

ZOOLOGY
(DEGREE STANDARD)

CODE NO: 270

UNIT I

Non-Chordata: General organisation - Classification with diagnostic features upto classes. Evolutionary relationship among taxa, symmetry.

Protozoa: Structure, reproduction and life history of Amoeba, Paramecium, Trypanosoma, Plasmodium, Monocystis, Leishmania - locomotion, nutrition, economic importance. Porifera: Sponges canal system, skeleton, reproduction and economic importance.

Coelenterata: Diploblastic organization - life history of Obelia and Aurelia, Metagenesis - Polymorphism in Hydrozoa. Corals and Coral formation - relationships of Cnidaria and Acnidaria. Helminthes: Structure and life history of Planaria, Fasciola, Teania, Ascaris and Wuchereria - parasitic adaptations - Helminthes in relation to man.

Annelida: Nereis, earthworm and leech - Coelom and metamerism - modes of life in polychaetes. Onychophora: Structure, affinities and distribution of Peripatus.

Arthropoda: Prawn, Scorpion and Cockroach - Larval forms and parasitism in Crustacea - Mouth parts, vision, respiration and excretion. Metamorphosis and social life in insects.

Mollusca: Freshwater mussel, Pila, Sepia. Echinodermata: General organisation - Water vascular system. Larval forms and affinities.

UNIT II

Prochordata: Amphioxus, Balanoglossus - Ascidian retrogressive Metamorphosis, neoteny and affinities.

Chordata: General Organisation - Characters, Outline, classification upto class level.

Pisces: Locomotion, migration, respiration, Parental care, economic importance; structure and affinities of dipnoi.

Amphibia: Origin of amphibians – Respiration, Parental care - South Indian amphibians.

Reptiles: Origin - Conquest of land - adaptations to live on land, adaptive radiation - Temporal Vacuities - identification of poisonous and non-poisonous snakes - poison apparatus – South Indian snakes.

Birds: Origin - flight adaptations - mechanism of flight - double respiration - migration - Flightless birds.

Mammals: Dentition, skin derivatives - distribution - adaptive radiation. Protothria, Metatheria, eutheria and their Phylogenetic relationships.

UNIT III

Cell and Molecular Biology: Cellular Organelles - Structure and function - Plasma membrane, Mitochondria, Golgi bodies, Endoplasmic reticulum and Ribosomes – Nucleus and Nucleolus. Cell division, cell cycle; Chromosomes - DNA structure and function, replication of DNA, Genetic code - RNA and protein synthesis. Gene expression, regulation of gene expression in prokaryotes and Eukaryotes. Recombinant DNA - Genetic engineering, its uses in agriculture, industries and medicine.

UNIT IV

Genetics: Mendelian concepts, multiple alleles, blood groups, Rh-factor. Linkage, crossing over - mutation (Natural and induced); Sex chromosomes, Sex determination and Sex Linked inheritance - Chromosome number and form ploidy - cytoplasmic inheritance – Karyo types – chromosome mapping, Normal and abnormal genetic disorders; Bio-chemical genetics – Eugenics. Human genome Project. Bio-statistics: Mean, Median and standard deviation. Bio-informatics: DNA and Protein sequence analysis, Prediction functional structure, protein folding, Phylogenetic tree construction.

UNIT V

Bio Chemistry: Bio-molecules, Structure and role of carbohydrates, lipids, proteins and amino acids - Glycolysis and kreb's cycle - oxidation, reduction - oxidative phosphorylation - energy conservation and release, cyclic AMP, ATP; enzymes – mechanism; Hormones-classification biosynthesis and function.

Physiology: With reference to mammals, digestion, nutrition, balanced diet - assimilation, intermediary/metabolism. Composition of blood - Coagulation, Transport of oxygen, Carbon dioxide, Blood pigments, Mechanism of respiration. Muscles, mechanism of muscle contraction. Temperature regulation, Acid base balance and homeostasis, Nerve impulses and conduction, neurotransmitters.

Receptors- photo, phono and chemo reception. Nephron and urine formation. Endocrine glands, testis, ovary and pituitary organs and their inter relationship. Physiology of reproduction in humans, Hormonal development in insects, pheromones and their uses. Bioluminescence. Biological clock. Physiology of immune response- Antigens – Immuno globulins - humoral and cell mediated immunity. T and B cells, mechanism of antibody formation - Immunodeficiency diseases; vaccination.

UNIT VI

Development Biology: Gametogenesis – fertilization, Parthenogenesis, type of eggs – blastulation, cleavage and gastrulation in frog and chick. Morphogenetic movements – organizer, potency, organogenesis with reference to ear, eye, kidney, brain. Formation and fate of extra embryonic membranes in chick.

Placentation- types, functions. - metamorphosis in Frog – Regeneration. Stem cells- sources, types and their uses in human welfare, IVF, embryo transfer and cloning - Aging and senescence.

UNIT VII

Environmental Biology: Biotic and abiotic factors, their role, Intra and inter specific association. Biogeochemical cycles. Ecosystem- structure and function of ecosystems, types of ecosystems. Ecological succession, Community structure - Stratification. Population and Population dynamic - Habitat ecology. Wild life, need for conservation management and methods of conservation. Sanctuaries with special reference to Tamil Nadu. Pollution - air, water and land - Perspective policy planning for the environment.

UNIT VIII

Evolution: Origin of life - Evolutionary theories - Contributions of Lamarck, Darwin and De Vries - present status of Darwinism and Lamarckism - modern synthetic concept - Hardy Weinberg Law - Polymorphism and mimicry in evolution. Speciation: evolutionary species concept – Isolation, mechanisms and their role, role of hybridization in evolution. Fossils and Fossilization, Indian fossils, Geological time scale. Origin and evolution of horse and man - Culture evolution and Biochemical evolution.

Animal distribution: Zoogeographical distribution - Continental and island fauna - Continental drift - Discontinuous distribution, adaptive radiation. Natural resources and their conservation. Alternative sources of energy.

UNIT IX

Economic Zoology: Parasitism and Commensalism - Protozoan Parasites and diseases, helminthes parasites and diseases of man and domestic animals; Beneficial and harmful insects. Insect pests on crops and stored products - Control methods. IPM. Sericulture, apiculture, lac culture, seaweed culture, vermiculture, - oyster culture and pearl formation, poultry, pisciculture and induced breeding, Shell fisheries, Aquaculture practices in Tamil Nadu and their impact on the environment and on agriculture.

UNIT X

Instrumentation and Bio-techniques: Microscopy-Phase contrast, fluorescent, TEM, SEM. Colorimetric techniques, Centrifugation techniques. Fixation, staining techniques. Electrophoretic techniques: Principles, AGE and PAGE. DNA finger printing, RFLP, RAPD and AFLP.

