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25MBU205

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION MAY 2026
(Second Semester)

Branch – **MICROBIOLOGY**

MICROBIAL DIVERSITY AND TAXONOMY

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	Carl Woese's classification is based on the analysis of (i) DNA polymerase gene (ii) 16S rRNA sequence (iii) Plasmid DNA (iv) mRNA	K1	CO1
	2	The principle of phenetic classification explains grouping by (i) Natural selection (ii) Mutation rate (iii) Genetic drift (iv) Overall resemblance	K2	CO1
2	3	Name the photosystem present in oxygenic photosynthetic bacteria (i) Photosystem I only (ii) Photosystem II only (iii) Both PSI and PSII (iv) No photosystem	K1	CO2
	4	The ecological role of anoxygenic phototrophs can be interpreted as: (i) Oxygen production (ii) Sulfur cycling (iii) Methane oxidation only (iv) Nitrogen respiration only	K2	CO2
3	5	The cell wall of Actinomycetes contains (i) Cellulose (ii) Peptidoglycan (iii) Chitin (iv) Lignin	K1	CO3
	6	The sterols present in Mycoplasma membrane function to (i) Fix nitrogen (ii) Produce ATP (iii) Synthesize protein (iv) Provide membrane stability	K2	CO3
4	7	The cytoplasmic membrane primarily functions in (i) Spore formation (ii) DNA storage (iii) Transport of substances (iv) Photosynthesis only	K1	CO4
	8	The cell membrane of halophilic archaea can be explained as containing: (i) Ether-linked lipids (ii) Peptidoglycan lipids (iii) Steroid lipids only (iv) Ester-linked lipids	K2	CO4
5	9	Name the lipid-containing outer covering present in some animal viruses: (i) Capsule (ii) Envelope (iii) Cell wall (iv) Glycocalyx	K1	CO5
	10	Nuclear Polyhedrosis Virus (NPV) can be explained as infecting the: (i) Cytoplasm only (ii) Mitochondria (iii) Nucleus of insect cells (iv) Cell membrane	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.	Explain the concept of microbial diversity as described in Vedic Indians.	K2	CO1
		(OR)		
	11.b.	Classify organisms into the Three Kingdoms based on their cellular organization		
2	12.a.	Illustrate the environmental conditions favoring the growth of Purple sulfur and Purple non-sulfur bacteria.	K2	CO2
		(OR)		
	12.b.	Describe the structural and physiological characteristics of photosynthetic bacteria.		
3	13.a.	Analyze the characteristic features of members of the family Enterobacteriaceae.	K4	CO3
		(OR)		
	13.b.	Differentiate endospore-forming rods from cocci based on morphological and industrial characteristics		
4	14.a.	Apply structural knowledge to differentiate cell wall–less archaea from wall-containing archaea.	K3	CO4
		(OR)		
	14.b.	Organize the major archaeal groups based on their metabolic properties.		
5	15.a.	Construct a comparative classification of RNA and DNA plant viruses.	K3	CO5
		(OR)		
	15.b.	Organize fungal viruses into families based on molecular properties.		

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	Illustrate the structural and nutritional organization of organisms included in the Five Kingdom system	K2	CO1
2	17	Classify Cyanobacteria into major groups and explain their characteristics.	K2	CO2
3	18	Evaluate the normal developmental cycle of Chlamydias and its biological significance.	K5	CO3
4	19	Construct a comparative account of thermophilic and halophilic archaea based on habitat, metabolism, and adaptations.	K3	CO4
5	20	Analyze the classification of bacteriophages based on nucleic acid type and capsid symmetry.	K4	CO5

Z-Z-Z END