

## SYLLABUS 2020 – 2021

**STANDARD: 12**

**SUBJECT : BIO – BOTANY (THEORY)**

| CHAPTER   | CONTENT  |
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| <b>CHAPTER: 1</b><br><b>Asexual and Sexual</b><br><b>Reproduction in Plants</b> | 1.1 Asexual reproduction<br>1.4 Pre-fertilization structure and events<br>1.4.1 Androecium<br>1.4.2 Gynoecium<br>1.4.3 Pollination<br>1.6 Post fertilization and events<br>1.7 Apomixis<br>1.8 Polyembryony<br>1.9 Parthenocarpy   |
| <b>CHAPTER: 2</b><br><b>Classical Genetics</b>                                  | 2.1 Heredity and variation<br>2.2.3 Terminology related to Mendelism<br>2.3 Monohybrid cross<br>2.3.4 Dihybrid cross<br>2.3.5 The Dihybrid test cross<br>2.4 Intragenic interactions<br>2.4.1 Incomplete dominance - No blending of genes<br>2.4.2 Codominance (1 : 2 : 1)<br>2.4.3 Lethal genes<br>2.4.4 Pleiotropy - A single gene affects multiple traits<br>2.5 Intergenic interactions    |
| <b>Chapter: 3</b><br><b>Chromosomal Basis of</b><br><b>Inheritance</b>          | 3.1.3 Comparison between gene and chromosome behaviour<br>3.2 Linkage<br>3.2.1 Coupling and repulsion theory<br>3.2.2 kinds of Linkage<br>3.2.3 Linkage Groups<br>3.3 Crossing Over<br>3.3.1 Mechanism of Crossing Over<br>3.3.3 Importance of Crossing Over<br>3.3.4 Recombination<br>3.3.5 Genetic Mapping<br>3.4 Multiple alleles<br>3.5.1 Types of mutation<br>3.5.3 Chromosomal mutations |

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| <p><b>CHAPTER 4:<br/>Principles and<br/>Processes of<br/>Bio-technology</b></p> | <p>4.2. Fermentation, SCP<br/> 4.3. Advancements in Modern Biotechnology<br/> 4.4. Tools for Genetic Engineering<br/> 4.5. Methods of Gene Transfer<br/> 4.6. Screening for Recombinants<br/> 4.6.1. Insertional Inactivation - Blue White Colony Selection Method<br/> 4.6.2. Antibiotic resistant markers<br/> 4.6.4. Molecular Techniques - Isolation of Genetic Material and Gel Electrophoresis<br/> 4.6.5. Nuclure Acid Hybridation<br/> 4.6.6. Bioassay for Target Gene Effect<br/> 4.6.7. Genome Sequencing and Plant Genome Projects<br/> 4.6.8. Evolutionary pattern assessed using DNA<br/> 4.6.10. RNA Interference (RNAi)<br/> 4.7.2. Herbicide Tolerant - Basta<br/> 4.7.3. Insect resistance - Bt Crops<br/> 4.7.7. Polyhydroxybutyrate (PHB)<br/> 4.7.11. Bioremediation<br/> 4.7.13. Bioprospecting<br/> 4.8. Applications of Biotechnology</p> |
| <p><b>Chapter 5<br/>Plant Tissue Culture</b></p>                                | <p>(5.1) (5-2): Introduction-Techniques involved in PTC<br/> 5.2.3: Types of plant Tissue culture - Meristem culture (Type:3-4)<br/> 5.4-: Applications of Plant Tissue Culture-cryopreservation<br/> 5. 7. Future of Biotechnology</p>  |
| <p><b>Chapter 6<br/>Principles of Ecology</b></p>                               | <p>6.1.1. Definitions of ecology<br/> 6.1.2. Ecological hierarchy<br/> 6.1.4. Habitat &amp; Niche<br/> 6.1.5. Ecological equivalents<br/> 6.2.b. Thermal Stratification<br/> 6.2.c. Water<br/> 6.2.2. Edaphic factors<br/> 6.2.3. Topographic factors<br/> 6.2.4. Biotic factors - Interspecific interactions<br/> 6.3. Ecological adaptations - Hydrophytes, Xerophytes Mesophytes</p>  |

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| <b>Chapter 7 Ecosystem</b>                   | 7.2.1 Photosynthetically Active Radiation<br>7.2.3. Concepts of trophic level in an Ecosystem<br>7.2.4 Energy flow<br>7.2.5 food chain<br>7.2.6. Food web<br>7.2.7 Ecological pyramids<br>7.2.9 Biogeo Chemical cycle carbon cycle & phosphate cycle<br>7.2.10 Types of ecosystem<br>7.3 plant succession<br>7.3.1. Characteristics of Ecological succession<br>7.3.2. Types of succession<br>7.3.3 Classification of plant succession<br>7.3.4 Significance of plant succession |
| <b>Chapter 8 Environmental Issues</b>        | 8.1 Green house effect & Global warming & Ozone depletion<br>8.2 Forestry<br>8.3 Deforestation<br>8.4 Afforestation<br>8.5 Alien species<br>8.7 Carbon capture and storage<br>8.9 Environmental impact assessment<br>8.10 GIS  |
| <b>Chapter 9 Plant Breeding</b>              | 9.1 Relationship -human & Plants<br>9.2 Domestication of plants<br>9.4 Organic agriculture<br>9.5 Plant breeding<br>9.6 Conventional plant breeding methods<br>9.6.1 Plant introduction<br>9.6.4 Heterosis<br>9.6.6 Polyploid breeding<br>9.7 Modern Plant breeding  |
| <b>Chapter 10 Economically useful plants</b> | 10.9. Traditional system of Medicine<br>10.10 Medicinal plants<br>10.11 Entrepreneurial Botany   |

# PRACTICAL

STANDARD: 12

SUBJECT : BIO – BOTANY

| Sl.No  | Topic   |
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| <b>Preserved Specimens/ Model/ Photograph / Pictures</b> |   |
| 1.   | E.Coli cloning vector (pBR 322)                                 |
| 2.   | Types of Ecological Pyramids – Number, Biomass, Energy          |
| <b>Solving Problems</b>                                  |   |
| 3.   | To verify Monohybrid cross                                      |
| 4.   | Analysis – Dihybrid Cross                                       |
| 5.   | Flow of energy – 10 % Law                                       |
| 6.   | Quadrat method – Population density and frequency determination |
| 7.   | Genetic linkage maps  |
| <b>Experiments</b>                                       |   |
| 8.   | Study of Pollen germination on a slide                          |
| 9.   | Isolation of DNA from plant material                            |