SCHEME OF EXAMINATION FOR B.Sc. (ZOOLOGY) SEMESTER SYSTEM
w.e.f. Session 2010-2011
Scheme of B.Sc. II

Semester III					
Sr. No.	Paper code	Nomenclature	Marks+IA	Periods / week	Time
1.	3.1	Life and Diversity of Chordates – I	50+5	4	3 hrs.
2.	3.2	Mammalian Physiology – I	50+5	4	3 hrs.
Semester IV					
3.	4.1	Life and Diversity of Chordates – II	50+5	4	3 hrs.
4.	4.2	Mammalian Physiology – II	50+5	4	3 hrs.
5.	P-301 & P-401	Practical*	80	4+4	6 hrs. (Two Session)
Total Semester III & IV			300		

*practical examination will be held at the end of 4th semester (annually)

SYLLABUS

B.Sc. Part-II (Semester III & IV)

SEMESTER - III

Paper 3.1

Life and Diversity of Chordates – I

Max Marks: 50 + 5 (Internal assessment) **Time allotted: 3 Hours**

Note: Nine questions are to be set in all and the candidates are required to attempt five questions including compulsory question.

1. Question number I is compulsory consisting of 10 parts (1.0 mark each) covering the entire syllabus. Answer to each part should not exceed 20 words.
2. Out of remaining eight questions, two questions are to be set from each unit (I to IV), possibly splitting them in parts. Candidate is required to attempt four questions, selecting one question from each unit.

UNIT-I

Chordates: Principles of classification; Origin and Evolutionary tree; Role of amnion in evolution; Salient features of chordates; Functional morphology of the types with examples emphasizing their biodiversity, economic importance and conservation measures where required.

UNIT-II

General characters and classification of phyla upto orders with examples emphasizing their biodiversity, economic importance and conservation measures where required.

Protochordates: Systematic position, distribution, ecology, morphology and affinities

Urochordata: *Herdmania* – type study

Cephalochordata; *Amphioxus* – type study

UNIT-III

General characters and classification of phyla upto orders with examples emphasizing their biodiversity, economic importance and conservation measures where required.

Cyclostomes: Classification and ecological significance

Type study of *Petromyzon.*

UNIT-IV

General characters and classification of all phyla upto orders with examples emphasizing their biodiversity, economic importance and conservation measures where required.

Pisces: Scales & Fins, Parental care in fishes, fish migration.

Types study of Labeo

Note: Type study includes detailed study of various systems of the animal.

SEMESTER - III

Paper 3.2

Mammalian Physiology – I

Max Marks: 50 + 5 (Internal assessment) **Time allotted: 3 Hours**

Note: Nine questions are to be set in all and the candidates are required to attempt five questions including compulsory question.

1. Question number I is compulsory consisting of 10 parts (1.0 mark each) covering the entire syllabus. Answer to each part should not exceed 20 words.
2. Out of remaining eight questions, two questions are to be set from each unit (I to IV), possibly splitting them in parts. Candidate is required to attempt four questions, selecting one question from each unit.

UNIT-I

Introduction, Classification, Structure, function and general properties of carbohydrates and lipids.

UNIT-II

Introduction, Classification, Structure, function and general properties of proteins; Nomenclature, Classification and mechanisms of enzyme action.

Transport through biomembranes (Active and Passive), buffers

UNIT-III

Nutrition: Nutritional components; Carbohydrates, fats, lipids, Vitamins and Minerals. Types of nutrition & feeding, Digestion of dietary constituents, viz. lipids, proteins, carbohydrates & nucleic acids; symbiotic digestion. Absorption of nutrients & assimilation; control of enzyme secretion.

UNIT-IV

Muscles: Types of muscles, ultra-structure of skeletal muscle. Bio-chemical and physical events during muscle contraction; single muscle twitch, tetanus, muscle fatigue muscle, tone, oxygen debt., Cori's cycle, single unit smooth muscles, their physical and functional properties.

Bones: Structure and types, classification, bone growth and resorption, effect of ageing on Skeletal system and bone disorders.

SEMESTER - IV

Paper 4.1
Life and Diversity of Chordates – II

Max Marks: 50 + 5 (Internal assessment) **Time allotted: 3 Hours**

Note: Nine questions are to be set in all and the candidates are required to attempt five questions including compulsory question.

1. Question number I is compulsory consisting of 10 parts (1.0 mark each) covering the entire syllabus. Answer to each part should not exceed 20 words.
2. Out of remaining eight questions, two questions are to be set from each unit (I to IV), possibly splitting them in parts. Candidate is required to attempt four questions, selecting one question from each unit.

UNIT-I

Amphibia: Origin, Evolutionary tree. Type study of frog (*Rana tigrina*), Parental Care in Amphibia

UNIT-II

Reptilia: Type study of Lizard (Hemidactylus), Origin, Evolutionary tree. Extinct reptiles; Poisonous and non-poisonous snakes; Poison apparatus in snakes.

UNIT-III

Aves: Type study of Pigeon (*Columba livia*); Flight adaptation, Principles of aerodynamics in Bird flight, migration in birds.

UNIT-IV

Mammals: Classification, type study of Rat; Adaptive radiations of mammals dentition.

Note: Type study includes detailed study of various systems of the animal.

SEMESTER - IV
Paper 4.2
Mammalian Physiology – II

Max Marks: 50 + 5 (Internal assessment) **Time allotted: 3 Hours**

Note: Nine questions are to be set in all and the candidates are required to attempt five questions including compulsory question.

1. Question number I is compulsory consisting of 10 parts (1.0 mark each) covering the entire syllabus. Answer to each part should not exceed 20 words.
2. Out of remaining eight questions, two questions are to be set from each unit (I to IV), possibly splitting them in parts. Candidate is required to attempt four questions, selecting one question from each unit.

UNIT-I

Circulation: Origin, conduction and regulation of heart beat, cardiac cycle, electrocardiogram, cardiac output, fluid pressure and flow pressure in closed and open circulatory system; Composition and functions of blood & lymph; Mechanism of coagulation of blood, coagulation factors; anticoagulants, haempoiesis

UNIT-II

Respiration: Exchange of respiratory gases, transport of gases, lung air volumes, oxygen dissociation curve of hemoglobin, Bohr's effect, Haburger's phenomenon (Chloride shift), control / regulation of respiration.

Excretion: Patterns of excretory products viz. Amonotelic, ureotlic uricotelic, ornithine cycle (Kreb's – Henseleit cycle) for urea formation in liver.

UNIT-III

Excretion: Urine formation, counter-current mechanism of urine concentration, osmoregulation, micturition.

Neural Integration: Nature, origin and propagation of nerve impulse along with medullated & non-medullated nerve fibre, conduction of nerve impulse across synapse.

UNIT-IV

Chemical integration of Endocrinology: Structure and mechanism of hormone action; physiology of hypothalamus, pituitary, thyroid, parathyroid, adrenal, pancreas and gonads.

Reproduction: Spermatogenesis, Capacitation of spermatozoa, ovulation, formation of corpus luteum, oestrous-anoestrous cycle, Menstrual cycle in human; fertilization, implantation and gestation.

B.Sc.-Semester III
PRACTICAL PAPER (P-301)

Max. Marks: 40 Time allowed: 3Hrs

1. Classification upto orders, habit, habitats, external characters and economic importance (if any) of the following animals:-

Protochordata : *Molqula, Hetryllus, Pyrosoma, Doliolum, Olikopleura*, and *Amphioxus.*

Cyclostomata : *Myxine, Petromyzon* and *Ammocoetus larva.*

Chondrichthyes: *Zygaena, Pristis, Narcine* (electric ray), *Trygon, Rhinobatus, Raja* and *Chimaera.*

Osteichthyes : *Acipenser, Lepidosteus, Muraena, Mystus, Catla, Hippocampus, Syngnathus, Exocoetus, Anabas, Diodon, Ostraczion, Tetradon, Echinus, Lophius, Solea* and *Polypterus.* Any of the Lung Fishes.

2. Examine and dissect the following animals:

Herdmania : General anatomy

Labeo (locally available fish) : Digestive and reproductive systems: cranial nerves, Ear ossicle

1. Study of the skeleton of *Scoliodon, Labeo*
2. Study of the following prepared slides:
   Tornaria larva, T.S. *Amphioxus* (through different regionds). Oikopleura, different types of scales.
3. Make permanent stained preparations of the following:
   Salpa, Spicules, and Pharynx of *Herdmania, Amphioxus,* Cycloid scales

PHYSIOLOGY PRACTICALS:

1. Qualitative tests for identification of simple sugars, disaccharides and polysaccharides.
2. Study of human salivary amylase activity: Effect of temperature, pH, Concentration.
3. Use of Kymograph unity

Project Report:

1. Migration in fishes
2. Ornamental fishes

B.Sc.-Semester IV
PRACTICAL PAPER (P-401)

Max. Marks: 40 Time allowed: 3Hrs

1. Classification up to orders, habit, habitats, external characters and economic importance (if any) of the following animals:-

Amphibia : *Necturus, Proteus, Amphiuma, Salamandra, Amblystoma, Axolotie larva, Alytes, Bufo, Rana.*

Raptilia : *Hemidactylus, Calotes, Draco, Varanus, Phrynosoma, Chamaeleon, Typhops, Python, Eryx, Ptyas, Bungarus, Naja, Hydrus, Viper, Crocodilus, Gavialis, Chelone* (Turtle) and *Testudo* (Tortoise).

Aves : *Casuarius, Arden, Anas, Milvus, Pavo, Eudynamis, Tyto* and *Alcedo, Halcyon*

Mammalia : *Ornithorphynchus, Echidna, Didelphis, Macropus, Loris, Macaque, Hystrix, Funambulus, Telix, Panthera, Canis, Herpestes, Capra, Pteropus*

2. Examine and dissect the following animals:
   Hemidactylus : Digestive, arterial, venous and urinogenital systems.
   Rat : Digestive, arterial, venous and urinogenital systems.
3. Study of the skeleton of *Rana* (Frog), *Varanus,* Pigeon or Gallus and *Orcyctolagus*/rat, Palates of birds, skulls of dog & rabbit.
4. Study of the following prepared slides:
   Histology of rat (compound tissues).
5. Zoological excursion and its report are compulsory in the practical examination.

PHYSIOLOGY PRACTICALS:

1. Estimation of abnormal constituents of urine (Albumin, sugar, ketonebodies).
2. Use of respirometer.
3. Haematein crystal preparation.
4. Estimation of Hb.
5. DLC of Man/RBC count/WBC count.

Project Report:

1. Survey of diversity
2. Parental care
3. Dentition in mammals
4. Migration in birds

B.Sc. PART- II (Zoology Practical)

(Semester 3 & 4)

Guidelines/Instructions for Practical Examination (Paper-301* & 401*)

Max Marks: 80 (40+40) **Time allowed: 6Hrs (3Hrs+3Hrs)**

Note: Following exercises will be set in the examination as per marks assigned

S. No.	Exercise	Marks
1.	Dissection –one	10
	(CD/Demonstration/Model/Exposition, labelled	
2.	Temporary mounting –one	5
	(Staining, identification, sketch)	
3.	Museum specimens - four	10
	(identification and classification)	
4.	Ecological note –one specimen	2
5.	Permanent slides - two	8 (2x4)
	(Identification with reasons)	
6.	Bone – identification & sketch	5
7.	Physiology (two exercise)	10 (5+5)
8.	Practical record and slides	5
9.	Viva	5
10	Project report	20

*P-301 & 401 (3hrs duration each) shall be conducted at the end of 4th semester jointly by one external and one internal examiner.