DE–7460 **11**

DISTANCE EDUCATION

M.Sc. (Zoology) DEGREE EXAMINATION, DECEMBER 2013

ANIMAL DIVERSITY

Time : Three hours Maximum : 100 marks

SECTION A — ($5 \times 8 = 40$ marks)

Answer any FIVE of the following questions in about 300 words each.

1. What are the four levels of hierarchical organization in a multicellular organism? Explain.
2. Briefly explain the extracellular structural elements in metazoan animals.
3. Give an account on the adaptive radiation of Euglenozoa.
4. Write a note on the ecological relationships of porifera.
5. Briefly explain the body forms of the Echinodermata.
6. Give note on the functional adaptation of fishes.
7. Briefly write down the origin and evolution of bony fishes.
8. List out the characteristic features or reptiles.

SECTION B — ($4 \times 15 = 60$ marks)

Answer any FOUR of the following questions in about 500 words each.

9. Give an account on the body cavities of metazoan animals.
10. Discuss in detail the concept of species in biodiversity.

11. Explain in detail the form and function of sponges.

12. Discuss in detail about the phylogeny and adaptation of molluscs.

13. Explain the organization and phylogenic consideration of cephalochordata.

14. Give a detailed account on early evolution of terrestrial vertebrates and modern amphibians.

15. Write an essay on the migration and navigation of birds.

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DE–7461 **12**

DISTANCE EDUCATION

M.Sc. (Zoology) DEGREE EXAMINATION, DECEMBER 2013.

CELL AND MOLECULAR BIOLOGY

Time : 3 hours Maximum : 100 marks

PART A — (5 × 8 = 40 marks)

Answer any FIVE questions.

All questions carry equal marks.

1. Describe briefly the structural peculiarities of prokaryotic cell organization.

2. Write about the chemical composition of plasma membrane.

3. Elaborate the specific role of two different DNA polymerases for the synthesis of leading and lagging strands.

4. Distinguish the role of helicases and SSB proteins in DNA replication.

5. What are transcription factors? Describe three different RNA polymerases in Eukaryotes.

6. Write short notes on

   (a) Enhancer sites (b) Polyadenylation

7. How do the functions of rRNA, mRNA and t-RNA differ during the process of protein synthesis?

8. Describe any one operon model for regulation of gene expression.

PART B — ($4 \times 15 = 60$ marks)

Answer any FOUR questions.

9. What is endoplasmic reticulum? Describe the types, structure and functions of the endoplasmic reticulum.

10. Describe the two classical experiments which demonstrated the semi conservative mode of DNA replication.

11. Discuss the post – transcriptional modification of heterogeneous nuclear RNA in Eukaryotes.

12. Give an account on the mechanism of prokaryotic protein synthesis.

13. Explain the activation of amino acids and their attachment to its specific t–RNA.

14. Describe the regulation of gene action in Eukaryotes at the DNA level.

15. Write in detail the regulation and gene expression of trp operon.

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DE–7462 **13**

DISTANCE EDUCATION

M.Sc. (Zoology) DEGREE EXAMINATION, DECEMBER 2013.

GENETICS AND EVOLUTION

Time : Three hours Maximum : 100 marks

PART A — (5 × 8 = 40 marks)

Answer any FIVE of the following questions, each in about 300 words.

1. Write short notes on chromosomal abnormalities.

2. Add notes on linkage and crossing over.

3. Give an account on types of mutations.

4. Briefly explain the genetic regulation of development of *Drosophila*.

5. Comment on recapitulation theory.

6. Give an account on isolating mechanisms and its significance in evolution.

7. Write short notes on molecular drives.

8. Explain the contribution of *Coenorhabditis* in evolution studies.

PART B — (4 × 15 = 60 marks)

Answer any FOUR of the following questions, each in about 500 words.

9. Discuss the human chromosome and its abnormalities.

10. What is induced mutation? Add notes on its detection and role in evolution.

11. Explain the genetic theory of natural selection.

12. Explain the role of gene regulation in development and differentiation in Zebra fish.

13. Discuss molecular evolution in relation to its drive, variation and analysis with modern techniques.

14. Discuss the adaptation pattern seen at population level and its role in evolution.

15. Write short notes of the following:
    (a) Multiple allelic inheritance
    (b) Barr bodies
    (c) Clustal analysis.

DE–7463 **14**

DISTANCE EDUCATION

M.Sc. DEGREE EXAMINATION, DECEMBER 2013.

Zoology

BIOCHEMISTRY AND ANIMAL PHYSIOLOGY

Time : Three hours Maximum : 100 marks

SECTION A — ($5 \times 8 = 40$ marks)

Answer any FIVE questions.

All questions carry equal marks.

1. Write an account on physiologically important compound lipids.

2. Explain the mechanism of enzyme action.

3. Explain the transamination and deamination reactions.

4. Describe the regulatory mechanisms of blood sugar.

5. Explain the role of enzymes in the digestion of food materials.

6. Explain the mechanism of urine formation in a mammal.

7. Write an account on mechanoreceptors in vertebrates.

8. Explain the circadian rhythm in animals.

SECTION B — ($4 \times 15 = 60$ marks)

Answer any FOUR questions.

All questions carry equal marks.

9. Describe the B group vitamins and their nutritional role in animals.

10. Explain the Beta oxidation of fatty acids.

11. Explain:
    (a) Gluconeogenesis and
    (b) Glyconeolysis

12. Describe the mechanism of synaptic transmission.

13. Explain the transport process of oxygen and carbon-di-oxide.

14. Explain how animals are adapted to extreme temperatures.

15. Write an essay on physiological basis of learning and memory.

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DE–7464 **15**

DISTANCE EDUCATION

M.Sc. (Zoology) DEGREE EXAMINATION, DECEMBER 2013.

BIOPHYSICS AND BIOSTATISTICS

Time : Three hours Maximum : 100 marks

SECTION A — (5 × 8 = 40 marks)

Answer any FIVE of the following questions.

1. Describe the quantum principle of atomic structure.

2. Explain the free energy concept.

3. Describe the working principle of laser.

4. Write an account on the effect of radiation on macromolecules.

5. Explain the technique of X ray diffraction crystallography.

6. Describe the different types of blotting techniques.

7. Explain the different methods of collecting primary data.

8. Calculate mean and standard deviation for the following data :

Number of eggs laid (X) :	1–3	3–5	5–7	7–9	9–11
Number of insects (f) :	15	18	27	10	6

SECTION B — (4 × 15 = 60 marks)

Answer any FOUR of the following questions.

9. Explain the types of bonds existing in biomolecules.

10. State and explain the laws of thermodynamics.

11. State and explain the Beer and Lambert's laws of light absorption.

12. Explain the working principle and application of gas liquid chromatography.

13. Explain the instrumentation technique of Gieger Muller counter.

14. Describe the types of diagrammatic representation of biological data.

15. Obtain the two regression equations, length (X) on weight (Y) and weight (Y) on length (X) from the following data on the length (X in cm) and weight (Y in gm) of 8 fishes.

X :	5	7	3	1	9	12	8	3
Y :	8	9	5	4	9	13	7	9

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DE–7465 **21**

DISTANCE EDUCATION

M.Sc. (Zoology) DEGREE EXAMINATION, DECEMBER 2013.

ENVIRONMENTAL BIOLOGY

(2012 onwards)

Time : Three hours Maximum : 100 marks

SECTION A — (5 × 8 = 40 marks)

Answer any FIVE of the following questions in about 300 words each.

1. Define food chain. Give a comparative account on grazing and detritus food chain.
2. Explain the factor compensation with suitable examples.
3. Discuss the ecological significance of recycle pathways.
4. Write an account on population fluctuations.
5. Discuss briefly the various theories of climax concept in succession.
6. What is natural resource? Give a brief account on different natural resources with special reference to India.
7. Describe briefly the consequences of global warming and climate change.
8. Explain the problems associated with making and implementing the environmental laws.

SECTION B — (4 × 15 = 60 marks)

Answer any FOUR of the following questions in about 500 words each.

9. Describe the energy flow in freshwater and marine environment with suitable diagrams.
10. What is biogeochemical cycle? Describe different types of biogeochemical cycle and their significance.

11. Define population. Describe the various factors that characterize a population ecology.

12. Define biotic community. Give a brief account on various characteristics of a community.

13. Discuss the salient features of freshwater habitat with suitable diagram. Add a note on adaptations of aquatic habitats.

14. Describe in detail the causes and consequences of air pollution. Add notes on its control measures.

15. Discuss the need and environmental applications of bioremediation. Add a note on the role of microbes in bioremediation.

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DE–7466 **22**

DISTANCE EDUCATION

M.Sc. (Zoology) DEGREE EXAMINATION, DECEMBER 2013.

DEVELOPMENTAL BIOLOGY

Time : Three hours Maximum : 100 marks

SECTION A — (5 × 8 = 40 marks)

Answer any FIVE questions.

Each questions carry equal marks.

1. Explain the endocrine control of vitellogenesis.

2. What are the sequences of events in sperm entry into the egg?

3. Explain the patterns and factors influencing cleavage.

4. Briefly explain the concept of Spemon's primary organizer.

5. With reference to organogenesis, explain cellular interaction.

6. What is Epiboly? Explain the various types of epiboly movements.

7. What are the developmental stages of extraembryonic membranes?

8. Explain the concept of Assisted Reproduction Technologies (ART).

SECTION B — ($4 \times 15 = 60$ marks)

Answer any FOUR questions.

Each questions carry equal marks.

9. Discuss on different stages-of oogenesis.

10. What do you mean by egg activation? Discuss the various steps leading to early and late responses by the egg after fertilization.

11. With suitable sketches describe the gastrulation of an amphibian.

12. Discuss the importance of epithelis – mesenchymal interactions in organogenesis with suitable examples.

13. Compare and contract the patterns of gastrulation in frog and chick.

14. Explain the process of cell death in development stage.

15. With reference to morphogenesis explain the various factors involved in cell recognition and sorting out of embryonic tissue.

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DE–7467 **23**

DISTANCE EDUCATION

M.Sc. (Zoology) DEGREE EXAMINATION, DECEMBER 2013.

MICROBIOLOGY AND IMMUNOLOGY

Time : Three hours Maximum : 100 marks

SECTION A — ($5 \times 8 = 40$ marks)

Answer any FIVE of the following questions, each in about 300 words.

1. Describe the unique features of bacterial diversity with suitable examples and diagrams.

2. Explain various methods of storage of microbes.

3. Give a brief account on microbes of food with a note on methods used for their identification.

4. Elucidate different modes of transmission of bacteria pathogenic to humans with suitable examples.

5. List out the types and distribution of different types of immune cells. Add a note on their functions.

6. What are humoral and cell-mediated immune responses? Explain their importance in immunity.

7. Discuss the major reasons for onset of auto-immune diseases.

8. Distinguish between agglutination and precipitation reactions. Explain their applications in disease diagnosis.

SECTION B — ($4 \times 15 = 60$ marks)

Answer any FOUR of the following questions, each in about 500 words.

9. Describe in detail the ultrastructure of Gram-positive bacteria.

10. What is food poisoning? Explain the methods of food preservation.

11. Give a detailed account on types, sources and functions of immune molecules.

12. Explain any four methods of antigen classification with suitable examples and highlight their merits.

13. Discuss the salient features of primary and secondary immune responses with an emphasis of their roles in acquired immunity.

14. How does immune system react against tumours?

15. "RIA is the most sensitive and specific immunological technique" – Discuss.

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DE–7468 **24**

DISTANCE EDUCATION

M.Sc. (Zoology) DEGREE EXAMINATION, DECEMBER 2013.

ANIMAL BIOTECHNOLOGY

Time : Three hours Maximum : 100 marks

SECTION A — (5 × 8 = 40 marks)

Answer any FIVE of the following questions in about 300 words each.

1. What is the important role of plasmids in genetic engineering? Explain briefly.

2. How will you determine genetic variation in an organism using RAPD?

3. Give an account on the various methods of cell preservation in animal cell culture.

4. What are cell lines? How is the growth characteristics of cell lines determined?

5. Briefly explain the ecological roles and economic importance of earthworms.

6. Write a note on harvesting and quality of silkworm cocoons.

7. Give an account on Multiple Sequence Alignment and its importance in phylogentic analysis of an organism.

8. Briefly write down the bioinformatic tools used for the analysis of protein structure.

SECTION B — (4 × 15 = 60 marks)

Answer any FOUR of the following questions, each in about 500 words.

9. Write detailed notes on the following with suitable diagram :

   (a) pBR322

   (b) YAC vector.

10. Write an essay on human genome project and its potential application.

11. Describe in detail the bioreactors and scaling-up technologies involved in cell cultures in product development.

12. Write an essay on vermiculture technology.

13. Describe the life cycle and rearing methods of silkworm, *Bombyx mori*.

14. Explain different types of vaccine and its production through biotechnological techniques.

15. What is data mining? Explain in detail its application in bioinformatics.

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DE–7469 **251**

DISTANCE EDUCATION

M.Sc. (Zoology) DEGREE EXAMINATION, DECEMBER 2013.

FISHERIES AND AQUACULTURE

Time : Three hours Maximum : 100 marks

SECTION A — ($5 \times 8 = 40$ marks)

Answer any FIVE of the following questions in about 300 words each.

1. Comment on fishing crafts and gears.
2. Write a note on food and feeding habits of cultivable fishes.
3. Write a brief note on the hatching techniques used for carps.
4. Explain the mass culture of zooplanktons.
5. Write a brief account on integrated fish farming
6. Explain the present status of pearl culture in India.
7. Comment on BIS and HACCP concepts in quality control.
8. Give the present status of fisheries in India.

SECTION B — ($4 \times 15 = 60$ marks)

Answer any FOUR of the following questions in about 500 words each.

9. Describe the life history of a cultivable finfish known to you.
10. Write an account on fish by-products and their economic value.

11. Compare the aquaculture practices in freshwater and brackish water with a note on their merits and demerits.

12. What is meant by integrated farming? Describe the method with reference to paddy cum fish culture in India.

13. What are the different types of fish diseases that are generally encountered in finfish culture? Describe the symptoms and treatments.

14. Enumerate induced breeding of fishes with its significance.

15. Describe the various methods employed for fish preservation.

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DE–7470 **252**

DISTANCE EDUCATION

M.Sc. (Zoology) DEGREE EXAMINATION, DECEMBER 2013.

PARASITOLOGY

Time : Three hours Maximum : 100 marks

PART A — ($5 \times 8 = 40$ marks)

Answer any FIVE questions.

All questions carry equal marks.

1. How are facultative parasites differ from obligatory parasites?

2. Discuss briefly the general patterns of parasite transmission.

3. Explain the general characteristics and classifications of Balantidium Coli.

4. Write the diagnosis, treatment and prevention for Trypanosoma.

5. Write an account on Taenia Solium.

6. Discuss the symptoms and medical care for filariasis.

7. Give an detailed account on Myiasis fleas.

8. Write a note on the emerging diseases and bioterroism.

PART B — ($4 \times 15 = 60$ marks)

Answer any FOUR questions.

All questions carry equal marks.

9. Describe the life cycle of Plasmodium.

10. Explain the biology and morphology of Cyclops and its medical importance.

11. How are the parasitic diseases controlled by vaccines and the modern approaches?

12. Explain the pathological mechanism of tsetsefly.

13. Explain the molecular based diagnostic approach in parasitology.

14. Differentiate and explain the life cycle of lung fluke and blood fluke with suitable illustrations.

15. Write in detail the factors contributed to the epidemic parasitic infections.

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