

Intermediate II YEAR - BOTANY
SECOND YEAR – THEORY

UNIT-I PLANT KINGDOM : 22 Periods

Introduction and Classification of Plant Kingdom in brief. Study of the structure and life history of the following forms. Spirogyra, Rhizopus, Funaria, Pteris and Cycas.

UNIT-II MICROBIOLOGY: 10 Periods

Introduction and importance of microbiology. Bacteria: Introduction, structure, nutrition, reproduction and economic importance. Viruses: Introduction, structure of TMV and Bacteriophage, multiplication, transmission, symptoms of plant viral diseases and their control measures.

UNIT-III PLANT PATHOLOGY: 10 Periods

Introduction to plant pathology Symptoms, causative organism and control measures of the Following Diseases

1. Blast of paddy
2. Red rot of sugarcane
3. Grain (covered) smut of Sorghum
4. Citrus canker

UNIT-IV PLANTS AND HUMAN WELFARE : 22 Periods

A. Crop improvement:

Aims of Crop improvement:

Methods of crop improvements: Definition, method, merits, limitations and achievements of Introduction, Selection (Mass, pureline, clonal), Hybridization and Hybrid vigour (Heterosis); Mutation (Spontaneous and induced) and Polyploidy (Euploidy and Aneuploidy) breeding and their applications in Crop improvement.

B. Biotechnology:

Definition, Scope and application of Biotechnology. Genetic Engineering – Recombinant DNA Technology. Gene Cloning, Transgenic plants, Single cell protein.

Tissue Culture: Process of tissue culture;

Anther and Embryo cultures; Applications of plant tissue culture.

Mushroom Cultivation:

Food value, Types of mushrooms, Method of Cultivation of white button mushroom.

UNIT-V PLANT PHYSIOLOGY : 36 Periods

A. SOIL AND WATER RELATIONS OF PLANTS:

- i) Soil: Definition, soil profile and components of soil.
- ii) Diffusion, Imbibition, Osmosis, Plasmolysis, water potential, Absorption of water.
- iii) Ascent of Sap: Definition, Cohesion – Tension theory
- iv) Transpiration: Definition and types of transpiration, structure of stomata, mechanism of stomatal movement, factors, significance. Antitranspirants.
- v) Mineral nutrition: Definition, List of macro and micronutrients, ion absorption (carrier concept only), Bio – fertilizers.

B. METABOLISM:

- i) Enzymes: Definition, Properties and nomenclature, major groups of Enzymes (hydrolases and desmolases)
- ii) Photosynthesis: Definition, photosynthetic pigments (chlorophylls, carotenoids and phycobilins); Hills reaction, Emerson enhancement effect, PSI and PSII, Calvin cycle (C₃– cycle) Hatch and Slack pathway (C₄– cycle); Factors influencing photosynthesis – Blackman's law of limiting factors.

- iii) Respiration: Types of respiration; Mechanism of aerobic respiration: Glycolysis, Krebs cycle, Electron transport system; Mechanism of anaerobic respiration, Alcoholic fermentation; Respiratory quotient (R.Q)
- iv) Nitrogen metabolism: Introduction, Biological nitrogen fixation (Symbiotic, Non-symbiotic); Biosynthesis of proteins (Genetic code, transcription and translation).
- v) Plant growth regulators: Auxins, Gibberellins, Cytokinins, Abscisic acid and Ethylene and their physiological functions and applications in agriculture and horticulture;