

**SWAMI RAMANAND TEERTH MARATHWADA  
UNIVERSITY, NANDED**

**B.Sc. First Year**

**Semester I**

**Paper:I**

**LIFE AND DIVERSITY OF ANIMALS - I**

**Non-chordata**

**Marks 50**

**Periods 45**

**Unit I**

1. Introduction of Non-chordates
2. Concept of species and speciation
3. **Protozoa:**  
General Characters and classification upto class level.  
**Plasmodium vivax:**  
Life Cycle, Pathogenicity and control measures.
4. **Porifera:**  
General Characters and classification upto class level.  
**Sycon:**  
General Morphology, different types of cells.  
Canal system in sponges..

**Unit II**

1. **Coelenterata:**  
General Characters and classification upto class level.  
**Obelia:**  
Structure and life history.  
Coral and coral reefs.

## 2. **Platyhelminthes:**

General Characters and classification upto class level.

**Faciola hepatica:** Structure and life cycle

**Taenia solium:** Structure and life cycle

## 3. **Nematehelminthes.**

**Ascaris:** Structure and life cycle.

### **Unit - III**

#### 1. **Annelida:**

General Characters and classification upto class level.

**Leech:**

General Morphology, Digestive and Urinogenital system

#### 2. **Arthropoda:**

General Characters and classification upto class level.

**Prawn:**

External Morphology, Digestive system, Respiratory system, Nervous system .

Crustacian larvae.

### **Unit IV**

#### 1. **Mollusca:**

General Characters and classification upto class level.

Economic Importance of Mollusca.

#### 2. **Echinodermata:**

General Characters and Classification upto class level.

**Star Fish**

External Morphology and Water vascular system.

#### 3. **Hemichordata:**

General Characters and Affinities.

**PAPER II**  
**CELL BIOLOGY**

**MARKS 50**

**PERIODS 45**

**Unit I**

1. Light microscopy and electron microscopy –an elementary idea
2. Comparison between prokaryotic and eukaryotic cells.
3. **Plasma membrane** : -structure, composition and function.
4. **Endoplasmic reticulum**:- structure and functions.

**Unit II**

1. **Golgi complex** : Structure and functions.
2. **Mitochondria**: Structure and functions.
3. **Ribosomes** – Structure & functions.

**Unit III**

1. **Lysosomes**: Structure and function.
2. **Nucleus** : Structure and functions.
3. **Nucleolus** : Structure and functions.
4. Cytology of cancer.

**Unit IV**

1. **Chromosomes**: Structure and elementary idea about polytene and lambrush chromosomes.
2. **Cell cycle**:
  - a) **Mitosis**:
  - b) **Meiosis**,
  - c) Chromosomal movements during cell cycle.

# SEMISTER – II

Paper: III

Marks 50

period: 45

## LIFE AND DIVERSITY OF ANIMALS II

### CHORDATES

#### Unit :I

1. General characters and classification of chordates
2. **Protochordata:**  
**Urochordata:-** General characters, concept of retrogressive metamorphosis.  
**Cephalochordata:** General Characters.
3. **Agnatha:**  
**Cyclostomata :** General characters of cyclostomes.

#### Unit II

1. **Pisces:**  
general characters and classification of pisces upto class level.  
Migration in fishes.  
**Scoliodon (Dogfish):** External characters, Digestive system, Respiratory system, structure of heart and ventral aorta, Urinogenital system, Nervous system-brain and spinal chord.

#### Unit III

1. **Amphibia:-**  
General characters and classification upto to order level.  
Parental care in amphibians.
2. **Reptillia:**  
General characters and classification upto order level.  
Poisonous and Non poisonous snakes-identification only.
3. **Aves:**  
General characters and classification upto order level.  
Flight Adaptations in birds.  
Migration of birds.

## **Units IV**

### **1. Mammals:**

General characters and classification upto order level.

### **2. Rat-**

External characters,

Digestive system (Anatomy),

Respiratory system,

Circulatory system-Heart and Blood (Composition and functions)

Nervous system - Brain and spinal cord

Eye and Ear,

# PAPER IV

## Developmental Biology

**MARKS 50**

**PERIODS 45**

### Unit I

1. **Gametogenesis:**  
Spermatogenesis  
Oogenesis
2. **Types of eggs** (on the basis of amount and distribution of yolk)
3. **Gametes of frog**
4. **Fertilization in frog**

### Unit II

1. **Frog Embryology:**  
Cleavage,  
Blastulation,  
Gastrulation  
formation of three germinal layers.
2. Elementary idea about **regeneration** in non chordates and chordates

### Unit III

1. **Chick Embryology:** Extra embryonic membranes in chick :
  1. Amnion
  2. Chorion
  3. Allantois
  4. Yolk sac
2. **Placentation in mammals** -
  1. Mode of origin
  2. Mode of implantation
  3. Mode of distribution of villi
  4. Mode of histology

## **Unit IV**

### **1. Stem cells:** Sources,

Types Embryonic, Homopoitic, Adult, Nervous.

Stem Cells & human welfare.

### **2. Embryo transfer techniques:**

GIFT (Gamete intra Fallopian Transfer),

Test tube baby.

Infertility in Male

Infertility in female.

### **3. Parthenogenesis**

# PRACTICAL

## Paper V

Marks 60

- 1) Study of atleast two museum specimens from invertebrate phyla (protozoa to Echinodermata and Hemichordata)
- 2) Study of atleast two museum specimens from protochordata to mammalia
- 3) Dissections:  
**Leech:** Digestive System and Urinogenital system  
**Prawn:** Nervous system, digestive systems  
**Scoliodon:** Digestive system, heart and ventral Aorta, Afferent arteries, Brain
- 4) Mountings:  
Spicules and gemmules of sycon  
Obelia colony,  
Jaws of leech & Nephridia.  
Nereis Parapodia  
Scales: Ctenoid, Cycloid and Placoid
- 5) Skeleton of Rat/Rabbit: Atlas Vertebra, Thoracic Vertebra, Pectoral Girdle, Pelvic Girdle Humerus, Femur, Tibia-Fibula, Radius-ulna
- 6) Study of mitosis in Onion root tips.
- 7) Study of meiosis in Onion buds.
- 8) Study of permanent slides of Frog Embryology.
- 9) Mountings of chick embryo demonstration only.
- 10) Study of permanent slides of Chick Embryo: 18 hrs., 24 hrs., 36 hrs., 48 hrs., 72 hrs. stages.
- 11) Short excursion/ study Tour in compulsory.

Note: Candidates shall be required to produce:

- i) Practical record book duly signed by the teacher incharge/Head of the Dept.
- ii) Five permanent stained micropreparations.
- iii) Excursion report.



### **Books Recommended (All latest editions)**

- 1) Hickman, C.P. Jr. F.M. Hickman and L.S. Roberts, Integrated principles of Zoology Mosby College Publication St. Louis.
- 2) Ayyar, E.K. and T.N. Ananthkrishnan, Manual of Zoology Vol. I (invertebrata), Part-I & II S. Vishwanathan (Printers and Publishes) Pvt. Ltd. Madras.
- 3) Ayyar, E.K. and T.N. Ananthkrishnan, Manual of Zoology Vol. I (Vertebrata), part-I & II S. Viswanathan (Printers and Publishes) Pvt. Ltd. Madras.
- 4) Jordan, E.L. and P.s. Verma Invertebrate Zoology, S. Chand and Co., Ltd. Ram Nagar, New Delhi.
- 5) Jordan, E.L. and P.S. Verma Invertebrate Zoology, S. Chand and Co., Ltd., Ram Nagar, New Delhi.
- 6) Nigam H.C., Zoology of Chordates, Vishal Publication, Jalandhar-144008.
- 7) Parkar and Haswell, Text Book of Zoology, Vol. I (Invertebrata) A.Z.T.B.S. Publishers and Distributors, New Delhi-110051.
- 8) Parker and Haswell, Text book of Zoology Vol. II (Vertebrata) A.Z.T.B.S. Publishers and Distributors, New Delhi.-110051.
- 9) Waterman, Allyn J. et. al. Chordate structure and function, Mac Millan and Co. Newyork.
- 10) S.N. Prasad: Text Book of Invertebrate Zoology.
- 11) Majpuria: Invertebrate Zoology.
- 12) Dhami and Dhami: Non-chordate Zoology.
- 13) R.L. Kotpal: Modern Text Book of Invertebrate Zoology.
- 14) Kotpal: Modern Text Book of Invertebrate Zoology.
- 15) P.G. Puranik and Thakur, Invertebrate Zoology.
- 16) S.S. Lal, Practcal Zoology, Invertebrate.
- 17) S.S. Lal, Practcal Zoology, vertebrate.
- 18) Alberts Bray, Lewis, Raff, Roberts and Watman Molecular Biology of the cell (Garland)
- 19) Balinsky, An Introduction to Embryology, (CBS College Publishers)

- 20) Grant: Biology of developing system (Halt, Reihart and Winston)
- 21) Gilbert: Development Biology (Sinauer)
- 22) Alerts, B. et.al., Molecular Biology of the cell (Garland)
- 23) Lodish, H. et.al., Molecular Biology, (Freedom)
- 24) C.B. Powar: Cell Biology
- 25) S.N. Prasad: Text Book of Choradate
- 26) Majpuria: Verebrate Zoology.
- 27) Text Book of Zoology (Non Chordata)-Mantale, Talikhedkar, Kolpuke.
- 28) Text Book. Of Embryology Armugam, Saras Pub.
- 29) Elements of Biotechnology-P.K. Gupta, Rastogi.
- 30) Biotechnology-U Satyanarayan, Books and alhed Private Ltd. Kolkata.
- 31) Biotechnology-B.D. Singh Kalyani Publication-Noida, New Delhi.

**SWAMI RAMANAND TEERTH  
MARATHWADA UNIVERSITY, NANDED**

**B.Sc. First Year**

**Zoology**

**SYLLABUS**

**EFFECT FROM JUNE 2009**

**( SEMISTER PATTERN )**

**SWAMI RAMANAND TEERTH  
MARATHWADA UNIVERSITY, NANDED**

**B.Sc. First Year**

**Zoology**

| Sr.No. | Paper No.          | Titles of the Paper                  | Periods | Marks<br>UA + CA |
|--------|--------------------|--------------------------------------|---------|------------------|
| 1      | Semester I<br>I    | LIFE AND DIVERSITY OF<br>ANIMALS - I | 45      | 50+10=60         |
| 2      | II                 | CELL BIOLOGY                         | 45      | 50+10=60         |
| 3      | Semester II<br>III | LIFE AND DIVERSITY OF<br>ANIMALS II  | 45      | 50+10=60         |
| 4      | IV                 | Developmental Biology                | 45      | 50+10=60         |
| 5      | V                  | PRACTICAL                            |         | 60               |

**Total Marks =300**

Note : UA = University Assessment.

CA = College Assessment.

(10 Marks = 5 Marks mid term exam + 5 marks for home assessment.)