

BHAVNAGAR UNIVERSITY

BHAVNAGAR

(NACC Accreditation Grade “B”)

CREDIT AND SEMESTER SYSTEM

SYLLABUS

BACHELOR OF SCIENCE (B.Sc.)

ZOOLOGY

(In Force From Academic Year: 2011-2012)

तमसो मा ज्योतिर्गमय



- ♣ The course content has been designed on **Semester pattern: Two semesters (III & IV)** in Academic Year.
 - ♣ The work load for theory: There shall be **three lectures** per paper in a week set up by department.
 - ♣ The work load for Practical: There shall be **three Practicals** in a week set up by department.
 - ♣ There shall be **three theory paper** and **one practical paper** in Semester end Examination.
 - ♣ The University Theory examination comprise of 3 **theory papers**.
 - ♣ Each theory paper shall be of **3 hours** duration and carry 70 **marks**.

 - ♣ **Internal Marks: 30**
 - **Component – I** (Assignments - 10 Marks) per theory Paper
 - **Component – II** (Seminar - 10 Marks) per theory Paper
 - **Component – III** (Test - 10 Marks) per theory Paper.

 - ♣ Practical Examination: 12 Hours (in 02 days, 03 hours per session)
 - ♣ Practical paper: **150 Marks** 1st day [60 marks + 07 viva-voce] +2nd day [60 marks + 08 viva-voce] [10 marks Journal] [05 marks Presentation]
- 60 + 07 + 60 + 08 + 10 + 05 = 150**



B.Sc.
Credit and Semester System Syllabus

NAME OF THE SUBJECT: **ZOOLOGY**

SEMESTER: 3rd

SR. NO.	PAPER NO	NAME OF THE PAPER	TOTAL MARKS EXT+INT* = TOTAL	PASSING STANDARD EXT+INT = TOTAL	TOTAL TEACHING HOURS	UNIVERSITY EXAM. HOURS	CREDITS
1	Z-301	Non Chordate And Economic Zoology (Theory)	70 + 30* = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03	03
2	Z-302	Chordates and Osteology (Theory)	70 + 30* = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03	03
3	Z-303	Physiology, Genetics, Immunology and Embryology (Theory)	70 + 30* = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03	03
4	Z-304	Practicals	90 + 00 = 90 (External Only)	36 + 00 + 36	15 Weeks x 09 Hours = 135	09	09
		TOTAL	300 + 90 = 390	120 + 36 = 156	---	18	18

* <u>INTERNAL</u>	<u>MARKS</u>
ASSIGNMENT	10
SEMINAR	10
TEST	10



B.Sc.
Credit and Semester System Syllabus

NAME OF THE SUBJECT: **ZOOLOGY**

SEMESTER: **4th**

SR. NO.	PAPER NO	NAME OF THE PAPER	TOTAL MARKS EXT+INT*=TOTAL	PASSING STANDARD EXT+INT=TOTAL	TOTAL TEACHING HOURS	UNIVERSITY EXAM. HOURS	CREDITS
PRINCIPAL & FIRST SUBSIDIARY:							
1	Z-401	Non Chordate And Economic Zoology (Theory)	70 + 30* = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03	03
2	Z-402	Chordates, Applied Zoology and Environmental biology (Theory)	70 + 30* = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03	03
3	Z-403	Enzymology, Genetics, Histology and Zoogeography (Theory)	70 + 30* = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03	03
4	Z-404	Practicals	90 + 00 = 90 (External Only)	36 + 00 + 36	15 Weeks x 09 Hours = 135	09	09
		TOTAL	300 + 90 = 390	120 + 36 = 156	---	18	18

* <u>INTERNAL</u>	<u>MARKS</u>
ASSIGNMENT	10
SEMINAR	10
TEST	10

There shall be Local Excursion (*Principal and Subsidiary subject*) and Zoological study tour in any part of India (for only Principal subject) for the study of Wildlife and faunal diversity. [Including visit to Forest, Desert, Sea cost, Zoological park, Nature Park, Animal science based Research institutes and government institutions.] Students shall have to submit Field report / Tour report in their Journal.



B.Sc. (ZOOLOGY)

SEMESTER – III

Paper No. Z-301: Non Chordate And Economic Zoology:

Credit: 03

Total Marks: 100
Marks: Semester End Examination: 70
Continues Internal Evaluation: 30

UNIT	DETAILED SYLLABUS	TEACHING HOURS	MARKS / WEIGHT
Unit – I	<p>Diversity of Life Classification of the following animals up to the class:</p> <p>1.1 Classification of Protozoa with example. Class: - (i) Rhizopoda (ii) Ciliata (iii) Mastigophora (Flagellata) (iv) Sporozoa</p> <p>1.2 Classification of Porifera with example. Class: - (i) Calcarea (ii) Hexactinellida (iii) Demospongia</p> <p>1.3 Classification of Coelenterata with example. Class: - (i) Hydrozoa (ii) Scyphozoa (iii) Anthozoa (Actinozoa)</p> <p>1.4 Classification of Platyhelmenthes with example. Class: - (i) Turbellaria (ii) Trematoda (iii) Cestoda (Cestoidea)</p> <p>1.5 Classification of Aschelminthes with example. Class: - Nematoda</p>	01 01 01 01 01 01 01 01 01 01 01	20
Unit – II	<p>General Morphology and Functional Anatomy of the following animals</p> <p>2.1 Plasmodium Vivex: - (i) Distribution of Plasmodium (ii) Life cycle: - (a) A sexual cycle (b) Sexual Cycle (iii) Human Malaria:- a. Early History b. Types of Malaria c. Symptoms and Pathogenesis d. Duration of Infection e. Control of Malaria</p>	01 01 01 01 01	30



	2.2 Leucosolenia: - (i) Habit & Habitat (ii) External Morphology (iii) Body Wall (iv) Reproduction and Development	01 01 01 01	
	2.3 Leech: - (i) Habit & Habitat (ii) External Morphology (iii) Body Wall (iv) Locomotion (v) Digestive System (vi) Respiration (vii) Excretory System (viii) Nervous System (ix) Reproductive System & Development (x) Parasitic adaptation	02 01 01 01 01 01 01 02 01	
Unit – III	Economic Zoology :- 3.1 Disease caused by mosquitoes (i) Anopheles ♣ Malaria ♣ Falciparum. (ii) Culex ♣ Elephantiasis (iii) Adis ♣ Dengue 3.2 Zoo Parasitic Helminthes And Human Disease (i) Paragonimus westermani (ii) Schistosoma (Blood fluke) (iii) Ascaris lumbricoides (iv) Enterobius vermicularis (v) Trichinella Spiralis 3.3 Parasitic Adaptation of Flatworm. (i) Morphological Adaptation (ii) Physiological Adaptati	02 01 01 01 01 01 01 01 01 01	20

Break up of Continuous Internal Evaluation:

1. Assignments	10 Marks
2. Seminar	10 Marks
3. Test	<u>10 Marks</u>
Total Marks	30 Marks



Paper No. Z-302: Chordates & Osteology:

Credit: 03

Total Marks: 100

Marks: Semester End Examination: 70

Continues Internal Evaluation: 30

UNIT	DETAILED SYLLABUS	TEACHING HOURS	MARKS / WEIGHT
Unit – I	Classification and general characters of chordates: Classification of the following animals: 1.1 General characters of Protochordates. 1.2 Classification of protochordates up to class with example. 1.3 Affinities of proto chordates. 1.4 General characters of Cyclostomata. 1.5 Classification of Cyclostomata with example. 1.6 General characters of Pisces. 1.7 Classification of Pisces up to sub class with example. 1.8 General characters of Amphibia. 1.9 Classification of Amphibia up to sub class with example.	02 01 02 01 02 01 02 01 01 02	23
Unit – II	The study of organizational and functional anatomy of the Scoliodon: 2.1 External character 2.2 Digestive system 2.3 Circulatory System 2.4 Brain and their functions 2.5 Urinogenital system 2.6 Internal Ear 2.7 Ampullae of lorenzini 2.8 (i) Types of scales in fish (ii) Types of fins in fish	01 02 02 02 02 02 02 02	24
Unit – III	The study of organizational and functional anatomy of the Frog: 3.1 External character 3.2 Digestive system 3.3 Arterial System 3.4 Male Urinogenital System 3.5 Female Urinogenital system 3.6 Brain and their functions 3.7 Skeleton system of Frog.	01 02 02 02 02 02 04	23

Break up of Continuous Internal Evaluation:

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|--------------------|-----------------|
| 1. Assignments | 10 Marks |
| 2. Seminar | 10 Marks |
| 3. Test | <u>10 Marks</u> |
| Total Marks | 30 Marks |



Paper No. Z-303: Physiology, Genetics, Immunology and Embryology:

Credit: 03

Total Marks: 100

Marks: Semester End Examination: 70

Continues Internal Evaluation: 30

UNIT	DETAILED SYLLABUS	TEACHING HOURS	MARKS / WEIGHT
Unit – I	Physiology:		
	1.1 Metabolism of carbohydrate (i) Glycogenesis (ii) Glycogenolysis (iii) Glycolysis (iv) Krebs cycle	05	23
	1.2 Metabolism of Proteins (i) Deamination (ii) Oxidative Deamination (iii) Transamination (iv) Decarboxylation (v) Transmethylation (vi) Formation of Urea (vii) Formation of ammonium salts	05	
	1.3 Metabolism of Fat (i) Fat stores (ii) Break down (Oxidation) of Fat a. Oxidation of Glycerol b. Oxidation of Fatty acids ♣ Activation ♣ Desaturation ♣ Hydration ♣ Oxidation ♣ Thiolytic cleavage (iii) Ketosis (iv) Metabolism of Cholesterol	05	
Unit – II	Genetics:		
	2.1 Interaction of genes: - (i) Complimentary genes (9:7) (ii) Duplicatory genes (15:1) (iii) Epistasis a. Recessive Epistasis (9:3:4) b. Dominant Epistasis (13:3) (iv) Inheritance of comb in fowls (9:3:3:1)	07	24



	2.2 Sex determination in animals: - (i) Chromosomal theory of sex determination a. Sex determination in Drosophila b. Sex determination in Butterfly c. Sex determination in Grasshopper d. Sex determination in Man e. Genic balance theory f. Gynandromorph (ii) Environmental determination of sex (iii) Hormonal theory of sex determination a. Free-martin b. Sex reversal in chicken c. Sex reversal in man (iv) Metabolic differentiation theory (v) Effect of parasites in sex determination	08	
Unit – III	Immunology: (i) Antigens (ii) Antibodies ♣ Immunoglobulins ♣ IgG, IgA, IgM, IgD, IgE. (iii) Monoclonal antibodies (iv) Interferons (v) Interleukin	08	23
	Embryology: Amphioxus embryology (i) Eggs (ii) Fertilization (iii) Cleavage (iv) Blastulation (v) Gastrulation and organogenesis (vi) Larval development	07	

Break up of Continuous Internal Evaluation:

1. Assignments	10 Marks
2. Seminar	10 Marks
3. Test	<u>10 Marks</u>
Total Marks	30 Marks



SEC.-B	<p><u>Based on theory Z-302</u> <u>Classification of the Following animals up to the sub classes:</u></p> <p>Practical – 1 Classification of protochordates: 03 Hemichordata: - Balanoglossus, Urochordata: - Ascidia, Salpa, Doliolum, Pyrosoma, Oikopleura Cephalochordata: - Amphioxus.</p> <p>Practical – 2 Classification of Cyclostomata: - Lamprey, Hagfish 03</p> <p>Practical – 3 Classifications of Pisces. 03 Chondrichthyes: - Pristis, Torpedo, Chimaera, Hammer headed Shark, Osteichthyes: - Protopterus, Amia, Lepidosteus, Eel, Cat fish, Hemirhamphus, Hippocampus</p> <p>Practical – 4 Classification of Amphibia 03 Ichthyophis, Cryptobranchus, Axolotal - Larva, Triton, Siren, Salamander, Hyla, Alytes, Frog, Buffo.</p> <p>Practical – 5 To study Parental care in Amphibia. 03 Ichthyophis, Hyla, Alytes.</p> <p>Practical – 6 To study External character & Digestive system of the Shark. 03</p> <p>Practical – 7 To study Circulatory system of the Shark. 03</p> <p>Practical – 8 To study Brain and their functions in the Shark. 03</p> <p>Practical – 9 To study Urinogenital system of the Shark. 03</p> <p>Practical – 10 To study mountings of the Shark. 03 (a) Internal Ear. (b) Ampullae of Lorenzini. (c) Placoid scales.</p> <p>Practical – 11 To study skeleton of Frog. 03 (1) Axial skeleton of Frog - skull bones and vertebrae with urostyle. (2) Appendicular skeleton of frog - Pectoral girdle, Pelvic girdle, Fore limb bones, Hind limb bones.</p> <p>Practical – 12 To study External character & Digestive system of the Frog. 03</p> <p>Practical – 13 To study Circulatory system of the Frog. 03</p> <p>Practical – 14 To study Brain and their functions in the Frog. 03</p> <p>Practical – 15 To study Urinogenital system of the Frog. 03</p>		
SEC.-C	<p><u>Based on theory Z-303</u></p> <p><u>Ecology:</u></p> <p>Practical – 1 Estimations of free CO₂ in the sample water. 03</p> <p>Practical – 2 Estimations of Alkalinity in the sample water. 03</p> <p>Practical – 3 Estimations of Chlorinity in the sample water. 03</p> <p>Practical – 4 Estimations of Total Hardness in the sample water. 03</p> <p>Practical – 5 Estimations of Ca & Mg hardness in the sample water. 03</p>		



<p><u>Biochemistry:</u></p> <p>Practical – 6 To detect the Glucose form the given unknown solution by biochemical test. 03</p> <p>Practical – 7 To detect the Maltose form the given unknown solution by biochemical test. 03</p> <p>Practical – 8 To detect the Lactose form the given unknown solution by biochemical test. 03</p> <p>Practical – 9 To detect the Albumen form the given unknown solution LKby Biochemical test. 03</p> <p>Practical – 10 To detect the Peptone form the given unknown solution by biochemical test. 03</p> <p><u>Embryology & genetics:</u></p> <p>Practical – 11 To study the embryological development in Amphioxus (permanent slides). 03 (i) Eggs (ii) Fertilization (iii) Cleavage (iv) Blastulation (v) Gastrulation and organogenesis (vi) Larval development t – I & II.</p> <p>Practical – 12 To solve the problems of interaction of genes. 03 (a) Complimentary genes (9:7) (b) Duplicatory genes (15:1)</p> <p>Practical – 13 To solve the problems of interaction of genes. 03 (a) Recessive Epistasis (9:3:4) (b) Dominant Epistasis (13:3)</p> <p>Practical – 14 To solve the problems of interaction of genes. 03 (a) Inheritance of comb in fowls (9:3:3:1) (b) Blood group Inheritance.</p> <p>Practical – 15 Local excursion 03</p> <p>Journal (Paper Z-304)</p> <p>Presentation</p>		
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TEXT BOOKS RECOMMENDED:

1. Text Book of Zoology – Phylum Series	– R.L.Kotpal.
2. Chordate Zoology	– Majupuria.
3. Chordate Zoology	– E.L Jordan & P. S. Verma.
4. Invertebrate Zoology	– E. L. Jordan & P. S. Verma.
5. Invertebrate Zoology	– Majupuria.
6. A Manual of Zoology Vol. I & II	– Ekambernath Ayar.
7. Text Book of Zoology	– Dalela and Verma.
8. Text Book of Zoology	– S.N. Prasad.
9. Invertebrate Zoology	– Veer Bala Rastogi.
10. Modern T.B. of Zoology – Invertebrates	– Kotpal, Agrawal, Khetarpal.
11. Chordate Zoology	– Agrawal and Dalela.
12. T. B. of Cytology	– Dalela & Verma.
13. Introductory Cytology	– V. B. Rastogi.
14. T. B. of Cytology	– Wilson and Morrison.
15. T. B. of Cytology	– Swanson.
16. T. C. Cell Biology, Genetics, Evolution and Ecology	– Verma & Agrawal.
17. Text book of Zoology	– R. D. Vidyarthi.
18. Animal Ecology	– S.P.Singh.
19. Genetics	– P.K.Gupta.
20. Ecology	– R.L.Kotpal.
21. Pranishastra (Gujarati)	– Ravi Prakashan.
22. Jiv Vignan-2 (Gujarati)	– Nirav Prakashan.
23. A Text Book of General Biology	– Tomer & Singh.
24. Text Book of Zoology	– Sarus Publication.
25. Concept of Ecology	– N.Arumugam.
26. Economic Zoology	– G.S.Shukla & V.B.Upadhyay.
27. Pruthvanshi Praniyo ane Garbhvidya	– A.B.Vyas.
28. Utkrushtha Aprushthvanshi Praniyo	– U.M.Rawal.
29. Laboratory manual in biochemistry	– J Jayaraman.
30. Environmental science	– S.C. Santra
31. Manual of prac. zoology vol.- I, II, III	– P.K.G.Nair



B.Sc. (ZOOLOGY)

SEMESTER – IV

Paper No. Z-401: Non Chordate And Economic Zoology:

Credit: 03

Total Marks: 100

Marks: Semester End Examination: 70

Continues Internal Evaluation: 30

UNIT	DETAILED SYLLABUS	TEACHING HOURS	MARKS / WEIGHT
Unit – I	Diversity of Life Classification of the following Animals up to the class		
	1.1 Phylum: Annelida Class: (i) Oligochaeta (ii) Polychaeta (iii) Hirudinea	03 05	23
	1.2 Phylum: Arthropoda Class: (i) Crustacea (ii) Myriapoda (iii) Insecta (iv) Arachnida	02	
	1.3 Phylum: Mollusca Class: (i) Amphineura (Placophora) (ii) Lamellibranchiata (Bivalvia) (Pelecypoda) (iii) Gastropoda (iv) Cephalopoda (v) Scaphopoda	02	
	1.4 Phylum: Echinodermata Class: (i) Asteroidea (ii) Echinoidea (iii) Ophiuroidea (iv) Holothuroidea (v) Crinoidea	02 01	
Unit – II	General morphology and functional anatomy of the Following animals:	09	24
	2.1 Liver fluke :- (a) Habit & Habitat (b) External Morphology (c) Body Wall (d) Digestive System (e) Excretory System (f) Nervous System (g) Reproductive System (h) Life cycle & Development (i) Parasitic adaptation		
	2.2 Pila: - (b) Habit & Habitat (c) External Morphology (d) Mantle Cavity (e) Digestive System (f) Respiratory System (g) Circulatory System (h) Nervous System (i) Sense Organs (i) eyes (ii) Statocyst (iii) Osphradium (iv) Tentacles (j) Reproductive system & Development	03	
		03	



Unit – III	Economic Zoology		
	3.1 Pearl culture	01	
	3.2 Economic importance of Mollusca	02	
	3.3 Mites And Ticks and their control	04	
	a. Mite		
	b. Straw Itch or Harvest Mite		
	c. Cattle Tick		
	d. Fowl Tick		
	3.4 Insects damaging food products	03	
	a. Rice weevil		
	b. Wheat weevil		
	c. Pulse beetle		
	d. Potato tuber moth (Aloo ki surhi)		
	e. Indian meal moth		
3.5 Insects effecting Human health	05		
a. House flies			
b. Mosquito			
c. Human louse			
d. Bed bug			
e. Fleas			
		23	

Break up of Continuous Internal Evaluation:

1. Assignments	10 Marks
2. Seminar	10 Marks
3. Test	<u>10 Marks</u>
Total Marks	30 Marks



Paper No. Z-402: Chordates, Applied Zoology and Environmental biology:

Credit: 03

Total Marks: 100
Marks: Semester End Examination: 70
Continues Internal Evaluation: 30

UNIT	DETAILED SYLLABUS	TEACHING HOURS	MARKS / WEIGHT
Unit – I	<p>General characters and classification.</p> <p>1.1 General characters of Reptilia. 1.2 Classification of Reptilia up to subclass with example. 1.3 General characters of Aves. 1.4 Classification of Aves up to sub class with example. 1.5 General characters of Mammals. 1.6 Classification of Mammals up to sub class with example.</p> <p>Fisheries:</p> <p>a. Fresh water fishes ♣ Major carps: - <i>Catla catla</i>, <i>Labeo rohita</i>, <i>Cirrhins mrigala</i> ♣ Cat fish: - <i>Wallago attu</i>, <i>Clarias batrachu</i>, <i>Anabas testudineus</i> b. Fish by product:- Liver oil, Extraction of liver oil, Fish meal, Fish fertilizer.</p>	01 01 01 02 01 01 04 04	23
Unit – II	<p>The study of organizational and functional anatomy of the Calotes:</p> <p>2.1 External character 2.2 Digestive system 2.3 Circulatory System 2.4 Brain and their functions 2.5 Urinogenital system 2.6 Pectin 2.7 Hyoid Apparatus.</p> <p>General topics:</p> <p>(a) Adaptation of feet in birds (b) Adaptation of beak in birds (c) Identification of poisonous and non poisonous snake Cobra, Krait, Saw scaled viper, Russell's viper, Rat snake, Banded Racer, Trinket</p>	01 01 01 01 02 01 01 03 02 02	24
Unit – III	<p>3.1 Leather industry a. Animals of leather industry b. Processing of skin industry (i) Flaying (ii) Curing (iii) Salting (iv) Tanning c. Recent efforts</p> <p>3.2 Current environmental issues:- Global warming and Greenhouse effect. - The main green house Gases - Green house gases and global climate change - Possible effect of global worming Possible impact of Global worming. - Sea level change - Crop yield - Water balance - Human health IPCC (Intergovernmental Panel on Climate Change). - Working group I,II and III - Future Green house gas Emission scenarios.</p>	07 08	23

Break up of Continuous Internal Evaluation:

1. Assignments	10 Marks
2. Seminar	10 Marks
3. Test	10 Marks
Total Marks	30 Marks



Paper No. Z-403: Enzymology, Genetics, Histology and Zoogeography:

Credit: 03

Total Marks: 100

Marks: Semester End Examination: 70

Continues Internal Evaluation: 30

UNIT	DETAILED SYLLABUS	TEACHING HOURS	MARKS / WEIGHT
Unit – I	<p>1.1 Enzymes</p> <ul style="list-style-type: none"> (i) Introduction (ii) Chemical nature of Enzymes (iii) Catalytic abilities of Enzymes (iv) Physical Properties (v) Chemical properties: Enzymes as catalyst (vi) General properties (vii) Mechanism of Enzyme action (viii) Effect of various conditions on enzymes activity <ul style="list-style-type: none"> a. Influence of Temperature b. Effect of pH c. Concentration of Enzyme d. Concentration of Substrate e. Other factors (ix) Classification of Enzymes <ul style="list-style-type: none"> a. Hydrolyses b. Oxidoreductase c. Transferases d. Isomerases e. Hydrases f. Coagulative enzymes g. Lysases & ligases or Synthetases 	<p>03</p> <p>05</p> <p>02</p> <p>02</p> <p>02</p> <p>01</p>	23
Unit – II	<p>Genetics :</p> <p>2.1 Sex linked inheritance</p> <ul style="list-style-type: none"> (i) Eye color in drosophila (ii) Colorblindness in Human (iii) Hemophilia in Human <p>2.2 Crossing over</p> <ul style="list-style-type: none"> (i) Mechanism of crossing over <p>2.3 Linkage</p> <ul style="list-style-type: none"> (i) Linkage in drosophila (ii) Coupling and repulsion in sweet pea <p>2.4 Non-disjunction in human.</p> <ul style="list-style-type: none"> (i) Klinefelter's syndrome. (ii) Turner's syndrome. (iii) Down's syndrome 	<p>05</p> <p>02</p> <p>04</p> <p>01</p> <p>03</p>	24



Unit – III	Histology: Study of Epithelial and connective tissues ♣ Squamous epithelium ♣ Cuboidal epithelium ♣ Columnar epithelium, ♣ Ciliated epithelium ♣ Stratified epithelium ♣ Areolar connective tissue ♣ Cartilage connective tissue	06	
	Zoogeography: ♣ Introduction ♣ Brief account of Zoogeographical realms with mammalian fauna Australian Region Oriental Region Neotropical Region Ethiopian Region Nearctic Region Palaeartic Region	09	23

Break up of Continuous Internal Evaluation:

1. Assignments	10 Marks
2. Seminar	10 Marks
3. Test	<u>10 Marks</u>
Total Marks	30 Marks



SEC.-B	Based on theory Z-402 <u>Classification of the Following animals up to the Sub Classes:</u> Practical – 1 Classification of Reptilia (up to order) Chelon, Tortoise, Turtle, Varanus, Draco, Chamaeleon, Mabuya (Skink), Rat snake, Alligator. 03 Practical – 2 Classifications of Aves. Weaver Bird, Wood pecker, king fisher, vulture, Parakeet, Hoopoe, Common myna, Crane, Quail, Babbler, Pigeon, Green bee eater 03 Practical – 3 Classifications of Mammals (up to sub-classes) Hedgehog, bat, scaly Anteater, Guinea pig, Squirrel, Loris, Mongoose, Platypus, Spiny anteater. 03 Practical – 4 Study of Fresh water fishes 03 (a) <i>Catla catla</i> , (b) <i>Labeo rohita</i> , (c) <i>Cirrhins mrigala</i> , (d) <i>Wallago attu</i> , (e) <i>Clarias batrachus</i> , (f) <i>Anabas testudineus</i> . Practical – 5 To Study byproducts of fish. 03 Practical – 6 To Study External character & Digestive system of the Calotes. 03 Practical – 7 To Study Circulatory system of the Calotes 03 Practical – 8 To Study Brain and their functions in the Calotes. 03 Practical – 9 To Study Urinogenital system of the Calotes. 03 Practical – 10 To Study mountings of the Calotes. 03 (a) Hyoid Apparatus. (b) Pectin. Practical – 11 To Study poisonous and non poisonous snakes 03 Cobra, Krait, Saw scaled viper, Russell's viper, Rat snake, Racer, Trinket. Practical – 12 To Study adaptation of feet in birds. 03 Practical – 13 To Study adaptation of beak in birds. 03 Practical – 14 To Study processing of leather. 03 Practical – 15 Local excursions 03		
SEC.-A	Based on theory Z-403 Practical – 1 Zoogeographical distribution of mammalian fauna Part-I 03 Practical – 2 Zoogeographical distributions of mammalian fauna Part-II 03 Practical – 3 Fill the map of Zoogeographical distribution of mammals 03 Practical – 4 Effect of ptyline on food stuff. 03 Practical – 5 Effect of pepsin on food stuff. 03 Practical – 6 To Study mitotic cell division from onion root tip (Squash tech.) 03 Practical – 7 To Study meiotic cell division in germ cell from floral bud. 03 Practical – 8 To Solve the problems of sex linked inheritance Colorblindness in Human 03 Practical – 9 To Solve the problems of sex linked inheritance Hemophilia in Human. 03		



Practical – 10 To Solve the problems of sex linked inheritance Eye color in drosophila	03
Practical – 11 Study of human Karyotype by slides / charts	
Practical – 12 Study of human Karyotype(non dis junction-Klinefelter's Turner's and Down's syndrome) by slides / charts.	03
Practical – 13 To study density gradient with the help of glycerol Solutions series.	03
Practical – 14 To Study Epithelial and connective tissues by permanent slide. (Squamous epithelium, columnar epithelium, stratified epithelium, Cuboidal, ciliated, Areolar, Cartilage)	03
Practical -15 Local excursions.	
Journal (Paper Z-304)	03
Presentation	

TEXT BOOKS RECOMMENDED:

1. Text Book of Zoology – Phylum Series	- R.L.Kotpal.
2. Chordate Zoology	- Majupuria.
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14. T. B. of Cytology	- Wilson and Morrison.
15. T. B. of Cytology	- Swanson.
16. T. C. Cell Biology, Genetics, Evolution and Ecology	- Verma & Agrawal.
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22. Jiv Vignan-2 (Gujarati)	- Nirav Prakashan.
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25. Concept of Ecology	- N.Arnumugam.
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30. Environmental science	- S.C. Santra
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