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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

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 : 4×5=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 : 5×2=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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