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09/01/2025

Your Roll No.....

Sr. No. of Question Paper : 1272

I

Unique Paper Code : 2493012003

Name of the Paper : DSE – Microbiology

Name of the Course : B.Sc. (Hons.) Biochemistry

Semester : III

Duration : 2 Hours

Maximum Marks : 60

**Instructions for Candidates**

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. There are 6 questions.
3. Attempt any 4 questions.
4. All questions carry equal marks.
5. Question no. 1 is compulsory.

P.T.O.

1. (a) Give the contribution of following Scientists.

- (i) Alexander Fleming
- (ii) Louis Pasteur
- (iii) Paul Ehrlich
- (iv) Sergei Winogradsky
- (v) Martinus W. Beijerinck

(b) Justify the following statements :

- (i) Agar-Agar is a better solidifying agent as compared to gelatin.
- (ii) Blood agar is both selective and enriched medium.
- (iii) Archaeobacteria is similar to both prokaryotes and Eukaryotes.
- (iv) Chlorine treatment should be avoided in water containing organic matter.

(c) What do you mean by "fermented food" and discuss with two suitable examples. (5,6,4)

2. (a) Compare the Gram positive and Gram-negative cell wall of the bacteria. What is the mechanism of Gram staining?
- (b) What are psychrophile and mesophiles? Discuss briefly dry heat and wet heat method of sterilization.
- (c) Why would microbial cells that are vigorously growing when inoculated into fresh culture medium have a shorter lag phase than those that have been stored in a refrigerator? (6,6,3)
3. (a) Discuss transduction and transformation bacterial gene transfer methods with suitable diagram.
- (b) What do you mean by gene mapping in bacteria? Discuss the method and significance.
- (c) Give the mechanism of action and application of Ethanol and UV in controlling microbial growth. (6,6,3)
4. (a) What do you understand by Human Microbiome. How does it influence gut health?
- (b) Schematically explain the industrial preparation of wine.

- (c) Discuss the characteristic features of Prions and Virioids? Give examples of any two diseases caused by them. (6,5,4)
5. (a) Describe the basic design of a fermenter. Differentiate between continuous and discontinuous culture?
- (b) Diagrammatically explain the following :
- (i) Two methods of isolation of a pure culture
  - (ii) Effect of temperature on microbial growth (9,6)
6. (a) Explain the various processes involved in the treatment of sewage. Mention the role of microbes in the wastewater treatment.
- (b) Define the doubling time and the mean growth rate constant. Calculate the mean growth rate and generation time of a culture that increases in the exponential phase from  $5 \times 10^2$  to  $1 \times 10^8$  in 12 hours.
- (c) What is Biogenesis? Give an experiment in support of it. (7,5,3)