

Syllabus and Course Scheme

Academic year 2017-18



Bachelor of Science- Zoology

Semester scheme

I Semester Examination - December, 2017

II Semester Examination – May, 2018

UNIVERSITY OF KOTA

**M. B. S. Marg,
Swami Vivekanand Nagar,
Kota - 324 005, Rajasthan, India
Website: uok.ac.in**

University of Kota, Kota
B.Sc. – Semester - I : Zoology
I Semester Examination – December, 2017

Scheme

Paper	Duration	Max. Marks	Min. pass Marks
-------	----------	------------	-----------------

Scheme will be same as notified in other subjects (Physics, Mathematics, Chemistry and Botany) run in the university campus.

B.Sc. – Semester - I : Zoology
I Semester Examination – December, 2017

Scheme

Paper	Duration	Max. Marks	Min. pass Marks
-------	----------	------------	-----------------

Scheme will be same as notified in other subjects (Physics, Mathematics, Chemistry and Botany) run in the university campus.

B.Sc. – Semester - I : Zoology
(For I Semester Examination – December, 2017)

Paper I - Taxonomy and Invertebrate Diversity (Protozoa to Porifera)

Paper II - Biochemistry

Paper III - Cell Biology

Paper I - Taxonomy and Invertebrate Diversity (Protozoa to Porifera)

Unit I

1. Brief history of Zoology: A history of Zoological studies in India and contemporary world.
2. Taxonomy: Definition, taxonomy systematic and classification, brief history and branches of taxonomy, significance.
3. Taxonomic key and key characters. Binomial nomenclature.

Unit II

1. Concept of Diversity, species and major and minor phyla.
2. Basis of classification: Number of cells in animal body, symmetry, metamerism, coelome, embryogeny and levels of structural organization.
3. Outline classification of Animal Kingdom.

Unit II

1. Classification of Phylum Protozoa.
2. Study of general topics: locomotion, osmoregulation and nutrition in protozoa.
3. Study of general topics: reproduction, parasitism and pathogenecity in Protozoa.

Unit III

1. Study of Habit, habitat, structural organization, life history, diseases and control of *Entamoeba*.
2. Study of Habit, habitat, structural organization, life history, diseases and control of *Giardia*.
3. Study of Habit, habitat, structural organization, life history, diseases and control of *Leishmania*.

Unit IV

1. Study of Habit, habitat, structural organization, life history, diseases and control of *Trypanosoma*.
2. Study of Habit, habitat, structural organization, life history, diseases and control of *Plasmodium*.
3. Study of Habit, habitat, structural organization and life history of *Paramecium*.

Unit V

1. Classification of Phylum Porifera.
2. Porifera: Habit, habitat, structure and physiology of *Sycon*.
3. Types of canal system.

Paper II - Biochemistry

Unit I

1. Biochemistry: an introduction, water and ions, hydrogen bonding and pH.
2. Enzymes: Nomenclature, classification, Action theory and specificity of Enzyme, enzyme activator, inhibitor, regulation and control of enzyme activity.
3. Energy cycle: Anaerobic and aerobic respiration, Energy transfer, redox, cytochrome-system.

Unit II

1. Structure and functions of Amino acids and Proteins.
2. Protein metabolism: catabolism, deamination, transamination.
3. Mechanism of protein synthesis: Genetic code, transcription, translation, Role of RNA, Regulation of protein synthesis.

Unit III

1. Cell metabolism: Anabolic and catabolic process.
2. Structure and functions of Carbohydrates.
3. Metabolism of carbohydrates. Ketone bodies.

Unit IV

1. Structure and functions of Lipids.
2. Metabolism of Lipids.
3. An elementary account of Biosignalling.

Unit V

1. Structure and functions of Nucleic Acid: Molecular model, properties and functions of DNA,
2. Molecular model, properties, types and functions of RNA.
3. Nucleic Acid synthesis: Biosynthesis of DNA and RNA.

Paper III – Cell Biology

Unit I

1. Introduction, Discovery of cell, history of cell biology and golden period of cell biology.
2. Cell theory, Comparative account of prokaryotic and eukaryotic cell, characteristics of animal cell.
3. Protoplasm: physical characters, colloidal property, chemical composition and Biological characters.

Unit II

1. Structural organization of typical Virus and prokaryotic cell (such as Bacteria).
2. Structure, chemical composition and functions of Cell organelles: plasma membrane.
3. Structure, chemical composition and functions of Endoplasmic reticulum, Ribosome, Golgi complex and lysosome.

Unit III

1. Structure, chemical composition and functions of Cell organelles: Mitochondria.
2. Structure, chemical composition and functions of filaments, flagella, cilia and centrosome.
3. Structure, chemical composition and functions of nucleus and nucleolus.

Unit IV

1. Cell cycle. Initiation and control of cell division, significance.
2. Cell division: Mitosis.
3. Cell division: Meiosis.

Unit V

1. Gametogenesis: Introduction, spermatogenesis and oogenesis significance.
2. Cellular aspects of Fertilization.
3. Cellular aspects of Parthenogenesis

Zoology- Practical

Practical exercises based on Paper I, II, III.

1. General survey of Invertebrate (Spot & Slides)

Protozoa: - *Entamoeba*, *Polystomella*, *Monocystis*, *Euglena*, *Noctiluca*, *Leishmania*, *Nyctotherus*, *Paramecium*, *Vorticella*.

Porifera: - *Sycon*, *Hyalonema*, *Euplectella*, *Spongilla* and *Euspongia*.

2. Study of TS/LS of organs & developmental stages. **Porifera:** - L.S. and T.S. of *Sycon*.

3. Tests: - **Biochemistry** (1) Protein (2) Fat (3) Carbohydrate

- (4) Catalases enzyme in animal tissue **Cell Biology**

- (1) Cell permeability

- (2) Acetocarmine preparation of mitotic activity

- (3) Demonstration of mitochondria by using vital stain.

- (4) Demonstration of Bacteria by using Gram's stain.

(Note- Animals used in dissection are subject to the condition that these are not banned under the wild life protection act.)

PRACTICAL

Distribution of marks Regular/Private / Ex.

1. Dissection - Through chart / model / Photograph / CD 10
2. Slide preparation
3. Cell Biology
4. Bio chemistry
5. Spots (10)
6. Record
7. Viva-voce
8. Participation in lab management
(cleanliness, contribution and regularity)

Total

B.Sc. – Semester - II: Zoology

(For I Semester Examination – December, 2017)

Paper I - Invertebrate Diversity (Coelenterata to Annelida)

Paper II - Genetics

Paper III - Microscopy and Biotechnology.

Paper I - Invertebrate Diversity (Coelenterata to Annelida)

Unit I

1. Classification of Phylum Coelenterata.
2. Habit, habitat, structure, function and life history of *Aurelia*.
3. Polymorphism in Phylum Coelenterata, coral reef.

Unit II

1. Ctenophora - Structural organization and affinities.
2. Classification of Phylum Platyhelminthes.
3. Classification of Phylum Nematyhelminthes (Aschelminthes).

Unit III

1. Structural organization and life history of *Dugesia*.
2. Structural organization and life history of *Fasciola*.
3. Structural organization and life history of *Taenia*.

Unit IV

1. Study of structure and life history of *Dracunculus medinensis*.
2. Nematode parasites and human diseases.
3. Parasitic adaptation in Helminthes.

Unit-V

1. Classification of Phylum Annelida (up to subclass).
2. Structural organization and life history of *Pharitima* (earthworm).

3. General account of metamerism and coelome in Annelida; Trochophore larva.

Paper II - Genetics

Unit-I

1. Introduction to the science of Genetics.
2. Mendel's laws of inheritance derived from the results of Monohybrid and dihybrid cross.
3. Deviations from Mendel's laws and Current status of Mendelism.

Unit-II

1. Genetic disorders in Human beings (Down's, Turner's, Klinefelter's and Edward's syndrome)
2. Types of chromosomal mutations.
3. Molecular basis of gene mutation, mutagens, crossing over and linkage.

Unit- III

1. Genetic variation: Variation in chromosome number (Euploidy and Aneuploidy).
2. Mutation.
3. Multiple allele-ABO, Rh and MN blood groups and their inheritance, polymorphic genes.

Unit-IV

1. Sex-determination XX-XY. XO-XY and WZ mechanisms.
2. Sex-linked inheritance (X-and Y-linked) Color blindness. Haemophilia.
3. Gene interactions. Supplementary, complementary, epistasis and inhibitory.

Unit-V

1. Gene structure (Recon. muton, cistron) and regulation of gene (lac operon: inducible and repressible system).
2. Bacterial genetic transformation, Transduction and conjugation. Lytic and lysogenic cycle.
3. Elementary idea about eugenics. Genetics and human welfare.

Paper III - Microscopy and Biotechnology.

Unit-I

1. Microscopy: - Introduction, types of microscopes.
2. Cytological techniques:
3. Autoradiography and Isolation of cell components.

Unit-II

1. Introduction. Historical prospective of animal biotechnology, major areas and future prospects of biotechnology.
2. Basic concepts of animal cell and tissue culture.
3. The Basic concepts of hybridoma technology.

Unit-III

1. Medicines and Biotechnology: Microbes in medicine, antibiotics, vaccine, antibodies, antigens.

Unit-IV

1. Environmental Biotechnology: use of micro organisms in metal and petroleum recovery. Surfactants and oil pollutants.

2. Waste treatment, Processing of industrial waste. Degradation of Xenophobic compounds including pesticides and surfactants.
3. Biotechnology in Pest control.

Unit V

1. Food and drink biotechnology, Food preservation, microbial spoilage.
2. Biotechnology of dairy products. Alcoholic beverages and Vinegar.
3. Monoclonal antibodies and their applications.

Zoology Practical

1. General survey of Invertebrate (Spot & Slides)

Coelenterate- Obelia colony (polyp & medusa) *Physalia*, *Porpita*, *Aurelia*, *Rhizostom*, *Alcyonium*, *Corallium*, *Gorgonia*, *Pennatula*, *Madrepora*. **Platyhelminthes-:** *Dugesia*, *Fasciola*, *Taenia*, *Schistosoma*. **Nematode-** *Filaria*, *Dracunculus*, *Wuchereria*, *Enterobius* **Annelida:** - *Neries* (*Heroneries with parapodia*) *Aphrodite*, *Arenicola*, *Pontobdella*, *Hirudinaria*, *Peripatus*.

2. Study of TS/LS of organs & developmental stages.

Platihelminthes- T.S of *Fasciola*, scolex, mature & gravid segment of *Taenia*, Hexacanth, bladderworm & cysticercus stage of *Taenia*, miracidium, sporocyst, redia, cercaria larva of *Fasciola*. **Annelida-** T.S through different region of *Pheritima*. Parapodia of *Nereis* and *Heteronereis*, trochophore larva.

3. Demonstration of dissection through chart / model / Photograph / CD: Earthworm –morphology, general anatomy, digestive and nervous system.

4. Permanent Mounting: Coelenterata- *Obelia* colony & medusa. Annelida –parapodia of *Nereis*.

5. **Genetics:** *Drosophila* – life cycle and its culture. Identification of male and female and wild and mutants (yellow, Ebony body, Vestigial wings, White-eye and vestigial wings). Preparation of slides of sex combs and salivary gland chromosomes of *Drosophila*. Barr body of human chromosomes. Identification of blood group (ABO and Rh factors). Simple problems based on monohybrid / dihybrid cross.

(Note- use of animals for dissection is subject to the conditions that these are not banned under the wild life protection act.)

PRACTICAL

Distribution of marks Regular/Private / Ex.

1. Dissection - Through chart / model / Photograph / CD 10
2. Slide preparation
3. Genetics
4. Microscopy
5. Biotechnology
6. Spots (10)
7. Record
8. Viva-voce

9. Participation in lab management

(Cleanliness, contribution and regularity)

Total