(6 pages) **Reg. No. :** .....

Code No. : 10884 E **Sub. Code : EMMI 11/ FCMI 11**

B.Sc. (CBCS) DEGREE EXAMINATION, NOVEMBER 2024.

First Semester

Microbiology — Core

FUNDAMENTALS OF MICROBIOLOGY AND MICROBIAL DIVERSITY

(For those who joined in July 2023 onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Antony van Leeuwenhoek is associated with _____.

(a) Telescope (b) Microscope

(c) Stains (d) Immunization

2. Even though the two domains are prokaryotic, the Archaea domain differs from the bacteria domain in _____.

(a) Lack muramic acid in their cell walls

(b) Posses membrane lipids with either-linked branched aliphatic chains

(c) Only (a) is true

(d) Both (a) and (b) are true

3. Teichoic acids _____.

(a) Found in gram positive bacteria

(b) Make the outer wall of bacateria

(c) Provide receptor for phage

(d) All of the above

4. _____ is the name of the filamentous structures that make up the body of a fungus?

(a) Spores (b) Hyphae

(c) Thallus (d) Rhizoids

5. Which of the following is an example of an enriched medium?

(a) Nutrient agar

(b) Blood agar

(c) MacConkey's agar

(d) Eosin Methylene blue agar

6. Which of the following gases is often used in anaerobic chambers to replace oxygen?

(a) Nitrogen (b) Helium

(c) Ozone (d) Hydrogen

7. What is the purpose of using immersion oil with a high-power objective lens?

(a) To clean the lens

(b) To prevent air bubbles

(c) To increase the refractive index and improve resolution

(d) To protect the lens from damage

8. Which of the following is used as a counter stain in the acid-fast staining method?

(a) Safranin

(b) Methylene blue

(c) Crystal violet

(d) Malachite green

9. Which of the following is a physical method of sterilization?

(a) Using ethylene oxide

(b) Ultraviolet radiation

(c) Alcohol

(d) Hydrogen peroxide

10. Which class of antibiotics disrupts the bacterial cell membrane?

(a) Quinolones (b) Tetracycline

(c) Polymyxins (d) Sulfonamides

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).
Each answer should not exceed 250 words.

11. (a) Describe the contribution of Louis Pasteur to the field of microbiology.

Or

(b) Briefly explain the five kingdom classification system proposed by Robert Whittaker.

12. (a) Differentiate between prokaryotic and eukaroytic micro organisms.

Or

(b) Describe the basic structure of fungi.

13. (a) Write the significance of the pour plate and spread plate technique in isolating pure cultures.

Or

(b) Define bacterial growth and explain the phases of the bacterial growth curve.

14. (a) (i) What are the advantages of dark-field microscopy?

(ii) Explain the basic concept of phase-contrast microscopy.

Or

(b) Briefly describe the Ziehl-Neelsen staining and its applications.

15. (a) List the different classes of antimicrobial agents and their targets.

Or

(b) Compare and contrast UV radiation and ionizing radiation for sterilization.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b)
Each answer should not exceed 600 words.

16. (a) Compare and contrast the genetic and structural differences between Eubacteria and Archaebacteria.

Or

(b) Discuss the ecological and economic importance of conserving biodiversity.

17. (a) With neat diagram explain the structure and components of bacterial cell.

Or

(b) Describe the general characteristics of algae.

18. (a) Discuss the different types of culture media used for bacterial growth. Provide examples and specific applications of each type.

Or

(b) Describe the different methods used for culturing anaerobic bacteria, including the equipment and materials required.

19. (a) Explain the working principle, parts and applications of Transmission Electron Microscopy.

Or

(b) Describe the different types of staining techniques used in microbiology and their purposes.

20. (a) Outline the structure, working principle and applications of hot air oven.

Or

(b) Discuss the role of antiseptics in infection control and prevention.
