

Semester - II
C4: Plant Physiology (Theory MBTCR2042T; Practical MBTCR2042P)

Theory: CIA: 10 Marks, End-Sem : 50 Marks
Practical: 40 Marks

Theory

Module A: (15 Marks)

(1 class per week)

UNIT I: Anatomy

The shoot and root apical meristem and its histological organization, simple & complex permanent tissues, primary structure of shoot & root, secondary growth, growth rings, leaf anatomy (dorsi-ventral and isobilateral leaf)

Module B: (35 Marks)

(3 classes per week)

UNIT I: Plant Water relations

Importance of water to plant life, diffusion, osmosis, plasmolysis, guttation, transpiration. Macro & micro nutrients: Essentiality of nutrients; Solute transport across the membrane, Long distance transport through xylem and phloem; mechanisms of loading and unloading of photoassimilates

UNIT II: Carbon & nitrogen metabolism

Photosynthesis-Photosynthesis pigments, concept of two photo systems, photophosphorylation , physiology of bacterial photosynthesis: light reactions, cyclic and non-cyclic photophosphorylation; carbon dioxide fixation, Calvin's cycle, C4 plants, CAM plants, photorespiration, compensation point.

Nitrogen metabolism- inorganic & molecular nitrogen fixation, nitrate reduction and ammonium assimilation in plants.

UNIT III: Growth and development: Definitions, phases of growth, growth curve, Plant growth regulators (auxin, cytokinin, gibberellin, abscisic acid, ethylene): Mode of action, biosynthesis, storage, breakdown, transport and application; Concepts of RAM and SAM; flower development.

UNIT IV: Light signaling in Plants: Phytochrome, cryptochrome, phototropins, concept of photoperiodism and vernalization; Seed dormancy and seed germination.

Teacher involved: Dr. Dipankar Chakraborti (Module A), Dr. Ronita Nag Chaudhuri (Module B)

Practicals:

1. Demonstration of transpiration.
2. Isolation of (photosynthetic pigments) chlorophyll
3. Auxin estimation
4. Demonstration assay of enzymes involved in plant
5. Preparation of stained mounts of anatomy of monocot and dicot's root, stem & leaf.

Teachers involved: Dr. Ronita Nag Chaudhuri, Dr. Dipankar Chakraborti

Texts & Reading/Reference Lists:

- 1) Plant Physiology- Taiz & Zeiger
- 2) Biochemistry & Molecular Biology of Plants – Buchanan
- 3) Plant Anatomy - Pijush Roy.
- 4) Plant Anatomy – A Fahn