

CBO-501 PLANT PHYSIOLOGY

Unit -I Growth and Development

Latent Life-Dormancy: Introduction and types of Dormancy; Causes and overcoming of Seed Dormancy; Bud Dormancy, factors affecting dormancy.

Seed Germination: Physiological aspects of Seed germination, Seedling emergence.

Senescence and Programmed Cell Death (PCD) :Basic Concepts , Mechanisms and Types Cell Death , PCD in life cycle of plants , metabolic Changes associated with senescence and its regulation , Influence of Hormones and Environmental Factors on Senescence.

Unit -II Physiology of Mineral Transport and Stress

Mechanism, regulation and transport of Macronutrients (K, P) and Micronutrients (Zn, Fe) in Plants

Physiological effects, mechanism and theories to explain:

Stress and stressful environments, Water and Salt stress, Light and Temperature stress, Biotic stress.

Development of stress resistant plants: Oxidative stress, Salt stress, Senescence tolerance.

Unit -III Photo-physiology

Photochemistry and Photosynthesis: General Concepts, Historical background, Photosynthetic Pigments systems and Light harvesting Complexes, Photo oxidation of water, Photophosphorylation and mechanisms of electron transport, C₃ Cycle, C₄ Cycle, CAM Pathway .

Respiration: Definition and types of Respiration, Glycolysis, The TCA Cycle, Electron Transport and ATP Synthesis, Pentose Phosphate Pathway, Gluconeogenesis, Glyoxylate Cycle. Chemiosmotic regeneration of ATP during respiration, model of Fo-F1 ATPase and its role in ATP synthesis.

Sensory Photobiology: History and discovery of Phytochromes and Cryptochromes and their Photochemical and Biochemical Properties.

Unit -IV Plant hormones and flowering

Plant Growth Regulators and Elicitors : Physiological Effects and Mechanisms of Action of Auxins , Gibberellins, Cytokinins, Ethylene , Abscisic Acid, Brassinosteroids, Polyamines, Jasmonic Acid and Salicylic Acid, Hormone Receptors, Signal Transduction and Gene Expression.

The Flowering Process: Photoperiodism and its significance, Floral Induction and Development-Genetic and Molecular analysis; Role of Vernalization.

Main Reference(s):

Mukherji S and Ghosh A K (2005) *Plant Physiology*, New Central Book Agency (P) Ltd., Kolkata (1st Central Edition).

Devlin Robert M and Witham Francis H (1986) *Plant Physiology*, CBS Publishers and Distributors, Delhi (4th Edition/ 1st Indian Edition).

References

Delvin R.M., Plant Physiology

Gill P S (), Plant Physiology (1st edition)

Mukherji S and Ghosh A K (), Plant Physiology (1st edition)

Ross Salisbury (), Plant Physiology (4th edition)

Srivastava H S (2004), Plant Physiology (2nd edition)

Sundara Rajan S (), Plant Physiology (edition),

Sornathai Annie, Rajakumar K, Jayakumar M and Rajarathinam K (), Plant Physiology (edition),

Verma S K and Verma Mohit (), Plant Physiology, Biochemistry and Biotechnology (),

Verma V (), A Text Book of Plant Physiology (), Emkay Publication, New Delhi.

Sundara Rajan S (2001), Practical Manual of Plant Ecology and Plant Physiology (1st edition),

Jain V.K., Fundamentals of Plant Physiology

Pandey S.N. and B.K. Sinha, Plant Physiology

Verma P.S. and P.K. Agarwal, Plant Physiology