SYLLABUS OF ALLEN - AIIMS & NEET-UG

PHYSICS

Section - 1

Ray optics and optical Instruments, Wave optics (Interference, Diffraction & Polarisation), Nature of Light, Photometry

Gravitation, The Universe, Atomic and Nuclear Physics

Digital Electronics (Logic Gates), Vaccum Tube Electronics,Semiconductor Electronics, Principle of Communication

Rotational Motion, Elasticity, Surface Tension, Viscosity and Hydraulics

Kinetic theory of gases, Heat and thermodynamics, Mode of Heat Transfer, Thermometry, Thermal Expansion, Humidity, Dew point

Oscillations (SHM, damped oscillations, forced oscillation & Resonance), Wave Motion, Doppler's Effect

Section - 2

Basic mathematics used in physics, vectors, Units, Dimensions and Measurement, Motion in One dimension, Motion in Two Dimension (Projectile Motion & Circular Motion)

Laws of motion and friction, Work, Energy, Power and Conservation laws, Centre of mass

Electrostatics, Capacitors

Current electricity,Thermal and Chemical effects of current

Magnetic effect of current and Magnetism

Electromagnetic Induction (EMI), Electromagnetic Waves (EMW), Alternating current (AC) and LC Oscillations

CHEMISTRY

Section - 1

d Block Elements, Coordination Chemistry, f-Block Elements, Organo Metalic Compounds.

s Block ElementsChemistry of Lighter Elements. p-Block Elements.

Atom, Molecule and Chemical Arithmatic, State of Matter (Solid State, Liquid & Gaseous State), Redox Reactions, Chemical Thermodynamics and Energetics.

Electrochemistry, Surface Chemistry

Chemical Equillibrium, Chemical Kinetics

Ionic Equilibrium, Acid-Base (Concepts), pH-Buffer Solution, Indicators, Volumetic Analysis, Solution

Section - 2

Organic Chemistry-some Basic Principle, Nomenclature, Isomerism, Classification of Organic Compounds, Reaction Mechanism

Alkane, Alkene, Alkyne, Aromatic Hydrocarbon.

Halogen Derivatives, Mono, Di & Tri Hydric alc., Phenol, Ether, Carbonyl Compound, Carboxylic acid & its Derivatives

Amine, Aniline, Nitro Benzene, Nitro Alkane, Cyanides, Isocyanides, Environmental Chemistry, Biological process, Polymers, Chemistry in action, Purification of Organic Compounds.

Atomic Structure, Nuclear Chemistry, Periodic Table & Periodicity in Properties. Heavier Metals occurance and Extraction

Chemical Bonding, Hydrogen and its Compound

BIOLOGY

Section - 1

Animal Tissues, MAMMALIAN SYSTEMS - Digestive System, Vitamins, Nutritional Imbalance and Deficiency Diseases,Excretory System, Limb Muscles,Reproductive System, Embryology.

MAMMALIAN SYSTEM - Respiratory System, Integumentary System, Circulatory System,Skeletal System.

MAMMALIAN SYSTEM - Endocrine Glands, Nervous System, Eye and Ear.

CONTINUITY OF LIFE : HEREDITY AND VARIATION : Introduction Mendel's Experiment with pea and idea of factors, Mendel's law of inheritance incomplete dominance/Co-dominance extranuclear gene (Cytoplasmic inheritance) viral genes linkage (genetic) map. Sex determination and sex linkage, gene manipulation (Genetic Engineering) Viral gene, Bacterial chromosome, Plasmid. Gene expression (Lac operon), gene regulation molecular basis of differentation, gene intereaction, polygenic inheritance multiple allel/Lethal gene/special type of gene, paedigree analysis, cloning, PCR technology, DNA fingerprinting population genetics,Genetic material and it's replication, genetic code transcription and translation.

THE LIVING WORLD : Nature and scope of Biology . Methods of Biology. Our place in the universe. Laws that govern the universe and life. Level of organisation. Cause and effect relationship.

Being alive. What does it mean ? Present approach to understand life processes molecular approach; life as an expression of energy; steady state and homeostasis; self duplication and survival; adaptation; death as a positive part of life. An attempt to define life in the above.

Origin of life and its maintenance. Origin and diversity of life. Physical and chemical principles that maintain life processes, the living crust and interdependence. The positive and negative aspects of progress in biological sciences. The future of the living world, identification of human responsibility in shaping our future.

ORIGIN AND EVOLUTION OF LIFE : Living and non-living, chemical evolution, organic evolution; Oparin ideas, Miller-Urey experiments. Interrelationship among living organisms and evidences of evolution : fossil records including geological time scale, Morphological evidence-homology, vestigial organs, embryological similarities and biogeographical evidence.

Darwin's two major contributions. Common origin of living organisms and recombination as sources of variability, selection acts upon variation, adaptation (Ledergerg's replica plating experiment for indirect selection of bacterial mutants), reproductive isolation, speciation. Role of selection change and drift in determining genetic composition of population. Selected examples : industrial melanism; drug resistance, mimicry, malaria in relation to G-6-PD deficiency and sickle cell disease. Human evolution : Paleontological evidence, man's place among mammals. Brief idea of Dryopithecus, Australopithecus, Home erectus, H.neanderthalensis, Cromagnon man and Homosapiens. Human chromosomes, similarity in different racial groups. Comparison with chromosomes of nonhuman primates to indicate common origin; Cultural vs. biological evolution.

MUTATION - Their role is speciation. Their origin in speciation, their origin in organisms .

APPLICATION OF BIOLOGY-I : Introduction, Role of Biology in the amelioration of human problems. Domestication of plant- a historical account, improvement of crop plants; Principles of plant breeding and plant introduction. Use of fertilizers and economic and ecological aspects.

Use of pesticides : advantages and hazards. Biological methods of pest control. Crops today, Current concerns, gene pools and genetic conservation. Underutilized crops with potential uses of oilseeds, medicines, beverages, spices, fodder, New crops-Leucaena (Subabul), Jojoba, Guayule, winged bean, etc. Bio-fertilisers-green manure, crop residues and nitrogen fixation (symbiotic, non symbiotic). Applications of tissue culture and genetic engineering in crops.

Domestication and introduction of animals, Livestock, poultry, fisheries (fresh water, marine, aquaculture). Improvement of animals : principles of animal breeding. Major animal diseases and their control. Insects and their products (silk, honey, wax and lac).

APPLICATION OF BIOLOGY-II : Bioenergy-biomass, wood (combustion, gasification, ethanol). Cow dung cakes, gobar gas, plants as sources of hydrocarbons for producing petroleum, ethanol from starch and lignocellulose, Biotechnology, a brief historical account-manufacture of cheese, yoghurt, alcohol yeast, vitamins, organic acids, antibiotics, steroids, dextrins. Scaling up laboratory findings to Industrial production. Production of insulin, human growth hormones, interferon.

Communicable diseases including STD and diseases spread through 'blood transfusion (hepatities, AIDS, etc) Immune response, vaccines and antisera. Allergies and Inflammations. Inherited diseases and dysfunctions, sex-linked diseases, genetic incompatibilities, and genetic counselling. Cancer- major types, causes, diagnosis and treatment Tissue and organ transplantation. Community health services and measures. Blood banks, Mental health, smoking, alcoholism and drug addiction-physiological symptoms and control measures. Industrial wastes, toxicology, pollution-related diseases. Biomedical engineering-spare parts for man, instruments for diagnosis of diseases and care. Human population related diseases. Human population growth problems and control, inequality between sexes, control measures; test-tube babies, amniocentesis, Growth, Repair and Ageing.

Section - 2

UNITY OF LIFE : Cell structure, Cell division, PROTOPLASM - Small molecules and Macro molecules.

DIVERSITY OF PLANT LIFE : Scientific Nomenclature, Binomial System, ICBN, Trinomial System, Taxonomic Hierarchy (taxon), Species concept, Types of Classification, Botanical Gardens and Herbaria, History of Plant Taxonomy, Two Kingdom, Four Kingdom and Five Kingdom Systems of Classification, Diagnostic Characters of Procaryotes, Bacteria, Virus, Mycoplasma

Diagnostic Characters of Thallophyta (Algae and Fungi), *Ulothrix, Spirogyra, Albugo, Mucor*, Lichen and Mycorrhiza, Diagnostic Characters of Bryophyta, *Riccia, Funaria*

Diagnostic Characters of Pteridophyta, *Pteridium, Selaginella*, Diagnostic Characters of Spermatophyta, Pinus, Branches of Botany

DIVERSITY OF ANIMAL LIFE : Classification of Animals (Protozoa to chordata upto Mammalia). Brief knowledge of *Amoeba, Plasmodium, Hydra, Ascaris*, Earthworm and Cockroach.

ORGANISMS AND ENVIRONMENT : Origin and concept of species, population; interaction between environment and populations, community. Biotic community, interaction between different species, biotic stability, changes in the community, succession. Ecosystem; Interaction between biotic and abiotic components; major ecosystems, man made ecosystem-Agroecosystem. Biosphere; flow of energy, trapping of solar energy, energy pathway, food chain, food web, biogeochemical cycles, calcium and sulphur, ecological imbalance and its consequences. Conservation of natural resources; renewable and non-renewable (in brief). Water and land management, wasteland development. Wild life and forest conservation; causes for the extinction of some wild life, steps taken to conserve the remaining species, concept of endangered species-Indian Examples, conservation of forest; Indian forests, importance of forests, hazards of deforestation, afforestation, Environmental pollution; air and water pollution, sources, major pollutants of big cities of our country, their effects and methods of control, pollution due to nuclear fallout and waste disposal, effect and control, noise pollution; sources and effects. Ecological adaptations-Hydrophytes and Xerophytes.

Plant tissues, Primary Structure of Root, Stem and Leaves, Anomalous Pri. Structure, Sec. growth.

Morphology of Angiosperms - Families of Angiosperms, Important Characters and Economic Importance of Cruciferae, Malvaceae, Solanaceae, Leguminosae, Liliaceae, Gramineae, Compositae, Cucurbitaceae and Ranunculaceae. Reproduction and Development of Angiosperms (Life History of Angiosperms). Seed dormancy and Seed Germination. Medicinal Plants.

Mineral and Water relation of Plants, Photosynthesis, Mineral Nutrition, Respiration, Enzymes, Growth, Growth Hormones, Plant Movements.