

## **AIMS AND OBJECTIVES OF UG PROGRAM IN ZOOLOGY**

1. The Program offers both classical as well as modern concepts of Zoology in higher education.
2. It enables the students to study animal diversity in both local and global environments.
3. To make the study of animals more interesting and relevant to human studies more emphasis is given to branches like behavioral biology, evolutionary biology and economic zoology.
4. More of upcoming areas in cell biology, genetics, molecular biology, biochemistry, genetic engineering and bioinformatics have also been included.
5. Equal importance is given to practical learning and presentation skills of students.
6. The lab courses provide the students necessary skills required for their employability.
7. Skill enhancement courses in classical and applied branches of Zoology enhance enterprising skills of students.
8. Take up research in biological sciences.
9. Get a flavour of research by working on project besides improving their writing skills. It will further enable the students to think and interpret individually.
10. The global practices in terms of academic standards and evaluation strategies.
11. Provides opportunity for the progression of the student both within and across the world.
12. It will also enable potential employers in assessing the performance of the candidates across the world.

**COURSE PATTERN AND SCHEME OF EXAMINATION OF  
B.Sc. ZOOLOGY  
UNDERGRADUATE COURSES  
SEMESTER SCHEME 2025-26 ONWARDS**

| <b>SEMESTER I</b>  |                    |  |                                |                                |            |           |                    |                |
|--------------------|--------------------|--|--------------------------------|--------------------------------|------------|-----------|--------------------|----------------|
| <b>Sl. No.</b>     | <b>Course Code</b> | <b>Title of the Course</b>               | <b>Category of the Courses</b> | <b>Teaching Hours per Week</b> | <b>SEE</b> | <b>IA</b> | <b>Total Marks</b> | <b>Credits</b> |
| <b>1</b>           | <b>BSZOCS 101</b>  | <b>Animal Diversity I (Non-chordata)</b> | <b>Theory</b>                  | <b>4</b>                       | <b>80</b>  | <b>20</b> | <b>100</b>         | <b>3</b>       |
| <b>2</b>           | <b>BSZOPS 101</b>  | <b>Animal Diversity I (Non-chordata)</b> | <b>Practical</b>               | <b>4</b>                       | <b>40</b>  | <b>10</b> | <b>50</b>          | <b>2</b>       |
| <b>SEMESTER II</b> |                    |  |                                |                                |            |           |                    |                |
| <b>3</b>           | <b>BSZOCS 201</b>  | <b>Animal Diversity II (Chordata)</b>    | <b>Theory</b>                  | <b>4</b>                       | <b>80</b>  | <b>20</b> | <b>100</b>         | <b>3</b>       |
| <b>4</b>           | <b>BSZOPS 201</b>  | <b>Animal Diversity II (Chordata)</b>    | <b>Practical</b>               | <b>4</b>                       | <b>40</b>  | <b>10</b> | <b>50</b>          | <b>2</b>       |

**POORNAPRAJNA COLLEGE (AUTONOMOUS)  
STATE EDUCATION POLICY (SEP-2024)  
B.Sc. DEGREE – ZOOLOGY**

|                                   |   |                                   |               |
|-----------------------------------|---|-----------------------------------|---------------|
| <b>Program Name</b>               | <b>B.Sc.</b>                                      | <b>SEMESTER</b>                   | <b>I</b>      |
| <b>Course Title</b>               | <b>ANIMAL DIVERSITY I (NON-CHORDATA) (THEORY)</b> |                                   |               |
| <b>Course Code</b>                | <b>BSZOCS 101</b>                                 | <b>No. of Credits</b>             | <b>3</b>      |
| <b>Contact hours</b>              | <b>48 Hrs (4 hours/week)</b>                      | <b>Duration of SEA/ Exam</b>      | <b>3 Hrs.</b> |
| <b>Formative assessment marks</b> | <b>20</b>   | <b>Summative assessment marks</b> | <b>80</b>     |

**Learning Outcomes:**

After the successful completion of the course, the student will be able to:

1. The identification and classification of Non-Chordates based on their morphological characteristics/ structures.
2. Demonstrate comprehensive identification abilities of Non-Chordate diversity.
3. Explain structural and functional diversity of Non-Chordates.
4. Develop understanding on the diversity of life with regard to protists and nonchordates.
5. The evolutionary relationship among non-chordates.
6. Examine the diversity and evolutionary history of a taxon through the construction of a basic phylogenetic/ cladistics tree.

| <b>Content</b>  |   | <b>Hours</b> | <b>Marks</b> |
|---|---|--------------|--------------|
| <b>Unit - I: Introduction, Biodiversity, Protozoa</b> |   |              |              |
| <b>1.1</b>  | <b>Introduction</b><br>Principles of animal classification- i) Binomial nomenclature<br>ii) Linnaean hierarchy<br>Criteria for animal classification- Body layers, Coelom, Body symmetry, Metamerism, Cephalisation.<br>Definition of species<br>Phylogeny<br>Schematic classification of Animal Kingdom up to phylum.              | <b>2</b>     | <b>6</b>     |
| <b>1.2</b>  | <b>Biodiversity</b><br>Levels of biodiversity - species, genetic and ecosystem.<br>Concept of Biodiversity hotspots.<br>Biodiversity hotspots of India with emphasis on<br>i) Western Ghats & ii) Himalaya hotspots   | <b>4</b>     | <b>10</b>    |
| <b>1.3</b>  | <b>Phylum: Protozoa</b><br>General characters of the phylum Protozoa.<br>Protozoa classification up to classes with suitable examples.<br>Structure of Plasmodium vivax (malarial parasite).<br>Life history of Plasmodium vivax.<br>Structure of Entamoeba histolytica (human parasite).<br>Life history of Entamoeba histolytica. | <b>6</b>     | <b>16</b>    |

| <b>Unit - II: Porifera, Coelenterata, Ctenophora</b>                  |   |          |           |
|---|---|----------|-----------|
| <b>2.1</b>  | <b>Phylum: Porifera</b><br>General characters of the phylum Porifera.<br>Porifera classification up to classes with suitable examples.<br>Sycon-morphology.<br>Canal system in sponges.   | <b>6</b> | <b>16</b> |
| <b>2.2</b>  | <b>Phylum: Cnidaria and Ctenophora</b><br>General characters of the phylum Cnidaria.<br>Cnidaria classification up to classes with suitable examples.<br>Polymorphism in Physalia and Halistemma.<br>Coral reefs – Fringing, Barrier, Atoll.<br>Structure of Corallite.<br>Metagenesis in Obelia.   | <b>6</b> | <b>16</b> |
| <b>2.2.1</b>  | Distinctive characters of Ctenophora.<br>Externals of Pleurobrachia.  |          |           |
| <b>Unit - III: Platyhelminthes, Nemathelminthes and Annelida</b>      |   |          |           |
| <b>3.1</b>  | <b>Phylum: Platyhelminthes</b><br>General characters of the phylum Platyhelminthes.<br>Platyhelminthes classification up to classes with suitable examples.<br>Structure and life history of liver fluke.<br>Structure and life history of tapeworm.  | <b>4</b> | <b>10</b> |
| <b>3.2</b>  | <b>Phylum: Nemathelminthes</b><br>General characters of the phylum Nemathelminthes with suitable examples.<br>External characters of Ascaris.<br>Life cycle of Ascaris.<br>Pathogenicity and preventive measures of Ascaris.  | <b>4</b> | <b>10</b> |
| <b>3.3</b>  | <b>Phylum: Annelida</b><br>General characters of the phylum Annelida.<br>Annelida classification up to classes with suitable examples.<br>Tubicolous adaptations in i) Sabella and ii) Chaetopterus.<br>External features of earthworm.<br>Life history of earthworm.   | <b>4</b> | <b>12</b> |
| <b>Unit - IV: Arthropoda, Onychophora, Mollusca and Echinodermata</b> |   |          |           |
| <b>4.1</b>  | <b>Phylum: Arthropoda and Onychophora</b><br>General characters of the phylum Arthropoda.<br>Arthropoda classification up to classes with suitable examples.<br>Externals of marine prawn (Penaeus) with detailed account of appendages.<br>Metamorphosis in insects- Definition, types with examples – ametabola, hemimetabola and holometabola. | <b>5</b> | <b>12</b> |

|            |  |          |           |
|------------|--|----------|-----------|
|            | Externals of Peripatus (Onychophora).  |          |           |
| <b>4.2</b> | <b>Phylum: Mollusca</b><br>General characters of the phylum Mollusca.<br>Mollusca classification up to classes with suitable examples.<br>External features of Unio.<br>External features of Pila.   | <b>3</b> | <b>10</b> |
| <b>4.3</b> | <b>Phylum: Echinodermata</b><br>General characters of the phylum Echinodermata.<br>Echinodermata classification up to classes with suitable examples.<br>External features of Asterias.<br>Water-vascular system of Asterias.<br>Larval forms of Echinodermata – Bipinnaria and Echinopluteus. | <b>4</b> | <b>10</b> |
|            | <b>Internal Assessment: Tests +Seminars/Assignments (10+10)</b>  |          | <b>20</b> |

**Note:**

1. Local examples with common and scientific names are to be given more emphasis for all the groups.
2. While selecting the examples, only such of the salient features of the examples have to be mentioned which are necessary to explain the general characters of the phylum/class.

**REFERENCES:**

1. Adam, S. 1990. A Students Text Book of Zoology, Vol. I, II & Vol. III. Low Price Publications, New Delhi.
2. Agarwal, V.K. 2017. Zoology for Degree Students: Non-Chordata, S. Chand & Company, New Delhi.
3. Ayyar, E. 1982. A Manual of Zoology Vol. I, Part I & II, S. Vishwanathan Pvt. Ltd.
4. Barnes, R.S.K., Calow. P., Olive, P.J.W., Golding, D.W., Spicer, J.I. 2002. The Invertebrates: Synthesis, Blackwell Publishing.
5. Dhama, P.S. & Dhama, J.K. 2021. Invertebrate Zoology, 5th Edition, R. Chand & Co. New Delhi.
6. Hickman, C., Roberts, L.S., Keen, S.L., Larson, A. and Eisenhour, D. 2018. Animal Diversity, McGraw-Hill.
7. Holland, P. 2011. The Animal Kingdom: A Very Short Introduction, Oxford University Press.
8. Hussain, S. A. & Achar, K.P. 1999. Biodiversity of the Western Ghats Complex of Karnataka. Resource Potential and Sustainable Utilization. Mangalore: Biodiversity Initiative Trust.
9. Jordan, E.L. & Verma, P.S. 2022. Invertebrate Zoology, S. Chand & Company, New Delhi.
10. Kotpal, R.L. 2017. Modern Text Book of Invertebrates, Rastogi Publications, Meerut.
11. Kotpal, R.L. 2017. Protozoa to Echinodermata (Phylum Series), Rastogi Publications, Meerut.
12. Lal, S.S. 2016. A Text book of Practical Zoology – Invertebrates, Rastogi Publications.
13. Verma, P.S. 2013. A Manual of Practical Zoology – Invertebrates, S. Chand & Co. New Delhi.

|                                   |  |                                   |               |
|-----------------------------------|--|-----------------------------------|---------------|
| <b>Program Name</b>               | <b>B.Sc.</b>   | <b>SEMESTER</b>                   | <b>I</b>      |
| <b>Course Title</b>               | <b>ANIMAL DIVERSITY I (NON-CHORDATA) (PRACTICAL)</b> |                                   |               |
| <b>Course Code</b>                | <b>BSZOPS 101</b>                                    | <b>No. of Credits</b>             | <b>2</b>      |
| <b>Contact hours</b>              | <b>40 Hrs (4 hours/week)</b>                         | <b>Duration of SEA/ Exam</b>      | <b>3 Hrs.</b> |
| <b>Formative assessment marks</b> | <b>10</b>  | <b>Summative assessment marks</b> | <b>40</b>     |

### **Learning outcomes:**

At the end of the course the student should be able to:

1. Understand the basics of classification of non-chordates.
2. Learn the diversity of habit and habitat of these species.
3. Develop the skills to identify different classes and species of animals.
4. Know uniqueness of a particular animal and its importance.
5. Enhancement of basic laboratory skill like keen observation, mounting, dissections and drawing.

### **Course Contents**

#### **A. Museum specimens and slides.**

Commonly available specimens cited in the list are to be selected for practicals.

#### **B. Dissections (Demonstration only)**

1. Prawn: Nervous system
2. Earthworm: Nervous system
3. Leech: a) Digestive system b) Reproductive system
4. Cockroach: a) Digestive system b) Nervous system c) Male and female reproductive systems

C. Observations of hay infusion culture for live protozoans like Euglena, Paramecium, Vorticella, Amoeba...etc.

#### **D. Mounting and Whole mount preparations**

- i) Demonstration of mounting of the following:
  - a. Prawn: Appendages
  - b. Leech: i) Salivary gland cells ii) Jaw
  - c. Cockroach: Salivary glands, Mouth parts
  - d. Earthworm: Ovary, Body setae
- ii) Whole mount preparation: Processing and mounting.
  - a. Cnidarian colonies - Obelia, Sertularia, Pennaria, Tubularia (any two).
  - b. Crustacean larvae – Nauplius, Zoea, Mysis (any two)

## LIST OF MUSEUM SPECIMENS AND SLIDES

1. **Protozoa:** Slides of Elphidium, Euglena, Plasmodium, Paramecium, Vorticella.
2. **Porifera:** Specimens of Euplectella, Sycon, slides of sponge spicules.
3. **Ctenophora:** Obelia, Physalia, Aurelia, Sea anemone, Fungia.
4. **Platyhelminthes:** Planaria, Liver fluke, Tapeworm.
5. **Nemathelminthes:** *Ascaris* (Male & female).
6. **Annelida:** Nereis, Chaetopterus, Pheretima, Leech.
7. **Arthropoda:** Carcinus (male or female crab), Lepas, Scolopendra, Limulus, Palamnaeus (Scorpion).
8. **Onychophora:** *Peripatus*.
9. **Mollusca:** Chiton, Dentalium, Xancus, Pila, Unio, Nautilus, Octopus.
10. **Echinodermata:** Asterias (Star fish), Ophiothrix (Brittle star), Echinus (Sea-urchin), Cucumaria (Sea-Cucumber), Antedon (Sea-lily), Bipinnaria larva, Pluteus larva.

|                                   |  |                                   |               |
|-----------------------------------|--|-----------------------------------|---------------|
| <b>Program Name</b>               | <b>B.Sc.</b>                                   | <b>SEMESTER</b>                   | <b>II</b>     |
| <b>Course Title</b>               | <b>ANIMAL DIVERSITY II (CHORDATA) (THEORY)</b> |                                   |               |
| <b>Course Code</b>                | <b>BSZOCS 201</b>                              | <b>No. of Credits</b>             | <b>3</b>      |
| <b>Contact hours</b>              | <b>48 Hrs (4 hours/week)</b>                   | <b>Duration of SEA/ Exam</b>      | <b>3 Hrs.</b> |
| <b>Formative assessment marks</b> | <b>20</b>                                      | <b>Summative assessment marks</b> | <b>80</b>     |

### Learning outcomes:

After the successful completion of the course, the student will be able to:

1. The identification and classification of Chordates based on their morphological characteristics/ structures.
2. Demonstrate comprehensive identification abilities of Chordate diversity.
3. Learn the structural biology and functional biology of Chordates.
4. Develop understanding on the diversity of life with regard to hemichordates and chordates.
5. Realize that very similar physiological mechanisms are used in very diverse organisms.
6. To understand the importance of anatomical structures to assess comparative study from lower to higher vertebrates.

| <b>Content</b>  |  | <b>Hours</b> | <b>Marks</b> |
|---|--|--------------|--------------|
| <b>Unit - I: Hemichordata, Chordata, and Cyclostomata</b> |  |              |              |
| <b>1.1</b>  | <b>Hemichordata</b><br>General characters of the phylum Hemichordata.<br>External features of Balanoglossus.<br>Tornaria larva.  | <b>3</b>     | <b>6</b>     |
| <b>1.2</b>  | <b>Chordata</b><br>General characters of Chordata.<br>Outline classification of Chordata up to subphyla.   | <b>1</b>     | <b>2</b>     |
| <b>1.2.1</b>  | <b>Protochordata</b><br>Characters of Urochordata with examples.<br>Characters of Cephalochordata with examples.<br>External features of Herdmania.<br>External features of Branchiostoma.   | <b>3</b>     | <b>6</b>     |
| <b>1.3</b>  | <b>Vertebrata</b><br>General characters of Vertebrata.<br>Outline classification of Vertebrata up to classes.  | <b>1</b>     | <b>4</b>     |
| <b>1.4</b>  | <b>Cyclostomata</b><br>General characters of Cyclostomata.<br>External features of Lamprey (Petromyzon).<br>External features of Hag fish (Myxine).<br>Differences between Lamprey (Petromyzon) and Hag fish (Myxine).<br>Structure of Ammocoetes larva.<br>Metamorphosis in Ammocoetes larva. | <b>4</b>     | <b>14</b>    |

| <b>Unit - II: Pisces and Amphibia</b> |  |          |           |
|---------------------------------------|--|----------|-----------|
| <b>2.1</b>                            | <b>Pisces</b><br>General characteristics of Pisces.<br>Aquatic adaptations of fishes.  | <b>2</b> | <b>6</b>  |
| <b>2.2</b>                            | <b>Chondrichthyes and Osteichthyes</b><br>General characters of Chondrichthyes with examples.<br>General characters of Osteichthyes with examples.   | <b>3</b> | <b>6</b>  |
| <b>2.3</b>                            | <b>Amphibia</b><br>General characters of Amphibia.<br>Classification of Amphibia up to orders.<br>Distinguishing features of Anura, Apoda and Urodela with suitable examples.  | <b>2</b> | <b>6</b>  |
| <b>2.3.1</b>                          | <b>Endoskeleton of Frog</b><br>Skull, lower jaw, hyoid apparatus, vertebral column, pectoral and pelvic girdles, limb skeleton.  | <b>5</b> | <b>14</b> |
| <b>Unit - III: Reptilia and Aves</b>  |  |          |           |
| <b>3.1</b>                            | <b>Reptilia</b><br>General characters of Reptilia.<br>Classification of Reptilia upto orders (living orders only) with suitable examples.<br>Temporal fossae and arcades in reptiles.<br>Indian snakes – Examples of poisonous and Non- poisonous snakes.<br>Distinguishing poisonous from non-poisonous snakes.<br>Poison apparatus and its working mechanism.<br>Snake venom and anti-venom. | <b>6</b> | <b>16</b> |
| <b>3.2</b>                            | <b>Aves</b><br>General characters of Aves<br>Schematic classification of Aves<br>Distinctive features of Archaeornithes and Neornithes with reference to Palaeognathae, Impennae and Neognathae giving suitable examples.<br>Flight adaptations in birds.  | <b>6</b> | <b>16</b> |
| <b>Unit - IV: Mammalia</b>            |  |          |           |
| <b>4.1</b>                            | <b>Classification and distinctive features</b><br>General characters of Mammalia.<br>Classification of Mammalia up to subclasses.<br>Distinctive features of Prototheria, Metatheria and Eutheria with important examples.   | <b>4</b> | <b>13</b> |
| <b>4.2</b>                            | <b>Important characters of following Eutherian orders with examples.</b>   | <b>5</b> | <b>13</b> |

|            |   |          |           |
|------------|---|----------|-----------|
|            | Primates, Chiroptera, Cetacea, Perissodactyla, Artiodactyla, Carnivora, Rodentia and Proboscidea. |          |           |
| <b>4.3</b> | <b>Organ systems</b><br>Study of digestive system of rat.<br>Study of reproductive system of rat. | <b>2</b> | <b>4</b>  |
| <b>4.4</b> | <b>Exoskeletal structures</b><br>Structure of horns, antlers, hooves & hairs.                     | <b>1</b> | <b>2</b>  |
|            | <b>Internal Assessment: Tests, Seminars/Assignments (10+10)</b>                                   |          | <b>20</b> |

**Note:**

1. Local examples with common and scientific names are to be given more emphasis for all the groups.
2. While selecting the examples, only such of the salient features of the examples have to be mentioned which are necessary to explain the general characters of the phylum/class.

**REFERENCES:**

1. Adam, S. 1990. A Students Text Book of Zoology, Low Price Publications, Delhi, Vol. I, II & Vol.III.
2. Ayyar, E. 1982. A Manual of Zoology Vol. II, S. Vishwanathan Pvt. Ltd.
3. Colbert, E.H. 2011. Evolution of the Vertebrates, Wiley Student Edition.
4. Dhami & Dhami. 2014. Chordate Zoology, R. Chand & Co. New Delhi.
5. Jordan, E.L. & Verma, P.S. 2013. Chordate Zoology, S. Chand & Company, New Delhi.
6. Kotpal, R.L. 2016. Modern Text Book of Zoology – Vertebrates, Rastogi Publications, Meerut.
7. Lal, S.S. 2009. Practical Zoology Vertebrate 12th Ed, Rastogi Publications, Meerut.
8. Parker, T. J. & William, A. H. 1990. A Text Book of Zoology, Low Price Publications, Delhi, Vol. I & II.
9. Prasad, S.N. and Kashyap, V. 2015. A text book of Vertebrate Zoology, New Age International Ltd, New Delhi.
10. Prabhakar Achar, K. & Geetha Nayak, K. 2000. Birds of Dakshina Kannada, Bhuvanendra Nature Club - India.
11. Prakash, M. & Arora, C. K. 1998. Laboratory Animals, Anmol Publicating, Ansari Road, New Delhi.
12. Verma, P.S. 2013. A Manual of Practical Zoology (Vertebrates), S. Chand & Company, New Delhi.

|                                   |   |                                   |               |
|-----------------------------------|---|-----------------------------------|---------------|
| <b>Program Name</b>               | <b>B.Sc.</b>                                      | <b>SEMESTER</b>                   | <b>II</b>     |
| <b>Course Title</b>               | <b>ANIMAL DIVERSITY II (CHORDATA) (PRACTICAL)</b> |                                   |               |
| <b>Course Code</b>                | <b>BSZOPS 201</b>                                 | <b>No. of Credits</b>             | <b>2</b>      |
| <b>Contact hours</b>              | <b>40 Hrs (4 hours/week)</b>                      | <b>Duration of SEA/ Exam</b>      | <b>3 Hrs.</b> |
| <b>Formative assessment marks</b> | <b>10</b>   | <b>Summative assessment marks</b> | <b>40</b>     |

### Learning outcomes:

At the end of the course the student should be able to:

1. Understand the basics of classification of chordates.
2. Handling of few animals as a museum model specimens to identify different classes and species of animals.
3. Learn the diversity of habit and habitat of type's species of each groups.
4. Know uniqueness of a particular animal and their evolutionary modifications and its importance.
5. Handling of few animals as a laboratory skill to understand their anatomy.
6. Enhancement of basic laboratory skill like keen observation, mounting, dissections and drawing.

### Course Contents

#### A. Museum specimens and slides.

The specimens cited in the list are to be selected for practicals.

#### B. Dissections (Demonstration only)

##### 1. Mouse

a) Digestive system

b) Male and Female Urinogenital systems

##### 2. Fish- Brain, Afferent branchial system, Cranial nerves V, VII, X.

#### C. Mounting

Fish scales (Placoid, Cycloid and Ctenoid)

#### D. Study of Exoskeletal structures.

Bird feathers (Down feather, Contour feather)

Horns (Cattle, Sheep)

Hooves (Cattle, Horse/ Donkey)

#### E. Study of Endoskeletal structures.

Skull- Amphibian, Reptilian, Avian, Mammalian.

Vertebrae of Frog- Atlas, Typical, 8<sup>th</sup>, 9<sup>th</sup>, Urostyle.

Girdles of Frog- Pelvic and Pectoral.

Limb skeleton of Frog- Forelimb and Hindlimb.

### List of Museum Specimens and Slides

1. Balanoglossus, Tornaria larva.
2. Herdmania, Amphioxus.
3. Petromyzon, Myxine, Ammocoetes larva.
4. Pristis (Saw fish), Trygon (Sting ray).

5. *Anguilla*, *Hippocampus*.
6. *Ichthyophis* (Caecilian), Salamander, *Bufo melanostictus* (Common Toad), *Hoplobatrachus tigerinus* (Indian Bull Frog) (1 limbless; 1 tailed; others -2).
7. *Varanus benghalensis* (Common Indian Monitor), *Draco dussumieri* (Draco), *Chameleon zeylancius* (Indian Chaemeleon).
8. *Ptyas mucosus* (Common rat snake), *Bungarus caeruleus* (Common Indian Krait), *Naja naja* (Indian Cobra), *Daboia russelii* (Russell's Viper).
9. *Chelone mydas*.
10. *Corvus splendens* (House Crow), Pigeon, Peacock, Parrot.
11. *Rattus rattus* (House Rat), *Funambulus palmarum* (Three striped palm squirrel), *Rousettus leshenulti* (Fulvous fruit bat).

Note:

1. Local examples with common and scientific names are to be given more emphasis for all the groups.
2. Only such of the salient features of the examples have to be mentioned which are necessary to explain the general characters of the phylum/class.
3. In the event of non-availability of specimens, related internet downloaded photos/movies can be shown.

**Scheme of Examination for 80 Marks (Theory)**  
**Core Subject: Zoology**

| <b>Question No.</b> | <b>Scheme</b>  | <b>Questions to be attended</b> | <b>Marks</b> |
|---------------------|--|---------------------------------|--------------|
| <b>PART - A</b>     |  |                                 |              |
| I                   | 2 marks Questions<br>(Give 3 questions from each unit) | 10 of 12                        | 10 x 2 = 20  |
| <b>PART - B</b>     |  |                                 |              |
| <b>Unit - I</b>     |  |                                 |              |
| II                  | 4 Marks Questions                                      | 2 of 3                          | 4 x 2 = 8    |
| III                 | 7 Marks Questions                                      | 1 of 2                          | 7 x 1 = 7    |
| <b>Unit - II</b>    |  |                                 |              |
| IV                  | 4 Marks Questions                                      | 2 of 3                          | 4 x 2 = 8    |
| V                   | 7 Marks Questions                                      | 1 of 2                          | 7 x 1 = 7    |
| <b>Unit - III</b>   |  |                                 |              |
| VI                  | 4 Marks Questions                                      | 2 of 3                          | 4 x 2 = 8    |
| VII                 | 7 Marks Questions                                      | 1 of 2                          | 7 x 1 = 7    |
| <b>Unit - IV</b>    |  |                                 |              |
| VIII                | 4 Marks Questions                                      | 2 of 3                          | 4 x 2 = 8    |
| IX                  | 7 Marks Questions                                      | 1 of 2                          | 7 x 1 = 7    |

**SCHEME OF PRACTICAL EXAMINATION**  
**B.Sc. ZOOLOGY: I SEMESTER**  
**Course Title: ANIMAL DIVERSITY- I (NON-CHORDATA)**  
**Code: BSZOPS 101**

**Duration: 3 hours**

**Max. Marks: 40**

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**I. Dissection - Identify, draw labeled diagram and comment on the systems A and B.**

(A & B in different animals' entire system)

**2 x 4 = 08**

(Identification of the system- 1 mark; Labelled diagram- 2 marks; Description – 1mark)

**II. Mounting – Identify and comment on C. 03**

Any one item from practical D-(i)

(Identification -1 Mark; Diagram -1 Mark; Minimum two unique characters -1 Mark)

**III. Mounting – Make a stained, temporary mounting of the given material D. 03**

Any one item from D-(ii)

(Stained preparation-2 Marks; Procedure-1 Mark)

**IV. Identify, classify, draw labeled diagram and comment on E, F, G, and H.**

(1 slide, 3 specimens)

**4x4=16**

(Identification - ½ Mark; Classification -½ Mark; Labelled diagram -1 Mark; Four Comments - 2 Marks)

**V. Class records 10**

**TOTAL = 40**

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**Note:**

1. Questions must be framed as per the scheme provided.
2. Internal assessment marks to be allotted after conducting one practical test at the end of the semester.

**SCHEME OF PRACTICAL EXAMINATION**  
**B.Sc. ZOOLOGY: II SEMESTER**  
**Course Title: ANIMAL DIVERSITY- II (CHORDATA)**  
**Code: BSZOPS 201**

**Duration: 3 hours**

**Max. Marks: 40**

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|   |          |
|---|----------|
| I. Dissection - Identify the entire system, draw labeled diagram and comment on the systems A and B. (A & B in different animals) | 2x4 = 08 |
| (Identification- 1 Mark; Labelled diagram- 2 Marks; Description – 1 Mark)   |          |
| II. Mounting – Make a stained, temporary mounting of the given material C (Fish Scale - Stained preparation).                     | 02       |
| III. Identify, classify, draw labeled diagram and comment on D, E, and F.   | 3x4=12   |
| (Identification-½ Mark; Classification-½ Mark; Labelled diagram-1 Mark; Four Comments-2 Marks)                                    |          |
| IV. Exoskeleton – Identify and comment on G.  | 02       |
| (Identification-1 Mark; Minimum two unique features-1 Mark)   |          |
| V. Endoskeleton – Identify and comment on the material H and I.   | 4+2=06   |
| (H- One Skull/Girdle/limb Skeleton; I- One vertebra).   |          |
| (H: Identification-1 Mark; Minimum six unique features-3 Marks)   |          |
| (I: Identification - ½ Mark; Minimum 3 unique features - 1½ Marks)  |          |
| VI. Class records   | 10       |
| <b>TOTAL = 40</b>   |          |

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**Note:**

1. Questions must be framed as per the scheme provided.
2. Internal assessment marks to be allotted after conducting one practical test at the end of the semester.