(14)

BOTANY

1- Cell and molecular biology of plants:-
Structural organization of plant cell, specialized plant cell types chemical foundation of plant cells, molecule of life, covalent and noncovalent bonds and their importance, biochemical energetics,

Plasmamembrane, plant vacuole, Chloroplast, Mitochondria: Nucleus, Ribosomes, Cell shape and Motility, Cell xcycle and adoptosis, Other Cell Organelles (Structure functions of microtubules Golgibodies, Lysosomes, endoplamic reticulum), Techniques use in cell biology.

II- Cytology, Genetics and Gytogentics
Chromation Organisation, Structural and Numerical alterations in chromosomes, Genetics, Gene Structure and Expression, Genetic recombination and Genetic Mapping, Plasmids, Mutations, Molecular Cytogenetics, Alien gene transfer through chromosomal magnipulations.

III- Biology and Biodiversity of Viruses, Bacteria, Fungi, Nematodes and Lower Plants:
Viruses, Phytoplasma, Archebacteria and Eubacteria, General Characters of fungi, reproduction in fungi, classification account of Mastiqonycotina, Zygomycotina, Ascomycotina, Basidiomycotina and Deuteromycotina, Phylogeny of Funji, Economic importance of fungi. General Character of plant parasitc nematodes. Phycology-Thalls structure, reproduction, classification economic uses as food, biofertilizer and in industry. morphology, anatomy reporduciton, classification of Bryophytes, Economic and ecological importance. Morphology anatomy cassification of pteridophytes, General account of foosil ptenidophytes (Rhynia, Horneophyton, Asterxylon) Diagnostic Features of Psilopida, Lycopsida, Sphenopsida & Pteropsida.

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Taxanomy and biodiversity of seed plants

Introduction: Gymnosperms, the vesseleless and fruitless seed plant having drop mechanism. Types of pollen grains and ovules, development of male and femal gametophyte.

Classification of gymnosperms (Coulter & chamberlain, Sahni, Sporne and Sandra Holms.) Distribution of living gymnosperms in India Economic importance of gymnosperms.

Brief acount of fossil families:Lygenopteridaceae Medulloseaceae. Ceytoniaceae and Glosspoteridaceae, General account of Cycadeodaceae and cordaitales, Vegetative structure and reproductive organs of cycadales, Ginkogales, Coniferales, Ephedrales and Gnetales.

Taxanomy of Angiosperms, The species concept, Taxanomic evidence, Taxonomic Tools, Systems of Angiosperms classification (Historical background, basis and outline classification of (i) Benthem and Hooker, (ii) Takhtajan, (iii) Bessey, (iv) Hutchinson, (v) Cronquist), Origin of interpolation variation, Diagnostic Characters of following families (Annonaceae, Ranunculaceae, Portulaceae, Fumeriaceae, Papaveraceae, Brassicaceae, Malvaceae, Rutaceae, Fabaceae, Apiaceae, Rhamnacae, Zhygophyllaceae, Moringceae, Lythraceae, Oleaceae, Acanthaceeae, Solanaceae, Lamiaceae, Chenopadiaceae, Euphorbiaceae. Convolulaceae, Schrophulariaceae, Caserarinaceae Liliaceae. Polygonaceae, Commelinaceae, Cyperaceae, Poaceae), Concept of Phytogeography.

Plant Development:Cell wall: Nature formation, growth of cell wall, microscope and submicroscopic structure, function of cell wall, shoot development, Root development, vascular Cambium, Secondary ducts and Laticiferous, Leaf growth and differentiation, Plant Reproduction (Flower Development, genetics of floral organ differentiation. Male gametophyte, female gametophyte, Pollination, Pollen-pistil interaction and fertilization. Self incompatibility, double fertilization and in vitro fertilization), Seed development and fruits Growth,

Plant Physiology and Biochemistry:

Energy flow, Enzymology, Membrane Transport and Trasnlocation of water and solutes, Sensory Photobiology, Fowering process, Plant growth regulators and elicitor, Photochemistry and

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Photosynthesis, Respiration and lipid metabolism, Nitrogen Fixation, nitrogen and sulphur metabolism, sensory photobiology, plant growth regulators and eleciters. The flowering process, stress physiology.

Plant Ecology.

Climate soil and major vegetation and soil types of the world,Vegetation organization, Ecosystem Organization, Vegetation Development, Biological diversity, Air,water and soil pollution, Ecosystem stability, Ecological management.

Plant Resource Utilization and conservation:

Plant Biodiversity, World centres of primary diversity of domesticated plants, Origin, Evolution, Botany, Cultivation and uses of - (i) Food (Wheat, Rice) forage (sorghum) and fodder crop (Berseem),(ii)fibre crop (cotton). (iii) Medicinal and aromatic plants, and (iv) Vegetable oil yielding crops.(v) Gums,dyes,Resins.(vi) Raw material for paper making (vii) Important Fire-wood and Timber yielding plants and nonwood forest product (NWFPS): Acacia, Mangifera, Delbergia.Tectona, Shorea, pinus and Cedrus. Strategies for conservation: In-situ conservation, Strategies for conservation: Ex situ conservation, Green Revolution.

Biotechnology and Genetic Engineering of Plant and Microbes

Biotechnology (Basic concept, principles, and scope new Vistas and emerging scenario, role of plant genetics manplation, Large Scale culture, prospects and problems of genetically modified food). Plant cell and Tissue Culture, Aseptic Technique, Organienesis, Organ Microculture, Protoplasm isolation and somatic hybridization, Recombinart DNA Technology (Gene cloning, principles and techniques, construction of genomic/CDNA Libraries choice of vectors, DNA synthesis and sequencing, polymerase chain reaction, DNA finger printing) Genetic Engineering of; plants (Aims, strategies for development of transgenic (with sutable examples). Agrobacterium the natural genetic engineer. T-DNA and transpon medicated cene tagging, choloroplast transformation and its utility, intellectual property rights, possible ecological risks and ethical concerns). Microbial Genetic manipulation, Genomicas and Proteomics.

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