R–3009

Sub. Code
509201/ 502502

M.Sc. DEGREE EXAMINATION, APRIL 2019

Second Semester

Zoology/Bioinformatics

IMMUNOLOGY AND IMMUNOTECHNOLOGY

(CBCS – 2016 onwards)

(Common for M.Sc. Zoology/Bioinformatics)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Define / Explain **all** of the following questions.

1. Innate immunity
2. External defense system
3. Langerhans cells
4. Antigenic determinants
5. T-cytotoxic cells
6. Immunoprophylaxis
7. Vaccines
8. Antimicrobial peptide
9. MHC
10. Radioimmuno assay.

Part B (5 × 5 = 25)

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

11. (a) Comment on the functions and structure of lymph node with a neatly labeled diagram.

Or

(b) Explain the salient features of primary and secondary immune responses.

12. (a) What is hypervariable site? Give its significance.

Or

(b) Distinguish between T_H1 and T_H2 functions.

13. (a) How does influenza virus and HIV-1 escape from the host immune systems?

Or

(b) Give a chart for the childhood immunization recommended by WHO.

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

Or

(b) Explain the role of MHC in NK cell response.

15. (a) What is immunoelectrophoresis? Explain the principle and applications of immunoelectrophoresis.

Or

(b) What is immunohistochemistry? Describe briefly methods of Tunnel assay and its importance.

Part C (3 × 10 = 30)

Answer any **three** questions.

All questions carry equal marks.

16. Define primary lymphoid tissue. Describe histology and physiology of thymus gland.

17. How does complement system undergo activation through alternative pathway?

18. Describe the structure and functions of TCR.

19. What is MHC? Give a brief account on organization and activity of class I and II MHC molecules in humans.

20. Write notes on :

    (a) Ring test for simple immunoprecipitation

    (b) Radial immunodiffusion.

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R–3010

Sub. Code
509202

M.Sc. DEGREE EXAMINATION, APRIL 2019

Second Semester

Zoology

GENETICS

(CBCS – 2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

All questions carry equal marks.

1. Define dominance.
2. Test cross.
3. Define homologous chromosomes.
4. What are chromosomal disorders? Give examples.
5. Introns.
6. What is meant by splicing?
7. Define parallelism.
8. What are vestigial organs?
9. What is meant by neutral evolution?
10. Define gene flow.

Part B (5 × 5 = 25)

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

11. (a) Give the schematic representation of gene inheritance with respect to law of dominance.

Or

(b) Write the significances of twin study.

12. (a) Briefly explain about (i) aneuploidy (ii) polyploidy.

Or

(b) Write short notes on Down syndrome.

13. (a) Comment on the properties of genetic code.

Or

(b) Explain catabolic repression.

14. (a) Write short notes on gene expression with suitable examples.

Or

(b) Write briefly about genetic regulations of development and differentiation.

15. (a) Briefly explain about biological clock.

Or

(b) Comment on the principles involved in the nucleotide sequence analysis.

Part C (3 × 10 = 30)

Answer any **three** questions.

All questions carry equal marks.

16. Give an account on the sex determination in humans.

17. Write a detailed note on gene mapping techniques.

18. Explain about mutation and briefly comment about the mutagens and their types.

19. Write an account of sequential expression of genes with reference to drosophila.

20. State Hardy-Weinberg law and explain about the factors that affects its equilibrium.

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R–3011

Sub. Code
509203

M.Sc. DEGREE EXAMINATION, APRIL 2019

Second Semester

Zoology

ECOLOGY

(CBCS – 2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Section A (10 × 2 = 20)

Answer **all** the questions.

All questions carry equal marks.

1. Habitat and Niche
2. Pyramid of Energy
3. Foodweb
4. Pollution
5. Mutualism
6. Aquatic ecosystem
7. Biosphere Reserves
8. Nitrification
9. Estuaries
10. Conservation Biology

Section B (5 × 5 = 25)

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

All questions carry equal marks.

11. (a) Write a short note on ecological pyramids and their significance.

Or

(b) Briefly describe about the properties and application of ecological network.

12. (a) Write note on mineral cycling.

Or

(b) Describe the nutrient cycle.

13. (a) Discuses population growth curves.

Or

(b) Write about species interactions with types?

14. (a) Given short note on mangrove ecosystem.

Or

(b) Give account on conservation management system model with suitable example.

15. (a) Explain the types of environmental pollution.

Or

(b) What is Bioremidiation? How microbes are helps in bioremidiation.

Section C (3 × 10 = 30)

Answer any **three** questions.

All questions carry equal marks.

16. Write an essay on structure and function of some of the ecosystems.

17. Describe about the community structure of ecosystem.

18. Explain Bio-geochemical cycle and their importance.

19. What are the types species interaction and their significance.

20. Write essay on biotechnology applications in environmental studies.

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R–3012

Sub. Code
509204

M.Sc. DEGREE EXAMINATION, APRIL 2019

Second Semester

Zoology

EVOLUTION

(CBCS – 2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Molecular clock
2. Gene duplication
3. Unicellular organisms
4. Branch of tree of life
5. Genetic variation
6. Industrial Melanism
7. Adaptive radiation
8. Co Speciation
9. Carbon dating
10. Paleontological evidence

Part B (5 × 5 = 25)

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

11. (a) Write short note on the concept of Natural selection.

Or

(b) Briefly describe about the molecular tools used in phylogeny.

12. (a) What are the difference between prokaryotic and Eukarotic cells.

Or

(b) Write short note on phylogeny.

13. (a) Write short note on the biology of population.

Or

(b) Write short note on genetic variation in population.

14. (a) Discuss about the characters of species.

Or

(b) How new species are formed due to geographical isoloation.

15. (a) Write short note on cultural evolution.

Or

(b) Briefly discuss about the types of fossils.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Describe about the molecular tools used in phylogeny, classification and identification.

17. Discuss about how the plants, fungai and animals are placed in phylogenic trees.

18. Explain about the involvement of natural selection in the formation of new species.

19. Write note on how the new species are formed through geographical and reproductive isolation.

20. Write an essay about the origin of humans.

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R–3013

Sub. Code
509503

M.Sc. DEGREE EXAMINATION, APRIL 2019

Second Semester

Zoology

WILD LIFE CONSERVATION AND MANAGEMENT

(CBCS – 2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define biodiversity.
2. *Ex-Situ* conservation.
3. Define mortality.
4. Puberty.
5. Endangered species.
6. Poaching.
7. Consumptive use.
8. National parks.
9. Define genetic.
10. Predators.

Part B (5 × 5 = 25)

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

11. (a) Explain the Bio-geographical classification of India.

Or

(b) Discuss the value of biodiversity.

12. (a) Describe the threats to biodiversity.

Or

(b) *In-situ* conservation of biodiversity.

13. (a) Explain the ecology of Wild life sanctuaries.

Or

(b) Status of forest in India.

14. (a) Rules and regulation of zoo authority of India.

Or

(b) Discuss the wild life protection act.

15. (a) Distribution of important Indian animals.

Or

(b) Write the nesting losses caused by predators.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Discuss on levels biodiversity in India.

17. Discuss on threats of biodiversity.

18. Explain the biological and ecological basis of wild life management.

19. Explain the Conservation of wild animals.

20. Explain population manipulation – habit analysis, resources and its management.

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R–3496

Sub. Code
509101

M.Sc. DEGREE EXAMINATION, APRIL 2019

First Semester

Zoology

ANIMAL DIVERSITY

(CBCS - 2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define Molecular taxonomy.

2. Brief account on animal architecture.

3. Short note on flagella.

4. Define clitellam.

5. Short note on Nematophora.

6. Define Nephridia.

7. Short note on myocomma.

8. Define neoteny.

9. What are remiges?

10. Comments on Parasitism

Part B (5 × 5 = 25)

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

11. (a) Give an account of Binomial nomenclature.

Or

(b) Describe about the principles of taxonomy.

12. (a) Brief account on the characteristic feature of Coelenterata.

Or

(b) Discuss the morphology of filarial worm.

13. (a) Describe the salient features of phylum Mollusca.

Or

(b) Illustrate the harmful impacts of invetebrates.

14. (a) Explain the habit and habitat of Balanoglosus.

Or

(b) Discuss the general characters of Pisces.

15. (a) Describe the adaptations of reptails.

Or

(b) Discuss about the origin and evolution of mammals.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Explain the tools involving in Molecular taxonomy

17. Essay about salient features of Phylum Annalida.

18. Explain in detail about parasitic behavior of invertebrates.

19. Detail account on adaptations of fishes.

20. Write an essay about adaptations of amphibians.

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R–3497

Sub. Code
509102

M.Sc. DEGREE EXAMINATION, APRIL 2019

First Semester

Zoology

BIOCHEMISTRY

(CBCS - 2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Section A (10 × 2 = 20)

Answer **all** questions.

ALL questions carry equal marks.

1. Classify amino acids based on their physico-chemical properties.

2. What is urea cycle?

3. What are monosaccharides? What is its molecular structure?

4. What is TCA cycle?

5. Draw the structure of sphingomyelins.

6. Write down the chemistry of nitrogen bases.

7. What kind of proteins serve as enzymes? Give reason.

8. Draw the chemical structure of vitamin B12.

9. Name the hormones involved in growth and development.

10. What are G-protein coupled receptors?

Section B (5 × 5 = 25)

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

11. (a) Explain the structure and functions of myoglobins.

Or

(b) Write a note on Ramachandran plot.

12. (a) Draw the structure of alpha and beta anomers of glucose.

Or

(b) Explain the mechanism of glycogenolysis.

13. (a) List out any five examples of unsaturated fatty acids with their chemical formula.

Or

(b) Differentiate between nucleoside and nucleotide.

14. (a) Explain the lock and key hypothesis of function of enzymes.

Or

(b) Describe briefly the structure and functions of ascorbic acid.

15. (a) Explain the role of iodine in the function of hormones of thyroid.

Or

(b) Explain the role of receptors in hormone signal transduction.

Section C (3 × 10 = 30)

Answer any **three** questions.

ALL questions carry equal marks.

16. What are essential and non-essential amino acids? Explain the biosynthesis of glutamate and aspartate amino acids.

17. Write an essay on eukaryotic electron transport system in biosynthesis of energy.

18. Discuss in detail the biosynthesis and degradation of purine nucleotides.

19. Classify vitamins with their functions and medical importance.

20. Describe the pancreatic hormones in human with their structure and functions

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R–3498

Sub. Code
509103

M.Sc. DEGREE EXAMINATION, APRIL 2019

First Semester

Zoology

MICROBIOLOGY

(CBCS - 2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

ALL questions carry equal marks.

1. Define asepsis.

2. Two-fold dilution technique.

3. Define fermentation.

4. Peritrichous flagella.

5. Obligate anaerobes.

6. Any two method to prevent viral infections.

7. Aspergillosis.

8. Acute pulmonary histoplasmosis.

9. Benefits of lactic acid bacteria.

10. Botulinum.

Part B (5 × 5 = 25)

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

All questions carry equal marks.

11. (a) Describe the ultra structure of Gram positive bacterial cell wall.

Or

(b) How the bacterial cells are arranged? Explain with suitable examples.

12. (a) Explain the various growth phases of bacteria.

Or

(b) Describe the methods used for culture preservation.

13. (a) Name the causative agent, symptoms and diagnosis of brucellosis.

Or

(b) Give short account on Rinder pest Disease.

14. (a) Describe the animal candidiasis. Explain the treatment methods of acute candidiosis.

Or

(b) Elucidate the clinical importance of ring worm infections in swine.

15. (a) Explain the methods of milk preservation.

Or

(b) How do you determine the spoilage of foods? Explain.

Part C (3 × 10 = 30)

Answer any **three** questions.

ALL questions carry equal marks.

16. Elucidate the structure and taxonomical significance of fungi.

17. Explain the classical and molecular methods used for identification of bacteria.

18. Give a detailed account on salmonellosis and tetanus.

19. Describe in detail about avian associated zoonotic diseases.

20. Give a detailed note on algal toxins.

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R–3499

Sub. Code
509104

M.Sc. DEGREE EXAMINATION, APRIL 2019

First Semester

Zoology

ANIMAL PHYSIOLOGY

(CBCS 2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Blood volume ratio.

2. List out the importance of haemoglobin in blood.

3. Comment on Portal vein.

4. Give the importance of bile.

5. Define action potential.

6. What is synapses?

7. Poikilotherms.

8. Trace the features of aestration.

9. Comment on Goiter.

10. Discuss habituation.

Part B (5 × 5 = 25)

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

11. (a) Give an account on mechanism of Gas exchange in alveolar sacs.

Or

(b) Describe the different group of blood.

12. (a) Give an elaborate note on digestive secretions of human.

Or

(b) Explain the importance of kidney and liver for excretion.

13. (a) Discuss in detail about the structural features of an ear. Add a note on the mechanism of hearing.

Or

(b) Explain the physiology of hypernation with suitable example.

14. (a) Give an account on the types of muscle contractions.

Or

(b) Explain the mechanism of synoptic transmission.

15. (a) Explain in detail about the criteria, origin and effects of circadian rhythm in biological system.

Or

(b) Explain the physiology of nocturnal animals. How it differ from diurnal life.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Give an elaborate note on types of blood corpuscles and their functions.

17. How kidney can regulate the water, acid – base and electrolytes of the blood? Explain.

18. Explain the types of muscles. Add a note on its contraction mechanism.

19. Give an elaborate note on ultra structure of eye and give the mechanism of vision development.

20. Discuss about :

    (a) Glucose homeostasis disorders,

    (b) Thyroid disorders and

    (c) Calcium homeostasis.

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R–3500

Sub. Code
509105

M.Sc DEGREE EXAMINATION, APRIL 2019

First Semester

Zoology

CELL AND MOLECULAR BIOLOGY

(CBCS 2016 onwards)

Time : 3 Hours Maximum : 75 Marks

PART A (10 × 2 = 20)

Answer **all** questions.

1. Define lipid bilayer model of plasma membrane.

2. List out functions of cytoskeleton.

3. Define B-DNA?

4. Role of Topoisomerase in DNA replication.

5. Define the role of structural gene in Lac operon.

6. Short note on post translational modifications.

7. Cell signaling.

8. What is integrins?

9. Define Pluripotent stem cell.

10. Examples of Stem cell therapy.

Part B (5 × 5 = 25)

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

11. (a) Explain the functions of Peroxisomes.

Or

(b) Describe the structure and function of cell membrane.

12. (a) Explain the role of enzymes and accessory proteins involved in DNA replication.

Or

(b) Explain about the mechanisms of eukaryotic replication.

13. (a) Discuss about splicing.

Or

(b) Write a short note on trp operon concept.

14. (a) Explain the role of adhesion molecules.

Or

(b) Write a note on Principle of cell signaling.

15. (a) Explain the applications of stem cell.

Or

(b) Write a note on regulatory issues on stem cell therapy.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Essay about the structure and function of mitochondria.

17. Detail account on DNA repair mechanisms.

18. With a neat diagram, explain the process of transcription in Eukaryotes.

19. Explain in detail about the neurotransmission.

20. Detail account on methods of stem cell culture.

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R–3501

Sub. Code
509501

M.Sc. DEGREE EXAMINATION, APRIL 2019

First Semester

Zoology

ANIMAL CELL CULTURE TECHNOLOGY

(CBCS 2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Cell membrane.

2. Give their contributions in cell culture technique
   (a) Syndey Ringer,
   (b) R.G. Harrison

3. Comment the composition of serum.

4. Natural media.

5. Limitations of primary cell cultures.

6. MIT assay.

7. Chromosome reshuffling.

8. Regenerative medicine.

9. Define necrosis.

10. Toxicity testing.

Part B (5 × 5 = 25)

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

11. (a) Differentiate organotypic and histotypic cultures.

Or

(b) Explain the structural organization of animal cells.

12. (a) What is artificial media? Discuss its importance.

Or

(b) Explain the role of CO_2 in cell cultures.

13. (a) Briefly describe the methods used for cell viability assay.

Or

(b) Demonstrate the process of programmed cell death.

14. (a) How the animal cell culture is scaled-up?

Or

(b) Elaborate the salient features of stem cell culture.

15. (a) Discuss about CEF culturing.

Or

(b) Give an account on secondary cell culture.

Part C (3 × 10 = 30)

Answer any **three** of the following.

All questions carry equal marks.

16. Write in detail about "a model cell culture laboratory".

17. Describe the criteria used for selection of suitable media for cell culture and organ culture.

18. Elaborate the methods used for maintenance of animal cells and trains.

19. What is tissue engineering? Explain its applications in biomedicine.

20. What is 3D culture? Add a note on its classification.