25BTU207

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION MAY 2026
(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	The genotypic ratio of a monohybrid cross is _____. (i) 1:2:1 (ii)3:1 (iii) 2:1:1 (iv)9:3:3:1	K1	CO1
	2	Which scientist first demonstrated sex-linked inheritance experimentally? (i) Mendel (ii) Morgan (iii) Watson (iv) Crick	K2	CO1
2	3	Which of the following is a common epigenetic modification? (i)DNA replication (ii)DNA methylation (iii)Translation (iv)Translocation	K1	CO2
	4	Which chromosomal aberration leads to a change in gene dosage? (i)Inversion (ii)Translocation (iii)Deletion (iv)Balanced translocation	K2	CO2
3	5	Cytoplasmic inheritance does not follow Mendel's law of____ (i) Dominance (ii)Segregation (iii) Independent assortment (iv)Both (ii) and (iii)	K1	CO3
	6	Which breeding technique helps in fixation of heterosis? (i) Clonal propagation (ii)Mass selection (iii) Self-pollination (iv)Pure line selection	K2	CO3
4	7	Down syndrome is most commonly caused by_____. (i) Monosomy X (ii)Trisomy 21 (iii)Trisomy 18 (iv)Deletion of chromosome 5	K1	CO4
	8	Hemophilia is inherited as a_____. (i) Autosomal dominant trait (ii) Autosomal recessive trait (iii) X-linked recessive trait (iv) Y-linked trait	K2	CO4
5	9	The equation p2 + 2pq+ q2 = 1 represents_____. (i)Genotype frequencies (ii)Allele frequencies (iii) Mutation rate (iv)Migration rate	K1	CO5
	10	Which of the following crops tolerates inbreeding well? (i) Maize (ii) Onion (iii) Alfalfa (iv) Wheat	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.	Relate the incomplete dominance with *Mirablis jalaba*.	K1	CO1
		(OR)		
	11.b.	Define the concept of multiple alleles with suitable example.		
2	12.a.	Explain the structural organization of chromatin in eukaryotic cells with neat diagram.	K2	CO2
		(OR)		
	12.b.	Illustrate the mechanism of DNA methylation.		
3	13.a.	Categorize the role of chloroplast genome in heredity plant cells.	K3	CO3
		(OR)		
	13.b.	Explain the agricultural significance of polyploidy.		
4	14.a.	Explain auto soural recessive disorder with example	K4	CO4
		(OR)		
	14.b.	Explain the treatment strategies for mitochondrial disorders.		
5	15.a.	Explain non-Assortative mating and their genetic consequences.	K4	CO5
		(OR)		
	15.b.	Examine the mechanism and its impact of natural selection.		

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	Explain the sex linked inheritance with suitable examples.	K2	CO2
2	17	Illustrate the structural chromosome aberrations with its genetic significance.	K2	CO2
3	18	Explain the cytoplasmic male sterility and its application.	K4	CO4
4	19	Discuss the general therapeutic approaches for genetic disorders. Explain different treatment strategies with examples.	K6	CO4
5	20	Analyze the Hardy-Weinberg equilibrium and discuss its significance in population genetics.	K4	CO4

Z-Z-Z END