

**PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)**

**BSc DEGREE EXAMINATION DECEMBER 2024
(Third Semester)**

Branch : BIOTECHNOLOGY

MOLECULAR BIOLOGY

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** marks

(10 × 1 = 10)

Question No.	Question	K Level	CO
1	Which of the following does not take part in gene expression? a) Transcription b) RNA processing c) Replication d) Translation	K1	CO1
2	Which of the following regarding the basic mechanism of gene expression is correct? a) DNA → tRNA → protein b) RNA → cDNA → mRNA → protein c) RNA → DNA → mRNA → protein d) DNA → protein	K2	CO 2
3	Replication fork is the junction between the two -----. a) Un-replicated DNA b) Newly synthesized DNA c) Newly separated DNA strands and newly synthesized DNA strands d) Newly separated DNA strands and the un-replicated DNA	K1	CO 1
4	How many polymerases are present in a replication fork? a) 2 b) 3 c) 4 d) 5	K2	CO 2
5	Which component of the rRNA binds to the mRNA? a) 16S b) 5S c) 28S d) 23S	K1	CO 1
6	How many loops are seen in the tRNA? a) 1 b) 2 c) 3 d) 4	K2	CO 2
7	Eukaryotic mRNA generally codes for a single protein because the eukaryotic translation includes -----. a) A single ORF b) Monocistronic codons c) Polycistronic codons d) Starts at the first triplet codon	K1	CO 1
8	Dicer is -----. a) DNase like enzyme b) RNase like enzyme c) An endonuclease d) An exonuclease	K2	CO 2
9	If the mutation has a negligible effect on the function of a gene, it is known as -----. a) Silent mutation b) Frame shift mutation c) Substitution mutation d) Insertion mutation	K1	CO 1
10	A point mutation that replaces a purine with another purine, or a pyrimidine with another pyrimidine -----. a) Nonsense mutation b) Silent mutation c) Transition mutation d) Transversion	K2	CO 2

Cont...

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

Question No.	Question	K Level	CO
11 a	Highlight the historical events of molecular biology.	K3	CO 3
	(OR)		
11 b	How does DNA serve as genetic material?		
12 a	Explain about the Meselson and Stahl experiment.	K2	CO 2
	(OR)		
12 b	Discuss the role of telomeres and telomerase in DNA replication.		
13 a	Compare and contrast lytic and lysogenic cycles.	K4	CO 4
	(OR)		
13 b	Illustrate the structure and functions of RNA polymerase.		
14 a	Explain Wobble hypothesis with diagram.	K4	CO 4
	(OR)		
14 b	Analyze the regulatory elements in transcription.		
15 a	Distinguish between induced and point mutations.	K3	CO 3
	(OR)		
15 b	Explain the mechanism of DNA damage by UV radiation.		

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

Question No.	Question	K Level	CO
16	Summarize the structure and properties of DNA.	K5	CO 5
17	Analyze the molecular mechanism of DNA replication.	K4	CO 4
18	How does RNA editing take place in eukaryotes?	K3	CO 3
19	Discuss the mechanism of translation in Prokaryotes.	K3	CO 3
20	Infer the models of homologous recombination and explain in detail.	K5	CO 5

Z-Z-Z

END