

CELL AND MOLECULAR BIOLOGY OF PLANTS

Max. Marks - 80

Units	Topics
I	<p>The dynamic cell: Structural organisation of the plant cell; specialized plant cell types; chemical foundation; biochemical energetics.</p> <p>Cell wall: Structure and functions; biogenesis; growth.</p> <p>Plasma membrane: Structure, models, and functions; sites for ATPases, ion carriers, channels and pumps; receptors.</p> <p>Plasmodesmata: Structure; role in movement of molecules and macromolecules; comparison with gap junctions.</p>
II	<p>Chloroplast: Structure; genome organization; gene expression; RNA editing; nucleo chloroplastic interactions.</p> <p>Mitochondria: Structure; genome organization; biogenesis.</p> <p>Plant vacuole: Tonoplast membrane; ATPases; transporters; as storage organelle.</p>
III	<p>Nucleus: Structure; nuclear pores; nucleosome organization; DNA structure; A, B and Z forms; replication, damage and repair, transcription, plant promoters and transcription factors; splicing; mRNA transport; nucleolous, rRNA biosynthesis.</p> <p>Ribosomes: Structure; site of protein synthesis; mechanism of translation, initiation, elongation and termination; structure and role of tRNA.</p>
IV	<p>Protein sorting: Targeting of proteins to organelles.</p> <p>Cell shape and motility: The cytoskeleton; organization and role of microtubules and microfilaments; motor movements; implications in flagellar and other movements.</p> <p>Cell cycle and apoptosis: Control mechanisms; orle of cyclins and cyclindependent kinases; retinoblastoma and E2F proteins; cytokinesis and cell plate formation; mechanisms of programmed cell death.</p>
V	<p>Other cellular organelles: Structure and functions of microbodies, golgi apparatus, lysosomes, endoplasmic reticulum.</p> <p>Techniques in cell biology: Immunotechniques; in situ hybridization to locate transcripts in cell types; FISH, GISH; confocal microscopy.</p>