

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

STANDARD: 12

SUBJECT : BIO – BOTANY

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

SYLLABUS- 2020 – 2021

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SUBJECT: BIO-ZOOLOGY - (THEORY)

UNITS	CONTENT
1 Reproduction in Organisms	Introduction 1.1. Mode of Reproduction 1.3 Sexual reproduction
2 Human Reproduction	Introduction 2.1. Human Reproductive system 2.2. Gametogenesis 2.4. Fertilization and Implantation 2.5 Maintenance of pregnancy and Embryonic development
3 Reproductive Health	Introduction 3.1. Need for reproductive Health problems and strategies 3.2. Amniocentesis and its statutory Ban 3.3. Social impact of sex ratio - female foeticide and infanticide 3.4. Population explosion and Birth control 3.8. Assisted Reproductive Technology(ART) 3.9. Detection of foetal disorders during early Pregnancy
4 Principles of Inheritance and Variation	Introduction 4.1. Multiple alleles 4.2. Human blood groups 4.3. Genetic control of Rh factor 4.4. Sex determination 4.5. Sex linked inheritance 4.6. Karyotyping 4.7. Pedigree analysis
5 Molecular Genetics	Introduction 5.1. Gene as the functional unit of Inheritance 5.2. In search of Genetic material 5.3. DNA is the Genetic Material 5.5. RNA - World 5.6 Properties of genetic Material 5.7. Packaging of DNA helix 5.9. Transcription 5.10. Genetic Code 5.12. Translation

	5.13 Regulation of gene Expression 5.14. Human genome project 5.15. DNA finger printing Technique
6 Evolution	Introduction 6.1 Origin of life 6.2. Geological Time Scale 6.3. Biological evolution 6.5. Theories of biological evolution 6.7. Hardy- Weinberg Principle
7 Human Health and Diseases	Introduction 7.1 Common diseases in Human beings 7.2 Maintenance of Personal and Public Hygiene 7.3 Basic concepts of Immunology 7.6 Adolescence - Drug and Alcohol abuse 7.7. Mental health and Depression
8 Microbes in Human Welfare	Introduction 8.2 Microbes in industrial products 8.3 Microbes in sewage treatment 8.5 Bioremediation
9 Applications of Biotechnology	Introduction 9.1. Applications in medicine 9.2. Gene therapy 9.3. Stem cell therapy 9.4. Molecular Diagnostics
11 Organisms and Populations	Introduction 10.1 Organisms and its environment 10.3. Major Abiotic components or factors 10.7 Populations 10.8 Population Attributes 10.12 Population Interaction
11 Biodiversity and Its Conservation	Introduction 11.1 Biodiversity 11.2 Importance of Biodiversity -Global and India 11.5 Causes of biodiversity loss 11.7 Biodiversity and its Conservation
12 Environmental Issues	Introduction 12.1 Pollution 12.6. Bio Magnification 12.7. Eutrophication 12.8. Organic farming and its Implementation 12.9 Solid Waste Management 12.10. Ecosan Toilets

PRACTICALS

STD: 12

SUBJECT : BIO-ZOOLOGY

Sl.No	Topic
1	Marking of wild life sanctuary and National parks in India Map
2	Human Mendelian traits
3	Human Sperm
4	Human Ovum
5	Paramecium Conjugation
6	Entamoebahistolytica
7	Thymus T.S
8	Lymph node
9	tRNA
10	Homologous organs
11	Analogous organs
12	X linked Disease
13	Autosomal Disease