Board of Intermediate Education, Andhra Pradesh.

Intermediate – II Year Syllabus w.e.f. 2013 – 14

Subject : BOTANY – II

S. No.	Topics	Page No.
1.	**Transport in Plants** **Means of Transport-** Diffusion, Facilitated Diffusion, Passive symports and antiports, Active Transport, Comparison of Different Transport Processes**, Plant-Water Relations-** Water Potential, Osmosis, Plasmolysis, Imbibition, **Long Distance Transport of Water-** Water Movement up a Plant, Root Pressure, Transpiration pull, **Transpiration-** Opening and Closing of Stomata, Transpiration and Photosynthesis, **Uptake and Transport of Mineral Nutrients-** Uptake of Mineral Ions, Translocation of Mineral Ions, **Phloem Transport: Flow from Source to Sink-**The Pressure Flow or Mass Flow Hypothesis	
2.	**Mineral Nutrition** **Methods to Study the Mineral Requirements of Plants, Essential Mineral Elements-**Criteria for Essentiality, Macronutrients, Micronutrients, Role of Macro- and Micro- nutrients, Deficiency Symptoms of Essential Elements, Toxicity of Micronutrients, **Mechanism of Absorption of Elements, Translocation of Solutes, Soil as Reservoir of Essential Elements, Metabolism of Nitrogen-**Nitrogen Cycle, Biological Nitrogen Fixation, Symbiotic nitrogen fixation, Nodule Formation	
3.	**Enzymes** Chemical Reactions, Enzymatic Conversions, Nature of Enzyme Action, Factors Affecting Enzyme Activity, Temperature and pH, Concentration of Substrate, Classification and Nomenclature of Enzymes, Co-factors	
4.	**Photosynthesis in Higher Plants** **Early Experiments, Site of Photosynthesis, Pigments Involved in Photosynthesis, Light Reaction, The Electron Transport-** Splitting of Water, Cyclic and Non- cyclic Photo-phosphorylation, Chemiosmotic Hypothesis, **Biosynthetic phase-** The Primary Acceptor of CO2, The Calvin Cycle, **The C4 Pathway, Photorespiration, Factors affecting Photosynthesis**	
5.	**Respiration of Plants** **Cellular respiration, Glycolysis, Fermentation, Aerobic Respiration-** Tricarboxylic Acid Cycle, Electron Transport System (ETS) and Oxidative Phosphorylation, The Respiratory Balance Sheet, **Amphibolic Pathway, Respiratory Quotient**	
6.	**Plant Growth and Development** **Growth-** Plant Growth, Phases of Growth, Growth Rates, Conditions for Growth, **Differentiation, Dedifferentiation and Redifferentiation, Development, Plant Growth Regulators-** Physiological Effects of Plant Growth Regulators, *Auxins, Gibberellins, Cytokinins, Ethylene, Abscisic acid,* **Seed Dormancy, Photoperiodism, Vernalisation**	

UNIT II	**Microbiology**	
7.	**Bacteria** **Morphology of Bacteria, Bacterial cell structure-** Nutrition, **Reproduction-** Sexual Reproduction, Conjugation, Transformation, Transduction, **The importance of Bacteria to Humans**	
8.	**Viruses** **Discovery, Classification of Viruses, structure of Viruses, Multiplication of Bacteriophages-** The Lysogenic Cycle, **Viral diseases in Plants, Viral diseases in Humans**	
Unit-III	**Genetics**	
9.	**Principles of Inheritance and Variation** **Mendel's Experiments, Inheritance of one gene (Monohybrid Cross)-**Back cross and Test cross, Law of Dominance, Law of Segregation or Law of purity of gametes, **Deviations from Mendelian concept of dominance-** Incomplete Dominance, Co-dominance, Explanation of the concept of dominance, **Inheritance of two genes-** Law of Independent Assortment, **Chromosomal Theory of Inheritance, Linkage and Recombination, Mutations-** Significance of mutations.	
Unit-IV	Molecular Biology	
10.	**Molecular Basis of inheritance** **The DNA-** Structure of Polynucleotide Chain, Packaging of DNA Helix, **The Search for Genetic Material,** Transforming Principle, Biochemical Characterisation of Transforming Principle, The Genetic Material is DNA, Properties of Genetic Material (DNA versus RNA), **RNA World, Replication-**The Experimental Proof, The Machinery and the Enzymes, **Transcription-**Transcription Unit, Transcription Unit and the Gene, Types of RNA and the process of Transcription, **Genetic Code-** Mutations and Genetic Code, tRNA– the Adapter Molecule, **Translation, Regulation of Gene Expression-**The *Lac* operon.	
UNIT V	**Biotechnology**	
11.	**Principles and processes of Biotechnology** **Principles of Biotechnology-**Construction of the first artificial recombinant DNA molecule, **Tools of Recombinant DNA Technology-**Restriction Enzymes, Cloning Vectors, Competent Host (For Transformation with Recombinant DNA), **Processes of Recombinant DNA Technology-** Isolation of the Genetic Material (DNA), Cutting of DNA at Specific Locations, Separation and isolation of DNA fragments, Insertion of isolated gene into a suitable vector, Amplification of Gene of Interest using PCR, Insertion of Recombinant DNA into the Host, Cell/Organism, Selection of Transformed host cells, Obtaining the Foreign Gene Product, Downstream Processing	
12.	**Biotechnology and its applications** **Biotechnological Applications In Agriculture-**Bt Cotton, Pest Resistant Plants, **Other applications of Biotechnology** Insulin, Gene therapy, Molecular Diagnosis, ELISA**,** DNA fingerprinting, **Transgenic plants, Bio-safety and Ethical issues-** Biopiracy	
UNIT VI	**Plants, Microbes and Human welfare**	
13	**Strategies for enhancement in food production** **Plant Breeding-** What is Plant Breeding?, Wheat and Rice, Sugarcane, Millets, Plant Breeding for Disease Resistance, Methods of breeding for	

	disease resistance, Mutation, Plant Breeding for Developing Resistance to Insect Pests, Plant Breeding for Improved Food Quality, **Single Cell Protein (SCP), Tissue Culture**	
14.	**Microbes in Human Welfare** Microbes in Household Products, Microbes in Industrial Products- Fermented Beverages, Antibiotics, Chemicals, Enzymes and other Bioactive Molecules, Microbes in Sewage Treatment, Primary treatment, Secondary treatment or Biological treatment, Microbes in Production of Biogas, Microbes as Biocontrol Agents, Biological control of pests and diseases, Microbes as Biofertilisers, Challenges posed by Microbes	
Topics deleted under 30% reduction of Syllabus due to COVID-19		
2	**Mineral nutrition – Total chapter deleted**	29 – 46
6	**Plant growth & development .** 6.1: Growth 6.2: Differentiation , De- differentiate and Re-differentiation 6.3: Development 6.5: Seed dormancy 6.6: Photo- periodism 6.7: Vernalisation	105 – 121
13	**Strategies for enhancement on food production** 13.1.2: Plant breeding for disease resistance 13.1.3: Plant breeding for developing resistance to insect pests 13.1.4: Plant breeding for improve feed Quality 13.2: Single cell Proteins (SCP)	 247 249 250 250