

M.Sc. Examination ZOOLOGY

M.Sc. (Previous)

There shall be five theory papers of 100 marks each and practical tests consisting of two parts carrying 250 marks (125 marks each.) The candidate must have to obtain minimum pass marks in the aggregate of theory papers and in the aggregate of practical examination separately.

Paper-I : Non-Chordate

Note : Eight questions have to asked out of which five questions have to be answered.

General survey, characteristics and classification of nonchordates phyla (Protozoa-Echinodermata).

Reproduction and Nutrition in Protozoa.

Affinities and canal, system in sponge.

Parasitism in helminthes.

General organization or Rotifers.

Segmental organs in Annelida.

Adaptive radiation in Polychaeta.

Organization and affinities of onychophora.

Parasitism in Crustacea.

Larval forms in crustacea. and their evolutionary significance.

Mouth parts of Insects.

Biology of harmful insects (Lepisma, Tribolium, Pediculus, Cimix and Dermestes.)

Elements of insect control.

Adaptive radiation in Molluscs.

Torsion in Gastropoda.

Larval forms in Echinodermata. and their evolutionary significance.

Affinities of Echinodermata.

Paper-II

Animal Ecology, Taxonomy and Evolution.

Note : Answer five question out of eight questions given in the paper.

Animal Ecology :

Scope of Ecology and its relationship with other science.

Principles/and concepts pertaining to energy and energy flow in ecological systems.

Principles pertaining to limiting factors.

Population, its organisation, structure growth, forms, density and control.

Community and its organization.

Predation, mutualism and commensalism.

Terrestrial, Marine and Fresh water (Lotic and lentic) ecology.

Habitats with particular reference to volent deep sea, and desert adaptation noise, radioactive and thermal pollution and their effects.

Taxonomy and Evolution :

Taxonomy, its history and function, taxonomic categories, species concept. Genes in population, hardyweiberg law, natural selection, synthetic theory of evolution.

Isolation mechanism.

Micro and macro evolution.

Loss of genetic variation.

Paper-III

Cell Physiology and Biochemistry

Note : The candidate have to answer five questions out of eight question put in question paper.

Prokaryotic and Eukaryotic cells, organization of different animal cell, Biological membranes and their properties, their ultrastructure, chemistry and transport mechanism involved their in.

Cell cycle.

Osmosis, diffusion, Active transport, Gibbs nan membrane equilibrium.

Electrolytes, pH and pK, Buffers, Hinderson Hasselbacl. Equation for buffers.

General structure, classification and properties of carbohydrates, lipids and proteins.

Enzymes : Classification, mechanism of action, factors affecting (influencing) enzymatic action, michaelis Menton equation, co-enzymes and Isoenzymes.

Vitamins : Classification and biological significance.

Nucleic acids : Structure, function and replication i.e. synthesis of DNA. Genetic code. detailed mechanism of Protein Synthesis.

Metabolic Pathways : Detailed study of Glycolysis, Kreb's cycle, Electron transport mechanism in Mitochondria and their role in Oxidation and Oxidative Phosphorylation.

Paper - IV

Mammalian Physiology :

Note : The candidate have to answer five questions out of eight questions given in the question paper.

Nervous System : Generation and conduction of nerve impulse, transmission of nerve impulses along axon and synapse, Neurohormones.

Muscles : Types, ultrastructure, chemistry, mechanism and regulation of muscle action.

Nutrition : Digestion of carbohydrate, protein and lipids. Regulation of secretion of digestive fluids absorption of digested food materials.

Circulation : Physiological categories of heart, cardiac cycle and its regulation, Blood groups, coagulation, structure and function of haemoglobin, Regulation of heart beat.

Respiration : Mechanism and regulation of breathing and metabolic rate. O₂ and CO₂ transport, respiratory pigments, haemoglobin-oxygen equilibrium (Bohr's effect.)

Excretion : Role of nephron in urine formation, acid-base balance and nitrogen excretion.

Temperature Regulation : Mechanism of homeothermy, poikilothermy and thermal acclimation.

Paper-V

Cytogenetics and Biostatistics

Note : The candidate have to answer five questions out of eight question given in the paper.

Cytogenetics :

Chromosome structure and their behaviour in cell division. Nucleosome concept. Polytene and lampbrush giant chromosomes. Heterochromatin and Euchromatin.

Imprinting of genes, chromosomes and genomes Human Genome. DNA finger Printing.

Methods of Gene cloning.

DNA and Gene Library and its importance.

Linkage and crossing over.

Sex Determination.

Chromosomal aberrations and their significance.

Gene : its chemical nature and replication.

Mechanism of gene action.

Mutation and their artificial production.

Cytoplasmic inheritance.

Biostatistics : Collection of biological data, its kind and classification Elementary ideas of probability, Measurement of central tendency; and variation in data, Null Hypothesis and tests of significance (t-test an chi-square tests).

Practicals :

The contents of practicals as given for the earlier years will be applicable as such but the distribution of the marks have to be followed as followings :-

Duration : 6 hrs.

Distribution of the marks :-

Laboratory Course - I

Major Dissection	:	12 marks
Preparation (S)	:	10 marks
Ecological Exercise	:	10 marks
Biological chemistry exercise	:	20 marks
Viva-Voice	:	10 marks
Spotting (12 spots)	:	24 marks
Sessional performance, Class record,	:	
Tour/Excursion Report	:	14 marks
Seminar	:	25 marks
Total =	:	125 marks

Laboratory Course - II

Annelida to Echinodermata excluding the dissection of Annelida and Echinodermata.

Duration : 6 hours.

Distribution of marks :-

Major Dissection	: 10 marks
Minor dissection	: 06 marks
Preparation (S)	: 10 marks
Physiology exercise	: 20 marks
Cytogenetics exercise	: 10 marks
Spotting (12 Spots)	: 24 marks
Viva-Voice	: 10 marks
Class Record	: 10 marks
Seminar	: 25 marks
Total =	125 marks

M.Sc. (Final)

There shall be five theory papers of 100 marks each. The practical tests 25 marks consisting of two parts of 125 marks each.

Paper IV and V are of special subject and choice will be available in Fish and Fisheries and Entomology.

The candidates must have to obtain minimum pass marks in the aggregation of the theory papers as well as in the practical examination separately.

Paper-I	: Chordates
Paper-II	: Animal Development and Morphogenesis.
Paper-III	: Endocrinology and Animal Behaviour
Paper-IV	: (A) Fish and Fisheries (B) Entomology
Paper-V	: (A) Fish and Fisheries. (B) Entomology

Paper-I : Chordata

General character and classification of the chordates (Protochordate-Mammalia).

Section-A

Protochordata-Amphibia

Affinities of Protochordates.

Reproduction and colony formation in Ascidian.

Origin of Chordates.

General organisation of Agnatha.

Placoderms and their inter relationship.

Dipnoi and Coelacanth.

Air Bladder and Weberian Ossicles of fishes.

Respiration in fishes.

Origin of Tetrapods.

Parental care in Amphibia and Neoteny.

Section-B

Reptilia-Mammalia

Origin and Evolution of reptiles; Terrestrial adaptations.

Origin and Extinction of Dinosaurs.

Rhynchocephalia.

Crocodylia as highest form of Reptiles.

Origin of Birds.

Flight mechanism in Birds.

Adaptation for aerial mode of life.

General organisation and affinities of Protochordates and Metatheria.

Adaptive radiation in Eutheria with special reference to aquatic mammals.

Dentition in mammals.

Paper-II : Animal Development and Morphogenesis

Gametes and fertilisation.

Nature of eggs and their cleavage.

Morphodynamics of gastrulation.

Germ layers and their Fate.

Organogeny of vertebrates brain and eye.

Evolution of viviparity in Mammals.

Implantation, amneogenesis, foetal membrane and Placentation in Mammals.

Cellular and Biochemical events in metamorphosis of insects and Amphibians.

Cellular differentiation and cell interaction.

