PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION MAY 2025
(Second Semester)

Branch – **APPLIED MICROBIOLOGY**

PRINCIPLES OF GENETIC ENGINEERING

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	Which enzyme is used to join the ends of DNA fragments after they have been cut by restriction enzymes? a) DNA helicase b) DNA ligase c) RNA polymerase d) Reverse transcriptase	K1	CO1
	2	Which of the following is a characteristic feature of restriction enzymes? a) They randomly cut DNA b) They cut DNA at specific sequences c) They add nucleotides to DNA d) They synthesize RNA.	K2	CO1
2	3	What does the "c" in cDNA stand for? a) Coding b) Complementary c) Circular d) Cytoplasmic	K1	CO2
	4	What is the first step in constructing a cDNA library? a) Amplification of DNA b) Isolation of mRNA c) Ligation of DNA into vectors d) Screening the library	K2	CO2
3	5	Which of the following is used to detect DNA in a sample? a) Southern blotting b) Northern blotting c) Western blotting d) Eastern blotting	K1	CO3
	6	Which of the following blotting techniques is used to detect RNA? a) Southern blotting b) Northern blotting c) Western blotting d) Southwestern blotting	K2	CO3
4	7	What does RT-PCR stand for? a) Real-Time Polymerase Chain Reaction b) Reverse Transcription Polymerase Chain Reaction c) Restriction Transcript Polymerase Chain Reaction d) RNA Transcription Polymerase Chain Reaction	K1	CO4
	8	What is the primary purpose of SAGE? a) To sequence the entire genome b) To measure gene expression levels c) To identify protein interactions d) To analyze DNA mutations	K2	CO4
5	9	What is the primary goal of genome sequencing? a) To identify protein interactions b) To determine the complete DNA sequence of an organism's genome c) To study RNA expression levels d) To analyze protein structures	K1	CO5
	10	Which technology was the first widely used method for sequencing genomes? a) Next-Generation Sequencing (NGS) b) Sanger sequencing c) Mass spectrometry d) Microarray analysis	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.	DNA modifying enzymes - Discuss in briefly.	K2	CO1
		(OR)		
	11.b.	Properties of vectors - Explain.		
2	12.a.	Write about the Blue white screening method.	K3	CO2
		(OR)		
	12.b.	Discuss in details about the Colony PCR.		
3	13.a.	Explain in details about the steps involved in southern blotting.	K3	CO3
		(OR)		
	13.b.	Interepret the RFLP analysis.		
4	14.a.	Explain in details about the overexpression system *E.coli*.	K4	CO4
		(OR)		
	14.b.	Discuss about bioluminescent reporters.		
5	15.a.	Eloborate the Sanger method of DNA sequencing.	K4	CO5
		(OR)		
	15.b.	Explain about the RAPD method.		

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	Describe in details about the types of restriction enzymes.	K4	CO1
2	17	Explain about the construction of cDNA library.	K4	CO2
3	18	Outline the steps involved in western blotting technique.	K4	CO3
4	19	Give an account on DNA microarray Method.	K4	CO4
5	20	Write an essay on PCR and its types.	K4	CO5

Z-Z-Z END