

APRIL 2024

57151/416C1A

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer any TEN questions each in 50 words

1. Name a type of microscope specifically used for studying the surface structures of microorganisms.
2. How does fluorescence microscopy work, and what is it commonly used for?
3. Define bacterial generation time.
4. Explain the concept of group translocation in nutrient transport.
5. Give an example of a specific transport system used by bacteria.
6. Describe the reproductive methods of fungi.
7. Give an example of an international culture collection center and describe its functions.
8. Name a national culture collection center and explain its role.

9. How do automated microbial identification systems assist in the identification of microorganisms?
10. What are the primary pigments responsible for light absorption in photosynthesis?
11. Differentiate between anaerobic metabolism and aerobic metabolism.
12. Name the key enzyme involved in the Calvin-Benson cycle.

PART B — (5 × 5 = 25 marks)

Answer any FIVE questions, each in 200 words

13. Discuss the historical significance of Louis Pasteur's experiments in microbiology.
14. Describe the structural differences between Gram-positive and Gram-negative bacterial cell wall.
15. Compare and contrast the extremophiles with respect to their habitats, traits and roles in the variety of microbes.

16. Discuss the importance of validating disinfection agents, highlighting the key parameters that should be considered during validation.
17. Discuss the significance and applications of special staining techniques in microbiology.
18. Compare and contrast anaerobic and aerobic metabolism, highlighting their energy yield, efficiency and end products.
19. Explain in detail about the electron transport chain in aerobic metabolism, emphasizing the production of ATP and its mechanism.

PART C — (4 × 10 = 40 marks)

Answer any FOUR questions each in 500 words

20. Explain the sample preparation techniques for SEM and TEM. Highlight their importance in obtaining high-quality images.
21. Discuss the various mechanisms of nutrient transport in bacteria.
22. Give an overview of the Conservation of Biodiversity Act, its objectives and its implications for the conservation of microbial diversity.

23. Describe the functions and significance of national and international culture collection centers.
 24. Discuss the process of photosynthesis in bacteria for energy production.
 25. Discuss the significance of enzyme kinetics and enzyme inhibition in bacterial cellular processes.
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