

MODERN'S

# ZOOLOGY

Life & Biodiversity Of Chordates-II  
and  
MAMMALIAN PHYSIOLOGY-II

B.Sc. Part-II (K.U.K./M.D.U./C.D.L.U.)  
SEMESTER-IV

Ashok Sabharwal  
Dr. Chander Shekhar



go green with mba

# : SYLLABUS :

Zoology B.Sc.-II

SEMESTER-IV

## PAPER-I : LIFE AND BIODIVERSITY OF CHORDATES-II

External Marks : 45

Time allotted : 3 Hours

Internal Assessment : 05

**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.

**PAPER-II : MAMMALIAN PHYSIOLOGY-II**

**Time allotted : 3 Hours**

**External Marks : 45**

**Internal Assessment : 05**

**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, haemopoiesis.
2. **Respiration :** Exchange of respiratory gases, transport of gases, lung air volumes, oxygen dissociation curve of haemoglobin, Bohr's effect, Haldane's phenomenon (Chloride shift), control / regulation of respiration.
3. **Excretion :** Patterns of excretory products viz. Ammonotelic, ureotelic, uricotelic, ornithine cycle (Krebs' - 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 medullated & non-medullated nerve fibre, conduction of nerve impulse across synapse.
5. **Chemical Integration or 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.

## PAPER -III : PRACTICAL

Max. Marks : 100

Time allotted : 6 Hours  
(Two Sessions)

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

- Protochordata :** *Molgula, Botryllus, 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, Ostracion, Tetradon, Echeinis, Lophius, Solea and Polypterus. Any of the Lung Fishes.*
- Amphibia :** *Necturus, Proteus, Amphiuma, Salamandra, Amblystoma, Axolotl larva, Alytes, Bufo and Rana*
- Raptalia :** *Hemidactylus, Calotes, Draco, Varanus, Phrynosoma, Chamaeleon, Typhops, Python, Eryx, Ptyas, Bungarus, Naja, Hydrus, Vipera, Crocodilus, Gavialis, Chelone (Turtle) and Testudo (Tortoise).*
- Aves :** *Casuaris, Ardea, Anas, Milvus, Pavo, Eudynamis, Tyto and Alcedo/Halcyon.*
- Mammalia :** *Ornithorhynchus, Echidna, Didelphis, Macropus, Loris, Macaque, Hystrix, Funambulus, Felis, Panthera, Canis, Herpestes, Capra and Pteropus.*

2. Examine and dissect the following animals :

- Herdmania :** General anatomy.
- Labeo (Locally available fish) :** Digestive and reproductive systems, cranial nerves and Ear ossicle.
- Hemidactylus :** Digestive, arterial, venous and urinogenital systems.
- Rat :** Digestive, arterial, venous and urinogenital systems.

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* and *Amphioxus*, Cycloid scales.

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

7. Physiology practicals :

- (i) Qualitative tests for identification of simple sugars, disaccharides and polysaccharides.
- (ii) Study of human salivary amylase activity : Effect of temperature, pH, Concentration.
- (iii) Estimation of abnormal constituents of urine (Albumin, sugar, ketone bodies).
- (iv) Use of Kymograph unit & respirometer.
- (v) Haematin crystal preparation.
- (vi) Estimation of Hb.
- (vii) DLC of Man/RBC count/WBC count.

# : CONTENTS :

## PAPER-I : LIFE AND BIODIVERSITY OF CHORDATES-II

### SECTION-A

1. Class Amphibia : Characters, Classification and Examples 3 - 17
2. Amphibia : Type study : *Rana tigrina* (Frog) 18 - 76
3. Amphibia in General 77 - 84
4. Class Reptilia : Characters, Classification and Examples 85 - 103
5. Reptilia : Type study - *Hemidactylus* (Common house lizard) 104 - 134
6. Reptilia in General 135 - 146

### SECTION-B

7. Class Aves : Characters, Classification and Examples 149 - 161
8. Aves : Type study : *Columba livia* (Pigeon) 162 - 216
9. Aves in General 217 - 225
10. Class Mammalia : Characters, Classification and Examples 226 - 246
11. Mammalia : Type study : *Rattus rattus* (House rat) 247 - 317
12. Mammalia in General 318 - 324

## PAPER-II : MAMMALIAN PHYSIOLOGY-II

### SECTION-A

13. Circulation 327 - 362
14. Respiration 363 - 384
15. Excretion *Tae* 385 - 406

### SECTION-B

16. Neural Integration 409 - 424
17. Chemical Integration (Endocrinology) 425 - 470
18. Reproduction 471 - 499