SEMESTER 2

Paper 2: Theory

Gymnosperms, Paleobotany, Morphology and Anatomy

Unit 1

1. Classification of gymnosperms according to Coulter and Chamberlain.
2. Phylogenetic relationship and affinities of gymnosperms.
3. Morphology, reproduction and life cycles of *Cycas, Pinus,*and *Gnetum.*
4. Economic importance of gymnosperms.

Unit 2

1. A general account of fossil gymnosperms Cycadofilicales
2. Geological time scale.
3. Fossil formation and plant fossil types.
4. General account of dominant Jurassic flora.

Unit 3

1. Types of bracts and inflorescence.
2. Floral morphology – Forms of calyx, corolla and aestivation; Types of stamens and carpels; ovule forms and placentation.
3. Leaf morphology – Phyllotaxy and venation, types of stipules.
4. Morphology and evolution of stamens and carpels.

Unit 4

1. Organization of apical meristem
2. Types of stomata in angiosperms
3. Components of xylem and phloem.
4. Secondary growth in stem.
5. Anomalous secondary growth in *Mirabilis, Bignonia* and *Dracaena.*

Paper 2: Practical

Gymnosperms, Paleobotany, Morphology and Anatomy

1. Study of vegetative and reproductive structures of all prescribed gymnosperms by preparing temporary stained slides (dissection, sectioning, drawing, description and identification upto genus).
2. Anatomical studies of anomalous secondary structures of *Mirabilis, Bignonia* and *Dracaena.*
3. Study of fossils through slides or specimens.
4. Spotting: Includes those groups and sections not covered in the preparations.
5. Study of double staining techniques (Safranin and Haematoxylin or Safranin and fast green).
6. Sectioning and observation of placentation types,ovule structure and anther through temporary preparations.