

No. of Printed Pages : 4

MBCE-014

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

Term-End Examination

June, 2025

MBCE-014 : MICROBIOLOGY

Time : 3 Hours

Maximum Marks : 100

Note : Answer any *five* questions. All questions carry equal marks.

1. (a) Explain the theory of spontaneous generation. Discuss any *two* experiments to support this theory. 10

- (b) Write short notes on the following :

2×5 = 10

(i) Binomial nomenclature for microorganism

(ii) Numerical taxonomy

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2. (a) Discuss the role of molecular sequences in determination of phylogeny. State the limitations of this method. 5
- (b) Explain the methods of nucleic acid base composition and nucleic acid hybridization in molecular characterization of microorganisms. 10
- (c) How does horizontal gene transfer take place in bacteria ? 5
3. (a) Write differences between the following :
 $2 \times 5 = 10$
- (i) Autotrophs and Heterotrophs
- (ii) Passive diffusion and Active diffusion
- (b) Describe general characteristics of viruses and its replication. 10
4. (a) Write the principle and applications of the following instruments : $2 \times 5 = 10$
- (i) Bacteriological incubator
- (ii) Centrifuge

- (b) (i) Describe differential staining with the help of a suitable example. 5
- (ii) What is oil overlay method of microbial storage ? Discuss its advantages and disadvantages. 5
5. Describe the following : $4 \times 5 = 20$
- (a) Immunological memory
- (b) Mechanical defence barriers
- (c) Peridontal diseases
- (d) Transmission of bacteria
6. (a) Write the mechanism of action of the following anti-microbial drugs : $5 \times 2 = 10$
- (i) Rifampicin
- (ii) Ivermectin
- (iii) Pyrimethamine
- (iv) Chloramphenicol
- (v) Griseofulvin
- (b) Explain the agar diffusion method. 5
- (c) "Pathogens can evade host immune system by modulating their cell surface." Justify the statement. 5

7. Write notes on the following : 4×5=20
- (a) Ruminant Stomach Ecosystem
 - (b) Biofilm formation
 - (c) Genotyping
 - (d) Whole genome sequencing
8. (a) Describe ammensalism/antagonism microbial interaction with suitable examples. 10
- (b) Write any *two* methods of isolation of microorganisms. Discuss their applications. 10

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