

Diversity of Microbes:

- 1) A general account of VIRUSES and MYCOPLASMA, 2) Prokaryotes: General structure and reproduction. Evolutionary relationships of Archaea. Autotrophic bacteria: Photosynthetic bacteria: Cyanobacteria - Cell Structure, thallus organization, economic importance (SCP, biofertilizers, etc.): Chemotrophic bacteria: Heterotrophic bacteria saprophytic, mutualistic and parasitic.

Diversity of cryptogams:

- (i) FUNGI: General characters, classification and economic importance of fungi. Structure, reproduction and systematic position of the following: Mastigomycotina (Albugo), Zygomycotina (Mucor), Ascomycotina (Pencilium, Peziza), Basidiomycotina (Puccinia) and Dueteromycotina (Alternaria), (ii) LICHENS: A general account of structure, reproduction, ecological significance and economic importance. (iii) ALGAE: general characters, classification and economic importance. Structure, reproduction and life-history of the following: Chlorophyceae (Volvox, Oedogonium and Chara). Xanthophyceae (Vaucheria), Bacillariophyceae (Lectocarpus), Rhodophyceae (Polysiphonia) and Bacillariophyceae (iv) BRYOPHYTES: General characters, classification, sexuality, and alternation of generations of bryophytes. Structure, reproduction and systematic position of Hepaticopsida (Marchantia), Anthocerotopsida (Anthoceros) and Bryopsida (Polytrichum). Evolution of land habit and saprophyte in bryophytes. (v) PTERIDOPHYTES: General characters, classification and life-cycle of Pteridophytes, Structure, reproduction and systematic position of Psilopsida (Rhynia), Lycopsidea (Lycopodium) Sphenopsida (Equisetum) and Pteropsida (Marselia), Evolution of stele, heterospory and seed habit.

Diversity of Flowering Plants:

- (i) CYCADOPHYTES and PALEOBOTANY: General features, diversity, distribution and economic importance of Gymnosperms, Geological time table, fossils and fossilization. General account of Bennettitales Morphology, anatomy of leaf, stem, and root, reproduction and life-cycle of Pinus and Gnetum.

PART-B

Marks-50

MAGNOLIOPHYTES:

- i) **TAXONOMY:** History and principles of plant classification. Current systems of classification. A comparative account of the systems of Bentham & Hooker and Engler & Prantl, Plant nomenclature: International code of botanical nomenclature (Vienna Code). Current concepts in taxonomy (Systematic embryology, cytotaxonomy, chemotaxonomy, and numerical taxonomy). Diversity and economic importance of the families: Magnoliopsida (Annonaceae, Malvaceae, Rutaceae, Fabaceae (Leguminosae), Cucurbitaceae, Rubiaceae, Asteraceae, Sapotaceae, Apocynaceae Asclepiadaceae, Acanthaceae, Lamiaceae, Amaranthaceae, Euphorbiaceae: Liliopsida, Orchidaceae, Liliaceae, Arecaceae and Poaceae.
- (ii) **ANATOMY:** Tissues and tissue systems. Organization of shoot and root apices, and associated theories. Leaf structure and internal diversity. Epidermal tissue system (trichome and stomatal types). Normal structure of the wood, sapwood and heartwood. Anomalous secondary growth in Magnoliopsida (Dicots) and Liliopsida (Monocots).
- (c) **EMBRYOLOGY and PALYNOLOGY:** Microsporogenesis, megasporogenesis. Fertilization; Endosperm types, development and Haustoria. A general account of embryogeny, Polyembryogeny and Apomixis. Palyology: A general account and importance.
- (iii) **PHYSIOLOGY:** A general account of plant-water relations, Enzymes: Characteristics, mechanisms of action, kinetics and factors affecting. Essential macro and micronutrients. Transport of organic substances. Photosynthesis: Pigments, concept of photosystems, photophosphorylation. Calvin cycle. C4 pathway, CAM plants, and photorespiration. A general account of Nitrogen and Lipid metabolism, Plant Growth Hormones, Photomorphogenesis, Fruit development, and Seed dormancy.
- (iv) **ECOLOGY:** Plants and Environment. Ecological factors like gases, light, temperature, soil, water, salinity, and biota. Adaptations of the plants to these factors. Population ecology, Community ecology. Ecosystem structure and function. Food chains, energy flow, ecological pyramids, biogeochemical cycles (carbon, nitrogen and phosphorus). Biogeographic regions of India. Vegetation types of India. A general account of air, water, soil, sound and thermal pollution.
- (v) **CELL BIOLOGY and GENETICS:** Cell and cell organelles; cell inclusions; separation of cell organelles; cell envelopes, DNA the genetic material; DNA protein interaction. Cell division - Meiosis and Mitosis. Mendelism, laws of segregation and independent assortment, linkage and crossing over with reference to two-point and three-point test crosses. Gene expression. Genetic variations: mutation and their significance. Extra nuclear genome. General account of genetic code.

- (vi) **TISSUE CULTURE and BIOTECHNOLOGY:** Basic aspects of plant tissue culture, totipotency, and morphogenetic factors. Applications of Biotechnology.

MODEL QUESTION PAPER

Time : 90 Minutes

Max. Marks : 100

The question paper consists of 100 questions in multiple choice covering the entire syllabus.

1. Cyathium is found in:

a) Phyllanthus

b) Acalypha

c) Euphorbia

d) Croton

ELIGIBILITY CRITERIA

M.Sc. (BOTANY): Candidates must have passed Degree Examination conducted by Kakatiya University or an examination recognized as equivalent by the Kakatiya University **with the subject** the candidate is intending to appear for the Entrance Test and they must have secured at least 45% marks in the subject concerned (40% for SC/ST).