

**ZOOLOGY—CODE NO. (18)****I. Cell structure and function:**

- (a) Prokaryote and eukaryote.
- (b) Structure of animal cell, structure and functions of cell organelles.
- (c) Cell cycle—mitosis, meiosis.
- (d) Structure and contents of nucleus including nuclear membrane, structure of chromosome and gene, chemistry of genetic components.
- (e) Mendel's laws of inheritance, linkage and genetic recombination; cytoplasmic inheritance.
- (f) Function of gene: replication, transcription and translation; mutations (Spontaneous and artificial); Recombinant DNA: principle and application.
- (g) Sex determination in *Drosophila* and man; sex linkage in man.

**II. Systematics :**

- (a) Classification of non-chordates (up to sub-classes) and chordates (up to orders) giving general features and evolutionary relationship of the following phyla:  
  
Protozoa, Porifera, Coelenterata, Platyhelminthes, Nematelminthes, Annelida, Arthropoda, Mollusca, Echinodermata, Minor phyla (Bryozoa, Phoronida and Chaetognatha) and Hemichordata.
- (b) Structure reproduction and life history of the following types:  
  
*Amoeba, Monocystis, Plasmodium, Paramaecium, Sycon, Hydra, Obelia, Fasciola, Taenia, Ascaris, Neanthes, Pheretima, Hirudinia, Palaemon, Buthus, Periplaneta, Lamellidens, Pila, Asterias and Balanoglossus.*
- (c) Classification of chordates (up to orders), giving general features and evolutionary relationship of the following: Protochordata; Agnatha; Gnathostomata—Pisces, Amphibia, Reptilia, Aves and Mammalia.
- (d) Comparative functional anatomy of the following based on type animals (*Scoliodon, Rana, Calotes, Columba and Oryctolagus*): integument and its derivatives, endoskeleton, digestive system, respiratory system, circulatory system including heart and aortic arches, urinogenital system; brain and sense organs (eye and ear); endocrine glands and other hormone producing structures (pituitary, thyroid, parathyroid, adrenal, pancreas, gonads) their function.

**III. Vertebrate Physiology and Biochemistry :**

- (a) Chemical composition of protoplasm; nature and function of enzymes, vitamins, their sources and role; colloids and hydrogen ion concentration; biological oxidation, electron transport and role of ATP, energetics, glycolysis, citric acid cycle; vertebrate hormones; their type, sources and functions; pheromones and their role.
- (b) Neuron and nerve impulse—conduction and transmission across synapses; neurotransmitters and their role, including acetyl cholinesterase activity.
- (c) Homeostasis; osmoregulation; active transport and ion pump.
- (d) Composition of carbohydrates, fats, lipids and proteins; steroids.

**IV. Embryology :**

- (a) Gametogenesis, fertilization, cleavage; gastrulation in frog and chick.
- (b) Metamorphosis in frog and retrogressive metamorphosis in ascidian; extra-embryonic membranes in chick and mammal; placentation in mammals; Biogenetic law.

**V. Evolution :**

- (a) Origin of life; principles, theories and evidences of evolution; species concept.
- (b) Zoogeographical realms, insular fauna; geological eras.
- (c) Evolution of man; evolutionary status of man.

**VI. Ecology, Wildlife and Ethology :**

- (a) Abiotic and biotic factors; concept of ecosystem, food chain and energy flow; adaptation of aquatic, terrestrial and aerial fauna; intra-and inter-specific animal relationships; environmental pollution: types, sources, causes, control and prevention.
- (b) Wildlife of India; endangered species of India; sanctuaries and national parks of India.
- (c) Biological rhythms.

**VII. Economic Zoology :**

- (a) Beneficial and harmful insects including insect vectors of human diseases.
- (b) Industrial fish, prawn and molluscs of India.
- (c) Non-poisonous and poisonous snakes of India.
- (d) Venomous animals—centipede, wasp, honey bee.
- (e) Diseases caused by aberrant chromosomes/genes in man; genetic counselling; DNA as a tool for forensic investigation.