M.Sc. II Semester Examination, 2025-26
Zoology
Assignment

First Paper
General Physiology
Assignment, March 2026

Attempt any four questions. One question from each unit

Unit I

Q1. Define absorption? How the end product of carbohydrate and protein digestion is absorbed?

Q.2 Write short notes on

a) Blood clotting
b) Physiology of respiration

Unit II

Q3. Explain formation of urine and its hormonal regulation

Q.4 Explain the structural organization of the sarcomere and the mechanism of muscle contraction

Unit III

Q5. Explain the role of Meditation and yoga and their effects on health

Q.6 Write short notes on

a) Counter-current heat exchanger
b) Hibernation and Aestivation

Unit IV

Q7. Describe the structural organization of the pituitary gland explain the hormones of the anterior pituitary and mention their functions.

Q. 8Explain the reproductive cycle in mammals with hormonal regulation.

Second Paper − Environmental Biology & Ethology

Unit I

Q1. Explain Ecological law of minimum and law of tolerance

OR

Write short notes on
a) Nutrient cycles in nature -carbon, nitrogen
b) Life history strategies (r and k selection)

Unit II

Q2. Give a detailed account on Biodiversity act of India and Biodiversity hot spots in India

OR

Write short notes on

a) Environmental Impact assessment.
(b) Simpson's diversity Index and Shannon's diversity index

Unit III

Q3. .Give a detailed account on Concepts of Ethology with the help of Suitable examples

OR

Discuss in detail Methods of studying brain and behaviour

Unit IV

Q4. Write an account on Communication in animals

OR

Write short notes on
a) Altruism and reciprocal altruism
b) Territorial behaviour

Paper III: Molecular Biology, Biotechnology and Bio-informatics

Attempt any four questions and one from each unit :-

UNIT I

Q1. What are the key differences between DNA and RNA in terms of structure and function with types of RNA, and what are their functions.

OR

Describe the process of DNA replication, including the roles of key enzymes such as DNA polymerase, helicase, a nd primase.

UNIT II

Q2. (a) What do u understand by Genetic Code?
(b) Explain Co and post translation modifications of protein?

OR

Write mechanism of Prokaryotic and eukaryotic Initiation, Elongation and termination of Translation ?

UNIT III

Q 3. Explain molecular markers in genome analysis RFLP,RAPD and AFLP analysis?

OR

(a) Describe Embryo sexing and cloning and Cloning of animals by nuclear transfer ?

(b) Write a note on :
(i) Screening for genetic disorders
(ii) ICSI, GIFT

UNIT IV

Q4. Write a note on Bio- informatics , Biological Database and Servers for Bio-informatics?

OR

What are predictive methods using nucleotide sequences of mice and men, and what do you understand by navigating public physical mapping?

Paper IV: MZO-204: Genetics and Molecular Evolution
Assignment 2026

Unit I

Q1 Give a detailed account of bacterial genetic mapping. Explain how conjugation, transformation and transduction are employed to determine gene order and map distance.

Q2 Define heterosis (hybrid vigor). Explain the genetic basis of heterosis and discuss its expression in livestock improvement.

Unit II

Q3 Describe pedigree analysis and karotype analysis in detail. Explain its principles, symbols and patterns of inheritance, highlighting its importance in human genetic studies.

Q4 Explain Human Genome Project and DNA fingerprinting with its principle and techniques involved.

Unit III

Q5 Explain the Hardy–Weinberg law of genetic equilibrium. Describe the assumptions on which the law is based and discuss its biological significance.

Q6 What is genetic drift? Explain the mechanism of genetic drift and discuss the founder effect and bottleneck effect with suitable examples.

Unit IV

Q7 Distinguish between micro-evolution and macro-evolution, highlighting their scale, mechanisms, time span and examples.

Q8 Explain molecular evolution and molecular clock hypothesis. Explain its principle, assumptions and calibration methods.

M Sc. Fourth Semester Assignment -2026
Zoology
PAPER-I : MZO-401: Applied Zoology and Biostatistics

Assignment 2026

Instructions to students: Assignment consists of 8 questions. Attempt 4 questions (1 from each unit)

Unit I

Q1 Explain the economic importance of Protozoa and Helminthes. Describe their beneficial and harmful effects on humans, livestock and the ecosystem.

Q2 Explain the principles of insect pest management. Discuss cultural, mechanical, biological and chemical control methods.

Unit II

Q3 Explain the economic importance of pisciculture.

Q4 Discuss the breeding methods in poultry, including natural breeding and artificial incubation.

Unit III

Q5 Compare mean deviation and standard deviation, highlighting their definitions, formulas, advantages, limitations and applications.

Q6 Explain the difference between correlation and regression analysis, highlighting their objectives and applications.

Unit IV

Q7 Compare parametric and non-parametric tests of significance, highlighting their assumptions and uses.

Q8 Describe the one-way ANOVA in detail. Explain its procedure, calculation steps and interpretation of results.

M Sc. Fourth Semester Assignment -2026
Zoology

PAPER-II: MZO-402: Tools and Techniques in Biology

Assignment 2026

Instructions to students: Assignment consists of 8 questions. Attempt 4 questions (1 from each unit)

Unit I

Q1 Explain interference microscopy. Describe its principle and working, explaining how optical path differences are converted into intensity differences.
Q2. Explain Confocal Laser Scanning Microscopy? Add an account of its merits, limitations, and major applications in cell biology and biomedical sciences.

Unit II

Q3 Explain the principle and working of gel electrophoresis. Discuss different supporting media used in
electrophoresis and compare agarose gel and polyacrylamide gel electrophoresis.
Q4 Describe the principle of UV–Visible spectrophotometry. Explain the instrumentation and working of a UV–Visible spectrophotometer with a neat labeled diagram.

Unit III

Q5 What are radioisotopes? Explain the law of radioactive decay and half-life. Discuss their uses in biological sciences.
Q6 What is autoradiography? Explain its principle, procedure, and applications. Add a note on the role of radioisotopes as tracers in biological systems.

Unit IV

Q7 Describe the principle and methodology of blotting techniques. Explain Southern, Northern, and Western blotting in detail, highlighting their differences and applications in molecular biology.
Q8 Describe cell culture techniques in detail. Explain the composition and types of culture media. Discuss primary culture, secondary culture, and establishment of cell lines.

M Sc. Fourth Semester Assignment -2026

Zoology

Elective Paper- Cell and molecular biology

Paper-III Cellular Mechanics

Instructions to students: Assignment consists of 8 questions. Attempt 4 questions (1 from each unit)

Unit I

Q1 .What is the difference between apoptosis and necrosis? Describe the mechanism of apoptosis in detail.

Q2 .Describe types of caspases in detail in intrinsic and extrinsic pathways.

Unit II

Q3 .Describe in detail about various stages of development of cancer

Q4 .Write short notes on (any two)

Properties of cancer cell
Tumour suppressor cells
Oncogenes

Unit III

Q 5. Explain role of telomerase in aging

Q 6.Describe the biology of Ageing

Unit IV

Q 7.What are stem cells.? Describe in detail applications of stem cells in medical science .

Q 8. Write short notes (any two)

Embryonic stem cells
Somatic cell nuclear transfer
Proliferation of differentiated cells

M Sc. Fourth Semester Assignment -2026
Zoology
MZO 404D [Molecular Immunology]

Assignment March 2026

Instructions to students: Assignment consists of 8 questions. Attempt 4 questions (1 from each unit)

Unit I

Q1. What is immunity? Describe various components of humoral and cell mediated immunity.

Q2. Write short notes on

a) B- and T-lymphocytes

b) Secondary Lymphoid Organs

Unit II

Q3. Describe various immunoglobulin-mediated effector functions with suitable diagrams.

Q4. Write short notes on

a) Epitopes and Haptens

b) Monoclonal antibodies and its applications

Unit III

Q5. What is major-histocomptability complex. Discuss general organization and inheritance of MHC.

Q6. Describe various antigen-antibody reactions with suitable examples.

Unit IV

Q7. Give a detail account on structure, function and properties of cytokines.

Q8. Explain immune response to various infectious diseases.

M Sc. Fourth Semester Assignment -2026
Zoology

Elective– Environmental Toxicology

Applied Aspects of Toxicology

Instructions to students: Assignment consists of 8 questions. Attempt 4 questions (1 from each unit)

Unit I

Q1 Discuss the **tolerance setting for substances in food,** including pesticide residues, veterinary drugs, and unavoidable contaminants.

OR

. Write short notes on the following

a) Food and colour additives , GRAS
b) Microbiologic Agents Substances produced by cooking

Unit II

Q2. Explain how analytical toxicology assists in the detection, identification, and interpretation of poisons in forensic cases.

OR

Give a detailed account on Criminal poisoning of the living

Unit III

Q3. Give a detailed account on Psittacosis, Silicosis and Asbestosis occupational diseases.

OR

Write short notes on the following

a) Toxicological Evaluation of Occupational agents
b) Determinants of dose occupational exposure limits

Unit IV

Q4. Give a detailed account on Hazard Identifications and risk assessment

OR

Discuss wildlife toxicology and its importance in environmental conservation.

Semester IV Elective Paper

Biomonitioring & Bioremediation

Assignment, March 2026

Instructions to students: Assignment consists of 8 questions. Attempt 4 questions (1 from each unit)

Unit-I

Q1. Write short notes

A. Bio fertilizers

B. Microbial and Antimicrobial pesticides

Q2. Give detail account on Vermi-composting and its application.

Unit-II

Q3. Give detail account on Role of microorganism in Bio degradation.

Q4 Write short notes-

A. Biomagnification

B. Bioaccumulation

Unit III

Q5. Write short notes on (any two)-

A. Biomonitering

B. Bioindicators

Q6. Write a detail account on types and Biological Effects of radioactive Substances on animals.

Unit-IV

Q7. Write short notes on (any two)-

A. Bioremediation Technologies

B. Bioremediation of Marine Oil pollutants

Q.8 Give a detail account on Microorganisms in Bioremediation and their role in Bioremediation.