(6 pages)

Reg. No. : .....

Code No. : 7449 **Sub. Code : ZZOM 23**

M.Sc. (CBCS) DEGREE EXAMINATION, NOVEMBER 2023.

Second Semester

Zoology – Core

GENETICS

(For those who joined in July 2021-2022)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Genotypic ratio of a monohybrid cross between two heterozygous individuals is
   (a) 1:1
   (b) 3:1
   (c) 1:2:1
   (d) 2:1:1

2. What is the gene that suppresses called in epistasis?
   (a) Dominant gene (b) Recessive gene
   (c) Epistatic gene (d) Hypostatic gene

3. Recombination denotes
   (a) The process by which DNA is copied before cell division
   (b) The process by which DNA is repaired after damage
   (c) The process by which genetic material is exchanged between homologous chromosomes
   (d) The process by which DNA is transcribed into RNA

4. Hemophilia B is caused by a deficiency in
   (a) clotting factor IX (b) clotting factor X
   (c) clotting factor XI (d) clotting factor XII

5. What is the characteristic of euchromatin?
   (a) It is tightly packed
   (b) It is less condensed
   (c) It is only found in bacteria
   (d) It does not contain active genes

6. Klinefelter's Syndrome is
   (a) A disorder characterized by the presence of an additional X chromosome in males
   (b) A disorder characterized by the presence of an additional Y chromosome in males
   (c) A disorder characterized by the absence of a Y chromosome in males
   (d) A disorder characterized by the absence of an X chromosome in males

7. The total number of alleles present in a population
   (a) Gene pool (b) Genetic drift
   (c) Genotype (d) Genetic equilibrium

8. What is the formula for calculating the frequency of the dominant allele in a population, according to the Hardy-Weinberg law?
   (a) $p = 1 - q$ (b) $q = 1 - p$
   (c) $p^2 + 2pq + q^2 = 1$ (d) None of the above

9. How do chemical mutagens cause mutations?
   (a) By directly breaking DNA strands
   (b) By interfering with DNA replication
   (c) By altering the base pairing of DNA
   (d) By creating free radicals that damage DNA

10. What is the cause of phenylalanine?
    (a) An excess of an enzyme called tyrosine hydroxylase
    (b) An excess of an enzyme called phenylalanine hydroxylase
    (c) A deficiency in an enzyme called tyrosine hydroxylase
    (d) A deficiency in an enzyme called phenylalanine hydroxylase

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).
Each answer should not exceed 250 words.

11. (a) Quote mentals law of dominance.

    Or

    (b) Define Epistasis.

12. (a) Define autosomal linkage.

    Or

    (b) Quote X-linked inheritance.

13. (a) Explain about Euchromatin and Heterochromatin.

    Or

    (b) Write about Amniocentesis.

14. (a) Appraise genotype frequency.

Or

(b) Conclude Genetic drift.

15. (a) Evaluate about types of Mutagens.

Or

(b) Point mutation – Justify.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b)
Each answer should not exceed 600 words.

16. (a) Describe monohybrid cross with example.

Or

(b) Define cytoplasmic inheritance example with kappa particles of paramecium.

17. (a) Discuss about gene mapping in prokaryotes.

Or

(b) Explain tetrad analysis in neurospora.

18. (a) A Illustrate about Polytene and lampbrush chromosomes.

Or

(b) Explain about Pedigree analysis.

19. (a) Illustrate about kinds of selection.

Or

(b) Estimate the Hardy Weinberg law.

20. (a) Summarize mutagenesis on genetic factors.

Or

(b) Evaluate the inborn errors of metabolism that cause phenylketonuria.

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