

YVUCET - 2020: SYLLABUS
TEST- 102: Botany

SECTION-A (Marks: 30)

Microbial Diversity, Cryptogams and Gymnosperms

1. **Viruses:** Structure, replication and transmission; plant diseases caused by viruses and their control.
2. **Bacteria:** Structure, nutrition, reproduction and economic importance. An outline Of Plant diseases of important crop plants caused by bacteria and their control.
3. **Cyanobacteria:** Cell structure, thallus organisation and their prospecting (uses)– Biofertilizers
4. **Algae:** General account, thallus organisation, structure, reproduction, classification and economic importance. Structure , reproduction and life history oedogonium, Ectoarpus and Polysilphonia
5. **Fungi:** General characters, classification and economic importance. General account of plant diseases caused by Fungi and their control. Structure reproduction life history of Rhizopus, Pencillium, Puccinia.
6. **Lichens:** Structure and reproduction; ecological and economic importance.
7. **Bryophytes:** General characters, classification and alternation of generations. Structure reproduction and life history of Machantia and Funaria.
8. **Pteridophytes:** General characters, classification, alternation of generations and evolution of sporophyte. Evolution of stele, heterospory and seed habit in Pteridophytes. Structure reproduction and life history of Lycopodium and Marsilea.
9. **Gymnosperms:** General characters, structure, reproduction and classification. Distribution and economic importance;. Structure reproduction and life history of Pinus and Gnetum.

SECTION-B (Marks: 30)

Anatomy, Embryology, Taxonomy and Medicinal Botany

1. **Meristems:** Types, histological organisation of shoot and root apices and theories.
2. **Tissues and Tissue Systems:** Simple and complex. & *secretory tissues*.
3. **Stem and root: Vascular cambium - Formation** and function. Anomalous secondary growth.
4. **Local timbers-** Economics importance- teak, Rose wood, Red Sandles, Arjun.
5. **Introduction:** History and importance of Embryology. Anther structure, Microsporogenesis and development of male metophyte.
6. **Ovule structure and types; Megasporogenesis;** types and development of female gametophyte
7. **Pollination - Types; Pollen - pistil interaction.** Fertilization.
8. **Endosperm - Development and types. Embryo - development and types; Polyembryony and Apomixis - an outline.**
9. **Introduction:** Principles of plant systematics, Systematics vs Taxonomy, Types of classification: Artificial, Natural and Phylogenetic.
10. **Systems of classification:** Salient features and comparative account of Bentham & Hooker and Engler & Prantle. An introduction to Angiosperm Phylogeny Group (APG).
11. **Current concepts in Angiosperm Taxonomy.**
12. **Nomenclature and Taxonomic resources:** An introduction to ICBN, Vienna code - a brief account. Herbarium: Concept, techniques and plications.
13. **Systematic study and economic importance of plants belonging to the following families:** Annonaceae, brassicaceae Rutaceae, Fabaceae (Faboideae/papilionoideae, Caesalpinoideae, Mimosoideae), Cucurbitaceae, Apiaceae, Asteraceae, Asclepiadaceae, Lamiaceae, Euphorbiaceae, Orchidaceae and Poaceae.

SECTION-C(Marks- 40)

Cell Biology, Genetics, Ecology and Biodiversity

1. Plant cell envelopes: Ultra structure of cell wall, molecular organisation of cell membranes.
2. Nucleus: Ultrastructure, Nucleic acids - Structure and replication of DNA; types and functions of RNA, Chromosomes, Special types of chromosomes: Lampbrush, polytene and B - chromosomes.
3. Cell division: Cell cycle and its regulation; (mitosis, meiosis for practical observation)
4. Mendelism: Laws of inheritance. Genetic interactions □ Epistasis, complementary, Supplementary and inhibitory genes. Linkage and crossing over.
5. Mutations, Chromosomal aberrations - structural and numerical changes, Gene mutations, transposable elements.
6. Gene Expression: Organisation of gene, transcription, translation, mechanism and regulation of gene expression in prokaryotes (Lac and Trp Operons). Extra nuclear genome: Mitochondrial and plastid DNA, plasmids.
7. Concept and components of Ecosystem. Energy flow, food chains, food webs, ecological pyramids, Plants and environment: Ecological factors - Climatic (light and temperature), edaphic. Ecological adaptations of plants.
8. Population ecology: ecotypes and ecads. Community ecology: Frequency, density, ecological succession (Hydrosere, Xerosere). Production ecology
9. Biodiversity: Concepts, Convention on Biodiversity - Earth Summit. Types of biodiversity. Levels, threats and value of Biodiversity. Hot spots of India – Endemism, North Eastern Himalayas, Western Ghats. Agro-biodiversity: Vavilov centres of crop plants.
10. Principles of conservation: IUCN threat-categories, RED data book - endangered plants of India. Role of organisations in the conservation of Biodiversity - IUCN, UNEP, WWF, NBPGR, NBD.

Physiology, Tissue Culture and Biotechnology.

1. *Water Relations*: Diffusion, Imbibition, Osmosis; water, osmotic and pressure potentials; ascent of sap; transpiration; Stomatal structure and movements.
2. *Mineral Nutrition*: Essential macro and micro mineral nutrients and their role; symptoms of mineral deficiency; absorption of mineral ions; passive and active processes.
3. *Enzymes*: mechanism and regulation of enzyme action, enzyme kinetics, factors regulating enzyme action.
4. *Photosynthesis*: Photosynthetic pigments, absorption and action spectra; Red drop and Emerson enhancement effect; concept of two photosystems; mechanism of photosynthetic electron transport and evolution of oxygen; photophosphorylation; Carbon assimilation pathways: C3, C4 and CAM; photorespiration.
5. *Translocation of organic substances*: Mechanism of phloem transport; source-sink relationships.
6. *Respiration*: Aerobic and Anaerobic; Glycolysis, Krebs cycle; electron transport system, mechanism of oxidative phosphorylation, pentose phosphate pathway.
7. *Nitrogen Metabolism*: Biological nitrogen fixation, nitrate reduction, ammonia assimilation, protein synthesis.
8. *Lipid Metabolism*: Structure and functions of lipids.
9. *Growth and Development*: Physiological effects of Phytochrome - auxins, gibberellins, cytokinins, ABA, ethylene and brassinosteroids; photoperiodism.