

Syllabus -Entrance Examination for Ph.D. in Botany

As per new Ordinance No.11 (2018)

सम - २०२४

Part A - (Based on Research Methodology)

- Introduction and need of quantitative techniques.
- Frequency distribution, Measures of Central value.
- Normal and Binomial distributions.
- Sampling techniques.
- Testing of significance.
- Experimental designs.
- Introduction to computers.
- Structural and functional aspects.
- Commonly used programmes and packages.
- Some basic methods (morphological, anatomical, ecological, cytological, physiological, molecular, tissue culture etc.) used in plant research.

Part B - (Based on Subject of Research)

- Biology and Diversity of Algae and Bryophytes.; distribution, structure, function and life cycle and economic importance of common species of each group.
- Biology and Diversity of Pteridophytes and Gymnosperms : distribution, structure, function and life cycle and economic importance of common species of each group.
- Morphology and Taxonomy of Angiosperms : Structure and functions of various parts of the plants specially reproductive parts. Major classifications, characteristic features of important families of dicots and monocots. Taxonomic tools.
- Plant Development and Reproduction : Types of tissues, apical meristems, development of various parts of the plant. Structure, development and functions of reproductive parts of the plant. Microsporogenesis and megasporogenesis, embryo sac, fertilization, etc.

- Cytogenetics and Genetics : Structure and functions of nucleus, chromosomes. Cell division. Numerical and structural changes of the chromosomes. Mendelian principles, quantitative and cytoplasmic inheritance, mutations, genetic recombination in prokaryotes and eukaryotes
- Cell and Molecular Biology : Ultrastructure of the cell, cell membrane, structure and functions of cell organelles like chloroplast, mitochondria, golgibodies. Structure and functions of DNA and RNA, replication, transcription and protein synthesis, regulation of gene expression.
- Ecology and Conservation of Plant Resources : Ecology and types of ecosystems, community organization, succession, food chain, energy flow. Biodiversity and conservation of natural resources. Pollution and climate change.
- Plant Physiology, Biochemistry and Metabolism : Plant water relations, water transport, growth regulators, photoperiodism, structure and functions of enzymes, photosynthesis, photorespiration, plant respiration, structure and functions of lipids.
- Basic Biotechnology: Basic principles. Plant, Tissue and organ culture and their applications in agriculture and industry. Fermentation technology. Environmental biotechnology.
- Genetic Engineering : Basic tools and techniques. Restriction enzymes, cloning vectors, Gel electrophoresis, PCR etc., direct DNA transfer, GMOs, applications in agriculture and industry. DNA Fingerprinting.
- Genomics and Proteomics: Basic aspects and applications.