

Syllabus For Biology NEET

CLASS XI SYLLABUS

Unit 1: Diversity in Living World:

What is living: Biodiversity, need for classification, three domains of life, taxonomy, Binomial nomenclature.

Five kingdom of classification: salient features and classification of monera, protista, fungi into major groups lichens, viruses and viroids

Salient features and classification of plants into major groups – Algae, Bryophytes, pteridophytes, gymnosperms, angiosperms. Angiosperms classification upto class, characteristic features, examples

Salient features and classification of animals-non chordate upto phyla level and chordate upto class level

Unit 2: structural organizations in Animals and Plants:

Morphology and modifications: Tissues; anatomy and functions of different parts of flowering plants: roots, stem, leaf, inflorescence, cymose and racemose, flower fruit and seed

Animal tissues: morphology, anatomy and functions of different systems (digestive, circulatory, respiratory, nervous and reproductive) of an insect (cockroach) (brief account only)

Unit 3: Cell structure and function:

Cell theory as the basic unit of life, structure of prokaryotic and eukaryotic cells; plant cell and animal cells, cell envelope, cell membrane, cell wall, cell organelles – structure and function, endomembrane system – endoplasmic reticulum, Golgi bodies, lysosome, mitochondria, vacuoles, ribosomes, plastids, micro bodies; cytoskeleton, cilia, flagella, centrioles.

Chemical constituents of living cells: biomolecules structure and functions of proteins and carbohydrates, lipids, nucleic acids

Cell division: Cell cycle, mitosis, meiosis, and their significance

Unit 4: Plant Physiology:

Transport in plant: movement of water, gases and nutrients, Cell to cell transport- diffusion, facilitated diffusions, active transport. Plant – water relations, inhibition water potential, osmosis, plasmolysis, long distance transport of water – adsorption, apoplast, symplast, transpiration, pull, root pressure and guttation. Transpiration – opening and closing of stomata, uptake and translocation and mineral nutrition, transport of food, phloem transport, mass flow: hypothesis, diffusion of gases *brief)

Mineral nutrition: Essential minerals, macro and micro nutrients and their role. Deficiency symptoms, mineral toxicity, elementary idea of hydroponics as a method to study mineral nutrition; nitrogen metabolism, nitrogen cycle, biological nitrogen fixation

Photosynthesis: Photosynthesis as a mean of autonutrition. Site of photosynthesis take place involved in photosynthesis (elementary idea), photochemicals and biosynthetic phases of photosynthesis, cyclic and non cyclic photophosphorylation, chemiosmotic hypothesis, photorespiration C3 and C4 pathways, respiratory quotient

Respiration: exchange of gases, cellular transpiration, glycolysis, fermentation (anaerobic), TCA cycle and electron transport system, (aerobic), energy relations – no. of ATP molecules generated, amphibiotic pathways

Plant growth and development: Seed germination, phases of plant growth and plant growth rate, conditions of growth, differentiation, dedifferentiation and redifferentiations, sequence of development process in plant cell, growth regulators – auxin, gibberellin, cytokinin, ethylene, ABA, seed dormancy, vernalisation, photoperiodism.

Unit 5: Animal Physiology:

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, caloric value of proteins, carbohydrates and fats, egestion – nutritional and digestive disorders

Breathing and Respiration: Respiratory organs in animals (recall only), respiratory system in humans, mechanism of breathing and regulation in humans, exchange of gases, transport of gases & regulation in respiration, respiratory volumes, disorder related to respiration

Body fluid and Circulation: Composition of blood, blood groups, coagulation of blood, composition of lymph and its functions, 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

Excretory products and their elimination: modes of excretion, ammonotelism, ureotelism, uricotelism, human excretory system, - structure & function, urine formation, osmoregulation, regulation of kidney function, rennin-angiotensin, atrial natriuretic factor, ADH and diabetes insipidus, Roles of other organs in excretion, Disorders

Locomotion and Movement: Types of movements, ciliary, flagellar, muscular, skeletal muscle contractile proteins, and muscle contraction, skeletal system and its functions (to be dealt with relevant practical of physical syllabus), joints, disorder of muscular and skeletal system.

Neural control and Coordination: neuron and nerves, nervous system in humans central nervous system, peripheral and visceral nervous system; generation & conduction of nerve impulse, reflex action, sense organs, elementary structure and function of ears and eyes

Chemical coordination and regulation: Endocrine glands and hormones, human endocrine system, hypothalamus, pituitary, pineal, thyroid, parathyroid, adrenal, pancreas, gonads; mechanism of hormone action (elementary idea), role of hormone and regulators, hypo and hyperactivity and related disorders.

Class XII Syllabus

Unit I: Reproduction:

Reproduction in organisms: Reproduction, a characteristic feature of all organisms for continuation of species, modes of reproduction- asexual and sexual, asexual reproduction – modes – binary fission, sporulation, budding, gemmule, fragmentation, vegetative propagation in plants

Sexual reproduction in flowering plants: flower structure, development of male and female gametophytes, agencies and examples; outbreeding devices, pollen-pistil interaction, double fertilization, pollen fertilization events – development of endosperm and embryo, development of seed and formation of fruit, special modes – apomixes, parthnocarpy, polyembryony, significance of seed and fruit formation

Human Reproduction: male and female reproductive organs, microscopic anatomy of testis and ovary; Gametogenesis – spermatogenesis & oogenesis. Menstrual cycle, fertilization, embryo development in to biocyst formation, implantation, pregnancy and placenta formation(alimentary idea), parturition & lactation (elementary idea)

Reproductive health: need for reproductive health and prevention of sexually transmitted diseases (STD); birth control – need and methods, contraception and medical termination of pregnancy (MTP), Amniocentesis; infertility and assisted reproductive technologies – IVF, ZIFT, GIFT (elementary idea general awareness)

Unit 2 :

Heredity and variation: Mendelian inheritance, deviations of Mendelism – incomplete dominance, co dominance, multiple alleles and inheritance of blood group, pleiotropy, elementary idea of polygenic inheritance, chromosome theory

of inheritance, chromosomes and genes, sex determination in humans, bees, honey bees.. Linkage and cross over, sex linked inheritance – hemophilia, colour blindness, Mendelian disorders in humans – thalassemia, chromosomal disorder in humans, Down's syndrome, Turner's and Klinefelter's syndromes

Molecular basis of inheritance: Search for genetic material and DNA as genetic material; structure of DNA & RNA; DNA replication, central dogma, transcription, genetic code, gene expression and regulation -lac operon, genome and human genome project, DNA finger printing

Evolution: Origin of life, biological evolution and evidences for biological evolution from paleontology, comparative anatomy, embryology, and molecular evidence, Darwin's contribution, Modern synthetic theory of evolution, mechanism of evolution, variation (mutation and recombination) and natural selection with examples; type of natural selection, gene flow and genetic drift, Hardy – Weinberg's principle, Adaptive radiation, human evolution

Unit 3: Biology and Human Welfare:

Health and disease: Pathogens; parasites causing human diseases (malaria, filariasis, ascariasis, typhoid, pneumonia, common cold, amoebiasis, ring worm); basic concepts of

immunology – vaccines, cancer, HIV and AIDS; Adolescence, drug and alcohol abuse

Improvement in food production; plant breeding, tissue culture, single cell protein, biofortification, apiculture & animal husbandry

Microbes in human welfare: In household food processing; industrial production, sewage treatment, energy generation and as biocontrol agents and fertilizers

Unit 4: Biotechnology and its Application:

Principles and process of Biotechnology: Genetic engineering (Recombinant DNA technology)

Applications of Biotechnology in health and agriculture: human insulin & vaccine production, gene therapy, genetically modified organisms – Bt crops, transgenic animals, biosafety issues, biosafety issues, biopiracy and patents

Unit 5: Ecology & Environment:

Organisms & environment: habitat & niche; population & ecological adaptations; population interactions – mutualism, competition, predation, parasitism; population attributes – growth, birth rate & death rate, age distribution.

Ecosystem: Patterns, components, productivity and decomposition. Energy flow; Pyramids of numbers, biomass &

energy; nutrient cycling (carbon & phosphorous); Ecological succession, Ecological services – carbon fixation, pollination, oxygen release.

Biodiversity & its conservation: Concept of biodiversity; patterns of biodiversity; importance of biodiversity; loss of biodiversity; biodiversity conservations; hotspots, endangered organisms, extinction, red data book, biosphere reserves, National parks & sanctuaries.

Environmental issues: Air pollution & its control; Water pollution & its control; Agrochemicals & its effects; Solid waste management; Radioactive waste management; Green house effect & global warming; Ozone depletion; deforestation; Any three case studies as success stories addressing environmental issues.