

**PARVATHANENI BRAHMAIAH SIDDHARTHA COLLEGE OF ARTS AND  
SCIENCE,**

**VIJAYAWADA.**

**SEMESTER- II PAPER- II**

**TITLE OF THE PAPER: ANIMAL DIVERSITY - BIOLOGY OF CHORDATES**

**NO OF HOURS: 60 CREDITS: 04**

**WEF: 2020-2021 COURSE CODE: ZOO T21A**

**AIM**

To know the biology of chordates

**OBJECTIVES**

- The study of fundamental organization of chordates
- The study of chordates
- Diversity of chordates
- Adaptations of chordates
- To study the typical adaptations of animals.

**PREREQUISITE**

- Knowledge of chordates acquired in Intermediate

**COURSE OUTCOMES**

By the end of the course students will be able to

**CO 1** Gain knowledge in the major Chordate groups, describe their salient features, appreciate the diversity and analyse the uniqueness of different groups.

**CO 2** Understand the fundamental organization of chordates and evaluate the similarities and differences among the different groups of chordates in the light of evolutionary significance.

**CO 3** Comprehend and compare the morphology and anatomy of different classes of chordates and apply the same to their fitness in the ecological habitats.

**CO 4** Develop the skill of identifying the vertebrate fauna in general and South Indian fauna in specific.

**CO 5** Acquaint with the significance of unique mechanisms and behavioural patterns exhibited by different groups of chordates.

**UNIT -1**

**18 HOURS**

1.0. Protochordates to cyclostomes

1.1. Protochordates

1.1.1 Salient features of Urochordata and Cephalochordata 1 hour

1.1.2. Structure and life-history of *Herdmania*, 2 hours

1.1.3. Significance of retrogressive metamorphosis. 2 hours

1.2. General organization of vertebrates 1 hour

1.3. General characters of cyclostomes 1 hour

1.4. Comparison of *Petromyzon* and *Myxine* 1 hour

**UNIT- II****13 HOURS**

## 2.0 Fishes

2.1. Type study – *Scoliodon* - Morphology, respiratory, circulatory, excretory and nervous systems and sense organs.8 hours

2.2. Migration in fishes 1 hour

2.3. Viviparity in fishes1 hour

2.4. Types of scales 1 hour

2.5. Accessory respiratory organs in fishes2 hours

**UNIT- III****12 HOURS**

## 3.0. Amphibia

3.1. South Indian Amphibians.1 hour

3.2. Type study - *Rana*: Morphology, digestive system, respiratory system circulatory system, excretory system, nervous system and reproductive system9 hours

3.3. Parental care in amphibians1 hour

**UNIT- IV****11 HOURS**

## 4.0. Reptilia

4.1. South Indian Chelonians.2 hours

4.2. Type study – *Calotes*: Morphology, digestive, respiratory, circulatory, urinogenital and nervous systems.8 hours

4.3. Identification of poisonous snakes1 hour

**UNIT- V****17 HOURS**

## 5.0. Aves and Mammalia

## 5.1. Aves

5.1.1 Birds as Glorified Reptiles. 2 hours

5.1.2. Type study-Pigeon (*Columbialivia*): Exoskeleton, respiratory, circulatory and excretory systems7 hours

5.1.3. Significance of migration in birds 2 hours

5.1.4. Flight adaptations in birds2 hours

## 5.2. Mammalia

5.2.1. Aquatic Mammals 2 hours

5.2.2. Dentition in Mammals. 2 hours

**Suggested Readings**

1. E.L.Jordan and P.S. Verma '*Chordate Zoology*' -. S. Chand Publications.
2. Mohan P.Arora. '*Chordata – I*, Himalaya Publishing House Pvt.Ltd.
3. Marshal, Parker and Haswell '*Text book of Vertebrates*'. ELBS and McMillan, England.
4. Alfred Sherwood Romer. Thomas S. Pearson '*The Vertebrate Body*, Sixth edition, CBS college Publishing, Saunders College Publishing
5. George C. Kent, Robert K. Carr. '*Comparative Anatomy of the Vertebrates*, 9<sup>th</sup> ed. McGraw Hill.
6. Kenneth Kardong '*Vertebrates: Comparative Anatomy, Function and Evolution*, 4<sup>th</sup>ed, 'McGraw Hill.
7. J.W. Young, '*The Life of Vertebrates*, 3<sup>rd</sup>ed, OxfordUniversity press.

8. Harvey Pough F, Christine M. Janis, B. Heiser, *Vertebrate Life*, Pearson, 6<sup>th</sup>ed, Pearson Education Inc.2002.

#### Textbooks

- Kotpal. R.L. *Modern Textbook of Vertebrates*, Rastogi Publications, Third ed
- Dhama.P.S. and J.K. Dhama, *Chordate Zoology*, 5<sup>th</sup>ed,

#### Examples

Allen,T(1974) *Vanishing wildlife of North America* ,Washington,D.C National Geographic Society

#### Encyclopedia & Dictionary

##### Examples:

Bergmann,P.G.(1993) Relativity.In *The new encyclopedia britannica* (Vol.26,pp.501-508). Chicago:Encyclopedia Britannica.

TI Storer&EJBoell(2007).*Encyclopedia of study of zoology* (Vol.3)Asiatic Publishing House.

AllabyMichael(2003).*Oxford Dictionary of Zoology*, Oxford University Press.

#### Magazine & News Paper articles

##### Examples:

Harlow,H.F (1983),*Fundamentals for preparing psychology journal articles*. *Journal of Comparative and Physiological psychology*,55,893-896.

#### Website or Webpage

##### Examples:

Devitt, T(2001, August 2)*Lightning injuries four at music festival The Why? Files*.Retrieved January 23,2002,from [http://whyfiles.org/137 lightning/index.html](http://whyfiles.org/137%20lightning/index.html).

### CO-CURRICULAR ACTIVITIES

- Preparation of charts on Chordate classification (with representative animal photos) and retrogressive metamorphosis
- Thermocol or Clay models of Herdmania and Amphioxus
- Visit to local fish market and identification of local cartilaginous and bony fishes
- Maintaining of aquarium by students
- Thermocol model of fish heart and brain
- Preparation of slides of scales of fishes
- Visit to local/nearby river to identify migratory fishes and prepare study notes
- Preparation of Charts on topics by students (Eg: comparative account of vertebrate heart/brain/lungs, identification of snakes etc.)
- Collecting and preparation of Museum specimens with dead frogs/snakes/lizards etc., and/or their skeletons
- Additional input on types of snake poisons and their antidotes (student activity).
- Collection of bird feathers and submission of report on Plumology
- Taxidermic preparation of dead birds for Zoology museum
- Map pointing of prototherian and metatherian mammals
- Chart preparation for dentition in mammals

**P.B. SIDDHARTHA COLLEGE OF ARTS AND SCIENCE,VIJAYAWADA.**

**TITLE OF THE PAPER: ANIMAL DIVERSITY - BIOLOGY OF CHORDATES  
MODEL QUESTION PAPER**

**Semester-II Course Code: ZOO T21A**

**Time: 3 Hrs Max. Marks: 75M**

Note: Draw neat labelled Diagrams wherever necessary.

**SECTION-A**

Answer any Five of the following. 5X5= 25M

1. Describe the structure of *Herdmania* – CO1 L2
2. Enumerate the general characters of Cephalochordata – CO1 L1
3. Explain the different types of Scales in fishes –CO1 L2
4. Enumerate the different South Indian Amphibians – CO4 L4
5. Describe the Female Genital System in *Calotes*- CO3 L2
6. Describe the structure of a Quill feather – CO1 L1
7. Explain and Illustrate the structure of Tooth – CO3 L3
8. Give an account of the lateral line system in *Scoliodon*- CO5 L2

**SECTION-B**

Answer the following Questions. 5X10=50M

9. What is meant by Retrogressive Metamorphosis? Apply the phenomenon with reference to

the development of *Herdmania* – CO5 L3

(Or)

Enumerate the General characters of Cyclostomes – CO1 L3

10. Describe the Respiratory system in *Scoliodon*– CO3 L2

(Or)

Explain the significance of Accessory respiratory organs –CO5 L2

11. Describe Respiratory system in *Rana*– CO3 L2

(Or)

Discuss Parental Care in Amphibians – CO3 L2

12. Explain about the South Indian Chelonians – CO4 L2

(Or)

Describe the Arterial System in *Calotes*- CO3 L2

13. Describe the Respiratory system in *Pegion* – CO5 L2

(Or)

Explain about the Aquatic Mammals – CO3 L2

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**PARVATHANENI BRAHMAIAH SIDDHARTHA COLLEGE OF ARTS AND  
SCIENCE,**

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**PRACTICAL- II (At the end of II Semester)**

**TITLE: ANIMAL DIVERSITY – BIOLOGY OF CHORDATES**

**No of Hours :30 Credits: 01**

**WEF: 2020-2021 Course Code: ZOO P21A**

**LEARNING OUTCOMES:**

By the end of the course students will be able to

1. Understand the general characters and classification from Pisces to Mammalia
2. Understand the importance of preservation of museum specimens
3. Identify chordates based on special identifying characters
4. Understand different organ systems through demo or virtual dissections
5. Maintain a neat, labeled record of identified museum specimens
6. Exhibit the hidden creative talent

**COURSE OUTCOMES**

CO1 To identify the systematic position of Protochordata, Cyclostomata and Pisces.

PO1, PO2, PO5, PO6, PO7, **PSO1**

CO2 To identify the systematic position of Amphibians and Reptiles.

PO1, PO2, PO5, PO6, PO7, **PSO1**

CO3 To identify the systematic position of Aves and mammals.

PO1, PO2, PO5, PO6, PO7. PO1, PO2, PO5, PO6, PO7, **PSO1**

CO4 To Study the Appendicular skeleton of *Varanus*, *Gallus* and *Oryctolagus*.

PO1, PO2, PO5, PO6, PO7, **PSO1**

CO5 To understand the various systems of Fish by Dissecting and process of Mounting the scales of Fish. PO1, PO2, PO5, PO6, PO7, **PSO1**

**SYLLABUS:**

General characters and classification of the following phyla and sub-phyla up to classes with suitable examples: Pisces (up to subclass only), Amphibia (up to orders), Reptilia (up to orders),

Aves (up to subclass only) and Mammalia (up to infraclass only).

**I DEMONSTRATION OF DISSECTIONS**

1. Mounting of fish scales.
2. *Channa*: Digestive system
3. *Scoliodon*: V, VII, IX and X cranial nerves

**II. SPECIMENS**

1. Protochordata: *Herdmania*, *Amphioxus*.

Slides: *Amphioxus* T.S through pharynx.

2. Cyclostomata: *Petromyzon*, *Myxine*.

3. Pisces: *Pristis, Torpedo, Channa, Pleuronectes, Labeo, Catla, Hippocampus, Exocoetus, Echeineis, Clarias, Anguilla.*

Slides: Fish scales.

4. Amphibia: *Ichthyophis, Amblystoma, Siren, Axolotl larva, Hyla, Rhacophorus.*

5. Reptilia: *Trionyx, Testudo, Draco, Chamaeleon, Uromastix, Daboia (=Vipera) russelli, Naja,*

*Enhydrina, Bungarus, Crocodilus.*

6. Aves: *Psittacula, Bubo, Alcedo, Passer, Eudynamis, Corvus*

Different types of feathers- quill, contour, filoplume and down.

7. Mammalia: *Ornithorhynchus, Didelphys, Pteropus, Funambulus, Manis, Erinaceus.*

### III. OSTEOLOGY

Appendicular skeleton of *Varanus, Gallus and Oryctolagus* - limbs and girdles.

Suggested manuals

1. Practical Zoology – Vertebrata - S.S.Lal

2. A manual of Practical Zoology – Chordata P.S.Verma

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**II B.Sc. ZOOLOGY PRACTICAL EXAMINATION**

**PRACTICAL- II COURSE CODE: ZOO P21A**

**TITLE OF THE PAPER: ANIMAL DIVERSITY - BIOLOGY OF CHORDATES**

**Time: 3hrs.**

**Max. Marks 40M**

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1. List out the general characters of Class Mammalia. CO1 L1 5 M

2. Identify and draw a neat labeled diagram of digestive system of *Channa*. CO4 L3 10 M

Identification: 2M

Diagram: 4 M

Labeling: 4 M

3. Identify, draw a labeled diagram, classify and write notes on A, B, C, D and E CO3 L2  
5 X 3 = 15 M

A. Protochordata and Cyclostomata

B. Pisces

C. Amphibia and Reptilia

D. Aves and Mammalia

E. Osteology

Identification: 1 M

Diagram: ½ M

Classification: ½ M

Comment 1 M

4. Practical Record Book CO5 L3 5 M

5. VIVA CO6 L5 5 M

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