

TECHNICIAN B (Based on CBSE Biology 10+2 Syllabus + Basic Computer Application Higher Secondary Level)

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 Archaeobacteria 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.

8. Computer Applications

Graphic and Diagrammatic representations. Classification and tabulation. Measures of central tendency and dispersion.

Introduction to probability, and distribution, sampling theory and errors. Tests of significance. Z, t, Chi square and F-test.

Analysis of variance. Correlation and regression.

Introduction to computers, hardware, storage and memory devices, input and output devices, file and folders concepts. File management, networks, printers, floppies, mouse, keyboard.

Different types of booting, operating systems-single user, multi-user and multi tasking operating systems with examples.

Internet and E-Mail. Important services provided by internet.