SEMESTER – IV

Paper-I : Life and Diversity of Chordates - II

External Marks : 40
Internal Assessment: 10 **Time allowed : 3 Hours**

Note: Nine questions are to be set in all and the candidates are required to attempt five questions including the compulsory question

1. Question 1 is compulsory consisting of 10 parts (1.5 marks each) covering the entire syllabus. Answer to each part should not exceed 20 words.
2. Out of remaining eight, four questions are to be set from each section A & B, possibly splitting them in parts. Candidates are required to attempt four questions, two from each section.

SECTION-A

1. **Amphibia**: Origin, Evolutionary tree. Type study of frog (*Rana tigrina),* Parental Care in Amphibia
2. **Reptilia:** Type study of Lizard (Hemidactylus), Origin, Evolutionary tree. Extinct reptiles; Poisonous and non-poisonous snakes; Poison apparatus in snakes.

SECTION-B

3. **Aves:** Type study of Pigeon (*Columba livia)*; Flight adaptation, Principles of aerodynamics in Bird flight, migration in birds.
4. **Mammals:** Classification, type study of Rat; Adaptive radiations of mammals dentition.

Note: Type study includes detailed study of various systems of the animal.

SEMESTER – IV

Paper-II : Mammalian Physiology-II

External Marks : 40
Internal Assessment: 10 **Time allowed : 3 Hours**

Note: Nine questions are to be set in all and the candidates are required to attempt five questions including the compulsory question

1. Question 1 is compulsory consisting of 10 parts (1.5 marks each) covering the entire syllabus. Answer to each part should not exceed 20 words.
2. Out of remaining eight, four questions are to be set from each section A & B, possibly splitting them in parts. Candidates are required to attempt four questions, two from each section.

SECTION-A

1. **Circulation**: Origin, conduction and regulation of heart beat, cardiac cycle, electrocardiogram, cardiac output, fluid pressure and flow pressure in closed and open circulatory system; Composition and functions of blood & lymph; Mechanism of coagulation of blood, coagulation factors; anticoagulants, haempoiesis.

2. **Respiration**: Exchange of respiratory gases, transport of gases, lung air volumes, oxygen dissociation curve of hemoglobin, Bohr's effect, Haburger's phenomenon (Chloride shift), control / regulation of respiration.

3. **Excretion:** Patterns of excretory products viz. Amonotelic, ureotlic uricotelic, ornithine cycle (Kreb's – Henseleit cycle) for urea formation in liver. Urine formation, counter-current mechanism of urine concentration, osmoregulation, micturition.

SECTION-B

4. **Neural Integration:** Nature, origin and propagation of nerve impulse alongwith meddullated & non-medullated nerve fibre, conduction of nerve impulse across synapse.

5. **Chemical integration of Endocrinology:** Structure and mechanism of hormone action; physiology of hypothalamus, pituitary, thyroid, parathyroid, adrenal, pancreas and gonads.

6. **Reproduction:** Spermatogenesis, Capacitation of spermatozoa, ovulation, formation of corpus luteum, oestrous-anoestrous cycle, Menstrual cycle in human; fertilization, implantation and gestation.

B.Sc. Part-II

Paper-III : PRACTICAL

Max. Marks : 100
Time allowed : 6 Hours
(2 Sessions M&E)

1. Classification upto orders, habit, habitats, external characters and economic importance (if any) of the following animals:-

Protochordata : *Molqula, Hetryllus, Pyrosoma, Doliolum, Olikopleura,* and *Amphioxus.*

Cyclostomata : *Myxine, Petromyzon* and *Ammocoetus larva*.

Chondrichthyes : *Zygaena, Pristis, Narcine* (electric ray), *Trygon, Rhinobatus, Raja* and *Chimaera.*

Osteichthyes : *Acipenser, Lepidosteus, Muraena, Mystus, Catla, Hippocampus, Syngnathus Exocoetus, Anabas, Diodon, Ostraczion, Tetradon, Echinus, Lophius, Solea* and *Polypterus.* Any of the Lung Fishes.

Amphibia : *Necturus, Proteus, Amphiuma, Salamandra, Amblystoma, Axolotie larva, Alytes, Bufo, Rana.*

Reptilia : *Hemidactylus, Calotes, Draco, Varanus, Phrynosoma, Chamaeleon, Typhops, Python, Eryx, Ptyas, Bungarus, Naja, Hydrus, Viper, Crocodilus, Gavialis, Chelone* (Turtle) and *Testudo* (Tortoise).

Aves : *Casuarius, Arden, Anas, Milvus, Pavo, Eudynamis, Tyto* and *Alcedo, Halcyon*

Mammalia : *Ornithorphynchus, Echidna, Didelphis, Macropus, Loris, Macaque, Hystrix, Funambulus, Telix, Panthera, Canis, Herpestes, Capra, Pteropus.*

2. Internal anatomy of the following animals:

(i) Computer simulated model/study of :

(a) *Herdmania* : General anatomy

(b) *Rat* : Digestive, arterial, venous and urinogenital systems.

(c) *Hemidactylus* : Digestive, arterial, venous and urinogenital systems

(ii) Demonstration & Study of Internal Anatomy of locally available fish (*Labeo)*. Digestive and reproductive systems: cranial nerves, Ear ossicle

3. Study of the skeleton of *Scoliodon, Labeo, Rana* (Frog), *Varanus,* Pigeon or Gallus and *Orcyctolagus*/rat, Palates of birds, skulls of dog & rabbit.

4. Study of the following prepared slides:
Tornaria larva, T.S. *Amphioxus* (through different regions). Oikopleura, Histology of rat (compound tissues), different types of scales.

5. Make permanent stained preparations of the following:
Salpa, Spicules, and Pharynx of *Herdmania*, *Amphioxus*, Cycloid scales,

Zoological excursion and its report is compulsory in the practical examination.

PHYSIOLOGY PRACTICALS:

1. Qualitative tests for identification of simple sugars, disaccharides and polysaccharides.
2. Study of human salivary amylase activity: Effect of temperature, pH, Concentration.
3. Estimation of abnormal constituents of urine (Albumin, sugar, ketonebodies).
4. Use of Kymograph unit & respirometer.
5. Haematein crystal preparation.
6. Estimation of Hb.
7. DLC of Man/RBC count/WBC count.