

D-1609

Sub. Code

35011

DISTANCE EDUCATION

M.Sc. DEGREE EXAMINATION, DECEMBER 2021.

First Semester

Zoology

ANIMAL DIVERSITY

(CBCS 2018 – 19 Academic Year Onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL questions.

All questions carry equal marks.

1. Linnaeus hierarchy
2. Karyology
3. Plasmodium
4. *Taenia solium*
5. Coelomate
6. Mesozoic reptiles
7. Larval forms of crustacean
8. Adaptation of Bird
9. Prototheria
10. Prochordate.

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

All questions carry equal marks.

11. (a) Write short notes on principles of classification.

Or

- (b) Add brief note on biological species of concept.

12. (a) How do you classify the major divisions of the animal kingdom?

Or

- (b) Discuss about Pseudocoelomate and Eucoelomate animals with examples.

13. (a) Write short notes on parasitic protozoan diseases.

Or

- (b) Explain brief about the various types of metamerism.

14. (a) What is adaptive radiation in reference to insect? Explain.

Or

- (b) List out the general characters of the Prochordates and Cephalopods.

15. (a) Write a short notes on dinosaurs.

Or

- (b) Add a brief account on adaptive radiation in mammals.

PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Define diversity? Explain in detail about the types of classification and binomial nomenclature.
17. Elaborately describe the major divisions and subdivisions of the animal kingdom.
18. Write a detailed essay life cycle of *Plasmodium* sp. in mosquito and human.
19. Elucidate the structural and functional adaptations of fishes.
20. Give an account on general characteristics of the following:
 - (a) Mesozoic reptiles
 - (b) Flightless birds
 - (c) Water vascular system in Echinoderms.

D-1610

Sub. Code

35012

DISTANCE EDUCATION

M.Sc. DEGREE EXAMINATION, DECEMBER 2021.

First Semester

Zoology

BIOCHEMISTRY

(CBCS — 2018-2019 Academic Year Onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL questions. All questions carry equal marks..

1. Define 'Epimers'.
2. What is Saturated Fatty acid? Give two examples.
3. What are three types of Proteins? Give one example each.
4. Explain 'Active Sites'.
5. Explain 'Km' and 'Vmax'.
6. Name two Thyroid Hormones and its function?
7. Explain 'Electron Transport System (ETS)'.
8. Explain 'Amino Acid Pool'.
9. Explain 'OBESITY'.
10. What is 'Carbon Skeleton'.

PART B — (5 × 5 = 25 marks)

Answer ALL questions. Choosing either (a) or (b).

All questions carry equal marks.

11. (a) Draw the structure of nucleosides: Adenosine and Cytidine molecules.

Or

- (b) List four primary functions of carbohydrates. Explain.

12. (a) Give an account on functions of Vitamins.

Or

- (b) Give an account on 'Induced Fit Model'.

13. (a) Illustrate the structure and functions of Thymus and Adrenal Glands.

Or

- (b) Describe the effect of substrate concentration and temperature on enzyme activity.

14. (a) Briefly discuss the various reactions involved in Urea Cycle.

Or

- (b) Give an account on biosynthesis of purine molecules.

15. (a) Write short notes on Fatty liver?

Or

- (b) Discuss about Symptoms, Causes and Treatment of Arthrosclerosis.

PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

All questions carry equal marks.

16. Give an account on classification of carbohydrates?
 17. Explain in brief about four major types of Protein structures.
 18. Discuss the stepwise process of Glycolysis and its significance.
 19. Write brief notes on the following:
 - (a) beta oxidation
 - (b) Membrane Lipids
 - (c) Ketoacidosis
 20. What is 'Phenylketonuria'? Write elaborate notes on symptoms, causes, diagnosis and treatment.
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D-1611

Sub. Code

35013

DISTANCE EDUCATION

**M.Sc. (Zoology) DEGREE EXAMINATION,
DECEMBER 2021.**

First Semester

CELL AND MOLECULAR BIOLOGY

(CBCS – 2018-19 Academic Year Onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL questions.

All questions carry equal marks.

1. Explain three principles of cell theory.
2. What are the three classes of lipids in biomolecules?
3. What is 'Cytoskeleton'?
4. Explain 'M-Phase'.
5. List out at least two Co-enzymes and its function.
6. Explain RNA Polymerase.
7. Okazaki Fragments.
8. Promoter Gene.
9. Lac Repressor
10. Explain Histones.

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

All questions carry equal marks.

11. (a) Draw the structure of bilayer of bio-membranes and briefly explain it.

Or

- (b) Briefly explain the Germplasm Theory of cell.

12. (a) Difference between Prokaryotic and Eukaryotic cells with neat diagrams.

Or

- (b) Write short notes on :

- (i) Chromosomes and
- (ii) Lysosomes.

13. (a) Write a short account on Gap Junction with illustration.

Or

- (b) Briefly discuss the three types of Centromeres with suitable diagram each.

14. (a) Give a brief account on Biogenesis of Ribosomes.

Or

- (b) What do you mean by Glycosylation? Explain with example.

15. (a) Differentiate between Prokaryotic and Eukaryotic Replication.

Or

- (b) Write an account on Post-Translational Modification.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

All questions carry equal marks.

16. Draw the ultra-structure of Mitochondria and write a detailed account on Electron Transport system and ATP generation.
17. Explain the process of Mitotic cell division with neat diagrams.
18. Discuss the functions of Endoplasmic Reticulum and Golgi complex.
19. Explain Transcription with suitable diagrams.
20. Briefly explain the process of Hormone regulation of gene expression.

D-1612

Sub. Code

35021

DISTANCE EDUCATION

**M.Sc. (Zoology) DEGREE EXAMINATION,
DECEMBER 2021.**

Second Semester

DEVELOPMENTAL BIOLOGY AND EVOLUTION

(CBCS 2018-19 Academic Year Onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL questions.

All questions carry equal marks.

1. Primordial Germ Cell
2. Sertoli cell
3. Acrosome
4. Graffian follicle
5. Blastocyst
6. Polar bodies
7. Fate map
8. Artificial insemination
9. Darwinism
10. Genetic variation.

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Explain the process of spermatogenesis.

Or

- (b) Describe the activation of egg with a neat diagram.

12. (a) What are the types of cleavages? Explain.

Or

- (b) Write short notes on Fate Map of Frog with neat diagram.

13. (a) Write a note on development of eye in chick.

Or

- (b) Elaborate the factors influencing teratogenesis.

14. (a) Give an account of placenta in mammals.

Or

- (b) Brief the concept of 'Assisted Reproductive Technology'.

15. (a) Explain Neo-Darwinism with suitable examples.

Or

- (b) Give an account on physiological evidences of evolution.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

All questions carry equal marks.

16. Write an essay on gamete fusion and chemical processes involved in fertilization.
17. Explain briefly about the process of cleavage and its various types.
18. Describe a detailed account on the process of changes occurred during gastrulation in frog.
19. Detail the Artificial Reproductive Technologies and their advantages.
20. Illustrate elaborately the anatomical evidences of evolution with suitable diagrams.

D-1613

Sub. Code

35022

DISTANCE EDUCATION

**M.Sc. (Zoology) DEGREE EXAMINATION,
DECEMBER 2021.**

Second Semester

GENETICS

(CBCS – 2018-19 Academic Year Onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL questions.

All questions carry equal marks.

1. Define the term 'Hybridization'.
2. Explain the Law of Segregation.
3. What is Epistasis?
4. List the importance of crossing over.
5. Define 'Barr Bodies'.
6. What is Non-disjunction?
7. Effect of Out breeding
8. What is Euphenics?
9. What is Satellite DNA?
10. Define the term 'Translocation'.

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

All questions carry equal marks.

11. (a) Explain the polygenetic inheritance with examples.

Or

- (b) Give a brief account on significance of mapping.

12. (a) Give an account of Pedigree Analysis and its significance in family studies.

Or

- (b) Compare the sex determination of Human with Insects.

13. (a) Give a brief account on the role of Barr bodies in sex determination.

Or

- (b) Write a note on QTL mapping.

14. (a) Explain supplementary gene interaction with example.

Or

- (b) Write short notes on gene expression control in Phages.

15. (a) Briefly explain the molecular regulation of cell death.

Or

- (b) Write a note on regulation of Lactose in prokaryotes.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

All questions carry equal marks.

16. Give a detailed account on the contribution of Mendel in the development of Genetics.
17. Give a detailed account on Allelic and Non-allelic gene interactions.
18. Write short notes on the following:
 - (a) Polytene chromosome
 - (b) Lampbrush chromosomes
 - (c) Holokinetic chromosomes.
19. Give an account on significance of Hardy Weinberg equilibrium and the factors affecting Hardy Weinberg equilibrium.
20. Briefly discuss about the Transcriptional regulation in Eukaryotes.

D-1614

Sub. Code

35023

DISTANCE EDUCATION

M.Sc. (Zoology) DEGREE EXAMINATION, DECEMBER 2021.

Second Semester

MICROBIOLOGY

(CBCS – 2018-19 Academic Year Onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL questions.

All questions carry equal marks.

1. Carl Woese
2. Halophytes
3. Prokaryotic ribosome
4. Growth phase
5. Synchronous culture
6. Fimbriae
7. *Plasmodium* sp.
8. Clustal-W
9. *Ebola*
10. GenBank.

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

All questions carry equal marks.

11. (a) Explain the structural organization in Lichens.

Or

- (b) Write in details about the Whittaker's concept of Five Kingdom.

12. (a) Give an account on the importance of Yeast and moulds in various fields.

Or

- (b) Explain in brief about application of SEM and TEM in identification of bacteria.

13. (a) Write brief notes on 'Gram's staining Technique'.

Or

- (b) Briefly comment on the importance of Protozoa.

14. (a) Discuss the importance of Metagenomics in identification of microorganisms.

Or

- (b) Give an account on classification of Macroalgae.

15. (a) Write short notes on construction of a Phylogenetic Tree.

Or

- (b) Write short notes on 'Hepatitis'.

PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

All questions carry equal marks

16. Explain the importance of Berger's Manual in classification of microorganisms.
 17. Give an account on classification of Fungi and its importance in various fields.
 18. Elaborately explain about the nutritional requirements and the factors affecting the growth of bacteria.
 19. Give a detailed account on molecular tools in assessing the diversity of Microbes.
 20. Write an essay on types, causes, symptoms and treatment of bacterial diseases.
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D-1615

Sub. Code

35031

DISTANCE EDUCATION

**M.Sc. (Zoology) DEGREE EXAMINATION,
DECEMBER 2021.**

Third Semester

ANIMAL PHYSIOLOGY

(CBCS – 2018-19 Academic Year Onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL questions.

All questions carry equal marks.

1. Assimilation
2. Intracellular digestion
3. Gastric juice
4. Nephron
5. Haemocyanin
6. Cardiac output
7. Bowman's capsule
8. Luteinizing Hormone
9. Hibernation
10. Tropism.

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

All questions carry equal marks.

11. (a) How the protein is digested? Explain.

Or

- (b) Brief the significance and diversity of Physiology.

12. (a) How oxygen is transported to tissues in mammals? Discuss.

Or

- (b) Briefly narrate the systolic and diastolic blood pressures.

13. (a) Describe the role of hormones in circulation.

Or

- (b) Give an account of physiological adaptation of marine animals.

14. (a) Explain the energetic of muscle contraction.

Or

- (b) Why do animals hibernate in freezing condition? Explain.

15. (a) Brief the disorders of thyroid dysfunction.

Or

- (b) Describe 'Circadian Rhythm'.

PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

All questions carry equal marks.

16. Write short notes on the following:
 - (a) Functions of neurons
 - (b) Sarcomere and its functions
 - (c) Basic composition of blood and its function.
17. Discuss a detailed account on Osmo-regulation in freshwater and marine water fishes.
18. What are Photoreceptors? Write brief notes on physiology of photoreceptors.
19. Describe elaborate notes on structure and functions of thyroid gland.
20. Give an account of biological clock and types of rhythms in animals.

D-1616

Sub. Code

35032

DISTANCE EDUCATION

**M.Sc.(Zoology) DEGREE EXAMINATION,
DECEMBER 2021.**

Third Semester

IMMUNOLOGY

(CBCS – 2018-2019 Academic Year Onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL questions.

All questions carry equal marks.

1. Explain Antigen presenting cells.
2. What is Antigen?
3. Explain Epitope.
4. Define Vaccines.
5. What is Memory cell?
6. Define Immuno-prophylaxis.
7. What is Humoral immunity?
8. Hypersensitivity
9. Explain ELISA.
10. Explain AIDS.

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

All questions carry equal marks.

11. (a) Give an account on various types of immune cells.

Or

- (b) Briefly discuss about the alternative pathway of complement system.

12. (a) Discuss about two major groups of Natural Killer Cells.

Or

- (b) Discuss about the hematopoiesis.

13. (a) Write brief notes on mechanism of cell mediated immunity.

Or

- (b) Write short notes on immunization schedule.

14. (a) Discuss brief notes about autoimmune diseases.

Or

- (b) Give a brief account on mechanism of transplantation.

15. (a) Give an account on Immune Blot Technique.

Or

- (b) Write brief notes on hybridoma technology.

PART C — (3 × 10 = 30 marks)

Answer THREE questions.

All questions carry equal marks.

16. Give an account on organs of immune system with suitable examples.
 17. Explain a detailed account on the specificity of Antibody-Antigen Interaction.
 18. Give a detailed account on 'Cytotoxic T Cells'.
 19. Give elaborate account on mechanism of cancer progression.
 20. Discuss elaborately the three variants of ELISA techniques.
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D-1617

Sub. Code

35033

DISTANCE EDUCATION

M.Sc.(Zoology) DEGREE EXAMINATION,
DECEMBER 2021.

Third Semester

ENVIRONMENTAL BIOLOGY

(CBCS – 2018-19 Academic Year Onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL questions.

All questions carry equal marks.

1. Food web
2. Decomposers
3. Thermal stratification
4. Tidal energy
5. Red Tide
6. Fossil fuel
7. Population density
8. Germplasm
9. Ecological niche
10. Global Warming.

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

All questions carry equal marks.

11. (a) Write an account on productivity of an ecosystem.

Or

- (b) Write short notes on :
(i) Grassland Ecosystem and
(ii) Lithosphere.

12. (a) Describe the significance of Nitrogen cycle with neat diagram.

Or

- (b) Narrate the effect of light and temperature on planktons.

13. (a) Write brief notes on mangrove ecosystem in India.

Or

- (b) Write notes on :
(i) Components of Geosphere and
(ii) Carrying Capacity.

14. (a) How metal pollution affects the marine ecosystem? Explain.

Or

- (b) Brief notes on Mono-climax and Poly-climax theories.

15. (a) Write notes on role of microbial enzymes in bioremediation of pollutants.

Or

- (b) Explain the ecological impact of green-house effects.

PART C —(3 × 10 = 30 marks)

Answer any THREE questions.

All questions carry equal marks.

16. Discuss elaborately the structure and functions of at least four types ecosystem.
17. Write down the unique features of coral reefs and their significance.
18. Explain how human activities have impacted on biogeochemical cycles.
19. Describe the predicted effects of climate change on biodiversity.
20. Give a detailed account on causes and effects of global warming.

D-1618

Sub. Code

35041

DISTANCE EDUCATION

**M.Sc. (Zoology) DEGREE EXAMINATION,
DECEMBER 2021.**

Fourth Semester

FISHERIES AND AQUACULTURE

(CBCS – 2018-19 Academic Year Onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL questions.

All questions carry equal marks.

1. Catamaran
2. Trawlers
3. Culture Fishery
4. Parthenogenesis
5. Invasive Species
6. Inorganic Fertilizers
7. Induced breeding
8. Canning
9. HACCP
10. Isinglass.

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

All questions carry equal marks.

11. (a) Write brief notes on “Capture Fishery in India” and its export potential.

Or

- (b) Write a short account on various types of Indigenous Crafts and Gears.

12. (a) Give a brief account on transportation techniques of Live Fish seeds.

Or

- (b) Discuss in brief about Endangered fish species with suitable examples.

13. (a) Write a short account on Infectious diseases associated with shellfish consumption.

Or

- (b) Explain the physio-chemical parameters affect the water quality in fish pond.

14. (a) Give a brief account on Hatching and Larval rearing in culture fishery.

Or

- (b) Write elaborate notes on various types of live feeds in aquaculture.

15. (a) Briefly explain the biochemical methods used to examine the freshness of fish.

Or

- (b) Write an account on Drying and Irradiation methods of preservation of fish.

PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

All questions carry equal marks.

16. Write an essay on current status of economically important marine fishes in India.
 17. Give a detailed account on conservation and management of marine fishery resources of India.
 18. Write a detailed account on the method of composite fish culture and integrated fish farming with examples.
 19. What are the different types of hatchery? Discuss about the post larval rearing and hatchery economics.
 20. Write elaborate essay on fishery by-products and their uses.
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D-1619

Sub. Code

35042

DISTANCE EDUCATION

**M.Sc. (Zoology) DEGREE EXAMINATION,
DECEMBER 2021.**

Fourth Semester

ANIMAL BIOTECHNOLOGY

(CBCS – 2018-19 Academic Year Onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL the questions.

All questions carry equal marks.

1. Genetically Modified Organism.
2. Differentiate between Cosmid and Phagemid.
3. DNA Ligase.
4. Hanging drop culture.
5. Embryo Transfer.
6. Dolly.
7. PCR.
8. Knock-in Technology.
9. Pheromones.
10. Disadvantages of Stem Cell Research.

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

All questions carry equal marks.

11. (a) Write notes on merits and demerits of vectors.

Or

- (b) What is Gene Transfer Technology? Write short notes on at least two Gene Transfer Technologies.

12. (a) Explain the Pro-Nuclear Microinjection method of transgenic animal production.

Or

- (b) Give an account on Serum Free Culture Media.

13. (a) Give a brief account on various sterilization techniques used in animal cell culture.

Or

- (b) Why is the conservation and management of Indigenous domestic animals important?

14. (a) Explain briefly about the Sanger's Di-deoxy method of DNA sequencing technique.

Or

- (b) How is insulin produced through recombinant DNA technology?

15. (a) Discuss the potential and future perspectives of Knock-out and knock-in technology.

Or

- (b) Write short essay on Application of transgenic animals in Drug and Industrial production.

PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

All questions carry equal marks.

16. Illustrate the construction and characterization of Yeast Artificial Chromosome library.
 17. Write a detailed note on use of transgenic animals in biotechnology, and its prospects and problems.
 18. Write short notes on the following :
 - (a) Xenotransplantation,
 - (b) Primary Cell Lines,
 - (c) DNA Barcoding.
 19. Elaborately write notes on the biotechnology application of Stem Cell Therapy.
 20. Elaborately discuss about the clinical applications of PET-CT and Molecular Imaging Techniques.
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D-1620

Sub. Code

35043

DISTANCE EDUCATION

M.Sc. (Zoology) DEGREE EXAMINATION,
DECEMBER 2021.

Fourth Semester

BIOPHYSICS, BIostatISTICS AND BIOINFORMATICS

(CBCS – 2018-19 Academic Year Onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL questions.

All questions carry equal marks.

1. Difference between atom and molecule.
2. NADPH
3. Primary Data
4. Variables
5. Bar-Diagram
6. Random Sampling
7. Standard Error
8. P value
9. Pharmacoinformatic
10. Next Generation Sequencing.

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

All questions carry equal marks.

11. (a) Write a detailed account on types of chemical bonds and properties.

Or

- (b) Give brief notes on :
(i) redox potential and
(ii) free energy.

12. (a) Write an account on :

- (i) Isotopes and
(ii) Autoradiography.

Or

- (b) Write notes on Infra-Red spectroscopy and its applications.

13. (a) Give a short note on types of data.

Or

- (b) Describe the types of sampling in biostatistics.

14. (a) Give short notes on hypothesis testing.

Or

- (b) Explain in details about various types of 'ANOVA'.

15. (a) Write a detailed notes on Biological Data bases.

Or

- (b) Draw a schematic diagram of Phylogenetic tree and its importance.

PART C — ($3 \times 10 = 30$ marks)

Answer THREE questions.

All questions carry equal marks.

16. Describe in detail about the polymerization process of organic molecules.
17. Discuss elaborately about
 - (a) Properties of light,
 - (b) Radiation and
 - (c) Geiger Muller counter.
18. Discuss elaborate notes on primary and secondary data in research.
19. Write notes on the following:
 - (a) Probability
 - (b) Regression and correlation analysis
 - (c) Medical informatics
20. Elaborately discuss about types of DNA sequence analysis and phylogenetic tree construction.