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22BTU207N

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION MAY 2025
(Second Semester)

Branch- **BIOTECHNOLOGY**

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	During his experiments, Mendel called genes by the term _____. a) Factors b) Traits c) Character d) Qualities	K1	CO1
	2	If a colour blind lady marries a normal man, their children will be _____. a) Normal daughters and normal sons b) Normal sons and carrier daughters c) Colour blind sons and carrier daughters d) Colour blind sons and colour blind daughters	K2	
2	3	A chromosome with a very short arm and a very long arm is referred to as _____. a) Metacentric b) Telocentric c) Acrocentric d) Sub-metacentric	K1	CO2
	4	In humans karyotype of 47, XXY leads to ___. a) Klinefelter's syndrome b) Turner's syndrome c) Down's syndrome d) Edward's Syndrome	K2	
3	5	The genes or factors controlling cytoplasmic inheritance are called_____ a) Plasma genes b) Homeotic genes c) Holandric genes d) Multiple alleles	K1	CO3
	6	Which one of the following factor does not affect heterosis? a) Genetic base of parents b) Moe of pollination c) Genetic diversity of parents d) Adaptability of FI	K2	
4	7	Which of the following is a trait of X-linked recessive inheritance? a) Albinism b) Haemophilia c) Huntington's diseases d) Sickle cell anemia	K1	CO4
	8	Hereditary transformation of cleft is through _____ a) Male, sex linked dominant gene b) Male, sex linked recessive recessive gene c) Female, sex linked recessive gene d) Female, sex linked dominant gene	K2	
5	9	p and q of the Hardy Weinberg equation represent _____of a diploid organism. a) Frequency of only allele A b) Frequency of allele p c) Frequency of allele A and a d) Frequency of the only allele a	K1	CO5
	10	The type of natural selection that operates to eliminate intermediate phenotypes in a population is known as _____ a) Directional selection b) Disruptive selection c) Stabilizing selection d) Reverse selection	K2	

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.	Describe the principle of Mendel's law of independent assortment.	K1	CO1
		(OR)		
	11.b.	Recall the characteristics and types of extrachromosomal inheritance.		
2	12.a.	Classify chromosome based on the position of the centromere.	K2	CO2
		(OR)		
	12.b.	Explain the influence of histone modification on gene expression.		
3	13.a.	Outline the applications of aneuploidy in crop improvement.	K3	CO3
		(OR)		
	13.b.	Distinguish between autosyndesis and allosyndesis.		
4	14.a.	Explain X -linked Dominant inheritance with an example of hypophosphatemia.	K4	CO4
		(OR)		
	14.b.	Describe mitochondrial disorder with reference to LHON.		
5	15.a.	Analyze the types and examples of assortative mating.	K4	CO5
		(OR)		
	15.b.	Categorize the causes, types and examples of genetic drift.		

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	Discuss in detail the mechanism of sex determination.	K1	CO1
2	17	Illustrate any two genetic diseases associated with structural changes of chromosome.	K2	CO2
3	18	Explain in detail the cytoplasmic male sterility in plants and add a note on its application.	K3	CO3
4	19	Analyze the autosomal dominant and recessive inheritance with suitable example.	K4	CO4
5	20	Discuss the concept of Hardy-Weinberg Law with reference to simple Mendelian inheritance.	K4	CO5

Z-Z-Z END