

B.Sc. ZOOLOGY SYLLABUS

B.Sc. Part I Zool. Subsidiary
(8) 75 marks

GROUP-A : Non-chordata

1. *Bionomics* : General characters and classification (up to orders) of the following phyle-Protozoa, Perifera, Coelenterata, Platyhelminthes, Aschelminthes, Annelida, Arthropoda, Mollesca, Echinodermata and Hemichordata. Detailed study of the structure and life-history of the following types.

(i) Protozoa	Paramecium
(ii) Perifere	Syeon
(iii) Cnidaria	Obelia
(iv) Platyhelminthes	Fasciola
(v) Aschelminthes	Ascaris
(vi) Annelida	Pheretima
(vii) Arthropoda	Palaemon
(viii) Mollusca	Pila
(ix) Echinodermata	Asteries
(x) Hemichordata	Balanoglossus

GROUP-B : Cell Biology, Genetics and Evolution

1. *Cell Biology and Genetics* :
- Gametogenesis, Fertilization and Parthenogenesis.
 - Ultra structure and function of the following collyrganelles-Plasma membrane, Endoplasmic reticulum, Mitochondria, Golgibody, Ribosomes, Chromosome Lysosome.
 - Structure and function of DNA.
 - Gene Mutation
 - Linkage and Crossing over.
2. *Evolution* : (i) Sources of hereditary variation and their role in evolution.
(ii) Darwin's theory of Natural selection & New-Darwinism.
(iii) Isolating mechanisms and their role in evolution.

Time : 3 Hours]

PRACTICAL

[Marks : 25

Dissection :

- Pherotima** : Reproductive system, nervous system, Alimentary canal.
Palaemon : Alimentary canal, Nervous system.
Pila : Alimentary canal, Nervous system, Organs of Pallial Complex.
- Mounting (Permanent stained preparation)** : Septal nephridia, Ovary
Setae of Earthworm, Statocyst of Prawn, Radula and Osphradium of Pila.
- Spotting** : (a) Muscum specimens (b) Slides (c) Evolution.
- Cytology** : Squash preparation to show stages of Mitosis. (Onion root tips) and Meiosis (Grasshoper testis Or Giant chromosomes of Chironomous/Drosophile larvae).
- Practical records.**

ZOOLOGY (HONOURS) PAPER-IA (Theory)

Time : 3 Hours]

(Non-Chordate)

[Marks : 75

In all ten questions are to be set out of which number 1 ad 2 shall consist of objective (1 × 15 marks) and short answers (3 × 5) requiring questions respectively and both shall span over the whole syllabus in the paper. Students would be required to answer five question, of which question numbered 1 and 2 shall be compulsory.

- I. *Bionomic* general characters and classification (upto orders) of the following Phyla : Protozoa, Porifera, Cnidaria, Ctenophora, Platyhelminthes Aschelminthes Annelida, Arthropoda, Mollusca, Echinodermata and Hemichordate.
Detailed study of the following types :
- Protozoa** : Paramecium Parastic protozoans and their modes of infection Polystomella (Elphidium).
 - Porifera** : Sycon, Canal system in sponges, affinities of the phylum.

(9)

3. Cnidaria : Obelia, Aurelia Sea, anemone
 4. Ctenophora : General organization of Hormiphora affinities of the phylum.
 5. Platyhelminthes Fasciola hepatica, Teenia sodium and Planearia.
 6. Aschelminthes : Ascaris lumbricoides, Wochelela bancrofti.
 7. Annelida : Pheretima posthuma, Leech, Nereis.
 8. Arthropoda : Palaemon, Peripatus, Adaptive variations in insect mouth parts, Saculina.
 9. Ectoprocta : Bugula.
 10. Mollusca : Unio, Pila, Sepia, Torsion and detorsion in Gastropoda.
 11. Echinodermata : Asterias larval form in Echinoderm.
- Time : 3 Hours] [Marks : 75

PAPER-IIA
(Ecology, Animal Behaviours and Biometry)

- I. Ecology :
 1. Concept of Biosphere (Lithosphere, hydrosphere and atmosphere).
 2. Ecosystem : Definition, structure and function of typical ecosystem, major ecosystems of the world.
 3. Structure (Abiotic and Biotic) and function (energy flow Biogeochemical cycles) of fresh water, grassland, desert and forest ecosystems.
 4. Community structure and its ecological succession.
 5. Pollution and its hazards. 6. Wild-life conservation.
- II. Animal Behaviour :
 1. Scope of Ethology, Innate and learned behaviour.
 2. Social behaviour in insects.
 3. Parental care in fishes and amphibia.
 4. Brooding, nesting and migratory behaviour in birds.
 5. Concept of Biological clock.
- III. Biometry : Scope and application of the following statistical method in Biology.
 1. Normal distribution and its attribution range, mode, median and arithmetic mean.
 2. Standard error, standard deviation, Simple test and Chisquare test.

ZOOLOGY (PRACTICAL)

PAPER-IB and-IIB

[Marks : 50

Time : 4 Hours]

1. Dissection : Pheretima, Leech-Alimentary canal, Reproductive Excretory and Nervous systems.
Palaemon-Alimentary canal, Nervous system.
Unio Pila and Sepia-Nervous system, organs of Pallial complex of Pila.
2. Permanent stained preparation of the following : Paramoecium
of Leech, statocyst of prawn, osphradium, radulla and gill of pila of unio
Glochidium larvae, of crustace and Echinodermata, Pedicellaria.
3. Spotting (Each of two marks) : (i) Museum specimens (ii) Slides (iii)
Specimens relating animal behaviour or parental care.
4. Ecology : (i) Analysis of soil/pond biota. (ii) Determination of dissolved
oxygen and pH of different water samples. (iii) Community structure of
Grassland. (iv) Moisture content of soil sample.
5. Biometry : Calculation of the arithmetic mean and standard deviation of
the samples provided.
6. Record and field work. 7. Viva.

B. Sc. Part-I : PHYSICS HONOURS

The course shall consist of two theory papers of 75 marks each paper-I (theory) and paper-II (theory). The pass marks in the theories papers taken together will be 46 and the examination in each paper will be of 3 hrs. duration.

ytes, Mesophytes, Parasites and ...
of pH of different types of soil with the help of pH
meter. 3. Study of different stages of mitosis and
meiosis. 4. Comment upon the spots (b) 5. Practical
records,

ZOOLOGY Honours Part-3

Time-3 hrs. Pepar-V F.M.-10

Biochemistry, Physiology & Endocrinology

Biochemistry : (i) Structure and classification of
Protein, Carbohydrate & fats. (ii) Structure and
classification of Aminoacids. (iii) Metabolism of
Carbohydrate... Glycogenesis and Krebs's cycle. (iv)
Vitamins Definition, Types and functions. (v) Beta
oxidation of fatty acids.

Physiology [Mammals] : 1. Physiology of digestion
3. Physiology of Respiration [Ventilation of lungs and
transport of gases]. 3. Physiology of excretion and
Osmoregulation. 4. Physiology of Blood coagulation
5. Mechanism of thermoregulation. 6. Physiology of
testicular and ovarian cycles.

Endocrinology (Mammal)

1. Histology of the various endocrine glands.

2. Chemical nature and physiological actions of hormones secreted by Adenohypophysis, Neurophysis Adrenal, thyroid, Islets of Langerhans and Gonads

Note : In all ten questions are to be set out of which number 1 and 2 shall consist of objective (1X1) and short answers [3x5] requiring question respectively and both shall span over the whole syllabus in the paper. Students would be required to answer five questions, of which question numbered 1 and 2 shall be compulsory.

Paper VI

(Cell Biology, Genetics and Economic Zoology)

Cell Biology

(i) Ultrastructure and functions of the following cell organelles — Plasma membrane, Endoplasmic reticulum, Mitochondria, Golgi complex, Ribosomes, Chromosomes, Lysosomes, Nucleolus.

(ii) Gametogenesis fertilization and Parthenogenesis.

Genetics

(i) Linkage and crossingover, (ii) Structure and Replication of DNA; transcription and translation. (iii) Chromosomal aberrations—the genetic and cytological manifestation and significance. (iv) Gene mutation and molecular mechanism of its origin (v) Extra-nuclear genetic system.

Economic zoology

(i) Lac Culture (ii) Sericulture (iii) Apiculture (iv) Pisciculture (i) Elementary idea of the common pests of paddy, wheat, sugarcane and vegetables, their control. (vi) Vectors of kala-azar, malaria, and Falaria, their Biology mode of infection, prevention and control (vii) Wild-life conservation.

Note : In all questions are to be set out of which number 1 and 2 shall consist of objective (1X15 marks) and short answers (3X5) requiring questions respectively and both shall span over the whole syllabus in the paper. Students would be

required to answer five questions, of which question numbered 1 and 2 shall be compulsory.

PAPER—VII

[Evolution Zoogeography & Paleozoology]

Evolution : sources of hereditary variations and their role in evolution.

- (i) Principles of evolution; Lamarckism, Neo-Lamarckism, Darwinism & Neo-Darwinism.
- (ii) Regulating mechanisms and their role in evolution
- (iii) Hardy-Weinberg law and genetic equilibrium.
- (iv) Fossil history of Horse & Man.

Zoogeography and Paleozoology

- (i) Zoogeographical realms of the world—their boundaries and climatic peculiarities.
- (ii) Characteristic & Peculiar fauna of Oriental, Ethiopian and Australian regions.
- (iii) Characteristics of Island fauna.
- (iv) Theories & Principles pertaining to animal distribution.
- (v) Different geological eras of the world, their duration and climatic conditions.
- (vi) Faunistic Peculiarities of Paleozoic, Mesozoic and Cenozoic eras.
- (vii) Fossils, their mode of formation & age determination.

Note : In all ten questions are to be set out of which number 1 and 2 shall consist of objective (1X15) marks and short answers (3X5) requiring questions respectively and both shall span over the whole syllabus in the paper. Students would be required to answer five questions, of which question numbered 1 and 2 shall be compulsory.

PAPER—VIII A (Practical)

(Biochemistry, Physiology & Endocrinology)

Time—6 hrs.

Full Marks—50

1 Biochemistry

- 1. Benedict's test for reducing sugar
- 2. Molisch's test
- 3. Iodine test for starch and glycogen
- 4. Ninhydrin reaction for glycine/tyrosine/tryptophan.
- 5. Millan's reaction for glycine/tyrosine/phenylalanine.

2. Physiology—experiments to be performed in frog/bird/mammal (Two experiments each of 7 marks)

- 1. Enumeration of total RBC
- 2. Estimation of haemoglobin (gm/100ml) in blood
- 3. Determination of ESR of blood
- 4. Determination of bleeding and clotting time
- 5. Determination of O₂ uptake by terrestrial animal.
- 6. Simple heart-heat and muscle curve by drum method.

- ered 1 3. Dissection and display of any four the following endo-
ne glands in a mammal gonad, thyroid, adrenal, Pancreas.
4 Identification and comment upon the histological slides
our in number) of the following

r tele Pituitary, Adrenal, Ovary, Testes, Islets of Langerhans, Thymus
ism,, thyroid, Parathyroid and Vaginal smears.

5. Practical records 6. Viva.

Time : 6 Hours

Paper VIII B

Full Marks 50

(Cell Biology, Genetics, Paleozoology and Evolution)

Cell Biology

- and 1. Vital staining of secretory granules in Salivary glands of
and cockroach and Mitochondria in the buccal epithelium.

Genetics

1. Acetocarmine stained squash preparation of the onion root
ps and testes of grasshopper to demonstrate stages of mitotic
ion and meiotic divisions respectively.

2. Acetocarmine preparation of the giant chromosomes of the
en- *Chironomus/Drosophila* larvae
Evolution and Paleontology

- dr 1. 1. Serial homology is exhibited by the appendages of prawn,
is- 2. Homology and Analogy as exhibited by the wings of birds,
an 3. Adaptive radiation as exhibited by beaks of
ed 4. Study of Fossils.
2 identification and comments upon the specimens/slides on Econ-
omic Zoology (3) and Cytology (2).

5. Practical Record 6. Viva,

ZOOLOGY GENERAL

0 Time 3 Hrs.

Paper III A (Theory)

Full Marks 75

Five questions are to be set from each group, Students shall
answer five questions attempting not more than three from any
Group.

Group A

Ecology