

A-9794

Sub. Code

4MZO1C1

**M.Sc DEGREE EXAMINATION, APRIL 2021 &
Supplementary/Improvement/Arrear Examinations**

First Semester

Zoology

ANIMAL DIVERSITY

(CBCS – 2014 onwards)

Time : 3 Hours

Maximum : 75 Marks

Part A

(10 × 2 = 20)

Answer **all** questions.

1. Binomial nomenclature
2. Biological species concept
3. Any three protozoan parasites
4. Setae of Annelids
5. Radula
6. Torsion
7. Tornaria larva
8. Ampullae of Lorenzini
9. Paedomorphosis
10. Contour feathers

Part B

(5 × 5 = 25)

Answer **all** questions.

11. (a) Write notes on cladogram.

Or

- (b) What are the differences between natural selection and artificial selection?

12. (a) Write note on locomotion in Protozoa.

Or

- (b) Briefly describe about the classification of Coelenterate with examples.

13. (a) Write note on biramous appendages of Crustaceans.

Or

- (b) Write note on harmful and beneficial insects.

14. (a) What are the economic importance of fishes?

Or

- (b) What are the general characters of vertebrates?

15. (a) Describe about the functional adaptations of reptiles.

Or

- (b) Write note on migration of birds.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Describe about the different types of animal classifications.
17. Write about the life cycle of any one Platyhelminthes parasite.
18. Explain about the water vascular system in Echinodermata.
19. Describe about the structural and functional adaptations of fishes.
20. What are the adaptations of birds for flight?

A-9795

Sub. Code

4MZO1C2

**M.Sc DEGREE EXAMINATION, APRIL 2021 &
Supplementary/Improvement/Arrear Examinations**

First Semester

Zoology

BIOCHEMISTRY

(CBCS – 2014 onwards)

Time : 3 Hours

Maximum : 75 Marks

Part A

(10 × 2 = 20)

Answer **all** questions.

1. Deamination
2. Primary structure of protein
3. Biological importance of glucose
4. Glycogenesis
5. Phospholipids
6. t-RNA
7. Hydrolases
8. Scurvy
9. Insulin
10. Androgens.

Part B

(5 × 5 = 25)

Answer **all** questions.

11. (a) Write note on the properties of amino acids.
Or
(b) Briefly describe the structure of proteins.
12. (a) Give an account on formation of acetyl CoA.
Or
(b) Write note on the importance of Oxidative phosphorylation.
13. (a) Describe biosynthesis of glycerol in brief.
Or
(b) What are the different types of RNA found inside the cell?
14. (a) What are the factors affecting enzyme action?
Or
(b) How are vitamins classified?
15. (a) Write short note on the properties of hormones.
Or
(b) What are the hormone secreting glands present in human body?

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Give a detail account on Ornithine cycle.
17. Write an essay on HMP shunt.

18. Draw the structure of DNA and explain its replication process in detail.
19. Write an essay on classification of enzymes and their functions.
20. Describe the mechanism of action of hormones.

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Sub. Code

4MZO1C3

**M.Sc DEGREE EXAMINATION, APRIL 2021 &
Supplementary/Improvement/Arrear Examinations**

First Semester

Zoology

CELL AND MOLECULAR BIOLOGY

(CBCS – 2014 onwards)

Time : 3 Hours

Maximum : 75 Marks

Part A

(10 × 2 = 20)

Answer **all** questions.

1. Smooth Endoplasmic Reticulum (SER)
2. Peroxisomes
3. Okazaki fragments
4. DNA repair mechanism
5. Repressor
6. Post translational modifications
7. Cell surface receptors
8. Second messengers
9. Organ culture
10. Stem cell therapy.

Part B

(5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Draw the ultra structure of cell membrane.

Or

- (b) Write a brief note on lysosomes.

12. (a) Briefly describe about the synthesis of leading and lagging strands of DNA.

Or

- (b) Describe about the DNA repair mechanism.

13. (a) Write note on Lac operon model.

Or

- (b) What are post transcriptional modifications?

14. (a) Briefly describe about the role of oncogenes.

Or

- (b) Write note on cell adhesion.

15. (a) Write note on properties of stem cells.

Or

- (b) Briefly describe about the embryonic stem cells.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Describe the structure and function of Golgi apparatus.
17. Explain about the DNA damage and repair and their role in carcinogenesis.

18. Give an account on RNA synthesis and processing.
 19. Explain in detail about cellular communication.
 20. Write an essay about organ regeneration.
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Sub. Code

4MZO1E1

**M.Sc. DEGREE EXAMINATION, APRIL 2021 &
Supplementary/Improvement/Arrear Examinations**

First Semester

Zoology

Elective course-I (A): BIOSTATISTICS

(CBCS – 2014 onwards)

Time : 3 Hours

Maximum : 75 Marks

Part A

(10 × 2 = 20)

Answer **all** questions.

1. Secondary data
2. Pie diagram
3. Median
4. Standard Deviation
5. Poisson distribution
6. Variance
7. Chi -square test
8. Type II error
9. Rank correlation
10. Level of significance.

Part B

(5 × 5 = 25)

Answer **all** questions.

11. (a) Briefly describe about the methods for the collection of data.

Or

- (b) In a study of diabetic patients following data were obtained:

Age (in years)	No. of patients
10–20	2
20–30	10
30–40	25
40–50	15
50–60	5
60–70	3

Draw a frequency polygon for the above data.

12. (a) Write note on mean, median and mode with suitable example.

Or

- (b) Briefly describe about quartile deviation with example.

13. (a) Give an account on one way ANOVA.

Or

- (b) Write note on addition and multiplication theorem.

14. (a) Write note on the p value and its importance.

Or

- (b) Give an account on student's t-test.

15. (a) How do you identify correlation between samples graphically?

Or

- (b) Briefly describe about the basic idea of significance testing.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Describe about the diagrammatic representation of data.
17. Find out the mean, median and standard deviation of the following six fish weight in grams (g) :30,90,20,10,80,70.
18. Write note on binomial, normal and Poisson distribution and their applications.
19. A coin was tossed 100 times and obtained 65 head and 35 tails. By using Chi-square test report whether this result is significant from the expected result?
20. What is correlation and explain about different methods used for the estimation of correlation?

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Sub. Code

4MZO2C1

**M.Sc. DEGREE EXAMINATION, APRIL 2021 &
Supplementary/Improvement/Arrear Examinations**

Second Semester

Zoology

Elective: ANIMAL PHYSIOLOGY

(CBCS – 2014 onwards)

Time : 3 Hours

Maximum : 75 Marks

Part A

(10 × 2 = 20)

Answer **all** questions.

1. Salivary gland
2. Gills
3. Blood pressure
4. ADH
5. Cardiac muscle
6. Neuromuscular junction
7. Meissner's corpuscle
8. Rod cells
9. Insulin
10. Circannual rhythm.

Part B

(5 × 5 = 25)

Answer **all** questions.

11. (a) Write short notes on enzymes in carbohydrate digestion.

Or

- (b) Give an account on different types of respiratory organs present in animals.

12. (a) Write a brief account on respiratory pigments.

Or

- (b) Draw and illustrate the structure of human heart.

13. (a) What are the chemical changes happen during muscle contraction?

Or

- (b) Explain the mechanism of synaptic transmission.

14. (a) Write note on thermoregulation in poikilotherms and homeotherms.

Or

- (b) How are the animals adapted to pressure variation in high altitude?

15. (a) Briefly describe about the mechanism of hormone action.

Or

- (b) Write notes on lunar periodicity.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Draw the digestive system of human and explain its functions.
 17. Describe about the human excretory system.
 18. Draw the structure of muscle and explain the mechanism of muscle contraction.
 19. How are the fresh water and marine fishes adapted to the osmotic stress?
 20. Write an essay about the hormones of pituitary gland and their functions.
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A-9799

Sub. Code

4MZO2C2

**M.Sc. DEGREE EXAMINATION, APRIL 2021 &
Supplementary/Improvement/Arrear Examinations**

Second Semester

Zoology

GENETICS

(CBCS – 2014 onwards)

Time : 3 Hours

Maximum : 75 Marks

Part A

(10 × 2 = 20)

Answer **all** questions.

1. Genotype
2. Test cross
3. Complete linkage
4. Sex chromosome
5. QTL
6. Linkage map
7. Exon
8. Phagemid
9. Twin study
10. Founder principle

Part B

(5 × 5 = 25)

Answer **all** questions.

11. (a) Write short note on law of segregation.

Or

- (b) Briefly explain about the non Mendalian traits.

12. (a) What are the practical applications of mutations?

Or

- (b) Briefly describe about heterochromatization.

13. (a) Write short note on linkage maps.

Or

- (b) Write short note on molecular markers.

14. (a) Explain about the translation control of gene expression.

Or

- (b) Write short note sequential gene expression.

15. (a) What are the statements of Hardy – Weinberg equilibrium?

Or

- (b) Write short note the approaches to study animal behavior.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Write an essay about Mendel's contribution to genetics.
 17. Describe about ploidy and chromosomal abnormalities.
 18. Discuss about linkage and crossing over.
 19. Describe about the genetic regulation of development and differentiation.
 20. Describe about the molecular mechanism of biological clock.
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A-9800

Sub. Code

4MZO2C3

**M.Sc. DEGREE EXAMINATION, APRIL 2021 &
Supplementary/Improvement/Arrear Examinations
Second Semester
Zoology**

IMMUNOLOGY AND MICROBIOLOGY

(CBCS – 2014 onwards)

Time : 3 Hours

Maximum : 75 Marks

Part A

(10 × 2 = 20)

Answer **all** questions.

1. B – lymphocytes.
2. Antigen.
3. Autoimmune disease.
4. Hypersensitivity.
5. MHC class one molecule.
6. RIA.
7. Ultra structure of bacteria.
8. Enriched media.
9. Ring worm.
10. Probiotics.

Part B

(5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Give a brief account on MALT.

Or

- (b) Write short note on innate immunity.

12. (a) Write briefly about primary and secondary immune response.

Or

- (b) What is immunoprophylaxis?

13. (a) Write short note on western blotting.

Or

- (b) Briefly discuss about AIDS.

14. (a) Draw and illustrate the structure of virus.

Or

- (b) Write notes on the pure culture method of bacteria.

15. (a) Write short note on papoviridae and adenoviridae.

Or

- (b) Write short note on food poisoning.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Discuss about the structure and function of primary lymphoid organs.

17. Explain the mechanism of cell mediated immunity.

18. What are monoclonal antibodies and how they are prepared?
 19. How do you identify microbes through biochemical and molecular methods?
 20. Discuss about pathogenic fungi and the diseases caused by them.
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A-9801

Sub. Code

4MZO3C1

**M.Sc. DEGREE EXAMINATION, APRIL 2021 &
Supplementary/Improvement/Arrear Examinations**

Third Semester

Zoology

DEVELOPMENTAL BIOLOGY

(CBCS – 2014 onwards)

Time : 3 Hours

Maximum : 75 Marks

Part A

(10 × 2 = 20)

Answer **all** questions.

1. Spermatogonia
2. Oogenesis
3. Triploblastic organisms
4. Blastula
5. Mesodermal derivatives
6. Neurulation
7. Metanephric kidney
8. Blastema
9. Test tube baby
10. Discoid placenta.

Part B

(5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Draw the ultra structure of sperm cell.
Or
(b) How the eggs are classified based on nutrition?
12. (a) Write short note on morphogenetic movements.
Or
(b) Give a brief account on differential cell affinity.
13. (a) Explain about cell aggregation and differentiation in amphibia.
Or
(b) Write short note on the development of vertebrate ear.
14. (a) Briefly describe about the sex determination in animals.
Or
(b) What is neoteny?
15. (a) Write note on the induced breeding.
Or
(b) Briefly describe about the foetal membranes in chick.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Discuss in detail about the spermatogenesis and spermiogenesis.
17. Explain about the gastrulation in chick.

18. Write an account on the development of kidney in mammals.
 19. Explain about the mechanism of regeneration in vertebrates.
 20. Discuss about the recent advances in embryology.
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A-9802

Sub. Code

4MZO3C2

**M.Sc. DEGREE EXAMINATION, APRIL 2021 &
Supplementary/Improvement/Arrear Examinations**

Third Semester

Zoology

ECOLOGY

(CBCS – 2014 onwards)

Time : 3 Hours

Maximum : 75 Marks

Part A

(10 × 2 = 20)

Answer **all** questions.

1. Sigmoid growth curve
2. Symbiosis
3. Ecosystem
4. Food chain
5. Carbon foot print
6. Primary producer
7. Biome
8. Mangrove forest
9. Acid rain
10. Bioremediation.

Part B

(5 × 5 = 25)

Answer **all** questions.

11. (a) Classify the population based on age distribution.
Or
(b) Write note on the major characters of the community.
12. (a) Write short note on food web in a ecosystem.
Or
(b) Briefly explain about the niche concept.
13. (a) Write short note on water cycle.
Or
(b) Briefly describe about the cycling of organic nutrients.
14. (a) Write a short note on biological features of coral ecosystem.
Or
(b) Briefly describe about the estuarine ecosystem.
15. (a) Write short note on climate change and its impact.
Or
(b) Briefly discuss about germplasm conservation.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Discuss about the ecological succession and its impact.
17. Write an essay about trophic structure in ecosystem.

18. Describe about Oxygen and Carbon cycle.
 19. Describe about the natural resources and their conservation.
 20. Write in detail about biotechnology and its application in environmental studies.
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A-9803

Sub. Code

4MZO3C3

**M.Sc DEGREE EXAMINATION, APRIL 2021 &
Supplementary/Improvement/Arrear Examinations**

Third Semester

Zoology

EVOLUTION

(CBCS – 2014 onwards)

Time : 3 Hours

Maximum : 75 Marks

Part A

(10 × 2 = 20)

Answer **all** questions.

1. Darwinism
2. Spontaneous generation
3. Analogous organs
4. Fossil
5. Sympatric speciation
6. Extinction
7. Warning colouration
8. Camouflage
9. Cambrian period
10. Carbon dating.

Part B

(5 × 5 = 25)

Answer **all** questions.

11. (a) Write short note on Lamarckism.

Or

- (b) What is Neo Darwinism?

12. (a) What is the reason for mass extinction?

Or

- (b) Write short note on Vestigial organs.

13. (a) What is sexual selection?

Or

- (b) How the new species is formed?

14. (a) Write short note on founders principle.

Or

- (b) Briefly discuss about Co-evolution.

15. (a) Explain about cultural evolution.

Or

- (b) Briefly discuss about the molecular clock.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Write an essay about theory of natural selection.

17. Give an elaborate account on evidences for evolution.

18. Discuss about sexual isolating mechanism and the formation of new species.
 19. Describe about Geological time scale.
 20. What are the paleontology and developmental biology evidences of evolution?
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A-9804

Sub. Code

4MZO3E2

**M.Sc. DEGREE EXAMINATION, APRIL 2021 &
Supplementary/Improvement/Arrear Examinations**

Third Semester

Zoology

Elective – ANIMAL CELL CULTURE TECHNOLOGY

(CBCS – 2014 onwards)

Time : 3 Hours

Maximum : 75 Marks

Part A

(10 × 2 = 20)

Answer **all** questions.

1. Lysosomes.
2. CO₂ incubator.
3. Phosphate Buffered Saline (PBS).
4. Fetal Bovine Serum (FBS).
5. Cytotoxicity.
6. Apoptotic cells.
7. Pluripotent stem cells.
8. Micromanipulation.
9. Hybridoma technology.
10. Hydrogels.

Part B

(5 × 5 = 25)

Answer **all** questions.

11. (a) Write short note on equipments and materials required for animal cell culture technique?

Or

- (b) Describe the structure of a typical animal cell?

12. (a) Briefly discuss on the physical functions of different constituents of culture medium?

Or

- (b) Elucidate on the role of serum and supplements in animal cell culture?

13. (a) How will you measure the viability of cultured cells?

Or

- (b) Explain the basic techniques used in mammalian cell culture *in vitro*?

14. (a) Write short note on the applications of animal cell culture?

Or

- (b) What are the advantages of cell culture based vaccines?

15. (a) Describe the process of mass cell cultivation?

Or

- (b) Differentiate 2D and 3D cell culture?

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Give a detailed account of primary and established cell line cultures?
 17. Describe the chemical and metabolic functions of different constituents of culture medium?
 18. Write an essay on biology and characterization of cultured cells?
 19. Explain the process of cell transformation and general characteristics of transformed cells?
 20. Describe the characteristics of genetically engineered cells and add a note on mass cell cultivation?
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A-9805

Sub. Code

4MZO3E4

**M.Sc. DEGREE EXAMINATION, APRIL 2021 &
Supplementary/Improvement/Arrear Examinations**

Third Semester

Zoology

Elective – TRANSGENIC TECHNOLOGY

(CBCS – 2014 onwards)

Time : 3 Hours

Maximum : 75 Marks

Part A

(10 × 2 = 20)

Answer **all** questions.

1. Transgenic species.
2. Fertility.
3. Embryo transfer.
4. Immunogenetics.
5. HLA.
6. DNA cloning.
7. Fertilization.
8. Super ovulate.

9. Cell.
10. Cell technology.

Part B

(5 × 5 = 25)

Answer **all** questions.

11. (a) Write note on artificial insemination, fertility and sterility.

Or

- (b) Explain about Reproductive physiology.

12. (a) What are the principles of embryo transfer.

Or

- (b) Describe about Chemical nature of RNA.

13. (a) Write a short note on system and strategies for improvement of livestock of poultry

Or

- (b) Describe about Breeds of livestock for rabbits.

14. (a) Describe the embryos are cultured in *vitro* for a time, then implanted into surrogate mothers.

Or

- (b) Explain about Invitro gene transfer.

15. (a) Describe cell technology importance.

Or

- (b) What are applications of cell technology?

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Explain about reproductive physiology, semen characteristics and preservation.
 17. Give detailed account on recombinant technology.
 18. Describe systems and strategies for improvement of livestock.
 19. Explain about the DNA Cloning.
 20. Describe about merits and demerits of cell technology.
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A-9806

Sub. Code

4MZO4C1

**M.Sc. DEGREE EXAMINATION, APRIL 2021 &
Supplementary/Improvement/Arrear Examinations**

Fourth Semester

Zoology

ANIMAL BIOTECHNOLOGY

(CBCS – 2014 onwards)

Time : 3 Hours

Maximum : 75 Marks

Part A

(10 × 2 = 20)

Answer **all** questions.

1. Animal cell structure.
2. Concepts of genetic engineering.
3. Classification of plasmid.
4. Expression vector.
5. DNA fingerprinting.
6. Variance of PCR.
7. Difference between primary culture and subculture.
8. Insulin.
9. Embryo transfer.
10. Gene pharming.

Part B

(5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Explain the macro molecules in cell.

Or

- (b) Principles of recombinant DNA technology.

12. (a) Briefly explain about the classification of plasmids.

Or

- (b) Describe the isolation and purification of DNA.

13. (a) Define construction and screening of genomic and cDNA library.

Or

- (b) Write short note on molecular markers.

14. (a) Explain about stem cell culture.

Or

- (b) What are the cell types used for animal cell culture?

15. (a) Explain about super ovulation?

Or

- (b) Explain about the methods of embryo transfer.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Briefly explain about transgenic animal.

17. Write note on classification of plasmids.

18. Explain about the nucleic acid hybridization.

19. Write notes on monolayer and suspensions.
 20. Explain about the applications of transgenic animal technology.
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A-9807

Sub. Code

4MZO4E1

**M.Sc. DEGREE EXAMINATION, APRIL 2021 &
Supplementary/Improvement/Arrear Examinations
Fourth Semester
Zoology
Elective: FISHERY BIOLOGY AND AQUACULTURE**

(CBCS – 2014 onwards)

Time : 3 Hours

Maximum : 75 Marks

Part A

(10 × 2 = 20)

Answer **all** questions.

1. Spawning
2. Migration
3. *Ex situ* conservation
4. Post harvesting
5. MPEDA
6. Brood stock
7. CIBA
8. Extensive culture
9. Raceway
10. Cage culture

Part B

(5 × 5 = 25)

Answer **all** the questions, choosing either (a) or (b).

11. (a) Write the name of five marine water fishes and their economic importance.

Or

- (b) Write an account on byproducts from fishes.

12. (a) Write an account on *Ex situ* conservation in fishery biology.

Or

- (b) Write short note management of fisheries operation.

13. (a) Write an account on pond culture.

Or

- (b) Write an account on construction of earthen ponds.

14. (a) Describe in detail about larval production.

Or

- (b) Write short note on live feed production.

15. (a) Give an account on water quality in aquatic farming.

Or

- (b) Discuss in detail about open culture system.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Explain in detail about economically important freshwater fishes.
17. Write an essay on physical and biochemical methods to analysis freshness of fish.

18. Write as essay on brood stock management.
 19. Briefly discuss about diseases management in cultivable species of marine water fish
 20. Briefly discuss about integrated fish farming and their disease management
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