

# **SAURASHTRA UNIVERSITY**

## **RAJKOT**



Accredited Grade 'A' by NAAC

(CGPA 3.05)

FACULTY OF SCIENCE

[Three Years (6 Semesters) Full Time Course]

## **ZOOLOGY SYLLABUS**

**WITH EXAMINATION CODING SYSTEM**

**19-03-04-01-03-03-00 19-03-04-01-04-04-00**

**2020 - 21**

Saurashtra University

University Campus, Rajkot – 360 005 Gujarat,

India.

**-Website: [www.saurashtrauniversity.edu](http://www.saurashtrauniversity.edu)**

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**(BOS)**

## EXAMINATION CODING SYSTEM

Sr. No.	Name Of Programme	B.Sc. ZOOLOGY			
1	Title Of Paper	<b>(In Sem -III) Non Chordate : Systematic, Forms &amp; Functions, Cell Biology &amp; Genetics, Animal Behaviour &amp; Embryology, &amp; Evolution</b>	<b>( In Sem -IV) Chordate: Systematic, Forms &amp; Functions, Physiology &amp; Histology, Wild life Biology &amp; Ecology, Entomology &amp; Fisheries Biology</b>		
2	Theory Credit	4	4		
3	Practical Credit	3	3		
4	Total Credit	7	7		
5	External Marks Of Theory	70	70		
6	Internal Marks Of Theory	30	30		
7	Total Marks Of Theory	100	100		
8	External Marks Of Practical	35	35		
9	Internal Marks Of Practical	15	15		
10	Total Marks Of Practical	50	50		
11	Grand Total	150	150		
12	External Exam Time Duration	2½ Hours	2½ Hours		
<b>Course/ Paper Code</b>					
13	Year	1	7	1	7
14	Faculty	0	3	0	3
15	Subject	0	4	0	4
16	UG/PG	0	1	0	1
17	Semester	0	3	0	4
18	Paper	0	3	0	4
19	Core	0	0	0	0

# **SAURASHTRA UNIVERSITY**

## **RAJKOT**



### **ZOOLOGY**

### **SYLLABUS**

**WITH EXAMINATION CODING SYSTEM**

**19-03-04-01-03-03-00**

**19-03-04-01-04-04-00**

**[SYLLABUS FOR THE CHOICE BASED CREDIT SYSTEM (CBCS)]**

**(S.Y. B.Sc.)**

**SEMESTER III – PAPER – Z-03 &**

**SEMESTER IV – PAPER – Z-04**

**Revised Syllabus**

**INFORCE FORM JUNE – 2019**

# **SAURASHTRA** **UNIVERSITYRAJKOT**

[SYLLABUS FOR CHOICE BASED CRADIT SYSTEM (CBCS)]

INFORCE FORM JUNE – 2019

**SUBJECT: ZOOLOGY**

**WITH EXAMINATION CODING SYSTEM**

**19-03-04-01-03-03-00 19-03-04-01-04-04-00**

**SEMESTER – III**

**ZOOLOGY PAPER – Z \*–03**

Non Chordate : Systematic, Forms & Functions, Cell Biology & Genetics,  
Animal Behaviour & Embryology & Evolution

**SEMESTER – IV**

**ZOOLOGY PAPER – Z – 04**

Chordate: Systematic, Forms & Functions, Physiology & Histology, Wild life  
Biology & Ecology & Entomology & Fisheries Biology

## FORWARD

Renewing and updating of the Curriculum is the prime important criteria in the University education system.

Syllabus provides an educational guide line and demarks the horizon of a subject. Syllabus of different Theory and Practical papers should have subjective harmony and gradual relationship within periphery of a subject.

Formulation of Curriculum for a particular subject requires the following criteria.

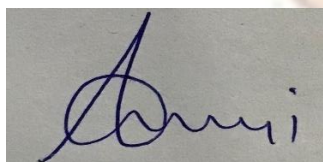
- (A) Background of previous Curriculum.
- (B) Relationship with other related subjects.
- (C) Resources of Educational needs at regional level as well as national level.
- (D) Financial and Statuary provisions of the State government.

All the above criteria are taken into consideration in formulation of this Curriculum.

This Curriculum is the result of prolonged discussions among the experienced teacher in this subject because after all, the college teachers are the real catalysts for implementation of this Syllabus.

The proposed Syllabus after required formalities will be implemented in the second year B.Sc.

Valuable guidelines and all facilities in this curriculum are provided by the authorities of the Saurashtra University, Rajkot.



**DR. A.N UPADHAYAYA**

Chairman,  
Board of Studies, Zoology,  
Saurashtra University,  
Rajkot – 360 005.

**DR. S.K TERAIYA**

Other Than Chairman,  
Board of Studies, Zoology,  
Saurashtra University,  
Rajkot – 360 005.

# SAURASHTRA UNIVERSITY

RAJKOT

(CBCS Syllabus)

**SEMESTER – III**

**ZOOLOGY**

**19-03-04-01-03-03-00**

**PAPER – Z-03**

Non Chordate : Systematic, Forms & Functions, Cell Biology & Genetics, Animal Behaviour & Embryology, & Evolution

## **UNIT – 1: SYSTEMATIC**

Salient feature & classification up to classes in Non-chordates, structural organization in different phylum of Non-chordates with examples. Phylum- Protozoa, Porifera, Coelenterata, Platyhelminthes, Aschelminthes, Annelida, Arthropoda, Mollusca, Echinodermata, Hemichordata.

## **UNIT – 2: FORMS AND FUNCTIONS IN ANIMALS**

**2.1** General structures and morphology with functional anatomy of following type

**ANNELIDA: Type Study: Leech**

### **2.2 ARTHROPODA:**

(i) Different type of Mouth parts in Insects.

1. Chewing & Biting Type – Cockroach
2. Chewing & Lapping Type – Honey Bee
3. Piercing & Sucking Type – Mosquito
4. Sponging Type – Housefly
5. Siphoning Type – Butterfly

## **UNIT – 3: CELL BIOLOGY AND GENETICS:**

**3.1 CELL BIOLOGY: Only Structure and Function of following organelles.**

- (i) Golgi Complex
- (ii) Ribosome

- (iii) Lysosome
- (iv) Centrioles & Basal Bodies

### **3.2 GENETICS:**

- (i) Structure of Chromosome
- (ii) Types of Chromosome according to Centromere
- (iii) Human Chromosome and Karyotyping
- (iv) Cytoplasmic inheritance
- (v) Sex Determination in Drosophila, Human being and Bonelia

## **UNIT – 4: ANIMAL BEHAVIOUR & EMBRYOLOGY:**

### **4.1 Social Behaviour:**

- (i) Honey bee
- (ii) Termite

### **4.2 Courtship & Reproductive Behaviour:**

- (i) Spider
- (ii) Scorpion (iii) Peacock

### **4.3 Parental Care Behaviour:**

- (i) Arius
- (ii) Ichthyophis
- (iii) Alytes
- (iv) Hornbill

### **4.4 EMBRYOLOGY:**

- (i) Types of Eggs according to yolk.
- (ii) Types of Cleavage

## **UNIT-5: EVOLUTION**

### **5.1 EVOLUTION:**

- (i) Introduction to Evolutionary Theories: Lamarckism, Darwinism, Neodarwinism
- (ii) Origin and Evolution of Earth
  - (iii) Isolation
  - (iv) Speciation
- (V) Morphological & Comparative anatomy of Homologous and Analogous Organs

## PRACTICALS RELATED TO PAPER – Z-03

### **Practical: 1 :Identification and classification of Invertebrate animals**

- (i) Phylum: Protozoa : Noctiluca, Amoeba, Plasmodium, Opalina, Paramecium
- (ii) Phylum: Porifera : Grantia, Hyalonema, Chalina

### **Practical: 2 :Identification and Classification of Invertebrate animals.**

- (i) Phylum: Coelenterata : Obelia, Aurelia, Gorgonia
- (ii) Phylum: Platyhelminthes : Bipalium, Schistosoma, MonieziaExpansa
- (iii) Phylum; Aschelminthes : Enterobius vermicularis, Filarial worm, Guinea worm

### **Practical: 3 :Identification and Classification of Invertebrate animals**

- (i) Phylum: Annelida : Nereis, Lumbricus, Pontobdella,
- (ii) Phylum : Arthropoda :- Peripatus, Prawn, Centipede, Grasshopper, Spider, Limulus

### **Practical: 4 :Identification and Classification of Invertebrate animals**

- (i) Phylum: Mollusca : - Chaetoderma, Mytilus, Aplysia, Dentelium, Loligo
- (ii) Phylum: Echinodermata: Anthena (Star fish), Ophiocoma (Brittle Star), Echinocardium (Heart urchin), Holothuria (Sea Cucumber), Antedon (Feather Star)
- (iii) Phylum : Hemichordata : Saccoglossus, Rhabdopleura

### **Practical: 5 :To Study Systems of Leech:**

- (i) External Characters
- (ii) Digestive System
- (iii) Nervous System
- (iv) Reproductive System - By chart or Multimedia

### **Practical: 6 :To Study Mounting of Leech:**

- (i) Jaws
- (ii) Salivary Gland
- (iii) Nephridia
- (iv) Ovary - By chart or Multimedia or Slide

### **Practical: 7 :To Study Mouthparts of Insects:**

- (i) Chewing &Bitting Type – Cockroach



- (ii) Chewing & Lapping Type – Honey Bee
- (iii) Piercing & Sucking Type – Mosquito
- (iv) Sponging Type – Housefly
- (v) Siphoning Type – Butterfly

**Practical: 8 :To Study Cell Organelles:**

- (i) Golgi Complex
- (ii) Ribosome
- (iii) Lysosome
- (iv) Centrioles & Basal Bodies

**Practical: 9 : To study types of Chromosomes according to Centromere.**

**Practical: 10 :To Study Human Chromosome & Its Karyotyping.**

**Practical: 11 : To study Sex determination in drosophila and human**

**Practical: 12 :To Study Animal Behaviours:**

**1. Social Behaviour:**

- (i) Honeybee (ii) Termite

**2. Courtship & Reproductive Behaviour:**

- (i) Spider (ii) Scorpion (iii) Peacock

**3. Parental Care Behaviour:**

- (i) Arius
- (ii) Ichthyophis
- (iii) Alytes
- (iv) Hornbill

**Practical: 13 : To study types of eggs according to Yolk.**

**Practical: 14 :To study types of Cleavage.**

**Practical: 15 : To Study Haemologus&Analogus organs.**

**Practical: 16 :Visit to any one National Park or Sanctuary OR Reserve forestarea OR Skilled based Educational programme/Lecture .**

## DISTRIBUTION OF UNITS

**19-03-04-01-03-03-00**

**SEMESTER – III**

### PAPER – Z-03

Unit No.	Unit Title	Theory Period	Marks.
Unit : 1	Systematic	12	14
Unit : 2	Forms and Functions	12	14
Unit : 3	Cell Biology and Genetics	18	14
Unit : 4	Animal behaviour & Embryology	15	14
Unit : 5	Evolution	13	14
<b>TOTAL :</b>		<b>70</b>	<b>70</b>

- Above statement concerned to only Theory portion of the paper.
- Above mentioned third column 'Theory Period' indicates total number of theory lectures per unit.
- Total syllabus should be completed within 65 theory lectures.
- Each and every units are carries equal 14 marks.
- Total marks for theory examination are 70 marks.
- **PAPER SETTER MUST FOLLOW THE UNIT WISEMARK SETUP.**

**SAURASHTRA UNIVERSITY -**  
**RAJKOTTHEORY EXAMINATION**

**SEMESTER – III**

**ZOOLOGY**

**19-03-04-01-03-03-00**

(Based on Paper – Z-03)

**Time: 2½ Hours**

**Total Marks: 70**

**Instructions:**

1. Illustrate your answer with neat and labeled diagram.
2. Figure to the right side indicates full marks of questions.

**QUESTION-1 (THIS QUESTION IS TAKEN FROM UNIT-1)**

**QUESTION-2 (THIS QUESTION IS TAKEN FROM UNIT-2)**

**QUESTION-3 (THIS QUESTION IS TAKEN FROM UNIT-3)**

**QUESTION-4 (THIS QUESTION IS TAKEN FROM UNIT-4)**

**QUESTION-5 (THIS QUESTION IS TAKEN FROM UNIT-5)**

**- ANY TYPE OF MCQs IS NOT INCLUDED IN THIS PAPER STYLE.**

**- EACH QUESTION CARRIES EQUAL MARKS – 14.**

**- THERE ARE 5 QUESTIONS CONTAINING SUBQUESTIONS (A), (B), (C), (D).**

**QUESTION-1: (From UNIT-1) [14]**

**(A) Give the answer of following questions. [04]**

Only short questions, Definitions and Fill in the blanks and NOT INCLUDED MCQs.

Each Question carries 1 Marks.

(1)

(2)

(3)

(4)

**(B) Write any one out of Two. [02]**

Each Question carries 2 Marks.

(1)

(2)

**(C) Write any one out of Two. [03]**

Each Question carries 3 Marks.

(1)

(2)

**(D) Write any one out of Two. [05]**

Each Question carries 5 Marks.

(1)

(2)

**QUESTION-2: (As Above) (From UNIT-2) [14]**

**QUESTION-3: (As Above) (From UNIT-3) [14]**

**QUESTION-4: (As Above) (From UNIT-4) [14]**

**QUESTION-5: (As Above) (From UNIT-5) [14]**

**SAURASHTRA UNIVERSITY -**  
**RAJKOT PRACTICAL EXAMINATION**

**SEMESTER – III**

**ZOOLOGY**

**19-03-04-01-03-03-00**

(Based on Paper – Z-03)

**Time: 3 Hours**

**Total Marks: 35**

Que -1: Sketch and label \_\_\_\_\_ system of Leech. [06]

Que – 2: Sketch and label /Mountings of Leech\_\_\_\_\_.

(Practical-6) [03]

Que – 3: Do as per instruction and show it to examiner [03]

(Practical – 8)

Que – 4: Do as per instruction and show it to examiner [03]

(Practical – 09,10& 11)

Que – 5: Write as per instruction. [14]

(A) Identify and classify giving reasons.

(Lower invertebrate, Practical- 1&2)

(B) Identify and classify giving reasons.

(Higher invertebrate, Practical – 3&4)

(c) Identify and describe. (Practical- 7)

(D) Identify and describe. (Practical-12)

(E) Identify and describe (Practical-13)

(F) Identify and describe (Practical-14)

(G) Identify and describe (Practical-15)

Que. – 5: Viva-voice/Tour report. [03]

Que – 6: Certified Journal. [03]

# **SAURASHTRA UNIVERSITY – RAJKOT**

## **List of Slides, Specimens, Charts, Models & Photographs**

**SEMESTER – III**

**ZOOLOGY**

**19-03-04-01-03-03-00**

(Based on Paper – Z-03)

### **LIST OF SLIDES:**

- (1) All animals from Protozoa. [Practical-1, ( i)]
- (2) Obelia, Schistosoma, Enterobiusvermicularis, Filaria worm [Practical-2, (i), (ii), (iii)]
- (3) Mountings of Leech [Practical-6]
- (4) Mouth Parts of Insects. [Practical-7]
- (5) Termite [Practical-12, (i)]
- (6) Types of eggs according to Yolk [Practical – 13]
- (7) Types of Cleavage. [Practical – 14]

### **LIST OF SPECIMENS:**

- (1) All animal specimens from Phylum- Porifera to Phylum-Hemichordata. [Practical-1 to Practical-4, except Practical-1, (i) & Obelia, Schistosoma, Enterobiusvermicularis, Filariaworm ]
- (2) Animal Behaviour

### **LIST OF CHARTS/MODELS/PHOTOGRAPHS:**

- (1) Systems of Leech. [Practical-5]
- (2) Cell Organelles. [Practical-8]
- (3) Evolution chart [Practical-15]
- (4) Genetics chart [Practical-9 to 11]

## REFERENCE BOOKS

**19-03-04-01-03-03-00**

### SEMESTER – III

List of books For Unit-1 & 2

- 1 : Invertebrate Zoology.....E.L.Jordan&Dr.P.S.Verma
- 2 :Invertebrate Zoology.....P.S.Dhami&J.K.Dhami. 3  
:A modern textbook of Zoology Invertebrate Zoology.....R.L.Kotpal.
- 4 : A textbook of Practical Zoology-  
Invertebrates.....S.S.Lal
- 5 : Kotpal Series –  
Porifera.....R.L.Kotpal
- 6 : Kotpal Series –  
Annelida.....R.L.Kotpal
- 7 : Kotpal Series –  
Arthropoda.....R.L.Kotpal
- 8 : A Manual of Practical Zoology,  
Invertebrates.....P.S.Verma

List of books For Unit-3

- 9 : Cell Biology.....Dr.Satyeshchandra  
Roy.
- 10 : Cell  
Biology.....C.B.Power
- 11 : Cytology &  
Genetics.....P.K.Gupta
- 12 : Cell & Molecular Biology.....De  
Robertis.
- 13 :Biotechnological Cell Biology.....V.B.Rastogi. 14  
:Molecular Biology.....V.B.Rastogi15  
:Histology.....Atlas.
- 16 : Cell Biology, Genetics, Molecular Biology, Evolution and  
Ecology.....P.S.Varma&V.K.Agrawal.
- 17 : Cytology.....P.S.Verma&V.K.Aggarwal
- 18 : Cytology, Genetics & Evolution.....P.K.Gupta

List of books for Unit- 4 & 5

- 19 : Wild Life of Gujarat.....H.S.Singh.
- 20 : Applied Zoology..... N  
Arumugam
- 21 : Applied Zoology..... Nagendra S Pawar
- 22 : Applied Entomology..... P G Fenemore
- 23 : Indian National Parks and Sanctuaries.....Khati&Annand S.
- 24 : Modern textbook of Zoology  
Vertebrates.....R.L.Kotpal25 : Vertebrate  
Zoology.....E.L.Jordan&Dr.P.S.Verma
- 26 : Practical Zoology Vertebrate.....S.S.Lal27  
: Ecology & Environmental biology.....P.D.Sharma.
- 28 : Cell Biology, Genetics, Molecular Biology, Evolution and  
Ecology.....P.S.Varma&V.K.Agrawal.
- 29 : Fundamentals of Ecology.....Odum E.P. & Barrett G.W. 30  
: Basic Concepts of Ecology.....A. Arumugam31  
: Elements of Ecology.....Robert & Thomas.
- 32 : Environmental Biology.....P.S.Verma&V.K.Aggrwal

List of Books for Viva-Voices

- 33 : Practical Zoology Invertebrate.....S.S.Lal
- 34 : Practical Zoology Vertebrate.....S.S.Lal



**SAURASHTRA UNIVERSITY**  
**RAJKOT**  
(CBCS Syllabus)  
**SEMESTER - IV 19-03-04-01-04-04-00**  
**PAPER – Z-04**  
**ZOOLOGY**

Chordate: Systematic, Forms & Functions, Physiology & Histology, Wild life  
Biology & Ecology & Entomology & Fisheries Biology

**UNIT- 1: SYSTEMATIC:**

**1.1** Salient features and classification up to class in Chordates with examples.

**UNIT- 2: FORMS AND FUNCTIONS IN ANIMALS::**

**2.1** General structure and morphology with functional anatomy of following type.

**REPTILE: Type Study – Calotes**

**2.2** Difference between Poisonous & Non-Poisonous snakes.

**2.3** Snake bite, Anti-Venom, Preventive measures and First aid Treatment.

**UNIT- 3: PHYSIOLOGY & HISTOLOGY**

**3.1 EXCRETION:**

- (i) Nitrogenous Waste
- (ii) Structure of Nephron
- (iii) Formation of Urine
- (iv) Control of Renal Function

**3.2 HISTOLOGY:**

**Histological structure and function of following organs of Mammals.**

- (i) Pituitary
- (ii) Thyroid
- (iii) Spleen
- (iv) Lung

## **UNIT- 4: WILD LIFE BIOLOGY & ECOLOGY**

### **5.1 Wild-life in Gujarat:**

- (I) NATIONAL PARKS: (i) Vansda National Park  
(ii) Velavadar National Park
- (II) SANCTUARIES: (i) Ratanmahal Sloth bear Sanctuary  
(ii) Shoolpaneshwar Wild life Sanctuary

### **5.2 Household Insects:**

- (i) Insect affecting Human health: 1. Tse-Tse Fly, 2. House Fly, 3. Mosquito  
(ii) Insect damaging Household Goods: 1. Termite, 2. Silver Fish, 3. Cricket

### **5.3 Ecology:**

- (i) Energy Flow in Eco-system  
(ii) Ecological pyramids

## **UNIT – 5: FISHERIES BIOLOGY**

- 5.1 Introduction of fish morphology  
5.2 Difference between Chondrichthyes and Osteichthyes  
5.3 Scales in fishes  
5.4 Fins in fishes  
5.5 Some fishes of saurashtra sea coast
- (i) Pomfret
  - (ii) Bombayduck
  - (iii) Prawn
  - (iv) Lobster
  - (v) Pearl Oyster

## PRACTICALS RELATED ON PAPER – Z-04

### **Practical: 1 :Identification and classification of Chordate animals.**

- (i) Sub-Phylum : Urochordata : Ascidia, Doliolum, Oikopleura
- (ii) Sub-Phylum: Cephalochordata : Amphioxus
- (iii) Class: Cyclostomata : Myxine
- (iv) Super Class: Pisces : Tiger-Shark, Pristis, Trygon, Acipensor, Labeo, Protopterus

### **Practical: 2 :Identification and classification of Chordate animals.**

- (i) Class: Amphibia : Uraeotyphlus, Siren, Axolotal Larva, Rhacophorus, Hyla
- (ii) Class : Reptiles : Testudo, Sphenodon, Phrynosoma, Cobra, Crocodylus(Muggar), Gavialis(Ghariyal), Ophiosaurus

### **Practical: 3 :**

- (i) Class: Aves : Pigeon, Flamingo, Duck, Crow, Ostrich
- (ii) Class : Mammal : Spiny Anteater, Loris, Shrew, Rhesus Monkey

### **Practical: 4 :To Study systems of Catoles :**

- (i) External Characters
  - (ii) Digestive System
  - (iii) Arterial System
  - (iv) Venous System
  - (v) Urinogenital System
  - (vi) Brain
- Through chart or Multimedia

### **Practical: 5 :To Study Mountings of Calotes:**

- (i) Pecten
- (ii) Blood
- (iii) Striated Muscle

### **Practical: 6 :To Study diference between Poisonous & Non-PoisonousSnakes.:** -By charts or Multimedia.

### **Practical: 7 :To Study following Poisonous & Non-PoisonousSnakes.**

1. Rat Snake, 2. Python, 3. Sand Boa, 4. Hydrophis, 5. King Cobra, 6. Cobra, 7. Krait, 8. Russel's Viper, 9. Echiscarinata

**Practical: 8 :To Study Histological Structure of Mammalian Organs:**

- (i) Pituitary
- (ii) Thyroid
- (iii) Adrenal
- (iv) Kidney

**Practical: 9 :To Study National Parks and Sanctuaries of India( Location in map ):**

- (i) Vansda National Park
- (ii) Velavadar National Park
- (iii) Ratanmahal Sloth bear Sanctuary
- (iv) Shoolpaneshwar Wild life Sanctuary

**Practical: 10: To study Household insects (Part I)**

Insect affecting Human health: 1. Tse-Tse Fly, 2. House Fly, 3. Mosquito

**Practical: 11: To study Household insects (Part II)**

Insect damaging Household Goods: 1. Termite, 2. Silver Fish, 3. Cricket

**Practical: 12 : Fisheries Biology:**

- (i) Difference between Chondrichthyes and Osteichthyes
- (ii) Scales in fishes
- (iii) Fins in fishes

**Practical: 13 : To study different types boats and nets:**

**Practical: 14 : To study of Important fisheries:**

- (i) Pomfret
- (ii) Bombayduck
- (iii) Prawn
- (iv) Lobster (v) Pearl Oyster

**Practical: 15 : Visit to any one National Park or Sanctuary OR Reserve forest area OR Skilled based Educational programme/Lecture OR visit local education centers.**

## DISTRIBUTION OF UNITS

**19-03-04-01-04-04-00**

**SEMESTER – IV**

PAPER – Z-04

Unit No.	Unit Title	Theory Period	Marks.
Unit : 1	Systematic	12	14
Unit : 2	Forms and Functions	15	14
Unit : 3	Physiology & Histology	14	14
Unit : 4	Wild life biology, Ecology & Entomology	15	14
Unit : 5	Fisheries Biology	14	14
TOTAL :		<b>70</b>	<b>70</b>

- Above statement concerned to only Theory portion of the paper.
- Above mentioned third column 'Theory Period' indicates total number of theory lectures per unit.
- Total syllabus should be completed within 70 theory lectures.
- Each and every units are carries equal 14 marks.
- Total marks for theory examination are 70 marks.
- **PAPER SETTER MUST FOLLOW THE UNIT WISEMARK SETUPS.**

**SAURASHTRA UNIVERSITY -**  
**RAJKOTTHEORY EXAMINATION**

**SEMESTER – IV**

**ZOOLOGY**

**19-03-04-01-04-04-00**

(Based on Paper – Z-04)

**Time: 2½ Hours**

**Total Marks: 70**

**Instructions:**

1. Illustrate your answer with neat and labeled diagram.
2. Figure to the right side indicates full marks of questions.

**QUESTION-1 (THIS QUESTION IS TAKEN FROM UNIT-1)**

**QUESTION-2 (THIS QUESTION IS TAKEN FROM UNIT-2)**

**QUESTION-3 (THIS QUESTION IS TAKEN FROM UNIT-3)**

**QUESTION-4 (THIS QUESTION IS TAKEN FROM UNIT-4)**

**QUESTION-5 (THIS QUESTION IS TAKEN FROM UNIT-5)**

**- ANY TYPE OF MCQs IS NOT INCLUDED IN THIS PAPER STYLE.**

**- EACH QUESTION CARRIES EQUAL MARKS – 14.**

**- THERE ARE 5 QUESTIONS CONTAINING SUBQUESTIONS (A), (B), (C), (D).**

**QUESTION-1: (From UNIT-1) [14]**

**(A) Give the answer of following questions. [04]**

Only short questions, Definitions and Fill in the blanks and NOT INCLUDED MCQs.

Each Question carries 1 Marks.

(1)

(2)

(3)

(4)

**(B) Write any one out of Two. [02]**

Each Question carries 2 Marks.

(1)

(2)

**(C) Write any one out of Two. [03]**

Each Question carries 3 Marks.

(1)

(2)

**(D) Write any one out of Two. [05]**

Each Question carries 5 Marks.

(1)

(2)

**QUESTION-2: (As Above) (From UNIT-2) [14]**

**QUESTION-3: (As Above) (From UNIT-3) [14]**

**QUESTION-4: (As Above) (From UNIT-4) [14]**

**QUESTION-5: (As Above) (From UNIT-5) [14]**

**SAURASHTRA UNIVERSITY – RAJKOT**  
**PRACTICAL EXAMINATION**

**SEMESTER – IV**

**ZOOLOGY**

**19-03-04-01-04-04-00**

(Based on Paper – Z-04)

**Time :3 Hours**

**Total Marks : 35**

- Que – 1 : Sketch and label \_\_\_\_\_ system of Calotes. [05]  
(Practical-4)
- Que – 2 : Sketch and label /Mounting of Calotes \_\_\_\_\_ [03]  
(Practical-5)
- Que – 3 :Do as per instruction and show it to examiner [03]  
(Practical- 12)
- Que – 4: Do as per instruction and show it to examiner [03]  
(Practical –13)
- Que – 5 : Write as per instruction. [12]  
(A) Identify and classify giving reasons.(Lower chordate)  
(B) Identify and classify giving reasons. (Higher Chordate)  
(C) Identify and describe. (Practical-6/7)  
(D) Identify and describe. (Practical- 8/9)  
(E) Identify and describe. (Practical- 10/11)  
(F) Identify and describe. (Practical-14)
- Que – 6 : Tour report [03]
- Que – 7 : Viva – voice. [03]
- Que – 8 : Certified Journal. [03]



# **SAURASHTRA UNIVERSITY – RAJKOT**

## **List of Slides, Specimens, Charts, Models & Photographs**

**SEMESTER – IV**

**ZOOLOGY**

**19-03-04-01-04-04-00**

(Based on Paper – Z-04)

### **LIST OF SLIDES:**

- (1) Doliolum, Oikopleura [Practical-1,(i)]
- (2) Mountings [Practical-5], Also available in Chart.
- (3) Histological Structure of mammalian organs. [Practical-9]
- (4)

### **LIST OF SPECIMENS:**

- (1) All animal specimens from Sub-Phylum-Hemi Chordata to Class- Mammals. [Practical-1&2 except Doliolum&Oikopleura]
- (2) Snakes [Practical-8]
- (3) Fisheries [Practical-17]

### **LIST OF CHARTS/MODELS/PHOTOGRAPHS:**

- (1) Systems of Calotes [Practical-4]
- (2) National Parks & Sanctuaries of Gujarat State. [Practical-13 & 14]
- (3)

## REFERENCE BOOKS

**19-03-04-01-04-04-00**

### SEMESTER – IV

#### List of Books for Unit -1 & 2

- 1 : Chordate Zoology.....E.L.Jordan&Dr.P.S.Verma2  
: Modern textbook of Zoology Vertebrates .....R.L.Kotpal.  
3 : Chordate Embryology.....P.S.Verma&V.K.Agraval  
4 : A manual of practical Zoology, Vertebrates.....P.S.Verma  
5 : Practical Zoology, Vertebrates.....S.S.Lal

#### List of Books for Unit - 3

- 6 : Animal Physiology.....P.K.Gupta.  
7 : Animal  
Physiology.....V.K.Agrawal.  
8 : Animal  
Physiology.....M.P.Arora  
9 : A textbook of Animal  
Physiology.....TyagiPrasum10 : Human Physiology,  
Vol- I & II.....Chatterjee C.C. 11 : A text book of  
Animal Physiology.....A.K.Berry&K.Berry  
12 : Animal Physiology & Bio-Chemistry.....R.A.Aggrawal&  
Anil k. Shrivastva&Kaushal Kumar  
13 : Chordate Embryology.....P.S.Verma&V.K.Agraval

#### List of Books for Unit – 4

- 14 : Principle of Genetics.....Gardner.  
15 : Genetics.....P.S.Varma&V.K.Agrawal.  
16 : Problems on Genetics, Molecular Genetics & Evolutionary Genetics....  
.....Dr.P.K.Banergee.  
17 : Genetics & Biostatistics.....Meyyan.  
18 : Cell Biology, Genetics, Molecular Biology, Evolution&  
Ecology.....P.S.Verma&V.K.Agarval.

19 : Cytology, Genetics & Evolution.....P.K.Gupta

List of Books for Unit – 5

20 :Organic Evolution .....Dr. N. Arumugam.

21 :Evolution.....VeerbalaRastogi.

22 :Chordate Zoology.....E.L.Jordan&Dr.P.S.Verma

23 : Modern textbook of Zoology Vertebrates .....R.L.Kotpal.

24 :Fisheries Biology.....S S Khanna & H R Singh

List of Books for Viva-Voice

35 : Practical Zoology Invertebrate.....S.S.Lal

36 : Practical Zoology Vertebrate.....S.S.Lal

