



Download Bihar Public Service Commission (BPSC Mains)

Optional Subject - Botany

BOTANY

Section- I

1. Microbiology:- Viruses, bacteria plasmids-structure and reproduction. General account of infection and immunology. Microbes in agriculture, industry and medicine, and air, soil and water. Control of pollution using micro-organisms.
2. Pathology- Important plant diseases in India caused by viruses, bacteria, mycoplasma fungi and nematodes. Modes of infection, dissemination, physiology of parasitism and methods of control. Mechanic of action of biocides. Fungal toxins.
3. Cryptogams- Structure and reproduction from evolutionary aspect, and ecology and economic importance of algae, fungi, bryophytes and pteridophytes. Principal distribution in India.
4. Phanerogams:- Anatomy of wood secondary growth Anatomy of C2 and C2 plants, stomatal types, Embryology, barriers to sexual incompatibility. Seed structure. Apomixis and polyembryony Polynology and its applications. Comparison of systems of classification of angiosperms. Modern trends in biosystematics. Taxonomic and economic importance of Cyadaceae, Pinaceae, Gentianaceae, Magnoliaceae, Ranunculaceae, Cruciferae, Rosaceae, Leguminosae, Euphorbiaceae, Malvaceae, Dipterocarpaceae, Umbelliferae, Asclepiadaceae, Verbenaceae, Solanaceae, Rubiaceae, Cucurbitaceae, Compositae, Gramineae, Palmae, Liliaceae, Musaceae and Orchidaceae.
5. Morphogenesis – Polarity, symmetry and totipotency. Differentiation and dedifferentiation of cells and organs, Factors of morphogenesis Methodology and applications of cell, tissue, organ and protoplast cultures from vegetative and reproductive parts Somatic hybrids.

Section- II

1. Cell Biology—Scope and perspective. General Knowledge of modern tools and techniques in the study of cytology. Prokaryotic and eukaryotic cell-structural and ultrastructural details Functions of organelles including membranes. Detailed study of mitosis, meiosis. Numerical and structural variations in chromosome and their significance, study of polytene and lampbrush chromosomes structure, behavior and cytological significance.

2. Genetics and Evolution- Development of genetics and gene concept. Structure and role of nucleic acids in protein synthesis and reproduction. Genetic code and regulation of gene expression, Gene amplification Mutation and evolution. Multiple factors linkage and crossing over. Methods of gene mapping. Sex chromosomes and sexlinked inheritance. Malesterility, its significance in plant breeding. Cytoplasmic inheritance elements of human genetic. Standard deviation and Chi-square analysis Gene transfer in micro-organisms. Genetic engineering. Organic evolution evidence, mechanism and theories.

3. Physiology and Biochemistry- Detailed study of water relations. Mineral nutrition and ion/transport. Mineral deficiencies Photosynthesis mechanism and importance, photosystems I and II, photorespiration, Respiration and fermentation. Nitrogen fixation and nitrogen metabolism. Protein synthesis. Eæymes, Importance of secondary metabolites. Pigments as photoreceptors, photoperiodism, flowering. Growth indices, growth movements. Saescence. Growth substance- Their chemical nature, role and applications in agrihorticulture. Agrochemicals, Stress physiology, Vernalçation Fruit and seed physiology- dormancy, storage and germination of seed, Perthenocarphy fruit ripening.

4. Ecology- Ecological factors. Concept and dynamics of community, succession. Concept of biospheres. Conservation of ecosystems. Pollution and its control. Forest types of India. Aforestation, deforestation and social forestry. Endangered plants.

5. Economic Botnay- Origin of cultivated plants. Stydy of plants as sources of food, fodder and forage, fatty oils, wood and timber, fiber, paper rubber, bevarages, alcohol, drugs, narcotics, resins and gums essential oils, dyes, mucilage, insecticides and pesticides. Plant indicators, Ornamental plants, Energy plantation.