22ZOU309N

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 2025
(Third Semester)

Branch - **ZOOLOGY**

GENETICS

Time: Three Hours Maximum: 75 Marks

SECTION-A (10 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	Who introduced the term "Genetics" to describe the study of heredity? a) Gregor Johann Mendel b) William Bateson c) Hugo de Vries d) Charles Darwin	K1	CO1
	2	A cross between red and white flowers of *Mirabilis jalapa* gives pink flowers in F_1. This demonstrates: a) Co-dominance b) Incomplete dominance c) Multiple alleles d) Epistasis	K2	CO2
2	3	Two non-allelic dominant genes acting together to produce a phenotype that neither produces alone are called: a) Supplementary genes b) Complementary genes c) Epistatic genes d) Lethal genes	K1	CO2
	4	In coat colour of mice, the presence of a dominant allele "C" is necessary for pigment formation, while "cc" prevents colour expression of other genes. This is an example of: a) Duplicate genes b) Supplementary genes c) Recessive epistasis d) Lethal gene	K2	CO2
3	5	Who first proposed the concept of linkage in *Drosophila*? a) Gregor Mendel b) T.H. Morgan c) W. Bateson d) Sutton & Boveri	K1	CO2
	6	Haemophilia is more common in males because: a) The disorder is autosomal recessive b) Males have only one X chromosome, so recessive allele expresses c) Y chromosome carries the defective gene d) Females inherit protective hormones	K2	CO3
4	7	Numerical or structural changes in chromosomes leading to genetic disorders are called: a) Gene mutations b) Chromosomal aberrations c) Polygenic traits d) Epigenetic modifications	K1	CO4
	8	Which of the following statements about Klinefelter's syndrome is correct? a) Individuals are phenotypically male with one extra X chromosome b) Individuals are phenotypically female with monosomy X c) Caused by trisomy 21 d) Associated with absence of Barr body	K2	CO4
5	9	Who first described the concept of inborn errors of metabolism? a) Archibald Garrod b) Gregor Mendel c) William Bateson d) Thomas Hunt Morgan	K1	CO4
	10	The phenomenon in which hybrid offspring show superior vigour compared to their parents is called: a) Inbreeding depression b) Heterosis c) Genetic drift d) Epistasis	K2	CO5

Cont...

SECTION - B (35 Marks)

Answer **ALL** questions
ALL questions carry **EQUAL** Marks (5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Explain the scope and significance of Genetics in modern biology.	K2	CO1
		(OR)		
	11.b.	Describe Mendel's Law of Dominance with a suitable example.		
2	12.a.	Describe the inheritance of complementary gene with an example.	K2	CO3
		(OR)		
	12.b.	Explain the inheritance of Rh factor in man.		
3	13.a.	Explain the concept of linkage and discuss the factors affecting linkage strength.	K2	CO2
		(OR)		
	13.b.	Describe the genetic mechanism of sex determination in humans		
4	14.a.	Classify chromosomal aberrations with one example for each.	K2	CO4
		(OR)		
	14.b.	Describe the clinical features and karyotype of Turner's syndrome.		
5	15.a.	Explain any two inborn errors of metabolism with an example.	K2	CO4
		(OR)		
	15.b.	Describe the genetic cause and symptoms of sickle-cell anaemia.		

SECTION -C (30 Marks)

Answer **ANY THREE** questions
ALL questions carry **EQUAL** Marks (3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Analyze the concept of gene interactions with reference to Incomplete dominance and Co-dominance.	CO2	K4
2	17	Evaluate the importance of polygenic inheritance.	CO5	K5
3	18	Evaluate the importance of extra-chromosomal inheritance in human.	CO4	K5
4	19	Explain how chromosomal aberrations contribute to genetic disorders and evolutionary changes.	CO4	K4/K5
5	20	Explain the Hardy–Weinberg law, derive the equation, and discuss factors disturbing equilibrium with examples.	CO5	K4/K5

Z-Z-Z END