

SYLLABUS FOR M.Sc. ENTRANCE IN ZOOLOGY-2016-

UNIVERSITY OF KASHMIR, SRINAGAR

Total Marks : 60

Unit 1: Life and Diversity of Animals- I

Protozoa: General characters: Classification upto orders: Morphology, Life Cycle and Pathogenicity of *Plasmodium*, *Leishmania* and *Giardia*. Porifera: General characters, Classification upto orders: Type study: *Leucosolenia*; Canal systems; Skeletal elements
Coelenterata: General characters, Classification upto orders: Type study: *Obelia*; Corals and Coral reefs; Polymorphism. Helminths: General characters, Classification upto orders: Morphology, Life Cycle and Pathogenicity of *Fasciola hepatica*, *Taenia saginata* and *W. bancrofti*.

Unit 2: Life and Diversity of Animals –II

Annelida: General characters, Classification upto orders: Economic importance: Type study *Pheritima*, Metamerism Arthropoda: General characters, Classification upto orders: Type study: Prawn Mollusca: General characters, Classification upto orders: Economic importance and Shell in Molluscs . Echinodermata: General characters; Classification upto orders. Type study: Star fish, Echinoderm larvae.

Unit 3: Developmental Biology

Gametogenesis and Fertilization
Types and patterns of cleavage
Process of Blastulation and Gastrulation in frog and chick
Regeneration, primary organizer and elementary knowledge of extra embryonic Membranes
Concept of competence, Determination and Differentiation.

Unit 4: Evolution and Wildlife management

Concept of Species and Speciation
Modern concept of organic evolution
Phylogeny of horse
Wildlife management, conservation and control with reference to wildlife of J &K
Wildlife protection Act. Endangered species of India & status of mammals.

Unit 5: Economic Zoology

Aquaculture: Trout culture methods
Sericulture: Rearing & diseases of silkworm.
Apiculture: Bee-keeping-methods & diseases.
Agriculturally & Medically important insects.
Economic importance of helminthes with special reference to roundworms.

Unit 6: Animal Diversity

Origin of Chordates
General characters and classification up to order level of following:

Protochordates :(urochordates and cephalochordates)
Pisces, Amphibia ,Reptiles, Aves and Mammals

Unit 7: Comparative Anatomy of vertebrates:

Integumentary system: Integument & its derivatives: (Scales, feathers, hair, beaks and glands) Digestive System :Comparative account of alimentary canals of vertebrates. Dentition in Mammals. Respiratory system :Aquatic and Terrestrial respiration. Air sacs in birds. Circulatory System :Evolution of heart & Aortic Arches. Nervous System :Comparative account of brain. Urinogenital System: Comparative account of kidneys and their ducts. Gonads and their ducts. Endocrine system :Comparative account of vertebrate endocrine glands (Elementary Idea)

Unit 8: Physiology:

Digestion: Physiology of digestion. Types of digestion with special reference to ruminants. Respiration: Types of respiratory pigments and oxygen dissociation curves. Excretion: Formation & excretion of nitrogenous wastes. Reproduction: Reproductive cycles in mammals. Physiology of muscle contraction with special reference to skeletal muscle. Physiology of vision & hearing. Chemical nature of hormones & their modes of action (pituitary, thyroid, adrenalin).

Unit 9: Genetics:

Mendelian and Post Mendelian inheritance Linkage, Crossing over, Linkage maps. Mutation: Chromosomal aberrations, point mutations. Molecular genetics: Organization of genetic material, Structure of DNA, Replication in prokaryotes and eukaryotes, Transcription and posttranscriptional modification, Translation. Human genetics: Chromosomal and single gene disorders with special reference to sickle cell anemia, hemophilia and phenylketonuria. Population genetics : Hardy Weinberg's law, factors affecting Hardy Weinberg's law, Human genetics.

Unit 10: Animal Behavior:

Social organizations
Animal communications.
Parental care in amphibians.
Migration in fishes and birds.
Biological clocks.

Unit 11: Immunology:

Cells and tissues of immune system, Lymphatic system.
Innate immunity and Acquired immunity.
Immunoglobulins, formation of antibodies.
Antigen antibody reactions.
Autoimmune diseases.
Practical aspects of immunology (vaccines)
.MHC genes.

Unit 12: Biotechnology:

Microbial culture (techniques and management).
Recombinant DNA technology and its applications.
Vectors and their role.

Gene libraries (C-DNA & genomic libraries)
PCR, S-blotting, N-blotting, W-blotting.
Somatic cell hybridization.

Unit 13: Cell Biology:

Energy transduction, role of mitochondria and chloroplast.
Cell junctions, cell adhesions and extracellular matrix.
Ionic basis of membrane excitability.
Protein sorting.
Cell signaling.
Vesicular traffic in Secretary and endocytic pathway.

Unit 14: Biostatistics and Ecology:

Population characteristics.
Competition- inter & intra specific
Measurement of central tendencies. (Mean, Mode, Median)
Mean deviation, standard deviation, variation.
Probability test, Student T-test, Chi-square test.

Unit 15: Biochemistry:

Carbohydrates: Aerobic and anaerobic metabolisms. Pyruvate formation. TCA cycle and electron transport system. Proteins: Degradation of amino acids. Deamination and transamination. Ornithine cycle and its relation with Krebs's cycle. Lipids: Hydrolysis of lipids. Oxidation of fatty acids with special reference to α , β , ω Ketosis.

(Professor Fayaz Ahmed)

Head of the Department