201

TECHNICIAN A (Based on CBSE Biology 10+2 Syllabus)

1. Diversity in Living World

   What is living; Taxonomic categories and aids (Botanical gardens, herbaria, museums, zoological parks); Systematics and Binomial system of nomenclature.

   Introductory classification of living organisms (Two-kingdom system, Five-kingdom system); Major groups of each kingdom along with their salient features (Monera, including Archaebacteria and Cyanobacteria, Protista, Fungi, Plantae, Animalia); Viruses; Lichens

   Plant kingdom – Salient features of major groups (Algae to Angiosperms);

   Animal kingdom – Salient features of Nonchordates up to phylum, and Chordates up to class level.

2. Cell : The Unit of Life ; Structure and Function

   Cell wall; Cell membrane; Endomembrane system (ER, Golgi apparatus/Dictyosome, Lysosomes, Vacuoles); Mitochondria; Plastids; Ribosomes; Cytoskeleton; Cilia and Flagella; Centrosome and Centriole; Nucleus; Microbodies.

   Structural differences between prokaryotic and eukaryotic, and between plant and animal cells.

   Cell cycle (various phases); Mitosis; Meiosis.

   Biomolecules – Structure and function of Carbohydrates, Proteins, Lipids, and Nucleic acids.

   Enzymes – Chemical nature, types, properties and mechanism of action.

3. Genetics and Evolution

   Mendelian inheritance; Chromosome theory of inheritance; Gene interaction; Incomplete dominance; Co-dominance; Complementary genes; Multiple alleles;

   Linkage and Crossing over; Inheritance patterns of hemophilia and blood groups in humans.

   DNA – its organization and replication; Transcription and Translation; Gene expression and regulation; DNA fingerprinting.

   Theories and evidences of evolution, including modern Darwinism.

4. Structure and Function

   Animals Digestive system - organs, digestion and absorption; Respiratory system – organs, breathing and exchange and transport of gases. Body fluids and circulation – Blood, lymph, double circulation, regulation of cardiac activity; Hypertension, Coronary artery diseases. Excretion system – Urine formation, regulation of kidney function. Locomotion and movement – Skeletal system, joints, muscles, types of movement. Control and co-ordination – Central and

peripheral nervous systems, structure and function of neuron, reflex action and sensory reception; Role of various types of endocrine glands; Mechanism of hormone action.

5. Reproduction and Development in Humans

Male and female reproductive systems; Menstrual cycle; Gamete production; Fertilisation; Implantation; Embryo development; Pregnancy and parturition; Birth control and contraception.

6. Ecology and Environment

Meaning of ecology, environment, habitat and niche.

Ecological levels of organization (organism to biosphere); Characteristics of Species, Population, Biotic Community and Ecosystem; Succession and Climax.

Ecosystem – Biotic and abiotic components; Ecological pyramids; Food chain and Food web; Energy flow; Major types of ecosystems including agroecosystem.

Ecological adaptations – Structural and physiological features in plants and animals of aquatic and desert habitats.

Biodiversity – Meaning, types and conservation strategies (Biosphere reserves, National parks and Sanctuaries)

Environmental Issues – Air and Water Pollution (sources and major pollutants); Global warming and Climate change; Ozone depletion; Noise pollution; Radioactive pollution; Methods of pollution control (including an idea of bioremediation); Deforestation; Extinction of species (Hot Spots).

7. Biology and Human Welfare

Animal husbandry - Livestock, Poultry, Fisheries; Major animal diseases and their control. Pathogens of major communicable diseases of humans caused by fungi, bacteria, viruses, protozoans and helminths, and their control.

Cancer; AIDS.

Adolescence and drug/alcohol abuse;

Basic concepts of immunology.

Plant Breeding and Tissue Culture in crop improvement.

Biofertilisers (green manure, symbiotic and free-living nitrogen-fixing microbes, mycorrhizae);

Biopesticides (micro-organisms as biocontrol agents for pests and pathogens); Bioherbicides;

Microorganisms as pathogens of plant diseases with special reference to rust and smut of wheat, bacterial leaf blight of rice, late blight of potato, bean mosaic, and root - knot of vegetables.

Bioenergy - Hydrocarbon - rich plants as substitute of fossil fuels.