

**B.Sc.ZOOLOGY
SEMESTER-IV**

**N.G.M. COLLEGE (AUTONOMOUS) : POLLACHI
END-OF-SEMESTER EXAMINATIONS : MAY 2024**

**MAXIMUM MARKS: 50
TIME: 3 HOURS**

PART - III

22UZY405-GENETICS

SECTION – A

(10 X 1 = 10 MARKS)

ANSWER THE FOLLOWING QUESTIONS

1. The coat color in rabbits is determined by multiple alleles. How many alleles are typically involved in the rabbit coat color gene?
a) 1
b) 2
c) 3
d) 4
2. In a three-point cross involving three linked genes in *Drosophila*, how many recombinant classes are expected?
a) 1
b) 3
c) 6
d) 8
3. What is the term for the presence of hair on the outer ear of a human?
a) Hairy Helix
b) Hairy Pinna
c) Furry Lobe
d) Hirsute Auricle
4. In a pedigree, what symbol is used to represent a male individual?
a) Circle
b) Square
c) Diamond
d) Triangle
5. Which of the following is the primary genetic material in living organisms?
a) Proteins
b) Carbohydrates
c) Lipids
d) DNA

ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES

6. Polygenic inheritance
7. Gynandromorph
8. Euploidy
9. Eugenics
10. Bacterial conjugation

SECTION – B

(5 X 3 = 15 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.

11. a) Explain Mendel's Law of Independent Assortment and its role in dihybrid crosses.
(OR)
b) Discuss the interaction of genes in the context of lethal genes and epistasis
12. a) How is a three-point cross used to create a chromosome map in *Drosophila*?
(OR)
b) Describe the characteristics of Free Martin Cattle and their reproductive challenges.
13. a) What is sex-linked inheritance, and how does it differ from autosomal inheritance?
(OR)
b) Outline the types of twins and their genetic basis.

(CONT.....2)

14. a) Describe Down's syndrome as examples of anomalies resulting from non-disjunction of autosomes.
(OR)
b) Describe Alkaptonuria and its manifestation as an inborn error of metabolism.
15. a) Describe the process of bacterial transformation
(OR)
b) Explain the structure and function of TMV in the context of RNA as genetic material.

SECTION – C**(5 X 5 = 25 MARKS)****ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.**

16. a) Describe a monohybrid cross and provide an example using a specific trait.
(OR)
b) Explain the concept of multiple alleles using the example of ABO blood groups in humans
17. a) Differentiate between complete and incomplete linkage, providing examples for each.
(OR)
b) Provide examples of homogametic and heterogametic sex determination
18. a) Discuss the inheritance patterns of hemophilia and color blindness
(OR)
b) Define inbreeding and outbreeding in the context of population genetics.
19. a) Explain the genetic and phenotypic characteristics of individuals with Klinefelter's syndrome
(OR)
b) Discuss the genetic basis and consequences of Phenylketonuria (PKU).
20. a) Explain the significance of DNA as genetic material in the context of heredity.
(OR)
b) What are the applications of genetic counseling in addressing familial genetic risks and disorders?
