

# BOTANY

## PAPER -I

1. Microbiology-Viruses, bacteria, plasmid-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 mechanism 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 C and C plants stomata types. Embryology, barriers to sexual incompatibility. Seed structure, Apomixes and polyembryony palynology and its applications, Comparison of systems of classification of angiosperms. Modern trends in biosystematics Taxonomic and economic importance of Cycadaceae, Pinaceae, Genetales, Magnolias, Ranunculaceae, Cruciferae, Rosaceous, Leguminosae, Euphorbiaceae, Malvaceae, Dipterocarpaceae, umbelliferae, Asclepiaceae, Verbenaceae, Solanaceae, Rubiaceae, Cucurbitaceae, Compositae, Gramineae, Palmae, Liliaceae, Musiceae 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 parts somatic hybrids.

## PAPER- II

1. Cell Biology - scope and perspective Venereal Knowledge of modern tools and techniques in the study of cytology prokaryotic and eukaryotic cells structural and ultra structural 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, behaviour 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 sex linked inheritance male-sterility, its significance in plant breeding cytoplasm inheritance. Elements in human genetics Standard deviation and Chi-square analysis. Genotransfer 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, Enzymes. importance of secondary metabolites, Pigments as photoreceptors photoperiodism, flowering.  
Growth indices, growth movements, Senescence.  
Growth substances:- Their chemical nature, role and applications in agrhorticulture , Agrochemicals stress physiology.- Vernalization Fruit and Seed physiology-dormancy, storage and germination of seed parthenocarpy, fruit ripening.
4. Ecology:- Ecological factors. Concept and dynamics of community, succession, concept of biospheres. Conservation of ecosystems. Pollution and control. Forest types of India Aforestation, deforestation and social forestry Endangered plants.
5. Economic Botany:- Origin of cultivated plants. Study of plants as sources of food, fodder and forage, fatty oils. wood and timber, fiber, paper rubber, beverages, alcohol, drugs narcotics, resins and gums essential oils, dyes mucilage insecticides and pesticides. Plant indicators Ornamental plants Energy Plantation.