

PART 4: BIOLOGY (50 Questions)

BOTANY

Unit 1: Taxonomy of Angiosperm

Types of classifications - Artificial, Natural, Phylogenetic - Biosystematics - Binomial Nomenclature - Herbaria and their uses - Bentham and Hooker's classification of plants - Families Malvaceae, Solanaceae - Euphorbiaceae, Musaceae and Economic Importance.

Unit 2: Plant Anatomy

Tissues and Tissue System - anatomy of monocot and roots - anatomy of Monocot and dicot stem and anato dicot leaf.

Unit 3: Cell Biology and Genetics

Chromosomes - Structure and types - genes recombina of chromosomes mutation - chromosomal aberration - DNA as genetic material - Structure of DNA - replicat DNA - Structure of RNA and its type.

Unit 4: Biotechnology

Recombinant DNA Technology - Transgenic plants wi beneficial traits - plant tissue culture and its applicatio Protoplasmic fusion

Unit 5: Plant Physiology

Photosynthesis - Significance - site of photosynthesis - photochemical and biosynthetic phases - electron trans system - cyclic and non cyclic photophosphorylation - and C4 pathway - photorespiration - factor affecting photosynthesis - fermentation - plant growth - growth regulators - phytohormones - auxin - gibberellins - cytokinins - ethylene.

Unit 6: Biology in Human Welfare

Food production - breeding experiments - improved va and role of biofertilizer - crop diseases and their contrc biopesticides - genetically modified food - sustained agriculture and medicinal plants including microbes.

ZOOLOGY

Unit I: Human Physiology

Nutrition - introduction - carbohydrates - proteins - lip vitamins mineral - water - Balanced diet - calorie value (ICBM standard) obesity - Hyperglycemia - hypoglyce malnutrition. Digestion - enzymes and enzyme action - Bones and Joints (Major types) - Arthritis - Rickets an Osteomalacia - Gout.

Muscles - muscle action - muscle tone - Rigor Mortis - aerobic exercises (body building) myasthenia gravis.

Respiration - Process of pulmonary respiration - inspiration Expiration - Exchange of gases at alveolar level - Circulation - Functioning of heart origin and conduction of heart beat - Artificial pacemaker - coronary blood vessels and its significance - myocardial infarction - Angina pectoria - Atherosclerosis - heart attack - Resuscitation in heart attack

(First aid) Blood

components-functions-plasma-corpuses-blood clotting-anticoagulants-Thrombosis-embolism-blood related diseases like polycythemia-Leukemia-Lymph fluid.

Physiological Co ordination System:

Brain-functioning of different regions-memory-sleep-stroke- Alzheimer's disease-meningitis-Thyroid-parathyroid hormones-insulin and glucagon-Hormones of adrenal cortex and medulla-Reproductive hormones-problems related to secretion, non secretion of hormones.

Receptor Organs:

Eye-Focussing mechanism and photo chemistry of retina-short sightedness-Nyctalopia-Eye infection-conjunctivitis-Glaucoma-Ear-Hearing mechanism-Hearing impairments and aids - Noise pollution and its importance-skin-melanin functions - Effect of solar radiation / UV Excretion:

Ureotelism-urea-Biosynthesis(ornithine cycle)

Nephron-ultrafiltration-tubular reabsorption and tubular secretion-Renal failure-Dialysis kidney stone formation kidney transplantation-Diabetes.

Reproductive System:

Brief account of spermatogenesis and oogenesis-menstrual cycle-in vitro fertilization-Birth control

Unit 2: Microbiology

Introduction-History of medical microbiology-The influence of Pasteur, Koch and Lister-Virology-structure Genetics culture and diseases-AIDS and its control-Bacteriology-structure, Genetics and diseases-protozoan microbiology-Diseases oriented-pathogenecity of micro organism-anti microbial resistance chemotherapy. Single cell protein. Microbial culture technique and its applications - Strain Isolation and Improvement - Isolation of microbial products.

Unit 3: Immunology

Innate immunity (Non specific) - anatomical Barriers-Physiological barriers-phagocytic barriers Lymphoidal organs-Thymus- Bursa of fabricius-Peripheral Lymphoid organs-Lymph nodes-Transplantation immunology-Autoimmune disorders.

Unit 4: Modern Genetics and Animal Biotechnology

Introduction-scope-Human Genetics Karyotyping
Chromosome gene mapping-Recombinant DNA technology
and segmenting-genetic diseases-Human genome
project-cloning-Transgenic organisms-Genetically modified
organism(GMO)-Gene therapy-Animal cell culture and its
applications-Stem cell technology-Bioethics of
genetic engineering in animals.

Unit 5: Environmental Science

Human population and explosion-issue-Global
Warming Crisis-Green house effect-Ozone layer
depletion-waste management-Biodiversity
conservation (Biosphere reserve)

Unit 6: Applied Biology

Livestock and management-Breeds-Farming
method-poultry diseases-Economic value
Pisciculture-fish farming-Edible fishes of
Tamil Nadu.

Unit 7: Theories of Evolution

Lamarckism-Darwinism-Modern concept of
natural selection-species of concept-origin of
species and isolating mechanism.