SEMESTER I

B.Sc. ZOOLOGY

Paper- I 3Hrs Duration	**Min. Pass Marks 29**	**Max. Marks 80**
Practical 4 Hrs Duration	**Min. Pass Marks 15**	**Max. Marks 40**
Internal Assessment	**Min. Pass Marks 11**	**Max. Marks 30**

Based on Paper I and Practical 20+10=30

PAPER TAXONOMY AND ECONOMIC ZOOLOGY

NOTE: A course will contain 5 units. The question paper shall contain three sections. **Section A (10 marks)** shall contain 10 questions two from each Unit. Each question shall be of 1 marks. All the questions are compulsory. Section A will be prepared such that questions i through v are multiple choice questions, while question vi through x will be fill in the blank questions. **Section B (25 marks)** shall contain 5 questions (two from each unit with internal choice). Each question shall be of 5 marks. The candidate is required to answer all 5 questions. The answers should not exceed 150 words. **Section C (45 marks)** shall contain 5 questions, one from each Unit. Each question shall be of 15 marks. The candidate is required to answer any three questions by selecting these three questions from different units. The answers should not exceed 400 words.

UNIT-I

1. General principles of Taxonomy: Concept of the five kingdom scheme.
2. Basis of Classification of Non chordata; Symmetry
3. Concept of Protozoa, Metazoa and Levels of Organization. Coelome, segmentation and embryogeny.
4. Characters and Classification of various phyla upto classes and classification of the prescribed types up to the order level.

UNIT-II

Habits, structure, reproduction and life history of the following types:

1. Protozoa : Paramecium
2. Porifera: Sycon.
3. Coelenterata: Aurelia

UNIT-III

Habits, structure, reproduction & life history of the following types:

1. Platyhelminthes: Fasciola and salient features of Planaria,
2. Aschelminthes: Ascaris
3. Annelida: Hirudinaria

UNIT-IV

Habits, structure, reproduction & life history of the
following types:

1. Arthropoda: Palaemon
2. Mollusca: Pila.
3. Echinodermata: External features & water vascular system of Asterias.
4. Hemichordata: Balanoglossus.

UNIT-V

ECONOMIC ZOOLOGY

1. Classification, general characteristics, distribution, Life-cycle, mode of infection, epidemiology, pathologenicity, precautions and treatment of following patho gens: Entamoeba histolytica, Giardia, Taenia solium, Wuchereria bancroftti, Dracunculus medinensis,
2. Insects as pest:
   a. An introduction to common insect pests of stored food products, e.g., Tribolium, Rhizopertha, Sitophilus,
3. An introduction to Apiculture, Sericulture

PRACTICALS

1. Collection and culture methods:
Collection of animals from their natural habitat
during field trips, e.g., Paramaecium, Euglena, Daphnia, Cyclops,
etc.
II. Anatomy:
Hirudinaria:
External features, Alimentary canal reproductive system and Nervous system.
Palaemon: External features, Appendages, Alimentary canal and Nervous system
Pila: External anatomy, Pallial organs and Nervous system.

III. Permanent preparation and study of the following:, sponge spicules, spongin fibres, gemmule hastate plate and statocyst of Prawn, gill-lamella, radula and T.S.osphradium of Pila,

(IV) Study of Microscopic Slides: Protozoa: Euglena, Try-panosoma, Giardia, Entamoeba,, Monocystis, Plasmodium, Paramecium, Balantidium, Vorticella.

Porifera:
L.S. and T.S. Sycon, Spicules, spongin fibres, gemmules..
Coelenterata: Obelia Colony and Medusa. Hydra W.M., Hydra T.S. & L.S. of Body.
Platyhelminthes: Planaria; Fasciola, T.S.body of Fasciola,
miracidium, sporocyst, redia and cercaria
; scolex,T.S. mature proglottid and gravid proglottid of Taenia, cysticercus.
Aschelminthes:. Ascaris T.S. through different regions.
Annelida: T.S. body of Nereis, T.S.body of leech/ Earthworm through various regions

Arthropoda: V.S. compund eye, V.S. integument (cuticle), Pediculus, Cyclops, Daphnia, crustacean larvae.
Molllusca: V.S. shell, T.S. gill of Lamellidens, glochidium.

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(V) Study of museum specimens: Porifera: Leucosolenia, Euplectella, Spongilla;
Coelenterata: Porpita, Millepora, Physalia, Vellela, Aurelia, Alcyonium, Gorgonia, Pennatula, Sea-anemone.
Ctenophora:
Any ctenophore;
Platyhelminthes: Taenia; Fasciola.
Annelida: Neanthes, Heteronereis phase, Aphrodite, Chaetopterus
Arthropoda: Peripatus. Limulus, spider, scorpion, centipede, milli- pede, Lepas, Balanus, , Lac insect, Eupagurus, crab, mantis, honeybee, locust, silkworm, lice, mite, tick.
Mollusca: Chiton, Aplysia, Cypraea, Mytilus, Pearl oyster, Dentalium, Loligo, Nautilus, Helix.
Echinodermata: Pentaceros, Echinus, Ophiothrix, Cucumaria, Antedon.

S.No.	Permanent Exercise	Regular
1	Dissection	8
2	Culture	6
3	Preparation	6
4	Spots(5)	10
5	Record	5
6	Viva voce	5
	Grand Total	40

SEMESTER II

B.Sc. ZOOLOGY

Paper- I 3Hrs Duration	**Min. Pass Marks 29**	**Max. Marks 80**
Practical 4 Hrs Duration	**Min. Pass Marks 15**	**Max. Marks 40**
Internal Assessment	**Min. Pass Marks 11**	**Max. Marks 30**

Based on Paper I and Practical 20+10=30

PAPER CELL BIOLOGY, MICROBIOLOGY AND IMMUNOLOGY

NOTE: A course will contain 5 units. The question paper shall contain three sections. **Section A (10 marks)** shall contain 10 questions two from each Unit. Each question shall be of 1 marks. All the questions are compulsory. Section A will be prepared such that questions i through v are multiple choice questions, while question vi through x will be fill in the blank questions. **Section B (25 marks)** shall contain 5 questions (two from each unit with internal choice). Each question shall be of 5 marks. The candidate is required to answer all 5 questions. The answers should not exceed 150 words. **Section C (45 marks)** shall contain 5 questions, one from each Unit. Each question shall be of 15 marks. The candidate is required to answer any three questions by selecting these three questions from different units. The answers should not exceed 400 words.

UNIT-I

The Protoplasm:

1. Physical properties: an elementary idea of colloidal properties of protoplasm and their biological significance.
2. Chemical Constitution:(i) Inorganic constituents, (ii) Organic Constituents: Definition, general properties, Classification and biological importance of carbohydrates, protein, lipids, vitamins and nucleic acids.

UNIT-II

Metabolism:

1. Carbohydrate: Oxidation of glucose through glycolysis, Krebs cycle and Oxidative phosophorylation; elementary knowledge of inter-conversion of glycogen and glucose in liver.

2. Protein: Essential and non-essential amino acids; amino acid catabolism; decarboxylation; fate of ammonia, Ornithine cycle, fate of carbon skeleton.

3. Lipid: Biosynthetic and beta-oxidative pathways of fatty acids; brief account of biosynthesis of triglycerides.

UNIT-III

MICROBIOLOGY

1. Virus: Basic features and architecture; Microbial growth and nutrition Nucleic acids of mature virus (elementary idea only); bacteriophages;
2. Bacteria, General Introduction, Media for growth of bacteria and factors influencing Growth; General laboratory media, Synthetic media, Special media.

UNIT-IV

Bacteria of Medical importance:

1. Gram-positive:

Cocci:Staphylococci, Streptococci
Bacilli: Diptheria, Tetanus.

2. Gram-negative

Cocci: Gonnorrhea, Meningitis
Bacilli: Pneumonia, Diarrhea

3. Mycobacteria: Tuberculosis, Leprosy
4. Actinomycetes.

Microbes in medicine: Antibiotic, vaccines,

UNIT-V

Immunology;

Antibodies, antigens; cell mediated and humoral immunity; innate and acquired immunity, Structure of an antibody molecule: immunoglobulins. (IgG) T-Lymphocytes, B-Cells, structure of an antigen molecule. Antibody reactions.

PRACTICALS

1. **Cell Biology**

a. Cell membrane permeability (crenation and haemolysis in mammalian RBC.)
b. Preparation and use of culture media for microbes.
c. Study of Blood smear : peripheral blood smear
d .Preparation of Light microscopic vital staining of mitochondria in buccal smear
Study of mitosis in onion root tip

2.Microbiology:

a. Studyof microbes in blood, stool and sputum. 4. Study of microbes in food materials.
b. Study of microbes in sewage.
c.Gram Positive and Gram negative bacteria

3**.Immunology**

a. Study of antigen and antibody
b. ELISA Test : Principle, Procedure and Observations

4**.Educational tour** : microbiological laboratories, dairy,
food processing factory, distillery, museum of natural science and/or sea-shore for first-hand study and collection of material. Candidates are expected to submit a report of their visit.

S.No.	Permanent Exercise	Regular
1	Cell Biology	8
2	Microbiology	7
3	Immunology	7
4	Educational Tour/ Report	8
5	Record	5
6	Viva voce	5
	Grand Total	40

SEMESTER III

B.Sc. ZOOLOGY

Paper- I 3Hrs Duration	**Min. Pass Marks 29**	**Max. Marks 80**
Practical 4 Hrs Duration	**Min. Pass Marks 15**	**Max. Marks 40**
Internal Assessment	**Min. Pass Marks 11**	**Max. Marks 30**

Based on Paper I and Practical 20+10=30

PAPER CHORDATA AND EVOLUTION

NOTE: The course will contain 5 units. The question paper shall contain three sections. **Section A (10 marks)** shall contain 10 questions two from each Unit. Each question shall be of 1 mark. All the questions are compulsory. Section A will be prepared such that questions i to v are multiple choice questions, while question vi to x will be fill in the blank questions. **Section B (25 marks)** shall contain 5 questions (two from each unit with internal choice). Each question shall be of 5 marks. The candidate is required to answer all 5 questions. The answers should not exceed 150 words. **Section C (45 marks)** shall contain 5 questions, one from each Unit. Each question shall be of 15 marks. The candidate is required to answer any three questions by selecting these three questions from different units. The answers should not exceed 400 words.

UNIT-I

Classification of Chordata : Protochordata, Hemichordata and cyclostomes. Habit, Habitat, External features and Anatomy of Herdmania and Branchiostoma (Excluding development) Ascidian larva and retrogressive metamorphosis, Affinities of Urochordata and Cephalochordata. Habit, habitat and External features of Petromyzon and Myxine. Ammocoete larva and its affinities.

UNIT-II

Classification of vertebrat (excluding extinct forms) upto orders(Subclass in case of mammals). Poisonous and non-poisonous snakes and biting mechanism. Basic plan of skull, skull types in reptiles, jaw suspension, axial and appendicular skeleton

UNIT-III

Comparison of the following organ systems of vertebrates with special reference to evolutionary aspects Scoliodon, Rana, Uromastix(or any lizard), Columba livia, Oryctolagus (or any Mammals)

1. Integument including structure and development of placoid scales, feathers, hair, nails and claws.
2. Alimentary canal
3. Heart and evolution of aortic arches.
4. Respiratory system
5. Urinogenital system

UNIT-IV

Evolutionary thought: Lamarckism, Darwinism, origin of life, evidences of organic evolution, genetic basis of evolution, Hardy - Weinberg's law, natural selection,

isolation and isolating mechanism, speciation, variation, adaptation with special reference to flight adaptation, aquatic adaptation and desert adaptations

UNIT-V

Geological time scale, fossils, dating of fossils and imperfection of the geological records. Principle zoogeographical regions of the earth and their mammalian fauna, Extinct forms: Archaeopteryx, Dinosaurs, Evolution of horse.

PRCATICALS

(1)Study of Chordates: Balanoglossus, Herdmania, Ciona, Botrylus, Salpa, Doliolum, Pyrosoma, Amphioxus, Ammocoete larva, Petromyzon, Myxine, Zygaena, Torpedo, Chiamaera, Acipenser, Amia, lepidosteus, Labeo, Clarias, Anguilla, Hippocampus, Exocoetus, Echeneis, Pleuronectes, Protopterus, Ichthiophis, , Proteus, Ambystoma, larva (Axolotl), Siren, Alytes, Hyla, Testudo, Chelone, Tortoise,, Sphenodon, Hemidactylus, Phrynosoma, Draco, Chameleon, Eryx, Hydrophis, Naja, Viper, Bungarus, Crocodilus, Alligator, Archaeopteryx,(Model), Pavo cristatus, Ornithorhynchus, Macropus, , Bat, Loris, Scaly ant eater (Model)

(2) Permanent Slides: Mammalian histology, V.S. of Skin, T.S. of Spinal cord, T.S. of Pituitary gland, T.S. of Testis,, T.S. of Ovary, T.S. of Placenta, Bone, Oral hood, Velum, pharyngeal wall, T.S. of Amphioxus through various regions. T.S. of Balanoglossus, Whole mount of Amphioxus, Tadpole larva of Ascidia.

(3) Dissection/demonstration(Models, charts, computer simulation: carp or any other commercial fish/Scoliodon/Labeo- general anatomy, afferent and efferent branchial vessels, Cranial nerves, Internal ear, digestive system, Eye ball and its muscles, Urinogenital system.

(4) Permanent mounting, Spicules and pharyngeal wall of Herdmania, Ampulla of lorenzini,placoid scale

(5) Osteology: Comparative study of articulated and disarticulated bones of Frog, Varanaus, Fowl and Rabbit.

(6) Exercise in evolution-serial homology in appendages of Prawn, Analogy and homology(wings of birds and insects, forelimb of bat and rabbit.

DISTRIBUTION OF MARKS

S.	**Permanent exercise**	**Regular**
1	Dissection/ demonstration	8
2	Preparation	6
3	Exercise in evolution	6
4	Spot(5)	10
5	Record	5
6	Viva-voce	5
	Grand Total	**40**

SEMESTER IV

B.Sc. ZOOLOGY

Paper- I 3Hrs Duration	**Min. Pass Marks 29**	**Max. Marks 80**
Practical 4 Hrs Duration	**Min. Pass Marks 15**	**Max. Marks 40**
Internal Assessment	**Min. Pass Marks 11**	**Max. Marks 30**

Based on Paper I and Practical 20+10=30

PAPER MAMMALIAN PHYSIOLOGY AND BIOSTATISTICS

NOTE: A course will contain 5 units. The question paper shall contain three sections. **Section A (10 marks)** shall contain 10 questions two from each Unit. Each question shall be of 1 marks. All the questions are compulsory. Section A will be prepared such that questions i through v are multiple choice questions, while question vi through x will be fill in the blank questions. **Section B (25 marks)** shall contain 5 questions (two from each unit with internal choice). Each question shall be of 5 marks. The candidate is required to answer all 5 questions. The answers should not exceed 150 words. **Section C (45 marks)** shall contain 5 questions, one from each Unit. Each question shall be of 15 marks. The candidate is required to answer any three questions by selecting these three questions from different units. The answers should not exceed 400 words.

UNIT-I

Physiology of Digestion- nature of food stuffs and various types of digestive enzymes(Carbohydrases, proteinases, lipases) and their digestive action on corresponding food stuffs in the alimentary canal of mammals. Hormonal control of digestive functions. Mechanism of absorption of various products of digestion. elementary idea of common disorders related to digestive systems.

Excretory physiology- Structure of kidney, kind of nitrogenous excretory products. Role of liver in the formation of these products. Relation between nature of excretory products and habitat (fresh water, marine and terrestrial) functional architecture of mammalian kidney tubule and formation of urine. elementary idea of common disorders related to excretory systems.

UNIT-II

Circulatory physiology- Blood groups, Rh factors, blood clotting, heart beat, cardiac cycle, blood pressure, body temperature regulation, elementary ideas of cardiovascular disorders, hypertension, angina pectoris, myocardial infraction, pericarditis.

Respiratory physiology- Mechanism of breathing, exchange of gases, transportation of oxygen and carbon dioxide in blood, regulation of breathing, elementary idea about asthma and emphysema.

UNIT-III

Muscle Physiology- Functional architecture of skeletal muscle, mechanism of contraction and relaxation of muscle fibers. elementary idea of common disorders related to muscles.

Sensory physiology- Physiology of vision, hearing, pain and touch. Origin and Functional architecture of a neuron. propagation of nerve impulse, synaptic transmission, central control of reflex action, reflex arc. Elementary idea of common sensory and nervous disorders

UNIT-IV

Introduction and understanding of concepts of descriptive and inferential statistics, frequency distribution, graphical presentation, mean, mode, median, standard deviation, standard error of mean.

UNIT-IV

Productivity distribution, correlation and regression. Test of significance, Chi square and t-test. Biostatistical analysis of gene distribution in population.

PRACTICALS

I Experiments in physiology 1 :

(1) Estimation of Haematocrit value in a blood sample, Total Haemoglobin, RBC and WBC counting,
(2) ESR value, Blood coagulation time experiment,

Experiments in physiology 2

(3) Demonstration of enzyme activity,

(4) Blood urea estimation, Estimation of blood glucose level,
(5) Study of Blood Group
(6) Measurement of Blood Pressure

II. Study of permanent Slides :

(7) T.S. of ilium, stomach, Intestine, Liver, Lung, Kidney, Pacncreas, vls of skin, Muscle cells

III. Biostatistics

(8) Construction of frequency tables, Histogram, polygons, pie charts.
(9) Exercise on Mean, Median and Mode.
(10) Test of significance: t- test and Chi square test

S.No.	Permanent Exercise	Regular
1	Physiology 1	8
2	Physiology 2	7
3	Biostatistics	7
4	Prepared Slides(4)	8
5	Record	5
6	Viva voce	5
	Grand Total	40

SEMESTER V

B.Sc. ZOOLOGY

Paper- I 3Hrs Duration	**Min. Pass Marks 29**	**Max. Marks 80**
Practical 4 Hrs Duration	**Min. Pass Marks 15**	**Max. Marks 40**
Internal Assessment	**Min. Pass Marks 11**	**Max. Marks 30**

Based on Paper I and Practical 20+10=30

PAPER : DEVELOPMENTAL BIOLOGY AND GENETICS

NOTE: A course will contain 5 units. The question paper shall contain three sections. **Section A (10 marks)** shall contain 10 questions two from each Unit. Each question shall be of 1 marks. All the questions are compulsory. Section A will be prepared such that questions 1to 5 are multiple choice questions, while question vi through x will be fill in the blank questions. **Section B (25 marks)** shall contain 5 questions (two from each unit with internal choice). Each question shall be of 5 marks. The candidate is required to answer all 5 questions. The answers should not exceed 150 words. **Section C (45 marks)** shall contain 5 questions, one from each Unit. Each question shall be of 15 marks. The candidate is required to answer any three questions by selecting these three questions from different units. The answers should not exceed 400 words.

UNIT-I

1. Historical perspective, aim and scope of developmental biology.

2. Gametogenesis :

A. Spermatogenesis with emphasis on spermeiogenesis, structure of spermatozoa.

B. Oogenesis with special reference to vitellogenesis.

3. Fertilization-definition, external and internal fertilization, mechanism of fertilization, significance of fertilization.

4. Parthenogenesis: Natural and artificial parthenogenesis, significance of parthenogenesis.

5. Cleavage:

A. Type, patterns and planes of cleavage.

B. Significance of cleavage, Blastulation.

UNIT-II

1. Gastrulation, Morphogenetic movements (epiboly and emboly). Fate Map, significance of gastrulation.

2. Elementary idea of the following developmental processes: Embryonic induction, differentiation, organogenesis of limb, Malignancy, teratogenesis, aging, Regeneration in vertebrates and invertebrates (epimorphic and morphalactic).

3. Embryogenesis of frog: Structure of tadpole larva and its metamorphosis with special reference to endocrine control.

4. Development of chick up to 96 hrs. stage.

UNIT-III

1. Embryonic adaptations:

A. Development, structure and functions of extra- embryonic membranes in chick.

B. Placentation in mammals-Definitions, types, structure (morphology and histology) and functions of placenta.

UNIT-IV

1. Mendel's laws of inheritance-- Monohybrid and dihybrid cross, incomplete dominance. Current status of Mendelism.

2. Genetic variations.

A. Variations in chromosome number (Euploidy and Aneuploidy), genetic disorders in Human beings (Down's syndrome, Turner's syndrome, Klinfelter syndrome).

B. Chromosomal aberration-Deletion, Duplication, Translocation and Inversion.

C. Gene mutations-Detection, Molecular basis of gene mutations and Mutagens.

UNIT-V

1. Crossing over and linkage.

2. Sex determination-XO, XY and WZ-mechanism.

3. Sex linked inheritance-Haemophilia, colour blindness.

4. Genetic inter-actions: supplementary, complementary, duplicate, inhibitory and polymorphic genes.

5. Multiple alleles, ABO, Rh and MN-blood groups and their inheritance.

6. Elementary idea about Eugenics.

Practical

Developmental biology

1. Study of spermatogenesis (frog/rat) through slides/ models/charts.

2. Study of oogenesis (frog/rat) through slides/model/ charts.

3. Study of fertilization, external and internal (through charts).

4. Study of development of frog/toad through preserved materials (whole embryo or sections), egg, early cleavage, blastula, gastrula, neurula, tail bud, external gill, mature tadpole larva.

5. Study of metamorphosis (frog/toad) through preserved material/chart/model.

6. Study of foetal membrane (amnion, chorion, allantois and yolk-sac) of any amniote (chick) after 10-12 days of incubation.

7. Study of development of chick with the help of whole mounts: 18 hours; 21 hrs; 33 hrs; 72 hrs; and 96 hrs. stage.

Genetics

8. Drosophila culture (wild and mutants) and study of phenotypic characters.

9.Simple problem based on monohybrid/dihybrid cross.

10. Preparation of slide of Giant chromosome.

S.No	**Permanent exercise**	**Regular**
1	Developmental Biology	10
2	Exercise on Genetics	10
3	Spot(5)	10
4	Record	5
5	Viva-voce	5
6	**Grand Total**	**40**

SEMESTER VI

B.Sc. ZOOLOGY

Paper- I 3Hrs Duration	**Min. Pass Marks 29**	**Max. Marks 80**
Practical 4 Hrs Duration	**Min. Pass Marks 15**	**Max. Marks 40**
Internal Assessment	**Min. Pass Marks 11**	**Max. Marks 30**

Based on Paper I and Practical 20+10=30

PAPER : ENVIRONMENTAL BIOLOGY AND ANIMAL BEHAVIOUR

NOTE: A course will contain 5 units. The question paper shall contain three sections. **Section A (10 marks)** shall contain 10 questions two from each Unit. Each question shall be of 1 marks. All the questions are compulsory. Section A will be prepared such that questions i through v are multiple choice questions, while question vi through x will be fill in the blank questions. **Section B (25 marks)** shall contain 5 questions (two from each unit with internal choice). Each question shall be of 5 marks. The candidate is required to answer all 5 questions. The answers should not exceed 150 words. **Section C (45 marks)** shall contain 5 questions, one from each Unit. Each question shall be of 15 marks. The candidate is required to answer any three questions by selecting these three questions from different units. The answers should not exceed 400 words.

UNIT-I

1. Introduction to Ecology, definition, history, sub-divisions and scope of ecology.

2. The Environmental factors-

(a) Physical (abiotic) factors-soil, water, air, temperature.

(b) Biotic factors, Interspecific and intraspecific relations (Neutralism, Mutualism, commensalism, antibiosis, parasitism, predation, competition).

3. Concept of limiting factors: Liebig's Law of minimum, Shelford's law of tolerance and combined concept of limiting factors.

4. Population ecology:

(i) Definition

(ii) Characteristics of community

(iii) Ecotone

(iv) Habitat and ecological niche.

(v) Ecological succession-definition kinds of succession, (Pimary and secondary succession, autotrophic and heterotrophic succession), xerosere, mesosere and hydrosere. Climax community concept.

UNIT-II

1. Ecosystem:

(i) Concept of ecosystem.

(ii) Components of ecosystem.

(iii) Ponds as an ecosystem.

(iv) Trophic levels, food chain and food web.

(v) Ecological pyramids.

(vi) Energy flow in ecosystem.

(vii) Bio-geochemical cycles: CO2, N2, O2, S and P.

2. Fresh water ecology:

(i) Physico-chemical nature of fresh water habitat.

(ii) Lentic habitat (lake and pond)

(iii) Lotic habitat (stream and river)

(iv) Fresh water fauna and their adaptations.

UNIT-III

1. Marine ecology:

(i) Characteristic features of Marine habitat.

(ii) Zonation of Marine environment.

(ii) Marine water fauna and their adaptations.

(iv) Deep sea fauna and their adaptations.

(v) Estuarine habitat-their fauna and adaptations.

2. Terrestrial ecology:

(i) Characteristic features of terrestrial habitat.

(ii) Forest ecosystem (forest types).

(iii) Desert ecosystem; characteristics of desert environment, desert fauna and their adaptations, with special reference to Rajasthan.

UNIT-IV

1. Applied ecology:

(i) Pollution (water, air and sound).

(ii) Radiations, nuclear fall out and biological effects of radiations.

(iii) Food, food production on land, food produc- tion in sea and synthesis of food.

(iv) Fuels: coal, petroleum and nuclear fuels.

(v) Management of environment.

UNIT-V

1. Ethology:

(i) History and concept of ethology.

(ii) Methods of studying behaviour.

(iii) Social behaviour and Social Organisation among mammmals eg. Rhesus and Black buck.

(iv) Orientation; taxes and kinesis, fish and bird migration.

(v) Communication among animals-acoustic tactile, olfactory, language of bees.

(vi) Conservation and management of wild life of India with special reference to Rajasthan.

Practical

1. Examination of physical characteristics of soil/water sample : Temperature, Relative humidity, Texture
2. Examination of physical and chemical characteristics of soil/water sample : pH, turbidity, salinity, chloride content, dissolved O_2, alkalinity, Free CO_2 .
3. Study of local habitat (Pond and Terrestrial Ecosystem): Collection and examination of microscopic fauna(Zooplanktons/Phytoplanktons/Benthos)
4. Paramaecium culture and study of behaviour of Paramecium to different stimuli; Contact, chemicals, light.
5. Study of phototactic response of Tribolium/house fly.
6. Field Trip/ Zoo Report

S.No.	**Permanent exercise**	**Regular**
1	Ecology	10
2	Exercise on Ethology	10
3	Tour report	10
4	Record	5
5	Viva-voce	5
6	**Grand Total**	**40**