

**Tamil Nadu Public Service Commission**  
**Syllabus**  
**Zoology and Medical Entomology**  
**(PG Degree Standard)**

**Code: 567**

**Unit I (20 Questions)**

General Organization of Non-Chordate and Chordate - Classification upto Class Level - Structure of Cell - Cellular Organization - Membrane, Intercellular - Structure and Function - Cellular organelles. Chromosomes - Types and Organization of Genes. Cell Division, Cell Cycle and Regulation. Cell Communication and Cell Signaling. Structure of DNA and RNA. Genetic Code, Replication and Protein Synthesis.

Bio-Chemistry: Structure of Carbohydrates, Amino Acids, Proteins, Lipids - Glycolysis and Krebs cycle - Oxidation, Reduction - Oxidative Phosphorylation - Energy conservation and release - Cyclic AMP - ATP - Saturated and Unsaturated Fatty acids - Cholesterol - Enzymes, Mechanism, Action and Kinetics. Vitamins, Trace elements and Micronutrients and Co-enzymes. Antioxidant enzymes, Hormones - Classification, Biosynthesis and functions.

**Unit II (20 Questions)**

Physiology: With reference to Mammals digestion, Role of Salivary gland, Liver, Pancreas and Intestinal Glands in Digestion, Nutrition, Balanced Diet in Man-Assimilation, Intermediary Metabolism. Composition of Blood - Coagulation - Mechanism of Respiration. Muscles - Mechanism of Muscle Contraction, Temperature Regulation, Acid, Base Balance and Homeostasis. Nerve Impulse Conduction, Neurotransmitters - Receptors, Photo, Phono and Chemo Reception. Nephron and Urine formation. Endocrine glands - Testis, Ovary and Hypothalamus - Hypophyseal gonadal relationship. Pheromones and Reproduction. Bioluminescence.

**Unit III (20 Questions)**

Immunology: Immune responses - Primary, Secondary and Theories. Immunity types - Innate - Acquired - Cell mediated and Humoral immunity - Autoimmunity, Types of Antigens and Immunoglobulins. Vaccinations - ELISA, RIA Techniques. Developmental Biology: Gametogenesis, Fertilization: Significance, Polyspermy Gynogenesis, Androgenesis, Parthenogenesis, Differentiation - Nuclear and Chemical factors, Inductors and Organizers. ART - Stem cell biology - Sources, Types and Applications.

**Unit IV (20 Questions)**

Resource Ecology and Management, Renewable and Non-Renewable natural resources. Energy resources - Conventional and Non-Conventional. Bioremediation. Habitat Ecology. Wild Life conservation, Management and Acts. Air, Water, Soil, Sound pollutions. Laws related to Environment and Environmental Protection Act. Space Ecology and Radiation Ecology. Climate Changes and Global Warming.

**Unit V (20 Questions)**

Medical Entomology - Scope and Definition

Vectors of Medical Importance - Classification, Types of vectors (Mosquitoes, Sand fly, House fly, Bed bug, Human lice, Fleas) and their Identification, Epidemiology, Life cycle, Bionomics, Mechanism of diseases transmission. Protozoan Parasites and Diseases - Helminths, Parasites and Diseases on Man and Domestic Animals.

**Unit VI (20 Questions)**

Vector Borne Diseases spread through Mosquitoes - Malaria, Filariasis, Viral Encephalitis (Japanese Encephalitis, West Nile) Dengue, Chikungunya, Zika and Yellow fever.

## **Unit VII (20 Questions)**

Vectors from class Arachnida and Crustacea (Ticks, Mites, Cyclops) and their Identification, Epidemiology, Life cycle and Diseases transmitted.

Vector borne diseases spread through Houseflies - Typhoid, Paratyphoid, Dysentery, Cholera and Amoebiasis.

Vector borne diseases spread through Sandfly - Kala azar, Oriental sore and Sleeping sickness.

Vector borne diseases spread through Louse - Epidemic typhus, Relapsing fever and Trench fever.

Vector borne diseases spread through Rat flea - Bubonic Plague and Endemic typhus.

Vector borne diseases spread through Hard and Soft ticks, Trombiculid Mite and Cyclops.

## **Unit VIII (20 Questions)**

Classification of Insecticides of Public Health Importance (Larvicides and Adulticides) Mode of Action, Medical problems associated with Insecticides use. Occupational and accidental Poisoning of various Insecticides and their antidotes.

National Health Programmes related to vector control and prevention of diseases – National Vector Borne Disease Control Programme (NVBDCP).

## **Unit IX (20 Questions)**

Bio-Physics: Microscopy-Principles of Phase, Electron Microscope, Polarising, Fluorescent, Interference Microscope. Photo - Electric Calorimetry, Freeze drying - Freezing, Microtome, Fixation, Staining techniques. X-ray - Diffraction, Ultra - Violet and Infra Red, Spectroscopy and Autoradiography. Instrumentation methods: Centrifugation, Electrophoretic and Chromatographic Techniques. PCR, DNA Finger Printing, RFLP, RAPD, AFLP, FISH and GISH.

## **Unit X (20 Questions)**

Bio-Statistics: Collection of data. Primary and Secondary - Compiling and Sampling Methods - Frequency Distribution, Frequency Tables - Diagrammatic Representation - Variables - Measures of Central tendency. Standard deviation, Standard error - Correlation, Regression, Regression Analysis - Student's "t" Test and Chi-square Test. Bio-informatics: DNA and Protein Sequence Analysis, Prediction Functional Structure, Protein Folding, Molecular Docking, Metabolic and Regulatory Networks, General Challenges and Applications. SwissProt, NCBI: GENBANK, BLAST: Multiple Sequence Alignments.

Dated: 28.04.2025