SYLLABUS

BIOLOGY

CLASS XI (THEORY)

Time: 3 Hours | Max. Marks: 70

Unit	Title	No. of Periods	Marks
I.	Diversity of Living Organisms	27	12
II.	Structural Organisation in Plants and Animals	27	12
III.	Cell: Structure and Functions	26	12
IV.	Plant Physiology	40	17
V.	Human Physiology	40	17
	Total	160	70

UNIT-I: DIVERSITY OF LIVING ORGANISMS (27 Periods)

Chapter-1: The Living World

- What is living? Biodiversity; Need for classification; Taxonomy and Systematics; Concept of species and taxonomical hierarchy; Binomial nomenclature; Tools for study of Taxonomy-museums, Zoological parks, Herbaria, Botanical gardens, Keys for identification.

Chapter-2: Biological Classification

- Five kingdom classification; Salient features and classification of Monera, Protista and Fungi into major groups; Lichens, Viruses and Viroids.

Chapter-3: Plant Kingdom

- Salient features and classification of plants into major groups-Algae, Bryophyta, Pteridophyta, Gymnospermae and Angiospermae (salient and distinguishing features and a few examples of each category): Angiosperms-classification up to class, characteristic features and examples. Plant life cycles and alternation of generations.

Chapter-4: Animal Kingdom

- Basis of classification; Salient features and classification of animals, non-chordates up to phyla level and chordates up to class level (salient features and distinguishing features of a few examples of each category). (*No live animals or specimen should be displayed in school*).

UNIT-II: STRUCTURAL ORGANISATION PLANTS AND ANIMALS (27 Periods)

Chapter-5: Morphology of Flowering Plants

- Morphology and modifications: Morphology of different parts of flowering plants: root, stem, leaf, inflorescence, flower, fruit and seed. Description of families: Fabaceae, Solanaceae and Liliaceae (to be dealt along with the relevant experiments of the Practical Syllabus).

Chapter-6: Anatomy of Flowering Plants

- Anatomy and functions of different tissues and tissue systems in dicots and monocots. Secondary growth.

Chapter-7: Structural Organisation in Animals

- Animal tissues; Morphology, Anatomy and functions of different systems (digestive, circulatory, respiratory, nervous and reproductive) of an insect-cockroach (a brief account only).

UNIT-III: CELL: STRUCTURE AND FUNCTIONS (26 Periods)

Chapter-8: Cell-The Unit of Life

- Cell theory and cell as the basic unit of life, structure of prokaryotic and eukaryotic cells; Plant cell and animal cell; Cell envelope; Cell membrane; Cell wall; Cell organelles-structure and function; Endomembrane system-endoplasmic reticulum, ribosomes, golgi bodies, lysosomes, vacuoles; mitochondria, plastids, microbodies; Cytoskeleton, cilia, flagella, centrioles (ultrastructure and function); Nucleus.

Chapter-9: Biomolecules

- Chemical constituents of living cells: biomolecules, structure and function of proteins, carbohydrates, lipids, nucleic acids; concept of metabolism; Enzymes-properties, enzyme action, factors, classification, Co-factors.

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Chapter-10: Cell Cycle and Cell Division

- Cell cycle, mitosis, meiosis and their significance.

UNIT-IV: PLANT PHYSIOLOGY (40 Periods)

Chapter-11: Transport in Plants

- Movement of water, gases and nutrients; Cell to cell transpor-diffusion, facilitated diffusion, active transport; plant-water relations, imbibition, water potential, osmosis, plasmolysis; Long distance transport of water–Absorption, apoplast, symplast, transpiration pull, root pressure and guttation; Transpiration, opening and closing of stomata; Uptake and translocation of mineral nutrients-transport of food, phloem transport, mass flow hypothesis.

Chapter-12: Mineral Nutrition

- Elementary idea of hydroponics as a method to study mineral nutrition; Essential minerals, macro and micronutrients and their role; deficiency symptoms; Mineral toxicity; Nitrogen metabolism, nitrogen cycle, biological nitrogen fixation.

Chapter-13: Photosynthesis in Higher Plants

- Photosynthesis as a means of autotrophic nutrition; Early experiments, site of photosynthesis; Pigments involved in photosynthesis (elementary idea); Photochemical and biosynthetic phases of photosynthesis; Cyclic and non-cyclic photophosphorylation; Chemiosmotic hypothesis; photorespiration; C_3 and C_4 pathways; factors affecting photosynthesis.

Chapter-14: Cellular Respiration

- Exchange of gases; do plants breathe; cellular respiration–glycolysis, fermentation (anaerobic), TCA cycle and electron transport system (aerobic); energy relations–Number of ATP molecules generated; Amphibolic pathways; Respiratory quotient.

Chapter-15: Plant-Growth and Development

- Seed germination; Characteristics, measurements and phases of plant growth, growth rate; Conditions for growth; Differentiation, dedifferentiation and redifferentiation; Sequence of developmental processes in a plant cell; Growth regulators–auxin, gibberellin, cytokinin, ethylene, ABA; Seed dormancy; Vernalisation; Photoperiodism.

UNIT-V: HUMAN PHYSIOLOGY (40 Periods)

Chapter-16: Digestion and Absorption

- Alimentary canal and digestive glands, role of digestive enzymes and gastrointestinal hormones; Peristalsis, digestion, absorption and assimilation of proteins, carbohydrates and fats; Egestion; Nutritional and digestive disorders-indigestion, constipation, vomiting, jaundice, diarrhoea.

Chapter-17: Breathing and Exchange of Gases

- Introduction to Respiratory organs in animals, Respiratory system in humans; Mechanism of breathing and its regulation in humans–exchange of gases, transport of gases and regulation of respiration, respiratory volume; Disorders related to respiration-asthma, emphysema, occupational respiratory disorders.

Chapter-18: Body Fluids and Circulation

- Composition of blood, blood groups, coagulation of blood; Composition of lymph and its function; Circulatory pathways; Human circulatory system–Structure of human heart and blood vessels; Cardiac cycle, cardiac output, ECG; Double circulation; Regulation of cardiac activity; Disorders of circulatory system-hypertension, coronary artery disease, angina pectoris, heart failure.

Chapter-19: Excretory Products and their Elimination

- Modes of excretion–ammonotelism, ureotelism, uricotelism; Human excretory system–structure and function; urine formation, osmoregulation; Regulation of kidney function–renin-angiotensin, atrial natriuretic factor, ADH, diabetes insipidus; micturition; Role of other organs in excretion; Disorders-Uraemia, renal failure, renal, calculi, nephritis; Dialysis and artificial kidney, kidney transplant.

Chapter-20: Locomotion and Movement

- Types of movement–amoeboid, ciliary, flagellar, muscular; Types of muscles; Skeletal muscle, contractile proteins and muscle contraction; Skeletal system and its functions; Joints; Disorders of muscular and skeletal system-myasthenia gravis, tetany, muscular dystrophy, arthritis, osteoporosis, gout.

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Chapter-21: Neural Control and Coordination

- Neuron and nerves; Nervous system in humans–central nervous system and peripheral nervous system; Generation, conduction and transmission of nerve impulse; Reflex action; Sensory perception; Sense organs; Elementary structure and functions of eye and ear.

Chapter-22: Chemical Coordination and Integration

- Endocrine glands and hormones; Human endocrine system-hypothalamus, pituitary, pineal, thyroid, parathyroid, thymus, adrenal, pancreas, gonads; hormones of heart, kidney and gastrointestinal tract; Mechanism of hormone action (elementary idea); Role of hormones as messengers and regulators, hypo-and hyperactivity and related disorders; Dwarfism, acromegaly, cretinism, goiter, exophthalmic goiter, diabetes, Addison's disease.

  Note: Diseases related to all the human physiological systems to be taught in brief.

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