

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION MAY 2026
(Second Semester)

Branch - MICROBIOLOGY

CELL BIOLOGY & MICROBIAL 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 term "Cell" was first coined by: (i) Robert Brown (ii) Antonie van Leeuwenhoek (iii) Robert Hooke (iv) Schleiden	K1	CO1
	2	According to cell theory, the basic structural and functional unit of life is: (i) Tissue (ii) Organ (iii) Cell (iv) Organelle	K2	CO1
2	3	Nitric oxide acts as a signaling molecule by: (i) Binding to membrane receptors only (ii) Directly diffusing across membranes (iii) Acting as a steroid hormone (iv) Activating ribosomes	K1	CO2
	4	Neurotransmitters transmit signals across: (i) Tight junctions (ii) Gap junctions (iii) Synaptic cleft (iv) Nuclear membrane	K2	CO2
3	5	A composite transposon consists of: (i) Only transposase gene (ii) Two insertion sequences flanking a gene (iii) Ribosomal genes (iv) Only antibiotic gene	K1	CO3
	6	Transposons are also called: (i) Plasmids (ii) Jumping genes (iii) Operons (iv) Ribozymes	K2	CO3
4	7	A transition mutation involves: (i) Purine to pyrimidine change (ii) Pyrimidine to purine change (iii) Purine to purine or pyrimidine to pyrimidine change (iv) Deletion of base	K1	CO4
	8	Photo reactivation repair is carried out by: (i) DNA polymerase (ii) Ligase (iii) Photolyase (iv) Helicase	K2	CO4
5	9	During conjugation, the fertility factor (F factor) is transferred through: (i) Capsule (ii) Flagella (iii) Sex pilus (iv) Endospore	K1	CO5
	10	RecA protein is mainly involved in: (i) DNA replication (ii) Protein synthesis (iii) Homologous recombination (iv) Translation	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.	Write short notes on mitochondria and ribosomes.	K2	CO1
		(OR)		
	11.b.	Differentiate between mitosis and meiosis.		
2	12.a.	Describe the mechanisms and steps involved in cell signaling .	K3	CO2
		(OR)		
	12.b.	Write short notes on nitric oxide as a signaling molecule.		
3	13.a.	List on the types of bacterial plasmids and their functions with examples.	K3	CO3
		(OR)		
	13.b.	Delinate on the availabe detection methods of transposition in bacteria		
4	14.a.	Outline the molecular mechanism of transition and transversion mutations.	K4	CO4
		(OR)		
	14.b.	Illustrate on excision repair and its significance in semi conservative mode of replication.		
5	15.a.	Describe the principles and the mechanism of conjugation in bacteria .	K3	CO5
		(OR)		
	15.b.	Explain the role of RecA protein in bacterial recombination process.		

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	With a neat illustration explain the stages of mitosis and meiosis.	K3	CO1
2	17	Explain cell signaling mechanisms with reference to nitric oxide and neurotransmitters.	K4	CO2
3	18	Transposition is the process by which discrete DNA segments (transposons) move within a genome via two main mechanisms - Explain the process with neat illustration?	K6	CO3
4	19	Discuss importance of mutation and repair in evolution and disease.	K4	CO4
5	20	RecA is a critical bacterial protein primarily responsible for homologous recombination - Justify?	K5	CO5

Z-Z-Z

END