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25ZOP102 / 22ZOP102N

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION DECEMBER 2025
(First Semester)

Branch- **ZOOLOGY**

MOLECULAR 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	DNA is composed of repeating units called a) Amino acids b) Nucleotides c) Fatty acids d) Monosaccharides	K1	CO1
	2	Which form of DNA is most common in living cells? a) A-DNA b) B-DNA c) Z-DNA d) C-DNA	K2	CO1
2	3	The fine structure of gene was first studied by a) Griffith b) Watson & Crick c) Benzer d) Meselson & Stahl	K1	CO2
	4	The smallest functional unit of a gene is _____ a) Recon b) Operon c) Cistron d) Muton	K2	CO2
3	5	The starting codon for protein synthesis is a) UAG b) UAA c) AUG d) UGA	K1	CO3
	6	The removal of introns from pre-mRNA is called a) Splicing b) Replication c) Ligation d) Transcription	K2	CO3
4	7	The structure of tRNA is often described as a) Cloverleaf model b) Double helix c) Hairpin loop d) Beta-sheet	K1	CO4
	8	Enzyme responsible for activation (charging) of amino acids is a) Peptidyl transferase b) Aminoacyl-tRNA synthetase c) DNA ligase d) RNA polymerase	K2	CO4
5	9	Which of the following is a point mutation? a) Inversion b) Deletion of chromosome segment c) Base substitution d) Polyploidy	K1	CO5
	10	A mutation that results in the substitution of one amino acid for another is: a) Missense mutation b) Silent mutation c) Frameshift mutation d) Inversion	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.	Analyze the chemical nature of DNA.	K2	CO1
		(OR)		
	11.b.	Illustrate the mechanism of DNA replication in Prokaryotes.		
2	12.a.	Differentiate between split gene and overlapping gene.	K2	CO2
		(OR)		
	12.b.	What are repetitive DNAs? Mention their types.		
3	13.a.	Identify the role of promoter regions in transcription.	K3	CO3
		(OR)		
	13.b.	Demonstrate RNA splicing in simple steps.		
4	14.a.	Express the initiation of polypeptide synthesis.	K3	CO4
		(OR)		
	14.b.	Differentiate between elongation and termination steps of translation.		
5	15.a.	Define mutation and classify the types of mutations.	K2	CO5
		(OR)		
	15.b.	Record the effect of acridine dyes on DNA.		

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	Expound the semi-conservative mode of DNA replication with Meselson and Stahl's experiment.	K3	CO1
2	17	Highlight DNA repair mechanisms in detail with suitable examples.	K3	CO2
3	18	Explore transcription in eukaryotes and highlighting the role of RNA polymerases.	K3	CO3
4	19	Comment on the lac operon model of gene regulation.	K2	CO4
5	20	Organize the molecular basis of mutations.	K3	CO5

Z-Z-Z END