HBSE Class 11 Biology Syllabus

Syllabus
Class-11th
Subject-Biology

मास	पुस्तक का नाम	विषय वस्तु	शिक्षण के पीरियड	दोहराई के पीरियड	प्रयोगात्मक कार्य
अप्रैल		Diversity of living organisms Classification of the living organisms (five kingdom classification, major groups and principles of classification within each Kingdom). Systematic and binomial system of nomenclature. Salient features of animal (non chordates up to phylum level, and chordates up to class level) and plant (major groups; Angiosperms up to subclass) classification.	22	06	Practical 7
मई		Botanical gardens, herbaria, zoological parks and museums. Tissues in animals. Morphology, anatomy and functions of different systems of an annelid (earthworm), an insect (cockroach) and an amphibian (frog).	22	06	14
जून ग्रीष्मकालीन अवकाश 1 जून से 30 जून तक					
जुलाई		Digestion and absorption. Breathing and respiration. Body fluids and circulation.	22	04	14
अगस्त		Excretory products and elimination. Locomotion and movement.		06	12

		Control and coordination.	18		
सितम्बर		Revision			
अक्तूबर		Tissues Plants Morphology, anatomy and functions of different parts of flowering plants: Roots, Stem leaf, inflorescence, flower, fruit and seed	22	04	08
नवम्बर		Cell: Cell wall, cell membrane and cell organelles (plastids, mitochondria, endoplasmic reticulum, Golgi apparatus, dictyosomes, ribosomes, lysosomes, vacuoles, centrioles) and nuclear organization. Mitosis, meiosis, cell cycle.	22	04	08
दिसम्बर		Basic Chemical Constituents of living bodies structure and function of carbohydrates, proteins, lipids and nucleic acids. Enzymes: types, properties and function.	14	06	10
जनवरी		Movement of water, food, nutrients, and gases. Plants and water, Mineral nutrition, Respiration Photosynthesis. Plant growth & development Exam	20	02	04
फरवरी		Revision			

Detailed Syllabus

Unit- Ist: Diversity in the living World.

Chapter No.-1 : The Living World:

What is living, All living organisms grow, Reproduction-character of living organism, Metabolism-characteristic of life, consciousness-the defining property of living organisms. Diversity in the living world, Nomenclature, Identification, Binomial nomenclature rules, Classification, Taxonomy, Systematic, Taxonomic categories, Species, genus, family, order, class, phylum, kingdoms, Taxonomical Aids, Herbarium, Botanical gardens, Museum, Zoological park, key.

Chapter No.-2 : Biological Classification:

Two kingdom classification, Five kingdom classification, Kingdom Monera-classification of bacteria on basis of form, Archaebacteria, Eubacteria cyanobacteria, heterocysts, heterotrophic bacteria, fission in bacteria, Mycoplasma, kingdom Protista, chrysophytes, Dinoflagellates, Englenoids, Slime moulds, protozoans-amoeboid protozoans, flagellated, ciliated, sporozoans, kingdom-fungi- mycorrhizae, dikaryon, lichen, phycomycetes,ascomycetes, basidiomycetes, deuteromycetes. Kingdom-plantae, cuscuta, alternation of generation. Kingdom animalia, virus, viroids and lichens, phycobiont, mycobiont.

Chapter No. -3 : Plant Kingdom

artificial and natural system of classification, phylogenetic classification, numerical taxonomy, cytotaxonomy, chemotaxonomy, algae, green, brown and red algae – characters & products, examples. Photosynthetic pigments of these algae, Bryophytes- gametophyte, sporophyte, liverworts and mosses, gemma, protonema & its examples. Pteridophytes-sporophylls, prothallus, homosporous, heterosporous, seed habit, examples, Gymnosperms- examples, sporophylls, ovule archegonia, antheridia, angiosperms- flowers, dicots & monocots, double fertilization, embryo sac, life cycle of An angiosperm, Plant life cycles and alternation of generations- haplontic, diplontic & haplodiplontic life cycles.

Chapter No. 4 : Animal Kingdom:

Basis of classification-Level of organization, symmetry, diploblasticl triploblastic, coelom, segmentation, notochord, classification of animals, phylum—pariferae-characters & examples. Phylum- coelentrata (cnidaria)- characters & examples, ctenophora, platyhnelminthes, aschelminthes, annelida, arthropoda, mollusca, echinodermata, hemicherdata, charelata-urochordata, cephalochdata, vertebrate-class-cyclostomata, chondrichythyes, osteichthyes, amphibia, reptilian, aves, mammalia. chart of characters.

Unit-2: Structural organization in plants and animals

Chapter No.-5: Morphology of flowering plants:

The root, root systems, regions of root, modification of root, the stem-node & internode, modification of stem-underground stem, tendrils, thorns, suckers, corms, stem spine, Leaf-bud, leaf base, Petiole & lamina, venation. Reticulate & parallel, types of leaves- simple and compound- pinnate & palmate, phyllotaxy- alternate & opposite, whorled, modification of leaves- tendrils, spines, fleshy, Inflorescence- Racemose and cymose, flower- thalamus, arrangement of floral parts, unisexual, bisexual, symmetry- actinomorphic, zygomorphic or asymmetrical, trimerous, tetramerous, pentemerons, Bracteate, ebrecteate, ebicteolate, hypogynous, perigynous, epigynous, superior, inferior & half sueriour. Parts of flower calyx- gamosepalous, polysepalous, corolla- gamopetalous & polypetalous, aestivation- valvate, twisted, imbricate, vexillary androceium- staminode, typical epipetalous, epiphyllous mono, diadelphous & polyddelphous, gynoceium – ovary, style & stigma, placenta, apocorpous, synarpous, Placentation- marginal, axile, parietal, basal, free central & superficial. Fruit- parthenocarpic, percarp- epicarp, mesocarp & endocarp, seed- structure of dicot and monocot seed with example of maize & grams. Floral formula and floral diagram- in detail of family- Fabaceae, solanaceae, Liliaceae with examples.

Chapter No.-6; Anatomy of flowering plants:

The tisues and types- Meristamatic and Permanent, intercalary, primary, secondary, apical, lateral meristim, Permanent tissue- simple and complex, parenchyma, collenchyma, scherenchyma, sclereids & fibers.

Complex-xylem and phloem. tracheids, vessels, fibers, paranchma- protoxylem, metexylem, endarch, exarch, mesarch, phloem, sieve tube, companion cell, parenchyma and fibers, protophloem, metaphloem. The tissue system- epidermal, ground & vascular tissue system. epidermal epidermis, cuticle, stomata, guard cells, subsidary cells, stomatal apparatus. Root hair & Trichome. Ground tissue system mesophyll & cortex. Vascular tissue system- cambium, open & closed, Radial, conjoint, anatomy of dicot & monocot plants – Dicot & monocot root, stem & leaf. Secondary growth in dicot stem & dicot root- activity of vascular cambium, cork cambium, spring wood autumn wood, heart wood, sap wood, bark and lenticels.

Chapter No. III: Structural organization in animals:

Tissue and types epithelial- simple, compound, simple- squamous, cubodial, columnar, ciliated, glandular compound, skin, junctions.

connective tissue- loose and compact, dense, specialized, loose- areolar, adipose dense- regular & irregular, specalized ones and blood & cartilage.

Muscle tissue- skeletal, smooth and cardiac Nervous tissue, organ and organ systems, earthworm- morphology, anatomy, digestive, circulatory, reproductive, excretary, nervous, cockroach-morphology- mouth parts, anatomy-digestive, excretory, Respiratory, Reproductive, circulatory frog- morphology , anatomy- digestive, excretory, reproductive & others.

Unit 3: Cell: Structure and Functions:

chapter-8: Cell: the Unit of Life:

What is cell, cell theory, an overview of cell, Prokaryotic cell, cell envelope and its modification- Gram +ve & Gram –ve bacteria, cell wall, mesosome, pili, fimbriae, 7os Riboscmes, Polysome. Eukaryotic cell- cell wall, cell membrane, structure, fluid mosaic model, cell organelles- cell wall, ER, Golgi comples, Lysosomes, Vaccoules, Mitochondria, Plastids, Ribosomes, cytoskeleton- cilia & flagella, centrioles, nuclear- chromosomes, structure and classification. Active, passive transport, osmosis.

Chapter No.9: Biomolecules:

How to analyze chemical composition. organic & inorganic molecules, macromolecules, micromolecules, Primary and secondary metabolites, Proteins, Polysacharides, Nucleic acid, structure of proteins- Primary, secondary, tert & Quartenary peptide bond and qlycosidic bond, dynamic state of body constituents- concepts of metabolism- turnover no, Metabolism, catalytic actions and reaction of enzymes, metabolic basis for living, ATP, The living state-steady and homeostasis, Enzyme- chemical nature, denaturation, chemical reactions, how do enzymes bring about such high rate of chemical conversions. Nature of enzyme action, factors affecting enzymes activity- temp, pH, conc of substrate, inhibitors. Classification and nomenclature of enzymes, cofactors, prosthetic group, apoenzyme and coenzyme.

Chapter No. 10 : Cell cycle and cell Division:

Cell cycle, phases of cell cycle, interphase, Mphase, karyokinesis, cytokinesis, G1 phase, s, g2 phase Quiescent. G_0 state, M phase- Prophase, metaphase, anaphase, telophase.

Significance of mitosis, meiosis- meiosis I & II, Prophase-1 leptotene, zygotene, pachytene, diplotene, Diakinesis, synaptonemal complex, Bivalents, Tetrad, chiasmiata significance of meiosis.

Unit 4: Plant Physiology:

Chapter No. 11: Transport in Plants:

Means of Transport- diffusion, facilitated diffusion, Passive symports and antiports, porins and uniport, comparison of different transport processes, Plant water relation, Transpiration, water potential, solute potential, Pressure potential, Turgidity, osmosis, solcite, solvent, solution, SPM, pressure gradient, Plasmolysis- isotonic, hypotonic & hypertonic

solution, turgid, flaccid cells, imbibitions, long distance transports of water- mass or bulk flow, translocation how do plants absorb water- apoplest & symplast pathway plasmodes mata, endodermis, casparian strips, mycorrhizae, Water movement up a plant-root pressure, guttation, transpiration pul, cohesion tension transpiration pull- model transpiration- stomatal apparatus, guard cells, stomatal pore, surface tension, tensile strength capillarity, transpiration and photosynthesis- a compromise, uptake and transport of mineral nutrients, active absorption, translocation of mineral ions, phloem transport- flow from source to sink. The pressure flow or mass flow hypothesis.

Chapter No.12: Mineral Nutrition:

Methods to study the mineral requirements of plants, hydrophonics, essential mineral elements, criteria for essentiality macro & micronutrients & role. Defeciency symptoms of essential element s- chlorosis, necrosis, inhibited growth, premature fall of leave and buds & stunted plant growth, toxicity of micronulrients. Mechanism of absorption of elements active & flux. Translocation of solutes, soil as reserviour of essential elements, metabolisms of nitrogen, nitrogen cycle, N2 fixations, Nitrifications, chemoautotrophism, biological N2 fixation, synibiotic & nonsymbiotic N2 fixation, nodule formation, fate of ammonia, reductive amination, transamination.

Chapter No.13: Photosynthesis in Higher Plants:

What do we know? Early experiments, priestley's expt, Where does photosynthesis take place, chloroplast, light reaction and dark reaction, how many pigments are involved in photosynthesis. chlorophyll a, b, x anthophylls and cerotenoids. what is light reaction- PSI, PS II, electron transport, cytochromes, Z scheme, splitting of water, cyclic and nonocyclic photophosphorylation, chemiosmotic hypothesis, where are the ATP and $NADPN_2$ used biosynthetic phase_dark reacton calvin cycle, C3 and C4 pathway, graphical representation of calvin cycle. diagrammatic representation of Hatch and Slack phathway, Kranz anatomy, PEP, Photorespiration Factors affecting photosynthesis- Law of limiting factors. Light, Co_2 conc. Temp & water.

Chapter No. 14: Respiration in Plants:

Cellular respiration, repiratory substrates, Do plants breath, glycolysis, diagrammatic representation Kreb's cycle, fermentation, anaerobic, aerobic respiration ETC and onidative phosphorylation, Role of Mitochondria, Respriratory balance sheet, amphibolic pathway, Respiratory quotient.

Chapter No. 15 : Plant Growth and Development:

Diagrammatic representation of germination of bean seed and seedling, growth, plant growth is generally indeterminate, Growth is measurable, phases of growth, growth rate, constant

linear & sig moid. Conditions for growth, differentiation, dedifferntistion, Redifferentiation. Development, sequence of developmental process inplant cell, plasticity, plant growth regulators- characterstics, discovery of regulators, physiological effects of plant growth regulators- auxins, gibberllins, cytokinins, ethylene & ABA. Photoperodism- SDP, LDP & DNP, Vernalisation.

Unit 5 Human Physiolgy:

Chapter No. 16: Digestion and absorption:

Digestive system, alimentary canal and associated & glands, Graphical representation of human digestive system, types of teeth- the codont, diphyodont, dental formula, various parts of all digestive organs, digestive glends, digestion of food- deglution, bolus, chyme goblet cells, success entericus, digestion of carbohydrates proteins, fats & nucleic acid. Absorption of digested products in forms of summary, disorders of digestive system- jaundice, vomiting, diarrhoeae, constipation & indigestion.

Chapter No. 17: Breathing and exchange of Gases.

Breathing vs respiration. respiratory organs. Human respiratory system, tract and organs, Mechanism of breathing, inspiration and expiration respiratory volumes and capacities, exchange of gases. Diagramatic representation with special emphasis on alveolar capacity transport of gases, Transport of O2 & Co2. Regulation of Respiration, Disorders of Respirotory systems- Asthma, Emphysema, oRP.

Chapter No. 18: Body fluids and circulation :

Blood- Plasma, RBC, WBC. platelets, Blood group- ABO group Rh grouping, coagulation of blood, lymph (Tissue fluid) circulatory path way, open & closed circulatory system Human circulatory system, structure of heart, cardiac cycle, electrocardiograph, double circulation, shmatic plan of blood circulation in human. Regulation of cardiac activity. Disorder of circulatory system, hypertension- CAD, Angina, Heart failure.

Chapter No.19: Excretony products nad their elimination.

Ammonotelic, ureotelic, uricotelic anim,als, huma exertory system, diagrammatic representation of organs, Kidney (L.S) & nephron, urine formation, function of Tubules, Diakemmetic representation of urine formation, Mechanism of cenc. of the filtrate through Diagrammetic representation of nephron and vasa Recta. Regulation of Kidney function, Micturition, Role of other organs in excution. Disorders of excretory system. Ureamia, RF, Renal stones, Glomerulo nephritis.

Chapter No. 20 : Locomotion and movements:

Types of movement- Role of muscles. structure of contractile proteins, mechanism of muscle contraction through diagrammatic representation, sliding filament. theory, skeletal system- axial & appendicular, skull, ear ossicle, vertibral column, sternum, ribs, limb bones and girdles. Joints & types Disorders of muscular & skeletal system- myasthenia gravis. Muscular dystrophy, Tetany, Arthritis, osteoporosis & Gout Chapter No. 21: Neural control and coordination:

Chapter No. 21 : Neural Control and coordination :

Neural system, neurons, human neural system- CNS, PNS, ANS, Neuron as structural & functional unit of neural system, generation and conduction of nerve impulse, transmission of impulses at synaptic cleft, CNS- Brains & spiral cord, Reflex action and reflex arc, sensory receptors and processing, eye and its parts, mechanism of vision, ear & its parts, mechanism of hearing.

Chapter No. 22 Chemical coordination and Integration:

Endocrine glands and harmones, human endocrive system, hypothalamus, Pitutary, Pineal, thyroid gland, Parathyoid, thymus, Adrenal gland, Pancreas, Testis, Ovary- Harmons & disorder. Hormones of Heart, kidneys and gastro interstinal tract, Mechanism of hormones action.