

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION MAY 2026
(Third Semester)

Branch – MICROBIOLOGY

MICROBIAL PHYSIOLOGY AND METABOLISM

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 transport mechanism _____ requires carrier proteins, but no energy input. (a) simple diffusion (b) active transport (c) facilitated diffusion (d) group translocation	K1	CO2
	2	_____ are microorganisms use inorganic substances as an electron source. (a) Organotrophs (b) Lithotrophs (c) Heterotrophs (d) Phototrophs	K2	CO1
2	3	In a typical bacterial growth curve, the lag phase is characterized by _____. (a) adaptation of cells to new environment (b) maximum cell division (c) accumulation of toxic products (d) nutrient depletion	K1	CO5
	4	The spore cortex in <i>Bacillus</i> sp. is composed mainly of _____. (a) Peptidoglycan (b) Lipids (c) Proteins (d) Teichoic acids	K2	CO2
3	5	The bacterial TCA cycle occurs in the _____. (a) Nucleoid (b) Mitochondria (c) Periplasm (d) Cytoplasm	K1	CO4
	6	Bioluminescent bacteria are typically found in _____. (a) Human gut (b) Freshwater ponds only (c) Soil around plant roots (d) Marine environments	K2	CO4
4	7	DNA synthesis in bacteria occurs during which cell cycle event? (a) Binary fission (b) Lag phase only (c) Stationary phase only (d) Sporulation only	K1	CO4
	8	In bacteria, fatty acid synthesis occurs mainly in the _____. (a) Ribosomes (b) Cytosol (c) Plasma membrane (d) Periplasm	K2	CO4
5	9	In anaerobic respiration, the final electron acceptor is _____. (a) Oxygen (b) Organic compounds (c) Inorganic compounds (d) ATP	K1	CO4
	10	Homolactic fermentation produces _____. (a) Lactate + butanol (b) Lactate + ethanol + CO ₂ (c) Lactate + acetate (d) Lactate only	K2	CO5

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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.	Elucidate active transport mode of diffusion.	K2	CO2
	(OR)			
	11.b.	Explain about the nutrient uptake process into the bacterial cell.		
2	12.a.	Describe synchronous culture.	K2	CO2
	(OR)			
	12.b.	Discuss in brief, the factors affecting microbial growth.		
3	13.a.	Giva an account on HMP pathway.	K4	CO4
	(OR)			
	13.b.	Present the significance of bacterial photosynthesis.		
4	14.a.	Write the differences between fatty acid synthesis and β -oxidation.	K4	CO4
	(OR)			
	14.b.	Illustrate the biosynthesis of purines and pyrimidines.		
5	15.a.	Exemplify alcoholic fermentation.	K4	CO4
	(OR)			
	15.b.	Compare and contrast between lactic acid fermentation and alcoholic fermentation.		

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	Classify microorganisms based on their nutritional requirements. Add a note on the growth factors.	K1	CO1
2	17	State and explain the phases of bacterial growth curve with a neat diagram.	K2	CO2
3	18	Depict TCA cycle in detail.	K4	CO4
4	19	Write a summary on the biosynthesis of amino acids.	K4	CO4
5	20	Summarize the features of anaerobic respirations.	K4	CO4

Z-Z-Z END