

D-5120

Sub. Code

35011

DISTANCE EDUCATION

M.Sc.(Zoology) DEGREE EXAMINATION,DEC 2020.

First Semester

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. Biological species
2. Cellular grade of organization
3. Polyps
4. Scolex
5. Nephridia
6. Bipinnaria
7. Stomocord
8. Sucker fish
9. Fossil bird
10. Metatheria.

PART B — (5 × 5 = 25 marks)

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

All questions carry equal marks.

11. (a) Give a brief account on numerical taxonomy.

Or

- (b) Write note on symmetry in animals.

12. (a) Give a brief account on entamoeba.

Or

- (b) Describe the structural organization of leucosolenia.

13. (a) Give a brief note on the adaptive radiations in annelids.

Or

- (b) Write a brief account on the larval forms of crustaceans.

14. (a) List out the important characteristic features of phylum mollusca.

Or

- (b) Brief note on Mesozoic reptiles.

15. (a) Give brief note on flightless birds.

Or

- (b) Write a brief account on aquatic mammals.

PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

All questions carry equal marks.

16. Write an essay on the principles of taxonomic classifications.
 17. Describe the structure of Obelia colony with diagram.
 18. Describe the larval forms of echinoderm and its evolutionary significance.
 19. Explain the anatomical and physiological flight adaptations of birds.
 20. Write an elaborate account on the general characteristics of mammals.
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D-5121

Sub. Code

35012

DISTANCE EDUCATION

M.Sc.(Zoology) DEGREE EXAMINATION,DEC 2020.

First Semester

BIOCHEMISTRY

(CBCS 2018–19 Academic Year onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL questions.

1. What molecules make up disaccharides?
2. What are steroids drugs?
3. What is the role of amino acids?
4. Define – Hypervitaminosis.
5. What are the benefits of progesterone?
6. What is an example of a metabolic disease?
7. How is fatty acid synthesis regulated?
8. What are the three stages of cholesterol synthesis?
9. What are the early signs and symptoms of atherosclerosis?
10. What is difference between diabetes insipidus and mellitus?

PART B — (5 × 5 = 25 marks)

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

11. (a) What are the four types of lipoproteins? What supplements increase cholesterol?

Or

- (b) What is the difference between an amino acid and a protein? What are the five main functions of proteins?

12. (a) Explain in detail about induced fit model.

Or

- (b) Mention briefly about isoenzymes.

13. (a) What are the symptoms of pituitary gland problems?

Or

- (b) Write the classifications and biological functions of vitamins.

14. (a) Describe about glycogenesis and glycogenolysis.

Or

- (b) Explain in detail about ketogenesis.

15. (a) Explain in detail about diabetes mellitus.

Or

- (b) Mention briefly about maple syrup diseases.

PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Write the general structure, classification and chemical properties of amino acids.
17. How is DNA organized in the nucleus? Write the structure and functions of DNA (Watson and crick model).
18. Discuss about MM equation, line – Weaver and Burk plot.
19. Explain in detail about Pentose phosphate pathway.
20. Discuss about Zellweger Syndrome, Gaucher's disease and Niemann pick disease.

D-5122

Sub. Code

35013

DISTANCE EDUCATION

M.Sc. (Zoology) DEGREE EXAMINATION, DEC 2020.

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. Define Unicellular
2. Chromosomes
3. ER
4. Meiosis
5. Primase
6. Enhancers
7. C-value paradox
8. Translation
9. Repressor
10. Gene.

PART B — (5 × 5 = 25 marks)

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

All questions carry equal marks.

11. (a) Write short account on cell theory.

Or

- (b) Explain the ultra structure of cell membrane.

12. (a) Give an account on structure, types and function of RNA.

Or

- (b) Explain the mechanism of eukaryotic replication.

13. (a) Describe about RNA polymerase.

Or

- (b) Differentiate the prokaryotic and eukaryotic replication.

14. (a) Elucidate different post transcriptional modifications.

Or

- (b) Brief note on translocation.

15. (a) Describe about transcription factors.

Or

- (b) Write short note on analysis of gene expression.

PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

All questions carry equal marks.

16. Give an account on the cell cycle.
 17. Write in detail about the process of DNA replication in *E.coli*.
 18. Explain the process of translation in prokaryotes. State any four differences from eukaryotic translation.
 19. Discuss about trp operon.
 20. Comment on various characteristic motifs in DNA binding proteins.
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D-5126

Sub. Code

35031

DISTANCE EDUCATION

M.Sc.(Zoology) DEGREE EXAMINATION, DEC 2020.

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.

Define/Explain :

1. Chymotrypsin
2. Bowman's capsule
3. Synapse
4. Kymograph
5. Cone cells
6. Heterotherms
7. Glucagon
8. Green gland
9. Acclimatization
10. Brown fat.

PART B — (5 × 5 = 25 marks)

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

All questions carry equal marks.

11. (a) Briefly describe digestion of carbohydrates.

Or

- (b) Briefly describe hormonal control of osmoregulation.

12. (a) What is double circulation? Explain with a diagram.

Or

- (b) Explain briefly transmission of nerve impulse.

13. (a) Briefly describe the anatomy of pituitary glands.

Or

- (b) What are the major functions of parathormones?

14. (a) Briefly explain the adaptation of desert animals with reference to its thermoregulation.

Or

- (b) Give account of adaptation in animals that live at high altitudes.

15. (a) What is oxygen equilibrium curve? How oxygen equilibrium curve can explain oxygen affinity of a respiratory pigment.

Or

- (b) Give a brief account on the composition of blood in human.

PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

All questions carry equal marks.

16. Give a detailed account on hormonal control of digestion.
 17. Describe the urine formation and its regulation in human.
 18. What is “negative feedback”? Explain the phenomenon with reference to insulin and glucagon hormones.
 19. Give a detailed account of osmoregulation in freshwater fishes.
 20. What is hemopoiesis? Explain differentiation of various blood cell types from bone marrow cells.
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D-5127

Sub. Code

35032

DISTANCE EDUCATION

M.Sc.(Zoology) DEGREE EXAMINATION, DEC 2020.

Third Semester

IMMUNOLOGY

(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.

Define/ Explain :

1. Immune cells
2. Secondary lymphoid organ
3. Cytokines
4. Hematopoises
5. T-cytotoxic cells
6. T cells
7. Myeloid cells
8. Adaptive immunity
9. Immune response
10. Natural killer cells.

PART B — (5 × 5 = 25 marks)

Answer ALL questions.

All questions carry equal marks.

11. (a) Comment on the functions and structure of primary lymphoid organs with a neatly labeled diagram.

Or

- (b) Explain the types of immune cells involved in immune response.

12. (a) Illustrate the general structure of an immunoglobulin with a neat diagram.

Or

- (b) Distinguish between innate immunity and adaptive immunity.

13. (a) Define autoimmune disease and the treatment involved in treating disease.

Or

- (b) Give a note on major histocompatibility complex.

14. (a) Define hypersensitivity. What is the role of type III hypersensitivity on immune complex clearance?

Or

- (b) Define antibody engineering and its applications.

15. (a) Give an account on vaccine and explain the immunization schedule.

Or

- (b) Write notes on organ transplantation.

PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

All questions carry equal marks.

16. Give a detailed account on hypersensitivity.
17. Write a detailed note on :
 - (a) Antigens
 - (b) Antigenic determinants
 - (c) Adjuvant.
18. What is MHC? Give a brief account on organization and activity of class I and II MHC molecules in humans.
19. Discuss in detail about T and B-lymphocytes in immune response.
20. What is monoclonal antibody and explain the applications.

D-5128

Sub. Code

35033

DISTANCE EDUCATION

M.Sc.(Zoology) DEGREE EXAMINATION, DEC 2020.

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.

Define / Explain :

1. Food web
2. Ecotype
3. Neuston
4. Stratosphere
5. Mortality
6. Age pyramids
7. Edge effect
8. Greenhouse gases
9. Threatened species
10. *In situ* conservation.

PART B — (5 × 5 = 25 marks)

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

All questions carry equal marks.

11. (a) What is an ecological pyramid? Explain briefly different types.

Or

- (b) Briefly explain biological effects of temperature on aquatic organisms.

12. (a) List at least eight unique features of a coral reef.

Or

- (b) What is a biosphere? Explain its types.

13. (a) What is a climax community? Explain briefly monoclinal theory.

Or

- (b) What is global warming? Give a brief account on the factors that cause global warming.

14. (a) What is bioremediation? Explain briefly with an example.

Or

- (b) What is biodiversity? Explain briefly, ecological diversity and genetic diversity.

15. (a) Briefly explain a pond ecosystem with a neat diagram.

Or

- (b) Estuaries are a unique ecosystem. Discuss.

PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

All questions carry equal marks.

16. Light is a limiting factor – Discuss.
17. What is a gaseous cycle? Explain nitrogen cycle with a suitable diagram.
18. Give an account of factors responsible for regulation of population density.
19. What is succession? Describe the trend and basic types of succession.
20. What is “biodiversity hotspot”? Explain the characteristics of any one biodiversity hotspot in South India.

D-6500

Sub. Code

35041

DISTANCE EDUCATION

M.Sc. (Zoology) DEGREE EXAMINATION, DECEMBER 2020.

Fourth Semester

FISHERIES AND AQUACULTURE

(CBCS 2018 – 2019 Academic year onwards)

Time : Three hours

Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL questions.

All questions carry equal marks.

1. Pelagic fish
2. Catamaran
3. *In-situ* conservation
4. RAS
5. Eye-stalk ablation
6. *Lates calcarifer*
7. WSSV
8. FCR
9. Canning
10. Isinglass

SECTION B — (5 × 5 = 25 marks)

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

11. (a) Write an account on various gears and crafts used in east and west coast of India.

Or

- (b) How will you record the meristic characteristics of a fish?

12. (a) Give an account on composite fish culture practice in India.

Or

- (b) Give an account on integrated fish farming and its advantages.

13. (a) Briefly write about intensive shrimp farming.

Or

- (b) Briefly write about the advantages of *Litopenaeus vannamei* farming.

14. (a) Give an account on packing and transportation of fish seed.

Or

- (b) Comment on any three major shrimp viral diseases reported from India.

15. (a) How will you examine the freshness of fish in markets?

Or

- (b) Give an account on HACCP and its guidelines for quality control of fishery by-products.

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

All questions carry equal marks.

16. Give an overview of Indian fisheries, production, utilization and demand.
 17. Discuss in detail about Carp culture in India.
 18. How the fishes are induced for breeding in controlled condition - Discuss.
 19. Write an essay on good management practices (GMPs) in coastal shrimp farming.
 20. Give an elaborate account on spoilage of fish and methods of preservation.
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D-6501

Sub. Code

35042

DISTANCE EDUCATION

M.Sc. (Zoology) DEGREE EXAMINATION, DECEMBER 2020.

Fourth Semester

ANIMAL BIOTECHNOLOGY

(CBCS 2018 – 19 Academic year onwards)

Time : Three hours

Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL questions.

All questions carry equal marks.

1. Shuttle vectors
2. Microinjection
3. Monolayer culture
4. CO₂ incubator
5. Dolly
6. Artificial Insemination
7. RT-PCR
8. Pheromones
9. Stem cell
10. Recombinant vaccines.

SECTION B — (5 × 5 = 25 marks)

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

11. (a) Write a short note on YAC and its advantages in cloning experiments.

Or

- (b) Give an account on somatic gene therapy.

12. (a) Make a brief note on primary cell line.

Or

- (b) What is embryo transfer? Mention its advantages.

13. (a) Distinguish between natural and synthetic media.

Or

- (b) List out some of the characteristic features of transformed cells.

14. (a) How will you knock-out the mice to study human diseases?

Or

- (b) List out the various applications of stem cell.

15. (a) Explain the applications of molecular imaging in gene therapy.

Or

- (b) Write briefly about the ethical issues in genetic engineering and transgenics.

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

All questions carry equal marks.

16. Explain in detail about Human Genome Project and its applications.
 17. Describe about bioreactors and scaling up technologies in cell culture.
 18. Describe the method and applications of Southern hybridization.
 19. Explain in detail about the DNA finger-printing techniques.
 20. Discuss the methods involved in genetic engineering for the production of transgenics.
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D-6502

Sub. Code

35043

DISTANCE EDUCATION

M.Sc. DEGREE EXAMINATION, DECEMBER 2020.

Fourth Semester

Zoology

BIOPHYSICS, BIOSTATISTICS AND BIOINFORMATICS

(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.

Define/explain ALL of the following:

1. Polymerization.
2. NADP.
3. Thermodynamics.
4. Redox potential.
5. Variance.
6. Carbon dating.
7. Cheminformatics.
8. Radiation.
9. Null hypothesis.
10. Database.

PART B — (5 × 5 = 25 marks)

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

11. (a) Explain Beer Lambert's law.

Or

- (b) Give an account on Gibbs free energy.

12. (a) Write a note on sampling methods.

Or

- (b) Explain the different forms of data presentation.

13. (a) Discuss the applications of radioisotopes.

Or

- (b) Differentiate between correlation and regression.

14. (a) From a pack of 52 cards, one card is drawn at random. Find the chance of drawing a heart and a chance of not drawing a heart.

Or

- (b) A random variable x has the following Probability distribution Find the standard deviation.

$$X: \quad 0 \quad 1 \quad 2 \quad 3$$

$$P(X): \quad 1/7 \quad 3/7 \quad 2/7 \quad 1/7$$

15. (a) The one-tailed t-Test for the hypothesis $H_0 : \mu \leq 45$ sec and $H_1 : \mu > 45$ sec dissolving times [in sec] of a drug in agitated gastric juice:

42.7, 43.4, 44.6, 45.1, 45.6, 45.9, 46.8, 47.6.

Or

- (b) Give an account on DNA and protein sequence analysis.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

All questions carry equal marks.

16. Suppose a botanist grows many individually potted egg plants, all treated identically and arranged in groups of 4 pots on greenhouse bench. After 30 days of growth she measures total leaf area Y of each plant. Assume that the population distribution of Y is approximately normal with mean = 800 cm^2 SD = 90 cm^2 .
- (a) What percentage of plants in the population will have leaf area between 750 cm^2 and 850 cm^2 ?
- (b) Suppose each group 4 plants can be regarded as a random sample from the population. What percentage of the groups will have a group mean leaf area between 750 cm^2 and 850 cm^2 ?
17. Discuss the effect of radiation and measurement of radioactivity in detail.
18. A discrete random variable can have the values $X = 3$, $X = 8$, $X = 10$ and the respective probabilities are 0.2, 0.7 and 0.1. Determine the mean, variance and standard deviation.
19. Give a detailed account on animal genome diversity.
20. Discuss about probability distribution.