

Revised Syllabus of Zoology 2017 Onwards

CSJM UNIVERSITY KANPUR

Syllabus of Zoology

(B.Sc. I, II, & III year)

Following Major title of papers of B.Sc. I, II, and III were finalized with their contents:

Theory Paper's duration is of Three hours (except MCQ paper where duration is two hours only) and duration of practical assessment is Four hours.

B.Sc. I

Papers	Papers Title of paper	Max Marks
Paper I	Lower Non Chordata (Protozoa- Helminths)	50
Paper II	Higher Non Chordata (Annelida- Echinodermata)	50
Paper III	Cell Biology and Genetics	50
Practical	Practical Syllabus based on theory papers	50

B.Sc. II

Papers	Title of paper	Max. Marks
Paper I	Chordata	50
Paper II	Animal distribution, Evolution and Developmental Biology	50
Paper III	Physiology and Biochemistry	50
Practical	Practical Syllabus based on theory papers	50

B.Sc. III

Papers	Title of paper	Max. Marks
Paper I	Applied and Economic Zoology	75
Paper II	Biotechnology, Immunology, Biological Tools & Techniques and Biostatistics	75
Paper III	Ecology, Microbiology, Animal Behavior, Pollution and Toxicology	75
Practical	Practical Syllabus based on theory papers	75

CSJM UNIVERSITY KANPUR
Syllabus of Zoology
(B.Sc. I, II, & III year)
B.Sc. - First Year
Practical

1- Dissection (Major)	12 Marks
2- Dissection (Minor)	05 Marks
3- One Temporary Mount	03 Marks
4- One Permanent Mount	05 Marks
5- Cytology & Genetics Preparation/Prepared slides	05 Marks
5- Identify and Comment upon spots (1-10)	10 Marks
6- Viva-Voce	05 Marks
7- Practical class record	05 Marks
Total 50Marks	

CSJM UNIVERSITY KANPUR
Syllabus of Zoology
(B.Sc. I, II, & III year)
B.Sc. -Second Year²
Practical

1. Dissection(Major)	10 Marks
2. PermanentMount	05 Marks
3. Commentupon Physiology Apparatus	05 Marks
4. (i) Suitable preparation of Hemin crystals from the blood	05 Marks
(ii). Detect the Sugar /albumin / acetone from urine sample	
5. StainedPreparation of	05 Marks
(i) Striped or Unstriped muscles	
(ii) Cartilage (hand cut Section)	
(iii) Blood film/Aereolar tissue	
6. Identifyand Comment upon spots (1-10)	10 Marks
7. Viva-Vocetest	05 Marks
8. Practicalclass record	05 Marks
Total 50Marks	

CSJM UNIVERSITY KANPUR
Syllabus of Zoology
(B.Sc. I, II, & III year)

B.Sc. - Third Year

Practical

1- Identification & Comment upon Sports 1-10 (Pests, Economically important animals)	15 Marks
2- Life cycles of Silk worm, Honey bee & Lac insects.	05 Marks
3- Experiments on Biotechnology/Immunology/ Biostatistics/ Ecological Experiments.	10 Marks
4-Preparation of permanent mount (pertinent with Syllabus of practical)	10 Marks
5- Exercises on Microbiology/Tools.	05 Marks
6- Experiments on Pollution/Toxicology.	05 Marks
7- Experiments on Animal behavior	05 Marks
8- <i>Viva-voce</i> test	10 Marks
9- Project & Field Collection	10 Marks

Total75Marks

CSJM UNIVERSITY KANPUR
Syllabus of Zoology
(B.Sc. I, II, & III year)

There will be three written theory papers and a practical examination. The marks in the practical shall be converted into grade with a grade index number and that number will serve as conversion index for converting grades into marks as an average award out of marks of practical of one examination. Question No. 1 under section A in each class will be compulsory & comprehensively based on units I to IV and of short answer type. There will be two more sections B and C. B shall comprise of four questions (2 to 5) from first half units and C will have four questions (6 to 10) from second half of the syllabus of concerned paper. Examinee shall attempt two questions from section B and two from section C. Each question of section B and C shall carry equal marks.

B.Sc. Part I

Paper I- Lower Non Chordata (Protozoa to Helminths)

The habits, morphology, physiology, reproduction, development, and classification up to Orders with suitable examples of the following Phyla with detailed study of the types given in each.

Unit-I

Protozoa - Euglena, Monocystis and Paramecium, Trypanosoma, .

Unit-II

Porifera – Sycon, Canal System, Skeleton in Sponges

Unit-III

Coelenterata - Obelia and Aurelia, Coral and Coral reefs
Ctenophora - Salient features

Unit-IV

Platyhelminthes - Fasciola (liver fluke) and Taenia (tape worm)
Nematehelminthes - Ancylostoma (hook worm), Ascaris

Paper II- Higher Non Chordata (Annelida to Echinodermata)

The habits, morphology, physiology, reproduction, development, and classification up to Orders with suitable examples of the following Phyla with detailed study of the types given in each.

Unit-I

Annelida – Nereis, Hirudinaria

Unit-II

Arthropoda - Palaemon (prawn)

Unit-III

Mollusca - Pila (apple-snail), Unio

Unit-IV

Echinodermata - Pentaceros (excluding development)

Paper III- Cell Biology & Genetics

Unit-I

Cell Biology I: Ultra structure and function of cell organelles. Ultra structure and function of Plasma membrane, Gram +Ve & -Ve plasma membrane, Cell eating and Cell drinking.

Unit-II

Cell Biology II: Structure and function of cell organelles with special emphasis on mitochondria, golgi bodies, nucleus, ribosome and endoplasmic reticulum, Lysosomes. Transcription and Translation.

Unit-III

Genetics-I: Structure of Chromosomes, Watson & Crick Model of DNA, Differences between DNA & RNA, Cell Division: Mitosis and Meiosis. Mendel's principles of heredity on Chromosomal basis- monohybrid cross, test cross, dihybrid cross, back cross in complete dominance. Multiple Alleles, Blood group inheritance, Interaction of genes.

Unit-IV

Genetics II: Sex determination, sex differentiation, Prenatal detection of genetic diseases (amniocentesis), Sex-linked characters, Criss-cross inheritance with examples, Linkage and crossing over, chromosomal aberrations, Eugenics. Euthenics, Genetic diseases and abnormalities

B.Sc. Part I

ZOOLOGY PRACTICAL SYLLABUS

PROTOZOA

- (a) **Amoeba** : Examination of culture. Prepared Slide of Amoeba proteus and A. verrucosa.
- (b) **Euglena** : Culture examination for Euglena. Prepared slides.
- (c) **Monocystis** : Examination of contents of seminal vesicles of Pheretima or Eutyphoeus for different life- history stages and permanent preparation. Prepared slides.
- (d) **Plasmodium** : Preparation of blood film (Leishmen's stain). Prepared slides showing the parasites.
- (e) **Paramecium**
Culture examination.
- (f) Demonstration of ciliary movements in Paramecium. Addition to mucilage to restrain active movement. Treatment with Methyl green for staining. Feeding experiment with Congo Red and Yeast. Trichocysts (discharged), Prepared slides for structure, binary division and conjugation.
- (g) Examination of pond water for different kinds of protozoa with special reference to Arcella and Vorticella.
- (h) Study of prepared slides :
Polystomella, Gregarina, Trypanosoma and Noctiluca.
- (i) Examination of rectal protozoans Opalina, Balantidium and Nyctotherus.

PORIFERA

- (a) **Sycon**
General characters
Spicules glycerine preparation or permanent mount.
Prepared slides of transverse and longitudinal sections
- (b) Gemmule of Spongilla permanent preparation.
- (c) Different kinds of sponge spicules and sponging fibres of Euspongia-prepared slides.
- (d) Euplectella (Venus's flower-basket) Spongilla (fresh-water sponge), Euspongia (bath

sponge).

COELENTERATA

- (a) **Hydra**
Live specimens.
Prepared slides of entire specimens.
Longitudinal and transverse sections-prepared slides.
- (b) **Obelia**
Clolony-prepared slide.
Medusa-prepared slide.
- (c) **Aurelia**
General morphology.
Tentaculocyst-prepared slide.
Prepared slides and models of life-history stages.
- (d) **Physalia** (Portguese man of war), Corallium (red coral),
Fungia (Mushroom coral), Madrepora (staghom coral),
Pennatula (sea pen), Sagartia of Metridium (sea anaemone)

PLATHYHELMINTHES :

- (a) **Fasciola**
Specimens in situ and prepared slides. Transverse sections and prepared slides. Larval forms-
prepared slides.
- (b) **Taenia** : Prepared slides of scolex, mature and gravid proglottids and transverse section
of mature proglottid.
- (c) Planaria, Polystomum, Paramphistomum, Schistosma, Echinococcus and Dipylidium
Cysticercus (Bladder worm) and Cysticercoid.
- (d) Examination of type worms of pigeon of fowl in situ
- (e) Permanent preparation of mature and gravid proglottids of Cotugnia and Raellietina. :

NEMATHELMINTHES

- (a) **Ascaris**
External characters. Dissected specimens of male of female. Prepared slides of Transverse
sections of male and female.
- (b) *Ascaris lumbricoides* (from man) specimens *Enterobius vermicularisi* (from
man). *Ancylostoma duodenale* (from man) prepared slides.

ANNELIDA

- (a) **Nereis**
External characters. Dissected specimens. Parapodium permanent preparation. Transverse
sections-prepared slides.
- (b) **Pheretima**
External characters. Dissection. Glycerine preparations of setae in situ and brain. Permanent
preparations of ovary and septal nephridia. Prepared slides of transverse section through
various regions.
- (c) *Heteronereis*, *Arenicola*, *Aphrodite*, *Eutyopous*, *Dero*, *Branchellion*, *Haemadipsa*,
Bonellia (female).

ARTHROPODA

- (a) **Palaemon**

External characters; Examination of appendages. Dissections.

Glycerin or preparation stained preparation of hastate plate and statocysts.

(b) Periplaneta

External characters. Differences between male and female. Dissections. Circulation of blood in the wing of cockroach. Glycerin or preparation stained preparation of mouth appendages, salivary glands, trachea, Malpighian tubules, ovaries and testes.

(c) Anopheles and Cules

Glycerin or preparation stained preparation of mouth parts of male and female. Wings-prepared slides. Life history-prepared slides. Difference between Anopheles and Culex

(d) Musca

External characters. Glycerin or preparation stained preparation of proboscis

(e) Daphnia, Cyclops, Balanus, Eupagurus (hermit crab) Scylla (crab), Sacculina (on crab).

Larval forms Nauplius, Zoea, Lepisma (Silver fish), Schistocerca (locust), Odontotermes

(white ant), Cimex (bed bug), Pediculus (louse), Papilio (butterfly), Bombyx (Silk moth), Apis (honey- bee), Polistes (wasp), Camponotus (Black ant), Xenopsylla (rat flea), or Ctenocephalus (dog flea), Thyroglyphus (millipede), Scolopendra (centipede).

Lycosa (wolf-spider), Ixodes (tick), Limulus (King crab).

MOLLUSCA

(a) Lamellidens

External characters, Dissection of gill lamella and its permanent preparation. Transverse section through middle region of body and Glochidium (larva) - prepared slides.

(b) Pila

External characters. Dissection of nervous system. Permanent preparations of gill ctenidium and osphradium.

(c) Chiton, Teredo, Turbinellai (Shankh), Laevicaulis (slug), Doris, Aplysia, Dentalium Nautilus, Sepia and Margaritifera (Pearl Oyster).

ECHINODERMATA

(a) Pentaceros:

External characters. Dissected specimens. Pedicellaria and Transverse section of arm-prepared slide.

(b) Echinus (Sea urchin), Ophiothrix (brittle star), Holothuria (sea cucumber) and Antedon (feather star).

CYTOLOGY

(a) Cell-Structure – Prepared slides

(b) Cell Division – Prepared slides

(c) Preparation of giant chromosomes

(d) Preparation of onion root tip for the stages of mitosis

B.Sc. Part II (THEORY) Zoology

There will be three written papers and one practical examination. The following courses are prescribed.

Paper I: Chordata

Unit- I

Hemichordata: Classification up to orders ; detailed study (habit, morphology, anatomy, physiology and development) of *Balanoglossus*

Cephalochordata: Classification and detailed study (habit, morphology, anatomy and physiology) of *Branchiostoma* (*Amphioxus*). Its importance in chordate evolution.

Unit -II

Urochordata: Classification up to orders; detailed study (habit, morphology, anatomy, physiology and postembryonic development i.e retrogressive metamorphosis) of *Herdmania*

Unit-III

Classification of different classes of vertebrates (**Pisces, Amphibia, Reptilia,**) up to order with characters and examples. Poisonous and non poisonous snakes and biting mechanism. Neoteny. habit, morphology, anatomy and physiology of *Scoliodon* and *Uromastix*

Unit-IV

Classification of different classes of vertebrates (**Aves and Mammalian**) up to order with characters and examples.. Flight adaptation in Birds, perching mechanism of Birds, Origin and evolution of Birds, Dentition in mammals, general organization of Primates

Paper II: Animal distribution, Evolution and Developmental Biology

Unit-I

Animal distribution: Geological and Zoogeographical distribution in different region with their characteristic fauna; Different types of fossils.

Unit-II

Origin of Life, Theories of origin of life-Oparin model; concept of species (classical & modern concept)

Evolution: Evidences (Anatomical paleontological physiological and serological); Theories of evolution (including Neo-Lamarckism, Darwin-Wallace theory of natural selection, Neo-Darwinism, Modern synthetic theory). Evolution of Man. Mutation

Unit-III

Developmental Biology I: Aims and scope of Developmental Biology. Gametogenesis, Fertilization, Egg: structure and types. Types & patterns of cleavage

Unit-IV

Developmental Biology II: Process of Blastulation & Gastrulation. Fate Map. Development of Chick up to formation of Primitive streak and mammal (in outline) Extra embryonic membranes of chick. Placentation and types of Placenta.

Paper III: Physiology and Biochemistry

General physiology (in outline) with special reference to mammals

Unit-I

Physiology of digestion; Different enzymes and their functions from Saliva to Intestines and breakdown of complex food components, including function of exocrine pancreas and bile. Respiration; Physiology of exchange of gases respiratory pigment transport of Oxygen and CO₂ (Bohr's effect, Chloride shift) RQ
Blood and circulation-Composition of blood. Blood coagulation. Physiology of heart beat, general portal system in vertebrates

Unit-II

Physiology of excretion. Histological basis of Kidney function Broad view of urine formation. Osmoregulation in Marine and various terrestrial mammals.
Nerve and neural transmission;
Muscles; Structural and Mechanical basis of muscle contraction.

Unit-III

Physiology of endocrine system, Structure and Histology of various endocrine glands; their hormones target organs and functions.
Thermoregulation-in homotherms; in heterotherms-Aestivation and hibernation.

Unit-IV

Classification General chemistry and metabolism of carbohydrates, lipids and proteins;
Enzymes-nomenclature classification coenzyme and isoenzyme

B.Sc. Part II ZOOLOGY PRACTICAL SYLLABUS

Urochordata

(a) Herdmania

- (i) External characters
- (ii) Dissection
- (iii) (a) Permanent preparation of branchial wall
- (b) Section of test and glycerine preparation of spicules.
Glycerine and permanent preparation on neural gland complex (neural gland, nerve ganglion and dorsal tubercle).
- (iv) Larva and metamorphosis- prepared slides.

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(b) (i) Thaliacea : Pyrosoma, Doliolum

- (ii) Larvacea : Oikopleura .

Cephalochordata

Branchistoma (Amphioxus)

- (i) General features
- (ii) (a) Permanent preparation of the pharyngeal wall
- (b) Oral hood and velum- prepared slides
- (c) Transverse section through the body – prepared slides.
- (d) Models illustrating development

Cyclostomata

Petromyzon (Lamprey) - External characters

Chondrichthyes

(a) Fish

- (i) External characters

- (ii) Exo-skeleton Glycerine and permanent preparation of placoid scales
 - (iii) Myotomes
 - (iv) Endoskeleton
 - (1) Axial skeleton
 - (a) skull
 - (b) Visceral Skeleton
 - (c) Vertebral column
 - (2) Appendicular skeleton
 - (a) Pectoral girdle and fins
 - (b) Pelvic girdle, fins and claspers
 - (c) Median fins
 - (v) Dissection
 - (a) Digestive system
- Examination of the folds of stomach and “ scroll valve”
- (b) Vascular system
- Heart, ventral aorta, dorsal aorta, arterial arches (afferent and efferent)
- (c) Gills
 - (d) Urinogenital system
 - (e) Nervous system : Cranial nerves
 - (f) Internal ear
 - (g) Eye muscles
 - (h) Permanent preparation of ampullae of Lorenzini
 - (i) Section through various regions of the body of adult and embryo
 - (j) Embryo with yolk-sac placenta
- (b) Pritis (Saw fish), Astrape (Indian electric ray) Chimaera (rabbit fish) Slide showing development of placoid scales.

Osteichthyles

- (a) Labeo rohita (rohu)- General morphology and dissected specimen.
- (b) Acipenser (sturgeon), Lepiodosteous (gar-pike), Hippocampus (sea horse) Antennarius (Indian angler), Angulla (eel), Pleuronectes (sole), Exocoetus (flying fish), Clarius (cat fish), Anabas (climbing perch) and Neoceratodus (lungfish).
- (c) Different kinds of scales- prepared slides

Amphibia

- (a) Rana tigrina (The Indian bull-frog)
- Development of frog from modles
- (b) Urodela :
- Necturus, Ambystoma and Axolotal larva
- (c) Anura :
- Bufo, Rhacophorus (tree frog), Alytes (midwife toad).
- (d) Gymnophiona : Ichthyopnis

Reptillia

- (a) Varanus
- (i) External characters
- (ii) Skeleton
- (1) Axial Skeleton
 - (a) Skull
 - (b) Vertebral column

(c) Ribs and sternum

(2) Appendicular Skeleton

(a) Pectoral girdle and fore-limb.

(b) Pelvic girdle and hind-limb.

(b) Lacertilla

Varanus (Indian monitor), Holoderma (poisonous lizard)

Hemidactylus (wall lizard), Chamaeleon (garden lizard) Draco

(flying lizard).

(c) Ophidia

Difference between poisonous and non-poisonous snakes, Naja (cobra),

Vipera (viper), Typhlops (burrowing snake) and Python. Biting mechanism

of a poisonous snake (model).

(d) Chelonia : Derman armature

(e) Crocodilia : Difference between Alligator, Crocodile and Gavialis.

(f) Extinct reptiles, Models (five)

Dimetrodon, Diplodocus, Pteranodon, Tyrannosaurus and Ichthyosaurus

Aves

(A) Columba livia intermedia (pigeon)

(i) External Characters. Structure of Feather. Varieties of feathers. Developments of feather-prepared slide.

(ii) Skeleton of fowl Axial skeleton:

(a) Skull

(b) Vertebral column

(c) Ribs and sternum

(2) Appendicular skeleton.

(a) Pectoral girdle and fore-limb

(b) Pelvic girdle and hind-limb.

(B) (i) Archaeornithes-Archaeopteryx (cast)

(ii) Neornithes:

(a) Palaeognathae: **Struthio** (ostrich);

(b) Neognathae: **Gallus** (fowl), **Anser** duck, **Corvus** (crow) , **Psittacuca**

(parrot) and **Pavo** (peacock).

Perching mechanism: Model

Skulls and Beaks of Birds.

Feet of birds: Models

(C) Embryonic membranes-whole mount of 72 hour's chick embryo

Mammalia

(A) (i) Prototheria: Ornithorhynchus (Platypus)

(ii) Metatheria : Macropus (Kangaroo).

(iii) Eutheria :

(a) Edentata: Dasypus (Armadillo)

(b) Pholidota: Manis (Scaly ant-eater).

(c) Cetacea: Platanista (Ganges dolphin).

(d) Perissodactyla: Equus caballus (horse), Equus vulgaris (ass), Equus zebra (zebra), Rhinoceros unicornis (rhinoceros).

(e) Artictyla: Camelus dromedaries (A rabian camel), Giraffa camelopardalis (giraffe) Bos (ox), Ovis (sheep), Capra (goat), Cervus (deer), Sus (dog).

(f) Proboscidea: Elephas indicus (elephant).

(g) Carnivora: Felis domesticus (Cat), Panthera leo (lion), Acinonyx tigris

(Cheetah), *Canis familiaris* (dog), *Ursus* (bear) *Hyaena* (hyena), *Phoca* (seal)

(h) Rodentia: *Mus* (domestic rat), *Hystrix* (Porcupine)

(i) Lagomorpha: *Lepus* and *Oryctolagus* (hare and rabbit)

(j) Insectivora: *Erinaceus* (hedge-hog), *Crocidura* (chhachhundar)

(k) Chiroptera: *Pteropus* (Flying-fox).

(l) Primates: *Macaca* (rhesus monkey), *Hylobates* (gibbon), *Simia* (Orangutan), *Anthropo pithecus* (chimpanzee), *Gorilla*, *Homo sapiens* (man).

Histology

(i) Tissues: Preparation of the following

(a) Epithelia:

(i) Squamous (ii) Ciliated and (iii) Stratified

(b) Muscular:

(i) Striped muscles (ii) Unstriped muscles.

(c) Connective

(i) Areolar tissue (ii) Tendon the leg muscles of frog (tease and examine in glycerine)

(ii) Adipose tissue from insect and frog (iv) cartilage (free hand sections of frogs hyoid and suprascapula, stain with haematoxyline and (v) Bone (Decalcified).

(d) Blood; Preparation of Vertebrate blood film, stain with Leishmann's stain.

(e) Nervous: Neurons

(f) Histology of various organs-prepared slides.

Physiology

(i) Experiments to be performed by candidates: Test for amylase. Osmolarity of blood, Hemin crystals and test for sugar and acetone in urine Determination of haemoglobin % in blood sample (s).

(ii) Detection of amino acids in blood of an animal by paper chromatography.

General :

Candidates will be required, to show knowledge of the method of microscopic techniques and to examine, describe or dissect the types prescribed. Candidates will also be required to submit their notebooks containing a complete record of laboratory work initiated and dated by the teacher for the determination of result of examination.

B. Sc. Part III (THEORY) Zoology

There will be three written papers and one practical examination. The following courses are prescribed.

PAPER-I Applied and Economic Zoology

Unit-I

Parasitology:

Structure, life cycle, pathogenicity, including diseases, causes, symptoms and control of the following parasites of domestic animals and humans: Entamoeba histolytica, Giardia and Wuchereria,

Unit-II

Vectors and pests: Life cycle and their control of following pests: Gundhi bug, Sugarcane leafhopper, Rodents, Termites and Mosquitoes and their control

Unit-III

Animal breeding and culture: Aquaculture, Pisciculture, Poultry, Sericulture, Apiculture, Lac-culture.

Unit-IV

Wild Life of India: Endangered species. Important sanctuaries; national parks of India; Different projects launched for the preservation of animal species; in-situ and ex-situ conservation of wild life.

PAPER-II Biotechnology, Immunology, Biological Tools and Techniques and Biostatistics

Unit-I

Biotechnology: Genetic Engineering (concept and recombinant DNA technology) and its application in agriculture & medical areas and energy production. Biotechnology of food processing, pharmaceuticals (e.g. use of microbes in insulin production) and fermentation, alcohol and beverages

Unit-II

Immunology. Concepts of immunity, types of immunity, Antigen and Antibodies, vaccines of different diseases and immunological reactions.

Unit-III

Biological Tools and Techniques: Principles and uses of instruments: pH Meter, Calorimeter, Microtome, Spectrophotometer & Centrifuge. Microscopy (light, transmission and scanning electron microscopy) Chromatography and Electrophoresis.

Unit-IV

Biostatistics: Sampling, Measures of central tendency (mean, median and Mode) and dispersion (variance, standard deviation and standard error); Correlation and Regression

PAPER-III Ecology, Microbiology Animal Behavior and Pollution and Toxicology.

Unit- I

Ecology: Ecosystem: Concept, components, fundamental operations, energy flow, food-chain, food webs and trophic levels, ecological niche, abiotic and biotic factors. Population: Characteristics and regulation. Ecological succession. Adaptation: Aquatic, terrestrial, aerial and arboreal.

Unit-II

Microbiology: Morphology, physiology and infection (outline) of bacteria and viruses. Bacterial and viral diseases.

Unit-III

Animal Behavior: Introduction to Ethology and Psychobiology, Patterns of behavior (taxes, reflexes, instinct and motivation); biorhythms; learning and memory imprinting their role in, Migration of fishes, Schooling and shoaling & birds.

Unit-IV

Pollution and Toxicology: Concept, sources, types (air, water, soil, noise & radiation), and control of environmental pollution. Exposure of toxicants (routes of exposure, and duration and frequency of exposure); dose-response relationship categories of toxic effects.

B.Sc. Part III

ZOOLOGY PRACTICAL SYLLABUS

Permanent Preparation of: Euglena, Paramecium and rectal protozoans from frog.

Stool examination for different intestinal parasites.

Study of prepared slides/ specimens of Entamoeba, Giardia, Leishmania, Trypanosoma,

Plasmodium, Fasciola, Cotugnia, Taenia, Rallietina, Polystoma Paramphistomum,

Schistosoma, Echinococcus, Dipylidium, Enterobius, Ascaris and Ancylostoma;

Permanent Preparation of Cimex (bed bug)/ Pediculus (Louse), Haematopinus (cattle louse), fresh water annelids, arthropods; and soil arthropods.

Larval stages of helminths and arthropods.

Permanent mount of wings, mouth parts and developmental stages of mosquito and house fly.

Permanent preparation of ticks/ mites, abdominal gills of aquatic insects viz. Chironomus larva, dragonfly and mayfly nymphs, preparation of antenna of housefly.

Collection and identification of pests.

Life history of silkworm, honeybee and lac insect.

Different types of important edible fishes of India.

Prepared slides of plant nematodes.

Demonstration of counting of cells (blood and protozoan) by haemocytometer, haemoglobinometer, pH meter, Colorimeter

Microbiological Techniques: Media Preparation and sterilization, inoculation and Monitoring.

Study of an aquatic ecosystem, its biotic components and food chain.

Preparation of chromosomes, Test for carbohydrate Photochemical demonstration of proteins and lipids, using hand sections using hand sections, endocrine glands (Neurosecretory cells) of cockroach.

Demonstration of developmental stages of chick.

Project Report/ model chart making.

Dissections :

Cockroach : Central nervous system

Wallago : Afferent and efferent branchial vessels, Cranial nerves, Weberian ossicles.

Practical exercises based on Biostatistics, Microbiology, Immunology, Biotechnology, Animal Behavior, Pollution & Toxicology.