

**M. SC. (HONOURS) BIOCHEMISTRY
(MSCBCH)**

Term-End Examination

June, 2026

MBCE-014 : MICROBIOLOGY

Time : 3 Hours

Maximum Marks : 100

Note : (i) Attempt any **five** questions.

(ii) All questions carry equal marks.

1. (a) (i) Write Koch's postulates used for identification of a disease causing agent. 2
- (ii) How did Francesco Redi disprove the theory of spontaneous generation ? 3

- (b) Write short notes on the following (any *two*) : $2 \times 2\frac{1}{2} = 5$

- (i) Taxonomic ranks
- (ii) Polyphasic taxonomy
- (iii) Binomial nomenclature.

- (c) What is meant by microbial typing ?
How is DNA-DNA hybridization method used for molecular characterization of microbes ? $1+4$

- (d) Discuss the nomenclature and classification of living organisms based on the source of carbon, energy and electrons. 5

2. (a) Draw a labelled diagram of bacterial cell representing its general structure and discuss different types of bacteria based on the composition of their cell walls. $2+3$

- (b) Differentiate between any *two* of the following : $2 \times 5 = 10$
- (i) Batch culture and continuous culture

- (ii) Lag phase and Log phase of bacterial growth curve
- (iii) Sterilization and disinfection
- (c) Enlist desirable properties for a good antiseptic/disinfectant. 5
3. (a) Write *two* applications of any *two* of the following instruments : $2 \times 2\frac{1}{2} = 5$
- (i) Laminar air flow
- (ii) Bacteriological incubator
- (iii) Centrifuge
- (b) Distinguish between darkfield and brightfield microscopy. 5
- (c) Write short notes on the following : $2 \times 5 = 10$
- (i) Acid fast staining
- (ii) Capsule staining
4. (a) Write the name and type of causative microorganism for the following diseases : $5 \times 2 = 10$
- (i) Candidiasis
- (ii) Pneumonia

- (iii) Malaria
- (iv) Ringworm
- (v) Polio
- (b) Discuss different modes of bacterial transmission during infection. 5
- (c) Explain the type of mechanical defence barriers in protection against microbial invasion. 5
- 5. (a) How does antigenic variation of pathogens help them to escape host defences ? Justify your answer with suitable examples. 5
- (b) Discuss the mechanism of action of the following antimicrobial drugs : $2 \times 5 = 10$
 - (i) Tetracyclin
 - (ii) Sulfonamides
- (c) Explain the formation and purpose of bio-film. 5
- 6. (a) Write short notes on the following : $4 \times 5 = 20$
 - (i) Ruminants

- (ii) Lichen ecosystem
 - (iii) Bacteriophage typing
 - (iv) Wholegenome sequencing
7. (a) Give a brief account of use of microbes in industrial production citing at least *five* examples. 5
- (b) Discuss the role of cytokines in immunity. 5
- (c) Briefly describe the following : $2 \times 5 = 10$
- (i) Meningitis
 - (ii) Modes of reproduction in algae

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