.5.5.1.2 RNA Polymerase II	211
3.3.5.5.1.3 RNA Polymerase III	212
3.3.6 Introduction to Translation	213
3.3.6.1 Ribosome Structure	213
3.3.6.2 Structure of tRNA	214
3.3.6.3 Mechanism of Translation	214
3.3.6.4 Post-Translational Processing	218
3.3.7 Genetic Code	218
3.3.7.1 Characteristics of Genetic Code	219
3.3.7.2 Wobble Hypothesis	221
3.3.8 Introduction to Gene Regulation	222
3.3.8.1 Operon Concept and Lactose Operon	223
3.3.8.1.1 Components of Operon	223

3.3.8.1.2 Lactose (Lac) Operon	224
3.4 Human Karyotype	226
3.4.1 Detection of Karyotypes	227
3.4.1.1 Classic Karyotype Cytogenetics	227
3.4.2 Normal Human Karyotype	227
3.4.3 Bar Bodies	228
3.4.4 Lyon Hypothesis	229
3.4.4.1 Mechanism	229
3.4.4.2 Selection of One Active X Chromosome	230
3.4.5 Amniocentesis	230
3.4.6 Chromosomal Disorder	230
3.4.6.1 Autosomal Abnormalities	230
3.4.6.2 Allosomal Abnormalities	235
3.5 Organic Evolution	238
3.6 Genetic Basis of Evolution	238
3.6.1 Gene Pool	238
3.6.2 Genetic Variation	239
3.6.3 Gene Frequency	240
3.6.4 Hardy-Weinberg's Law	241
3.6.5 Natural Selection	242
3.6.5.1 Types of Selection	243
3.6.6 Genetic Drift	246
3.6.7 Isolation	248
3.6.8 Migration	251
3.6.9 Mutations	251
3.7 Speciation	254
3.7.1 Allopatry	256
3.7.2 Sympatry	258
3.8 Summary	259
3.9 Review Questions	260

# ANIMAL PHYSIOLOGY, GENETICS & EVOLUTION

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## UNIT I

### 1.0. Physiology of Digestion

- 1.1 Definition of digestion and types of digestion – extra and intracellular.
- 1.2 Digestion of Carbohydrates, proteins, lipids and cellulose digestion.
- 1.3 Absorption and assimilation of digested food materials.
- 1.4 Gastrointestinal hormones- control of digestion.

### 2.0 Physiology of Respiration

- 2.1. Types of respiration – external and internal respiration.
- 2.2. Structure of mammalian lungs and gaseous exchange.
- 2.3. Transport of oxygen – formation of oxyhaemoglobin and affinity of haemoglobin for Oxygen, Oxygen dissociation curves.
- 2.4. Transport of CO<sub>2</sub> – Chloride shift, Bohr effect.
- 2.5. Cellular respiration – Main steps of glycolysis, Krebs's cycle, electron transport, Oxidative phosphorylation and ATP production (Chemosmotic theory).

### 3.0. Physiology of Circulation

- 3.1. Open and closed circulation.
- 3.2. Structure of mammalian heart and its working mechanism- Heartbeat and cardiac cycle. Myogenic and neurogenic hearts.
- 3.3. Regulation of heart rate – Tachycardia and Bradycardia.

### 4.0. Physiology of Excretion

- 4.1. Definition of excretion.
- 4.2. Forms of nitrogenous waste material and their formation; classification of animals on the basis of excretory products.
- 4.3. Gross organization of mammalian excretory system and structure of kidney.
- 4.4. Structure and function of Nephron – Counter current mechanism.

## UNIT II

### 1.0. Physiology of muscle contraction

- 1.1 General structure and types of muscles.
- 1.2. Ultra structure of skeletal muscle.
- 1.3. Sliding filament mechanism of muscle contraction.

- 1.4. Chemical changes during muscle contraction – role of calcium, ATP utilization and its replenishment.

## **2.0. Physiology of nerve impulse**

- 2.1. Structure of nerve cell.
- 2.2. Nature of nerve impulse – resting potential and action potential. Properties of nerve impulse – threshold value, refractory period, all or none response.
- 2.3. Conduction of nerve impulse along an axon – local circuit theory and saltatory conduction theory.
- 2.4. Structure of synapse, mechanism of synaptic transmission – electrical and chemical transmissions.

## **3.0 Physiology of Endocrine System**

- 3.1. Relationship between hypothalamus and pituitary gland.
- 3.2. Hormones of hypothalamus.
- 3.3. Hormones of Adenohypophysis and Neurohypophysis.
- 3.4. Hormones of pineal gland, thyroid gland, parathyroid, thymus, adrenal and pancreas.
- 3.5. Endocrine control of mammalian reproduction – Male and female hormones – Hormonal control of menstrual cycle in humans.

## **4.0. Physiology of Homeostasis**

- 4.1. Concept of Homeostasis and its basic working mechanism.
- 4.2. Mechanism of Homeostasis – giving three illustrations viz., Hormonal control of glucose levels, Water and ionic regulation by freshwater and marine animals and temperature regulation in man.

# **UNIT III**

## **1.0 Genetics**

- 1.1 Mendel's laws – Law of segregation and independent assortment; Genetic interactions Incomplete dominance, codominance and epistasis.
- 1.2. Identification of DNA as the genetic material –Griffith's experiment and Hershey – Chase experiment.
- 1.3. Central dogma of molecular biology – Brief account of DNA replication (Semi-conservative method), Replication fork (Continuous and discontinuous synthesis); Transcription– Brief account of initiation, elongation and termination in eukaryotes; Translation; Genetic code; gene regulation as exemplified by lac operon.

1.4. Human karyotyping, barr bodies and Lyon hypothesis and Amniocentesis  
chromosomal disorders – Autosomal and sex chromosomes.

**2.0. Organic Evolution**

2.1. Genetic basis of Evolution, Gene pool and gene frequencies, Hardy-Weinberg's, Law, Force of destabilization, natural selection, genetic drift, Mutation, Isolation and Migration.

2.2. Speciation – Allopatry and sympatry.

***PHYSIOLOGY BIOTECHNOLOGY,  
SEED TECHNOLOGY AND HORTICULTURE***

**II - B.Sc (Botany)/ IV - Semester**

*As per Choice Based Credit System (CBCS)*



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**Year : 2024**

**Edition : First**

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# **CONTENTS**

## **Page No.**

### **Chapter-1**

1.0 Objectives	2
1.1 Introduction	2
1.2 Physical and Chemical Properties of Water	2
1.3 Diffusion	3
1.4 Imbibition	4
1.5 Osmosis	4
1.6 Osmotic, Potential Water and Potential Pressure Potential	5
1.7 Absorption	6
1.8 Transport of Water	8
1.9 Ascent of Sap	11
1.10 Transpiration	11
1.11 Summary	17
1.12 Review Questions	18

### **Chapter-2**

2.0 Objectives	20
2.1 Introduction	20
2.2 Criteria of Essentiality	21
2.3 General Functions of Essential Elements	21
2.4 Nutritional Deficiency Symptoms	21
2.5 Role of Macro Essential Elements and their Deficiency Symptoms	22
2.6 Role of Micro Nutrients and the Deficiency Symptoms	25
2.7 Sand Culture, Solution Culture and Hydroponics	28
2.8 Absorption of Mineralions	30
2.9 Summary	35
2.10 Review Questions	35

### **Chapter-3**

3.0 Objectives	38
3.1 Introduction	38

3.2	Structure of Enzymes	38
3.3	Properties of Enzymes	39
3.4	Nomenclature and Classification of enzymes	40
3.5	Mechanism of Enzyme Action	42
3.6	Enzyme Kinetics	42
3.7	Regulation of Enzyme Activity	46
3.8	Substrate Concentration	46
3.9	Summary	48
3.10	Review Questions	48

#### Chapter-4

4.0	Objectives	50
4.1	Introduction	50
4.2	Historical Background	50
4.3	Ultra Structure of Chloroplast	51
4.4	Absorption Spectrum and Action Spectrum	53
4.5	Red Drop and Emerson Enhancement Effect	54
4.6	Concept of Pigment Systems	54
4.7	Mechanism of Photosynthetic Electron Transport, Electron carries in Electron Transport	55
4.8	Dark Reaction and its Importance	61
4.9	Tracer Techniques	61
4.10	Calvin Cycle (C <sub>3</sub> cycle) Mechanism & Regulation	61
4.11	C <sub>4</sub> Cycle	65
4.12	The CAM Pathway (Crassulacean Acid Metabolism)	68
4.13	Photorespiration (or) Glycolate Metabolism (or) C <sub>2</sub> Cycle	69
4.14	Concepts of Limiting Factors	72
4.15	Factors affecting rate of Photosynthesis	72
4.16	Summary	74
4.17	Review Questions	75

#### Chapter-5

5.0	Objectives	77
5.1	Introduction	77

5.2	Direction of Translocation	78
5.3	Evidence in Support of Phloem	78
5.4	Structure of Phloem	79
5.5	Mechanism of Translocation	79
5.6	Factors Affecting Translocation	81
5.7	Summary	82
5.8	Review Questions	82

## Chapter-6

6.0	Objectives	83
6.1	Introduction	83
6.2	Types of Respiration	84
6.2.1	Aerobic Respiration	84
6.2.1.1	Glycolysis	85
6.2.1.2	Kreb's Cycle	87
6.2.1.3	Oxidative Phosphorylation / Electron Transport	90
6.3	Anaerobic Respiration	94
6.4	Pentose Phosphate Pathway	95
6.5	Respiratory Quotient (RQ)	97
6.6	Summary	98
6.7	Review Questions	99

## Chapter-7

7.0	Objectives	101
7.1	Introduction	101
7.2	Importance of Nitrogen	102
7.3	Sources of Nitrogen	102
7.4	Nitrate Reduction	102
7.5	Biological Nitrogen Fixation	103
7.5.1	Asymbiotic Biological Nitrogen Fixation	103
7.5.2	Symbiotic Biological Nitrogen Fixation	104
7.5.2.1	Sites of N <sub>2</sub> Fixation	105
7.5.2.2	Physiology Root Nodule Formation in Leguminous Plants	105
7.5.3	Mechanism of N <sub>2</sub> Fixation	106

7.6	Nitrogen Cycle	106
7.7	Synthesis of Amino Acids	108
7.8	Protein Synthesis	109
7.9	Summary	115
7.10	Review Questions	116

### Chapter-8

8.0	Objectives	118
8.1	Introduction	118
8.2	Classification of Lipids	118
8.3	Properties of Fatty Acids and Fats	121
8.4	Synthesis of Fatty Acids	121
8.5	Synthesis of Glycerol	123
8.6	Catabolism of Fatty Acids	123
8.7	Conversion of Fats in to Carbohydrates	126
8.8	Summary	128
8.9	Review Questions	129

### Chapter-9

9.0	Objectives	132
9.1	Introduction	133
9.2	Kinetics of Growth	133
9.3	Phases of Growth	134
9.4	Factors Affecting Growth	135
9.5	Phyto Hormones	136
9.6	Physiology of Flowering	152
9.7	Summary	158
9.8	Questions	159

### Chapter-10

10.0	Objectives	161
10.1	Introduction	161
10.2	Biotic Environmental Stress	162
10.3	Abiotic Stress-Light Stress	162
10.4	Temperature Stress	162

10.5	Salt Stress	163
10.6	Water Stress	163
10.7	Summary	164
10.8	Review Questions	164

## Chapter-11

11.0	Objectives	165
11.1	Introduction	165
11.2	Totipotency	166
11.3	Tissue Culture Techniques	166
11.4	Summary	169
11.5	Review Questions	169

## Chapter-12

12.0	Objectives	172
12.1	Callus Culture	172
12.2	Historical Background	172
12.3	Method	172
12.4	Importance of Callus Culture	173
12.5	Single Cell Culture (SCC)	174
12.6	Isolation	174
12.7	Importance of Single Cell Culture	175
12.8	Protoplast Culture	176
12.9	Organ Culture	179
12.10	Somatic Hybrids and Cybrids	183
12.11	Summary	186
12.12	Review Questions	187

## Chapter-13

13.0	Objectives	189
13.1	Introduction	189
13.2	Crop Improvement	189
13.3	Production of Disease Free Plants	190
13.4	Horticulture	190
13.5	Production of Somaclonal Variants	190

13.6	Shortening the Breeding Cycle	190
13.7	Synthetic Seed Production	190
13.8	Propagation of Rare Plants	191
13.9	Forestry	191
13.10	Micro Propagation	191
13.11	Storage of Germplasm	191
13.12	Genetic Transformation	191
13.13	Secondary Metabolites Production	191
13.14	Summary	192
13.15	Review Question	192

## Chapter-14

14.0	Objectives	193
14.1	Introduction	194
14.2	History	194
14.3	Biotechnology Scope and its Applications	195
14.4	Applications of Biotechnology	195
14.5	Medical Biotechnology	195
14.6	Human Applications	198
14.7	Industrial Biotechnology	198
14.8	Aqua Culture and Marine biotechnology	200
14.9	Mining – Biotechnology	200
14.10	Summary	200
14.11	Review Questions	200

## Chapter-15

15.0	Objectives	201
15.1	Introduction	202
15.2	Isolation of DNA	202
15.3	Isolation of Plasmid	203
15.4	Insertion of Gene into the Plasmid DNA	203
15.5	Introduction of r-DNA into Bacterial Cell	204
15.6	Selection of the Cells Containing the r.DNA	204

15.7 Cloning Vehicles (vectors)	205
15.8 Application of ã DNA Technology	206
15.9 Transgenic Plants	206
15.10 Summary	208
15.11 Review Questions	208

## Chapter-16

16.0 Objectives	209
16.1 Introduction	209
16.2 Seed Structure	209
16.3 Seed Types	210
16.4 Seed Dormancy	211
16.5 Methods of Breaking Dormancy	213
16.6 Summary	214
16.7 Review Questions	215

## Chapter-17

17.0 Objectives	218
17.1 Introduction	218
17.2 Seed Banks	221
17.3 Seed Viability	223
17.4 Genetic Erosion	224
17.5 Seed Testing	226
17.6 Seed Certification	228
17.7 Summary	231
17.8 Review Questions	232

## Chapter-18

18.0 Objectives	236
18.1 Horticulture, Ornamental Plants and Cultivation	236
18.2 Vegetables and Vegetable Gardening	244
18.3 Bonsai	251
18.4 Landscaping	256
18.5 Summary	259
18.6 Review Questions	261

## **Chapter-19**

19.0 Objectives	263
19.1 Introduction	263
19.2 Some Facts about Floriculture	264
19.3 Green House	264
19.4 Micro Irrigation Systems	268
19.5 Floriculture in India	270
19.6 Summary	271
19.7 Review Questions	272

## **Chapter-20**

20.0 Objective	273
20.1 Introduction	273
20.2 Methods of Propagation	273
20.3 Role of Hormones in Horticulture	282
20.4 Summary	282
20.5 Review Question	283



## **Physiology, Biotechnology, Seed Technology and Horticulture**

### **Unit - I: Physiology (Part-A)**

---

1. Water Relations: Importance of water to plant life, physical properties of water, diffusion, imbibition, osmosis; water, osmotic and pressure potentials; absorption, transport of water, ascent of sap; transpiration; Stomatal structure and movements.
2. Mineral Nutrition: Essential macro and micro mineral nutrients and their role; symptoms of mineral deficiency; absorption of mineral ions; passive and active processes.
3. Enzymes: Nomenclature, characteristics, mechanism and regulation of enzyme action, enzyme kinetics, factors regulating enzyme action.
4. Photosynthesis: Photosynthetic pigments, absorption and action spectra; Red drop and Emerson enhancement effect; concept of two photosystems; mechanism of photosynthetic electron transport and evolution of oxygen; photophosphorylation; Carbon assimilation pathways: C<sub>3</sub>, C<sub>4</sub> and CAM; photorespiration.
5. Translocation of organic substances: Mechanism of phloem transport; source-sink relationships.

### **Unit - II: Physiology (Part-B)**

6. Respiration: Aerobic and Anaerobic; Glycolysis, Krebs cycle; electron transport system, mechanism of oxidative phosphorylation, pentose phosphate pathway.
7. Nitrogen Metabolism: Biological nitrogen fixation, nitrate reduction, ammonia assimilation, amino acid synthesis and protein synthesis.
8. Lipid metabolism: Structure and functions of lipids; conversion of lipids to carbohydrates,  $\beta$ -oxidation
9. Growth and Development: Definition, phases and kinetics of growth. Physiological effects of phytohormon- auxins, gibberellins, cytokinins, ABA, ethylene and brassinosteroids; Physiology of flowering and photoperiodism, role of phytochrome in flowering.
10. Stress Physiology: Concept and plant responses to water, salt and temperature stresses.

### **Unit - III: Biotechnology**

11. Tissue culture: Introduction, sterilization procedures, culture media - composition and preparation; explants.
12. Callus culture; cell and protoplast culture, Somatic hybrids and cybrids.
13. Applications of tissue culture: Production of pathogen free plants and somaclonal variants, production of stress resistance plants, secondary metabolites and synthetic seeds.
14. Biotechnology: Introduction, history and scope.
15. rDNA technology: Vectors and gene cloning and transgenic plants.

#### **Unit - IV: Seed Technology and Horticulture**

16. Seed: Structure and types. Seed dormancy; causes and methods of breaking dormancy.
17. Seed storage: Seed banks, factors affecting seed viability, genetic erosion. Seed production technology; seed testing and certification.
18. Horticulture techniques: Introduction, Cultivation of ornamental and vegetable crops, Bonsai and landscaping
19. Floriculture: Introduction. Importance of green house, polyhouse, mist chamber, shade nets; Micro irrigation systems. Floriculture potential and its trade in India
20. Vegetative Propagation of plants: Stem, root and leaf cuttings. Layering and bud grafting. Role of plant growth regulators in horticulture.

# ***CHEMISTRY & INDUSTRY***

*II-B.Sc (Chemistry) / IV- Semester*

*As per Choice Based Credit System (CBCS)*



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**Tirupathi, AP -517 502**

**Year : 2024**

**Edtion : First**

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# **CONTENTS**

	<b>Page.No.</b>
<b>Unit-I</b>	
1.0 Aims and Objectives	1.1
1.1 Introduction	1.1
1.2 Solvent Extraction	1.2
1.2.1 Principles and Process	1.2
1.3 Batch Extraction	1.4
1.4 Continuous Extraction and Counter Current Extraction	1.4
1.5 Application and Determination of Iron (III)	1.9
1.6 Summary	1.10
1.7 Exercise	1.10
<b>Unit-II</b>	
2.0 Aims and Objectives	2.12
2.1 Introduction	2.12
2.2 Chromatography	2.12
2.2.1 Classification of Chromatography Methods	2.13
2.3 Principles of Differential Migration Adsorption Phenomenon	2.14
2.3.1 Adsorption Phenomenon, Nature of Adsorbents	2.15
2.3.2 Solvent Systems	2.16
2.3.3 RF Values	2.16
2.3.3.1 Factors Effecting RF Values	2.16
2.4 Paper Chromatography	2.16
2.4.1 Principles of RF Values	2.16
2.4.2 Experimental Procedures	2.17
2.4.3 Choice of Paper and Solvent Systems	2.17
2.4.4 Developments of Chromatography Ascending, Descending and Radial	2.17
2.4.4.1 Two Dimensional Chromatography	2.18
2.4.5 Applications	2.19
2.5 Thin Layer Chromatography (TLC)	2.20
2.5.1 Advantages	2.20
2.5.2 Principles	2.20
2.5.3 Factors Effecting $R_f$ Values	2.20
2.5.4 Experimental Procedures	2.21
2.5.4.1 Adsorbents and Solvents	2.21
2.5.5 Preparation of Plates	2.21
2.5.6 Development of the Chromatogram	2.22
2.5.7 Detection of the Spots	2.22
2.5.8 Applications	2.22
2.6 Column Chromatography	2.23
2.6.1 Principle	2.23
2.6.2 Experimental Procedures	2.25
2.6.3 Stationary and Mobile Phases	2.25
2.6.4 Separation Technique	2.26
2.6.5 Applications	2.26
2.7 High Performance Liquid Chromatography (HPLC)	2.27
2.7.1 Principles and Applications	2.27
2.8 Gas Liquid Chromatography (GLC)	2.28
2.8.1 Principles and Applications	2.28
2.9 Summary	2.29
2.10 Exercise	2.29

### Unit-III

3.0	Aims and Objectives	3.31
3.1	General Features of Absorption Spectroscopy	3.31
3.1.1	Introduction	3.31
3.2	Beer Lambert's Law and its Limitations	3.34
3.2.1	Introduction	3.34
3.3	Transmittance	3.35
3.4	Absorbance and Molar Absorptivity	3.36
3.5	Single and Double Beam spectrophotometers	3.36
3.6	Application of Beer-Lambert Law for Quantitative Analysis	3.37
3.7	Summary	3.38
3.8	Exercise	3.38

### Unit-IV

4.0	Aims and Objectives	4.39
4.1	Electronic Spectroscopy	4.39
4.1.1	Introduction to Molecular Spectroscopy	4.39
4.1.2	Interaction of Electromagnetic Radiation with Molecules and Types of Molecular Spectra	4.40
4.2	Potential Energy Curves for Bonding and Antibonding Molecular Orbitals	4.47
4.2.1	Introduction	4.47
4.3	Energy Levels of Molecules ( $\sigma, \pi, n$ )	4.51
4.4	Selection Rules for Electronic Spectra	4.51
4.5	Types of Electronic Transitions in Molecules Effect of Conjugation	4.52
4.6	Concept of Chromophore	4.55
4.7	Summary	4.57
4.8	Exercise	4.57

### Unit-V

5.0	Aims and Objectives	5.59
5.1	Energy Levels of Simple Harmonic Oscillator	5.59
5.1.1	Introduction	5.59
5.2	Molecular Vibration Spectrum	5.60
5.2.1	Selection Rules	5.62
5.3	Determination of Force Constant	5.62
5.4	Qualitative Relation of Force Constant to Bond Energies	5.63
5.5	Anharmonic Motion of Real Molecules and Energy Levels	5.63
5.6	Modes of Vibrations in Polyatomic Molecules	5.64
5.7	Characteristic Absorption Bands of Various Functional Groups	5.66
5.8	Finger Print Nature of Infrared Spectrum	5.67
5.9	Summary	5.68
5.10	Exercise	5.68

### Unit-VI

6.0	Aims and Objectives	6.69
6.1	Concept of Polarizability	6.69
6.1.1	Introduction	6.69
6.1.2	Selection Rules	6.73
6.2	Pure Rotational and Pure Vibrational Raman Spectra of Diatomic Molecules	6.73
6.2.1	Selection Rules	6.75
6.3	Summary	6.75
6.4	Exercise	6.76

### Unit-VII

7.0	Aims and Objectives	7.77
7.1	Principles of Nuclear Magnetic Resonance	7.77
7.2	Equivalent and Non-Equivalent Protons	7.85
7.3	Position of Signals and Chemical Shift	7.86
7.4	NMR Splitting of Signals	7.88
7.4.1	Spin-Spin Coupling, Coupling Constants	7.89
7.5	Applications of NMR	7.90
7.6	Summary	7.92
7.7	Exercise	7.92

<b>Unit-VIII</b>		
8.0	Aims and Objectives	8.93
8.1	Spectral Interpretation of Some Compounds	8.93
	8.1.1 Phenylacetylene	8.93
	8.1.2 Acetophenone	8.95
	8.1.3 Cinnamic acid	8.96
	8.1.4 Parinitroaniline	8.97
8.2	Summary	8.98
8.3	Review Questions	8.98
<b>Unit-IX</b>		
9.0	Aims and Objectives	9.99
9.1	Introduction Of Drug and Disease	9.100
	9.1.1 Historical Evolution, Sources-plant, Animal Synthetic	9.101
	9.1.2 Biotechnology and Human Genetherapy	9.106
9.2	Pharmacy	9.110
	9.2.1 Pharmacology	9.112
	9.2.2 Pharmacophore	9.112
	9.2.3 Pharmacodynamics	9.112
	9.2.4 Pharmacokinetics	9.113
	9.2.5 Metabolites and Antimetabolites	9.115
9.3	Nomenclature	9.115
	9.3.1 Classification Based on Structures and Therapeutic	9.121
9.4	Synthesis and TherapeuticActivity	9.123
9.5	Pencillin	9.127
	9.5.1 Separation and Isolation	9.129
9.6	Drug Development of different pencillins	9.131
9.7	Drug Development of HIV-AIDS	9.133
	9.7.1 Prevention of AIDS	9.143
	9.7.2 Drugs Available	9.145
	9.7.3 NNRTIS	9.146
	9.7.4 NNRTIS	9.146
	9.7.5 Monographs of Drugs	9.148
9.8	Summary	9.149
9.9	Exercise	9.149
<b>Unit-X</b>		
10.0	Aims and Objectives	10.151
10.1	Need of Conversion of Drugs into Medicine	10.151
	10.1.1 Additives used in Preparing the Dosage Form	10.151
10.2	Differnt Types of Formulation	10.155
10.3	Summary	10.156
10.4	Exercise	10.156
<b>Unit-XI</b>		
11.0	Aims and Objectives	11.157
11.1	Need of Conversion of Drugs into Medicine	11.157
	11.1.1 Types of Pesticides	11.158
11.2	Rodenticides Plant Growth Regulators	11.159
11.3	Pheromones and Hormones	11.160
11.4	Synthesis of Pesticides	11.161
11.5	Summary	11.166
11.6	Exercise	11.166
<b>Unit-XII</b>		
12.0	Aims and Objectives	12.167
12.1	Introduction	12.167
	12.1.1 Definition of Green Chemistry	12.169
	12.1.2 Need of Green Chemistry	12.170
	12.1.3 Basic Principles of Green Chemistry	12.170
12.2	Green Synthesis	12.171
	12.2.1 Evaluation of the Type of the Reaction	12.171
12.3	Pericyclic Reactions (No By-Product)	12.172
12.4	Selection of Solvents	12.172
	12.4.1 Green Catalysis	12.173
12.5	Microwave and Ultrasound Assisted Green Synthesis	12.176
	12.5.1 Aldol Condensation	12.175
	12.5.2 Connizaro Reaction	12.175

12.5.3 Diels-Alder Reaction	12.175
12.5.4 Strecker Synthesis	12.175
12.5.5 Williamson Synthesis Williamson Synthesis	12.175
12.5.6 Dieckmann Condensation	12.176
12.6 Summary	12.176
12.7 Exercise	12.176

### Unit-XIII

13.0 Aims and Objectives	13.177
13.1 Classification of Polymers	13.177
13.2 Chemistry of Polymerization	13.180
13.3 Chain Polymerization	13.187
13.4 Step Polymerisation	13.189
13.5 Coordination Polymerization-Tacticity	13.190
13.6 Molecular Weight of Polymers	13.190
13.6.1 Number Average and Weight Average Molecular Weight	13.191
13.7 Degree of Polymerization	13.193
13.8 Determination of Molecular Weight of Polymers by Viscometry	13.193
13.9 Osmometry and Light Scattering Methods	13.196
13.10 Kinetic of Free Radical Polymerization	13.199
13.10.1 Derivation of Rate Law	13.199
13.11 Preparation and Industrial Application	13.201
13.11.1 Polyethylene	13.201
13.11.2 PVC and Teflon	13.202
13.11.3 Poly acrylonitrile, Terelene and Nylon 66	13.203
13.12 Introduction to Biodegradability	13.207
13.13 Summary	13.207
13.14 Exercise	13.208

### Unit-XIV

14.0 Aims and Objectives	14.209
14.1 Superconductivity, Characteristics of Superconductors	14.209
14.1.1 Meissner Effect	14.210
14.1.2 Types of Superconductors and Applications	14.211
14.2 Nanomaterials	14.212
14.2.1 Synthetic Techniques	14.212
14.3 Types of methods of Nanotechnology	14.213
14.3.1 Bottom-up-sol-gel Method	14.213
14.3.2 Top-down-Electrodeposition Method	14.214
14.4 Nanomaterials	14.215
14.4.1 Properties and Applications of Nanomaterials	14.220
14.5 Composites-Definition, General Characteristics	14.222
14.6 Particle Reinforce and Fiber Reinforce Composites and their Applications	14.223
14.7 Summary	14.224
14.8 Exercise	14.224

### Unit-XV

15.0 Aims and Objectives	15.225
15.1 Homogeneous and Hetrogeneous Catalysis	15.226
15.2 Kinetics of Specific Acid Catalyzed Reactions	15.231
15.2.1 Inversion of Cane Sugar	15.234
15.3 Kinetic of Specific Base Catalyzed Reactions	15.234
15.3.1 Base Catalyzed Conversion of Acetone to Discetone Alcohol	15.235
15.4 Acid and Base Catalyzed Reactions	15.235
15.4.1 Hydrolysis of Esters, Multarotation of Glucose	15.236
15.5 Cataytic Activity at Surfaces	15.236
15.6 Mechanism of Hetrogenous Catalysis	15.237
15.7 Langmuir-Hinshelwood Mechanism	15.238
15.8 Enzyme catalysis: Classification and Characteristics of Eznzyme catalysis	15.238
15.8.1.1 Significance of Michaelis Constant	15.242
15.9 Factors Affecting Enzyme Catalysis	15.243
15.9.1 Effect of Temperature, PH Concentration & Inhibitor	15.243
15.10 Catalytic Efficiency	15.245
15.11 Mechanism of Oxidation of Ethanol by Alcohol Dehydrogenase	15.246
15.12 Summary	15.248
15.13 Exercise	15.248



### **UNIT-I: SEPARATION TECHNIQUES**

Introduction, Solvent Extraction, Principles and Process, Batch Extraction, Continuous Extraction and Counter Current Extraction, Application and Determination of Iron (III).

### **Unit-II: SPECTROPHOTOMETRY**

Introduction-Chromatography, Classification of Chromatography Methods-Principles of Differential Migration Adsorption Phenomenon, Adsorption Phenomenon, Nature of Adsorbents, Solvent Systems RF Values, Factors Effecting RF Values-Paper Chromatography, Principles of RF Values, Experimental Procedures, Choice of Paper and Solvent Systems, Developments of Chromatography Ascending, Descending and Radial, Two Dimensional Chromatography, Applications-Thin Layer Chromatography (TLC), Advantages, Principles, Factors Effecting Values, Experimental Procedures, Adsorbents and Solvents, Preparation of Plates, Development of the Chromatogram, Detection of the Spots, Applications-Column Chromatography, Principle, Experimental Procedures, Stationary and Mobile Phases, Separation Technique, Applications-High Performance Liquid Chromatography (HPLC) , Principles and Applications-Gas Liquid Chromatography (GLC), Principles and Applications.

### **Unit-III: MOLECULAR SPECTROSCOPY**

General Features of Absorption Spectroscopy-Introduction-Beer Lambert's Law and its Limitations-Introduction- Transmittance-Absorbance and Molar Absorptivity-Single and Double Beam spectrophotometers-Application of Beer-Lambert Law for Quantitative Analysis.

### **Unit-IV: ELECTRONIC SPECTROSCOPY**

Electronic Spectroscopy, Introduction to Molecular Spectroscopy, Interaction of Electromagnetic Radiation with Molecules and Types of Molecular Spectra-Potential Energy Curves for Bonding and Antibonding Molecular Orbitals, Introduction-Energy Levels of Molecules-Selection Rules for Electronic Spectra-Types of Electronic Transitions in Molecules Effect of Conjugation-Concept of Chromophore.

### **Unit-V: INFRA RED SPECTROSCOPY**

Energy Levels of Simple Harmonic Oscillator, Introduction-Molecular Vibration Spectrum, Selection Rules-Determination of Force Constant-Qualitative Relation of Force Constant to Bond Energies-An harmonic Motion of Real Molecules and Energy Levels-Modes of Vibrations in Polyatomic Molecules-Characteristic Absorption Bands of Various Functional Groups-Finger Print Nature of Infrared Spectrum.

### **Unit-VI: RAMAN SPECTROSCOPY**

Concept of Polarizability, Introduction, Selection Rules-Pure Rotational and Pure Vibrational Raman Spectra of Diatomic Molecules, Selection Rules.

### **Unit-VII: PROTON MAGNETIC RESONANCE SPECTROSCOPY**

Principles of Nuclear Magnetic Resonance- Equivalent and Non-Equivalent Protons-Position of Signals and Chemical Shift-NMR Splitting of Signals, Spin-Spin Coupling, Coupling Constants-Applications of NMR.

### **Unit-VIII: SPECTRAL INTERPRETATION**

Spectral Interpretation of Some Compounds, Phenylacetylene, Acetophenone, Cinnamic acid, Paranitroaniline.

### **Unit-IX: DRUGS**

Introduction of Drug and Disease, Historical Evolution, Sources-plant, Animal Synthetic, Biotechnology and Human Genetherapy –Pharmacy, Pharmacology, Pharmacophore, Pharmacodynamics, Pharmacokinetics, Metabolites and Antimetabolites-Nomenclature, Classification Based on Structures and Therapeutic-Synthesis and Therapeutic Activity –Pencillin, Separation and Isolation-Drug Development of different pencillins-Drug Development of HIV-AIDS, Prevention of AIDS, Drugs Available, NNRTIS, NNRTIS, Monographs of Drugs.

### **Unit-X: FORMULATIONS**

Need of Conversion of Drugs into Medicine, Additives used in Preparing the Dosage Form-Different Types of Formulation.

### **Unit-XI: PESTICIDES**

Need of Conversion of Drugs into Medicine, Types of Pesticides-Rodenticides Plant Growth Regulators-Pheromones and Hormones-Synthesis of Pesticides.

### **Unit-XII: GREEN CHEMISTRY**

Introduction, Definition of Green Chemistry , Need of Green Chemistry, Basic Principles of Green Chemistry-Green Synthesis, Evaluation of the Type of the Reaction-Pericyclic Reactions (No By-Product)-Selection of Solvents, Green Catalysis, Microwave and Ultrasound Assisted Green Synthesis, Aldol Condensation, Connizaro Reaction, Diels-Alder Reaction, Strecker Synthesis, Willaimson Synthesis Williamson Synthesis, Dieckmann Condensation.

### **Unit-XIII: MACROMOLECULES**

Classification of Polymers-Chemistry of Polymerization-Chain Polymerization-Step Polymerisation- Coordination Polymerization-Tacticity-Molecular Weight of Polymers, Number Average and Weight Average Molecular Weight-Degree of Polymerization-Determination of Molecular Weight of Polymers by Viscometry -Osmometry and Light Scattering Methods-Kinetic of Free Radical Polymerization, Derivation of Rate Law-Preparation and Industrial Application, Polyethylene, PVC and Teflon, Poly acrylonitrile, Terelene and Nylon 66-Introduction to Biodegradability

### **Unit-XIV: MATERIALS SCIENCE**

Superconductivity, Characteristics of Superconductors, Meissner Effect, Types of Superconductors and Applications-Nanomaterials, Synthetic Techniques-Types of methods of Nanotechnology, Bottom-up-sol-gel Method, Top-down-Electrodeposition Method-Nanomaterials, Properties and Applications of Nanomaterials-Composites-Definition, General Characteristics-Particle Reinforce and Fiber Reinforce Composites and their Applications.

### **Unit-XV: CATALYSIS**

Homogeneous and Hetrogeneous Catalysis-Kinetics of Specific Acid Catalyzed Reactions, Inversion of Cane Sugar-Kinetic of Specific Base Catalyzed Reactions, Base Catalyzed Conversion of Acetone to Discetone Alcohol-Acid and Base Catalyzed Reactions, Hydrolysis of Esters, Multarotation of Gulcose-Cataytic Activity at Surfaces-Mechanism of Hetrogenous Catalysis-Langmuir-Hinshelwood Mechanism-Enzyme catalysis: Classification and Characteristics of Eznzyme catalysis ,Significance of Michaelis Constant-Factors Affecting Enzyme Catalysis, Effect of Temperature, PH Concentration and Inhibitor-Catalytic Efficiency-Mechanism of Oxidation of Ethanol by Alcohol Dehydrogenase.

# ***APPLIED ZOOLOGY***

**II - B.Sc(Zoology) / IV - Semester**

*As per Choice Based Credit System (CBCS)*



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**Year : 2024**

**Edition : First**

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# **CONTENTS**

	<b>Unit-I</b>	<b>Page No.</b>
1.0	Aims and Objectives	<b>1.3</b>
1.1	Introduction	<b>1.3</b>
1.2	Capture Fishes	<b>1.9</b>
1.2.1	Classification of Capture Fishes	<b>1.9</b>
1.3	Types of Fisheries	<b>1.10</b>
1.3.1	Recreational	<b>1.10</b>
1.3.2	Small-Scale	<b>1.11</b>
1.3.3	Industrial/Commercial	<b>1.11</b>
1.3.4	Artisan Fisheries	<b>1.11</b>
1.3.5	Sport Fishing	<b>1.11</b>
1.3.6	Industrial Fisheries	<b>1.12</b>
1.3.7	Commercial Fisheries	<b>1.12</b>
1.3.8	Subsistence Fisheries	<b>1.12</b>
1.3.9	Traditional Fisheries	<b>1.12</b>
1.4	Fin Fishes and Shell Fishes	<b>1.12</b>
1.5	Fishing Crafts and Fishing Gears	<b>1.13</b>
1.5.1	Fishing Craft	<b>1.13</b>
1.5.2	Fishing Gear	<b>1.17</b>
1.5.2.1	Fishing Gear Material	<b>1.17</b>
1.5.2.2	Other Materials used for Gear	<b>1.19</b>
1.5.2.3	Properties of Gear Materials	<b>1.20</b>
1.5.2.4	Preservation of Fishing Gear	<b>1.20</b>
1.5.2.5	Types of Fishing Gear	<b>1.21</b>
1.5.2.5.1	Gill Net	<b>1.21</b>
1.5.2.5.1.1	Structure of Simple Gill Net	<b>1.22</b>
1.5.2.5.1.2	Classification of Gill Nets	<b>1.22</b>
1.5.2.5.2	Trawls	<b>1.23</b>
1.5.2.5.2.1	Structure of a Simple Trawl	<b>1.24</b>
1.5.2.5.3	Line Fishing	<b>1.24</b>
1.5.2.5.4	Purse Seining	<b>1.25</b>
1.5.2.5.4.1	Structure of Purse Seine	<b>1.25</b>
1.5.2.5.5	Other Gear Types	<b>1.26</b>
1.6	Fresh Water, Brackish Water and Mariculture	<b>1.27</b>
1.6.1	Fresh Water	<b>1.27</b>
1.6.2	Brackish Water-Culture	<b>1.30</b>

1.6.3	Mariculture	<b>1.36</b>
1.6.4	Site Selection Criteria	<b>1.47</b>
1.7	Methods of Pearl Formation	<b>1.55</b>
1.8	Aqua Cultural Systems-Introduction	<b>1.57</b>
1.8.1	Ponds	<b>1.57</b>
1.8.2	Indoor Rearing	<b>1.58</b>
1.8.3	Outdoor Rearing	<b>1.58</b>
1.8.4	Coastal Aquaculture	<b>1.59</b>
1.9	Induced Breeding	<b>1.59</b>
1.9.1	Definition	<b>1.59</b>
1.9.2	History of Induced Breeding	<b>1.59</b>
1.9.3	Technique of Induced Breeding	<b>1.59</b>
1.10	Hatchery Design	<b>1.60</b>
1.11	Larval Rearing	<b>1.63</b>
1.12	Shrimp and Prawn Culture	<b>1.63</b>
1.13	Hatchery Systems	<b>1.70</b>
1.13.1	Importance of Hatchery	<b>1.71</b>
1.13.2	National Fish Hatchery System	<b>1.72</b>
1.14	Post Harvesting Technology	<b>1.72</b>
1.14.1	Importance	<b>1.72</b>
1.14.2	Post Harvest Losses	<b>1.73</b>
1.15	Preservation and Processing	<b>1.73</b>
1.15.1	Methods of Preservation	<b>1.73</b>
1.15.2	Freezing	<b>1.74</b>
1.15.3	Drying	<b>1.76</b>
1.15.4	Salting	<b>1.76</b>
1.15.5	Smoking	<b>1.77</b>
1.15.6	Canning	<b>1.79</b>
1.15.6.1	Cans	<b>1.79</b>
1.15.6.2	Methods of Canning	<b>1.79</b>
1.15.7	Demerits of Fish Preservation	<b>1.79</b>
1.6	Let us Sum Up	<b>1.80</b>
1.7	Questions for Discussion	<b>1.80</b>
<b>Unit-II</b>		
2.0	Aims and Objectives	<b>2.82</b>
2.1	Introduction	<b>2.82</b>
2.2	Hematology	<b>2.82</b>

2.3	Blood Composition and Functions	<b>2.83</b>
2.3.1	Blood Group	<b>2.89</b>
2.3.1.1	Blood Group Systems	<b>2.91</b>
2.3.2	Blood Transfusion	<b>2.94</b>
2.3.2.1	Pre-transfusion Procedures	<b>2.94</b>
2.3.2.2	Neonatal Transfusion	<b>2.96</b>
2.3.2.3	Procedures	<b>2.96</b>
2.3.3	Blood Diseases	<b>2.100</b>
2.3.3.1	Anemia	<b>2.101</b>
2.3.3.2	Leukopenia	<b>2.106</b>
2.3.3.3	Leukocytosis	<b>2.107</b>
2.3.3.4	Leukemia	<b>2.108</b>
2.4	Biopsy	<b>2.114</b>
2.4.1	Analysis of Biopsied Material	<b>2.115</b>
2.5	Autopsy	<b>2.115</b>
2.5.1	Types	<b>2.115</b>
2.5.2	Process	<b>2.116</b>
2.6	Immunology	<b>2.118</b>
2.6.1	Types of Immunity	<b>2.119</b>
2.6.2	Adaptive (Specific) Immunity	<b>2.125</b>
2.6.3	Antigens	<b>2.125</b>
2.6.4	Structure of Human Immunoglobulins [IgG]	<b>2.129</b>
2.6.5	Hypersensitivity	<b>2.132</b>
2.6.5.1	Coombs and Gell Classification	<b>2.132</b>
2.6.5.2	Type IV Hypersensitivity	<b>2.138</b>
2.7	Important Human Parasites	<b>2.142</b>
2.7.1	Blood Parasites	<b>2.143</b>
2.7.2	Intestinal Parasites	<b>2.150</b>
2.7.2.1	Entamoeba	<b>2.153</b>
2.7.2.2	Structure	<b>2.153</b>
2.7.2.3	Giardia	<b>2.154</b>
2.7.2.4	Taenia solium	<b>2.155</b>
2.7.2.5	Ancylostoma	<b>2.157</b>
2.7.2.6	Pin Worm	<b>2.158</b>
2.8	Let us Sum Up	<b>2.159</b>
2.9	Questions for Discussion	<b>2.160</b>
<b>Unit-III</b>		
3.0	Aims and Objectives	<b>3.162</b>
3.1	Introduction	<b>3.162</b>

3.2	Biotechnology	<b>3.163</b>
3.2.1	Scope of Animal Biotechnology	<b>3.163</b>
3.2.1.1	Applications of Biotechnology	<b>3.164</b>
3.2.1.1.1	Medicine	<b>3.164</b>
3.2.1.1.2	Pharmacogenomics	<b>3.164</b>
3.2.1.1.3	Genetic Testing	<b>3.164</b>
3.2.1.1.4	Human Genome Project	<b>3.164</b>
3.2.1.1.5	Agriculture	<b>3.165</b>
3.2.1.1.6	Production of Novel Substances in Crop Plants	<b>3.167</b>
3.2.2	Cloning-Cloning Vectors	<b>3.168</b>
3.2.2.1	Common Features of Cloning Vectors	<b>3.171</b>
3.2.2.2	Features of Vectors	<b>3.171</b>
3.2.3	Plasmids	<b>3.172</b>
3.2.3.1	Examples of Plasmids	<b>3.174</b>
3.3	Gene Clonning	<b>3.178</b>
3.3.1	Introduction	<b>3.178</b>
3.3.1.1	History of Molecular Cloning	<b>3.179</b>
3.3.1.2	Steps in Molecular Cloning	<b>3.181</b>
3.3.1.3	Applications of Molecular Cloning	<b>3.184</b>
3.3.2	Enzymatic Cleavage of DNA	<b>3.184</b>
3.3.3	Restriction Enzymes	<b>3.185</b>
3.3.3.1	Types of Restriction Enzymes	<b>3.186</b>
3.3.3.2	Artificial Restriction Enzymes	<b>3.186</b>
3.3.3.3	Applications	<b>3.188</b>
3.3.3.4	Examples	<b>3.189</b>
3.3.4	Ligation	<b>3.189</b>
3.3.4.1	Ligase Mechanism	<b>3.189</b>
3.3.4.2	Applications in Molecular Biology Research	<b>3.190</b>
3.4	Transgenesis and Productions of Transgenic Animals	<b>3.191</b>
3.5	Application of Stem Cell Technology in Cell based Therapy	<b>3.197</b>
3.5.1	Diabetes	<b>3.200</b>
3.5.2	Parkinson Diseases	<b>3.205</b>
3.6	Let us Sum Up	<b>3.207</b>
3.7	Questions for Discussion	<b>3.208</b>



## Applied Zoology

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### UNIT I

#### 1.0 Fisheries and Aquaculture

- 1.1 Capture fisheries – Introduction
- 1.2 Types of fisheries, Fishery resources from Freshwater, Brackish water and Marine habitats.
- 1.3 Finfish and shell fisheries.
- 1.4 Fishing gears and fishing crafts.
- 1.5 Freshwater, Brackish water and Mariculture.
- 1.6 Site selection criteria.
- 1.7 Aquaculture systems.
- 1.8 Induced breeding.
- 1.9 Hatchery design and Management
- 1.10 Larval rearing – Nursery ponds, rearing and grow out ponds
- 1.11 Shrimp and prawn culture
- 1.12 Hatchery systems, Seed transport, common diseases and control
- 1.13 Post-harvest technology
- 1.14 Preservation and processing – Freezing, solar drying, Canning, salting, smoking.

### UNIT II

#### 2.0 Clinical Science

- 2.1 Hematology
  - 2.1.1 Blood composition and functions
  - 2.1.2 Blood groups and transfusion problems
  - 2.1.3 Blood diseases – Anemia, Leukemia, Leucocytosis, Leucopaenia
  - 2.1.4 Biopsy and autopsy – clinical importance
- 2.2 Immunology
  - 2.2.1 Types of immunity – Innate and acquired
  - 2.2.2 Antigens – Haptenes and epitopes and their properties
  - 2.2.3 Structure and biological properties of human immunoglobulin G (IgG)
  - 2.2.4 Hypersensitivity – immediate and delayed
- 2.3 Important Human Parasites

2.3.1 Blood Parasites (Structure and Clinical significance of *Plasmodium*).

2.3.2 Intestinal parasites – Structure and clinical significance *Entamoeba*,  
*Giardia*, *Taenia solium*, *Ancylostoma*, *Enterobius*

### **UNIT III**

#### **3.0 Animal Biotechnology**

3.1 Animal Biotechnology: Scope of Biotechnology, Cloning vectors - Characteristics of vectors, Plasmids.

3.2 Gene Cloning – Enzymatic cleavage of DNA, Restriction enzymes (Endonucleases) and Ligation.

3.3 Transgenesis and Production of transgenic animals (Fish and Goat).

3.4 Application of Stem Cell technology in cell based therapy (Diabetes and Parkinson's diseases)