

SYLLABUS 2020 – 2021

STANDARD: 12

SUBJECT : BIO – BOTANY (THEORY)

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

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

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

PRACTICAL

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Sl.No	Topic
Preserved Specimens/ Model/ Photograph / Pictures	
1.	E.Coli cloning vector (pBR 322)
2.	Types of Ecological Pyramids – Number, Biomass, Energy
Solving Problems	
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
Experiments	
8.	Study of Pollen germination on a slide
9.	Isolation of DNA from plant material