

R3615

Sub. Code

509301

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2025

Third Semester

Zoology

GENETICS

(CBCS – 2022 onwards)

Time : 3 Hours

Maximum : 75 Marks

Part A

(10 × 1 = 10)

Answer **all** the following objective type questions by choosing the correct option.

1. What is another name for a Barr body? (CO1, K2)
 - (a) Autosomal chromatin
 - (b) X-chromatin
 - (c) Y-chromatin
 - (d) Mitochondrial DNA

2. What is the mechanism of gene regulation in prokaryotes? (CO1, K2)
 - (a) Operon model
 - (b) DNA methylation
 - (c) Histone modification
 - (d) RNA splicing

3. What is a linkage group? (CO2, K4)
 - (a) A group of genes on different chromosome
 - (b) A set of genes located on the same chromosome
 - (c) Genes that are not inherited together
 - (d) A cluster of non-coding DNA regions

4. The occurrence of two or more different forms or variations of a trait (alleles, genes, or phenotypes) within a population is called (CO2, K4)
(a) Mutation (b) Genetic Drift
(c) Polymorphism (d) Natural Selection
5. Which of the following evolutionary traits is unique to hominins?
(a) Grasping hands (b) Bipedalism
(c) Color vision (d) Tail for balance
6. Which of the following processes provides raw material for the evolution of new genes? (CO3, K3)
(a) Gene mutation (b) Gene duplication
(c) Natural selection (d) Genetic drift
7. _____ evolutionary force is primarily responsible for the spread of neutral mutations. (CO4, K2)
(a) Natural selection
(b) Genetic drift
(c) Gene flow
(d) Mutation pressure
8. What does QTL stand for? (CO4, K2)
(a) Quantitative Trait Linkage
(b) Quantitative Trait Loci
(c) Quality Trait Locus
(d) Quantitative Testing Locus
9. Which BLAST program is used to compare a nucleotide sequence with a nucleotide database? (CO5, K4)
(a) BLASTp (b) tBLASTn
(c) BLASTx (d) BLASTn
10. _____ method is commonly used for sequence alignment in phylogenetic analysis? (CO5, K4)
(a) PCR (b) BLAST
(c) CLUSTAL W (d) CRISPR

Part B

(5 × 5 = 25)

Answer **all** questions not more than 500 words each.

11. (a) Explain — pedigree analysis. (CO1, K2)
Or
(b) Discuss in detail about twin study. (CO1, K2)
12. (a) Write short note on molecular markers. (CO2, K4)
Or
(b) Give an account on Gene mapping. (CO2, K4)
13. (a) Give a note on gene duplication. (CO3, K3)
Or
(b) Write shortly about site specific recombination. (CO3, K3)
14. (a) Discuss in brief about evolutionary genetics. (CO4, K2)
Or
(b) Explain — polymorphism. (CO4, K2)
15. (a) Give an account on BLAST. (CO5, K4)
Or
(b) Explain QTL mapping. (CO5, K4)

Part C

(5 × 8 = 40)

Answer **all** questions not more than 1000 words each.

16. (a) Write an essay mendalian traits in humans. (CO1, K2)
Or
(b) Discuss the mendalian principles and contributions. (CO1, K2)

17. (a) Discuss in detail Heterochromatization. (CO2, K4)

Or

(b) Write an essay on numerical abnormalities.
(CO2, K4)

18. (a) Briefly discuss about the somatic mutants.
(CO3, K3)

Or

(b) Write an essay on gene expression techniques.
(CO3, K3)

19. (a) Write an essay on origin of multicellular organisms.
(CO4, K2)

Or

(b) Discuss in detail a out origin of unicellular organisms.
(CO4, K2)

20. (a) Write an essay on protein sequence analysis.
(CO5, K4)

Or

(b) Discuss in detail about nucleotide sequence analysis.
(CO5, K4)

R3616

Sub. Code

509302

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2025

Third Semester

Zoology

EVOLUTION

(CBCS – 2022 onwards)

Time : 3 Hours

Maximum : 75 Marks

Part A

(10 × 1 = 10)

Answer **all** the following objective type questions by choosing the correct option.

1. The theory of Natural selection was proposed by _____ (CO1, K1)
 - (a) Lamark
 - (b) Louis Pasteur
 - (c) Darwin
 - (d) Edward Jenner
2. Law of independent assortment stated that gene for a particular character _____ (CO1, K2)
 - (a) Blend
 - (b) Blend and segregate
 - (c) Do not blend
 - (d) Do not blend and segregate
3. The golden period of fishes 'were during _____ period. (CO2, K2)
 - (a) Mesozoic
 - (b) Cambrian
 - (c) Carboniferous
 - (d) Devonian

4. The Mesozoic era is the golden period of _____ (CO2, K3)
(a) Mammals (b) Reptiles
(c) Birds (d) Fishes
5. The deciphering age of the biomolecules through mutation is called _____ (CO3, K3)
(a) Molecular clock (b) Sequencing
(c) Blotting (d) PCR
6. This tool is used for evolutionary genetic analysis _____ (CO3, K3)
(a) PoPGen (b) MEGA
(c) Curve fit (d) SPSS
7. Collection of all genes in the population is called as _____ (CO4, K2)
(a) Total gene (b) Cumulative gene
(c) Gene pool (d) River gene
8. In the absence of Mutation, immigration and emigration the Hardy-Weinberg the allele frequencies of the population remains _____ (CO4, K3)
(a) Increased (b) Decreased
(c) Constant (d) Zero
9. The self-scarification for others is called as _____ (CO5, K2)
(a) Nepotism (b) Altruism
(c) Selfish (d) Hatred
10. The long distance movement of birds from one place to other is called _____ (CO5, K3)
(a) Movement (b) Migration
(c) Orientation (d) Flying

Part B

(5 × 5 = 25)

Answer **all** questions not more than 500 words each.

11. (a) Briefly discuss about the law of use and disuse. (CO1, K4)
Or
(b) Write short note on Darwin's finches. (CO1, K3)
12. (a) Briefly discuss about the carbon dating. (CO2, K3)
Or
(b) Write a brief account on Neanderthal men. (CO2, K4)
13. (a) Briefly discuss about nucleotide sequence analysis. (CO3, K4)
Or
(b) Write short account on phylogenetic trees. (CO3, K3)
14. (a) Explain the principle of Hardy-Weinberg Law. (CO4, K3)
Or
(b) Appraise the significance of adaptive radiation. (CO4, K5)
15. (a) Compare the difference between proximate and ultimate causation of behaviour. (CO5, K3)
Or
(b) Explain briefly about social communication. (CO5, K2)

Part C

(5 × 8 = 40)

Answer **all** questions not more than 1000 words each.

16. (a) Explain in detail about Darwinism and Neo Darwinism. (CO1, K3)
Or
(b) Discuss about the origin of cells and molecular evolution. (CO1, K6)

17. (a) Write a detail account on evolutionary time scale.
(CO2, K3)

Or

- (b) Evaluate the important stages of human evolution.
(CO2, K6)

18. (a) Appraise the uses of molecular tools used in phylogeny.
(CO3, K6)

Or

- (b) Evaluate the protein and nucleotide sequence analysis.
(CO3, K6)

19. (a) Explain about the changes in gene frequencies happened during bottle neck effect or genetic drift.
(CO4, K6)

Or

- (b) Discuss in detail about the species concept and speciation.
(CO4, K3)

20. (a) Explain about Kin selection, Group selection and reciprocal altruism.
(CO5, K6)

Or

- (b) Discuss about the habitat selection and optimal foraging theory.
(CO5, K4)

R3617

Sub. Code

509303

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2025

Third Semester

Zoology

ECOLOGY AND CONSERVATION BIOLOGY

(CBCS – 2022 onwards)

Time : 3 Hours

Maximum : 75 Marks

Part A

(10 × 1 = 10)

Answer **all** the following objective type questions by choosing the correct option.

1. Which of the following statements define Environmental Engineering? (CO1, K2)
 - (a) Creation of procedures and infrastructure for water delivery
 - (b) Waste disposal
 - (c) Pollution control of various kinds
 - (d) All of the mentioned
2. Why carbon dioxide is called a greenhouse gas? (CO1, K1)
 - (a) Because they absorb heat
 - (b) Because they absorb moisture
 - (c) Because they absorb oxygen
 - (d) Because they absorb hydrogen
3. Which of the following is known as a topographic abiotic factor? (CO2, K2)
 - (a) Earth's surface
 - (b) Wind
 - (c) Temperature
 - (d) Humidity

4. What is the temperature at hydrothermal sea vents?
(CO2, K1)
- (a) 50°C (b) 110°C
(c) 25°C (d) 0°C
5. Which one of the following is an abiotic factor? (CO3, K2)
- (a) Animals (b) Plants
(c) Humidity (d) Fungi
6. Name the term which defined the study of the characteristics and parameters of the population.
(CO3, K1)
- (a) Demography
(b) Population ecology
(c) Population density
(d) Mortality
7. Name those organisms who can breed only once in their lifetime?
(CO4, K1)
- (a) Dispersed (b) Clumped
(c) Iteroparous (d) Semelparous
8. A substance, which cause pollution, is know as which of the following?
(CO4, K2)
- (a) Pollutant (b) Carcinogen
(c) Polluting element (d) Irritant
9. Which of the following is not a constituent of DDT?
(CO5, K2)
- (a) Carbon (b) Fluorine
(c) Chlorine (d) Hydrogen

10. An average human being requires nearly 12-15 times more air than the food. (CO5, K1)
- (a) True (b) False

Part B (5 × 5 = 25)

Answer **all** questions not more than 500 words each.

11. (a) Write down the structure and composition of atmosphere. (CO1, K2)

Or

- (b) Write a note on agro-climate zone of India. (CO1, K2)

12. (a) Describe how does the energy flow in eco system. (CO2, K3)

Or

- (b) Write down the classification and distribution of biomes. (CO2, K3)

13. (a) Explain the characteristics of population. (CO3, K5)

Or

- (b) Write about the concept of biological invasions. (CO3, K5)

14. (a) Write down the impact and their treatment strategies of water. (CO4, K5)

Or

- (b) Explain the environmental pollution in Marine Ecosystem. (CO4, K5)

15. (a) Describe the concept of gene pool. (CO5, K5)

Or

- (b) Define biodiversity and their importance. (CO5, K5)

Part C

(5 × 8 = 40)

Answer **all** questions not more than 1000 words each.

16. (a) Write about meteorological parameters. (CO1, K2)

Or

- (b) Discuss about biogeographically provinces of the world and agro-climate zone of India. (CO1, K2)

17. (a) Discuss about food chain and food web. (CO2, K2)

Or

- (b) What is ecosystem and Types of ecosystem in detail? (CO2, K2)

18. (a) What are the key factors that affects population ecology? (CO3, K5)

Or

- (b) What are the structure, attributes and measurements of community ecology? (CO3, K5)

19. (a) What are the control and ill effects of soil and marine pollution? (CO4, K5)

Or

- (b) Write a detailed account on thermal pollution. (CO4, K5)

20. (a) Explain in situ, ex situ and invitro conservation of biodiversity. (CO5, K5)

Or

- (b) Write down the measures of biodiversity in India. (CO5, K5)

R3618

Sub. Code

509304

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2025

Third Semester

Zoology

FISHERY BIOLOGY AND AQUACULTURE

(CBCS – 2022 onwards)

Time : 3 Hours

Maximum : 75 Marks

Part A

(10 × 1 = 10)

Answer **all** the following objective type questions by choosing the correct option.

1. The management and rearing of aquatic animals is called as _____. (CO1, K1)
 - (a) Pisciculture
 - (b) Sericulture
 - (c) Aquaculture
 - (d) Fishery
2. _____ is a modern craft used in capture fisheries. (CO1, K1)
 - (a) Large trawlers
 - (b) Wooden boats
 - (c) Fishing rafts
 - (d) Canoes

3. _____ is an example of post-harvest technology in fisheries. (CO2, K1)
- (a) Fish breeding
 - (b) Freezing or canning
 - (c) Fish meal production
 - (d) Fish farming
4. In situ conservation refers to the conservation of species (CO1, K1)
- (a) In their natural habitats
 - (b) Outside their natural habitats
 - (c) Through genetic modification
 - (d) By creating artificial environments for breeding
5. _____ culture system is characterized by the cultivation of aquatic organisms in controlled environments such as tanks or ponds? (CO4, K2)
- (a) Extensive culture system
 - (b) Intensive culture system
 - (c) Semi-intensive culture system
 - (d) Open water system
6. _____ is the most commonly used structure for aquaculture in freshwater systems. (CO4, K2)
- (a) Cages
 - (b) Raceways
 - (c) Tanks
 - (d) Ponds

7. What is the primary goal of induced breeding in shrimp and prawn hatcheries? (CO4, K2)
- (a) To select species with the highest growth rates
 - (b) To artificially induce reproduction to enhance breeding efficiency
 - (c) To control the water temperature for larvae
 - (d) To reduce the need for feed in the hatchery
8. What is the primary function of live feed production in hatcheries? (CO4, K2)
- (a) To supplement water quality
 - (b) To provide essential nutrients
 - (c) To enhance water filtration
 - (d) To control diseases in the hatchery
9. Which of the following species is commonly cultured in a monoculture? (CO4, K2)
- (a) Milkfish
 - (b) Sea bass
 - (c) Tilapia
 - (d) Grouper
10. Which of the following is a key factor in the effective management of diseases in shrimp and prawn hatcheries? (CO5, K3)
- (a) Use of high-density systems
 - (b) Regular monitoring and early detection of pathogens
 - (c) Frequent water changes
 - (d) Use of antibiotic treatments

Part B

(5 × 5 = 25)

Answer **all** questions not more than 500 words each.

11. (a) Discuss the economically important freshwater fishes. (CO1, K3)

Or

- (b) What is a mariculture and Name economically important marine fish? (CO1, K2)

12. (a) Discuss the post-harvest techniques used in fish processing. (CO2, K2)

Or

- (b) Discuss the advantages of using pen structures in aquaculture. (CO2, K2)

13. (a) Explain the role of hatcheries in aquaculture and its design. (CO3, K2)

Or

- (b) List the major types of organisms commonly cultivated in aquaculture. (CO3, K3)

14. (a) Discuss the significance of SPF brood stocks in shrimp and prawn hatcheries? (CO4, K4)

Or

- (b) What are the key components involved in feed management in shrimp and prawn hatcheries? (CO4, K3)

15. (a) Describe the importance of water quality management in shrimp and prawn hatcheries. (CO5, K3)

Or

- (b) Give a short note on disease management in shrimp and prawn hatcheries. (CO5, K3)

Part C (5 × 8 = 40)

Answer **all** questions not more than 1000 words each.

16. (a) Discuss the indigenous and modern crafts and gears used in fishing. (CO1, K3)

Or

- (b) Explain the spawning behavior in fishes. (CO4, K3)

17. (a) Explain the different types of freezing methods used in sea food processing. (CO2, K3)

Or

- (b) Discuss the importance of quality control and quality assurance in fish processing. (CO1, K3)

18. (a) Describe the various culture systems used in aquaculture. (CO3, K4)

Or

- (b) Write an essay about cultivable organisms in aquaculture. (CO3, K3)

19. (a) Discuss the live feed production and why is it critical for the development of larvae. (CO4, K3)

Or

- (b) Explain induce breeding method in aquaculture. (CO4, K3)

20. (a) Describe the different stages involved in shrimp and prawn hatchery production. (CO5, K5)

Or

- (b) Discuss the role of water quality and disease management in ensuring successful production in finfish hatcheries. (CO5, K3)
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R3619

Sub. Code

509507

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2025

Third Semester

Zoology

Elective – ENTOMOLOGY

(CBCS – 2022 onwards)

Time : 3 Hours

Maximum : 75 Marks

Part A

(10 × 1 = 10)

Answer **all** the following objective type questions
by choosing the correct option.

1. Which of the following is the smallest order of class Insecta? (CO1, K3)
(a) Odonata (b) Hemiptera
(c) Zerroptera (d) Coleoptera
2. How many pairs of legs do insects have? (CO1, K3)
(a) Two (b) Three
(c) Four (d) Two are three
3. Malpighian tubules present in the _____.
(CO2, K2)
(a) Junaction of midgut and hindgut
(b) Junaction of foregut and midgut
(c) Esophagus
(d) At the tip of telson

4. Insects respire through (CO2, K2)
(a) Tracheal tubes (b) Antennae
(c) Legs (d) Anus
5. _____ is the red flour beetle. (CO3, K2)
(a) *Tribolium castaneum*
(b) *Lasioderma serricorne*
(c) *Plutella xylostella*
(d) *Heliothis armigera*
6. *Spodoptera litura* is also called as (CO3, K2)
(a) Army worm (b) Beetle
(c) Bug (d) Bee
7. IPM stands for (CO4, K2)
(a) International Pest Management
(b) International Pesticide Management
(c) Integrated Pest Management
(d) International Product Management
8. Biological control of insect pests is _____. (CO4, K2)
(a) Highly toxic (b) Self perpetuating
(c) Highly expensive (d) Highly tolerant
9. Muga silk is produced by? (CO5, K3)
(a) *Anthreaea mylitta* (b) *Anthreaea pernyl*
(c) *Anthreaea roylei* (d) *Anthreaea assamensis*
10. In honey bees the pollen basket is present on _____ leg. (CO5, K3)
(a) *Prothoracic* (b) *Mesothoracic*
(c) *Metathoracic* (d) All

Part B

(5 × 5 = 25)

Answer **all** questions not more than 500 words each.

11. (a) What is Exopterygota and explain with suitable examples? (CO1, K3)

Or

- (b) Give an account on Lepidoptera with special reference to economic importance. (CO1, K3)

12. (a) What is Malpighian tubules? Explain the role of it. (CO2, K2)

Or

- (b) What is the role of neurosecretory cells in insects? (CO2, K2)

13. (a) Write short note on *Nilaparvatha lugens* and its life cycle (CO3, K2)

Or

- (b) Give detailed account on *Callosobruchus maculatus*. (CO3, K2)

14. (a) Explain about microbial biopesticides. (CO4, K2)

Or

- (b) What are the chemical pesticides used to control in agriculture pest management and their mode of action? (CO4, K2)

15. (a) Write short on *Antheraea mylitta*. (CO5, K3)

Or

- (b) Give an account on *Musca domestica* and their medical importance. (CO5, K3)

Part C

(5 × 8 = 40)

Answer **all** the questions not more than 1000 words each.

16. (a) Write an essay on insect classification with suitable examples. (CO1, K3)

Or

- (b) Write an essay on modern systematic techniques in insects. (CO1, K3)

17. (a) Enumerate the structure and function of insect digestive system. (CO2, K2)

Or

- (b) What are the hormones secreted in insects and describe their role in growth. (CO2, K2)

18. (a) Describe the life cycle of *Melanaspis glomerata* and their control measures in sugarcane. (CO3, K2)

Or

- (b) Describe the life cycle of *Helicoverpa armigera* and their control measures in cultivable crops. (CO3, K2)

19. (a) Discuss in detail about *Trichogramma chilonis* and its important in IPM. (CO4, K2)

Or

- (b) Write an essay on Insect Pest Management. (CO4, K2)

20. (a) Describe disease caused by *Pediculus humanus* and its medical importance. (CO5, K3)

Or

- (b) Explain - *Anopheles stephensi* and how it act as vector for dreadful diseases. (CO5, K3)