

2022

BASIC MICROBIOLOGY

Full Marks: 100

Time: Three hours

*The figures in the margin indicate full marks for the questions.*Group A: Answer ALL MCQ questions.

1.	Which one of the following is photoautotrophic? (a) Cyanobacteria (b) <i>Sulfolobus</i> (c) <i>Rhizobium</i> (d) <i>Azotobacter</i>	1
2.	Translation occurs in – (a) plasma membrane. (b) ribosome. (c) nucleoid. (d) cytoplasm.	1
3.	Which one of the following structures carry out bacterial cell locomotion? (a) Pili (b) Tentacles (c) Flagella (d) Pseudopodia	1
4.	Which one of the following is NOT a part of the bacterial endospore? (a) Exosporium (b) Cortex (c) Core (d) Plasmid	1
5.	Which one of the following is a major structural component of plasma membrane? (a) Lipid A (b) Peptidoglycan (c) O-antigen (d) Phospholipid	1
6.	Which one of the following nucleic acids is present in RNA, but not in DNA? (a) Adenine (b) Uracyl (c) Thymine (d) Cytosin	1
7.	Which one of the following antibiotics act against bacterial cell wall? (a) Penicillin (b) Streptomycin (c) Rifampin (d) All of these	1
8.	Prions were first invented by (a) Kary Mullis. (b) Louis Pasteur. (c) Stanley Prusiner. (d) None of them.	1
9.	Which one of the following is a type light microscope? (a) Dark field (b) Bright field (c) Phase contrast (d) All of them	1
10.	Which of the following carry out transcription in cell? (a) t-RNA (b) mRNA (c) r-RNA (d) All of these	1

Group B: Answer ANY FIVE of the following questions.

11.	a)	Describe bacterial cell wall structure using a schematic diagram.	10
	b)	List four major differences between Gram positive and Gram negative cell walls.	4
	c)	Enlist two importance of microbiology in each of the following areas – food, environment	4
12.	a)	How did Pasteur used “Goose-neck” experiment to establish “germ theory”?	8
	b)	Describe how translation occur in ribosome. Use a schematic diagram to enrich your answer.	7
	c)	What is the full form of PCR? What is it used for?	2
	d)	What is the causative agent of malaria	1

13.	a)	Describe the life-cycle of a malarial protozoa using a flow-diagram.	9
	b)	Draw a schematic diagram of bacteriophage structure, and label capsid, tail sheath, tail fibre, base plate, collar and DNA.	6
	c)	Write a brief description of the cortex of an endospore.	3
14.	a)	Briefly elaborate on primary active transport mechanism of bacterial nutrition uptake. Enrich your elaboration with a schematic diagram.	9
	b)	Write short-notes on any two of the following: (i) Basidiomycota, (ii) Lysogenic bacteriophage, (iii) Fluorescent microscopy	2 × 4.5
15.	a)	What are Koch's postulates? What is its significance in microbiology?	4 + 2
	b)	Describe contribution of microorganisms in nature's carbon-cycle. Use a flow-diagram to make your description comprehensive.	12
16.	a)	Describe (with a detailed, labelled schematic diagram) structure of bacterial plasma membrane. What are the significance of its two major structural components – (i) Phospholipid bilayer, (ii) Membrane proteins	8 + 4
	b)	What is a recombinant DNA (rDNA)? What is its importance? Name the scientists, who invented this technology.	2 + 2 + 2

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