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

Code No. : 30718 E Sub. Code : EM MI 11/
FC MI 11

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2025.

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. Pasteur developed vaccine for _____?

   (a) Anthrax

   (b) Rabies

   (c) Chicken cholera

   (d) All of the above

2. The Cavalier-Smith's eight kingdom classification includes all of the following, except?

   (a) Fungi (b) Bacteria

   (c) Viruses (d) Algae

3. Bacteria with tuft of flagella at one end called _____.

   (a) Monotrichate (b) Peritrichate

   (c) Bipolar (d) Lophotrichate

4. Rabies virus is in _____?

   (a) Bullet shape (b) Spherical shape

   (c) Brick shape (d) Rod shape

5. Which of the following is a selective medium?

   (a) Nutrient ager (b) Blood agar

   (c) MacConkey's ager (d) Chocolate agar

6. Which of the following media is commonly used to culture anaerobic bacteria?

   (a) Blood agar

   (b) Nutrient agar

   (c) Thioglycollate broth

   (d) MacConkey's agar

7. Which microscope is best suited for viewing live specimens?

   (a) Electron microscope

   (b) Phase-contrast microscope

   (c) Scanning tunneling microscope

   (d) Polarizing microscope

8. What is the primary stain used in the Ziehl-Neelsen method for acid fast bacteria?

   (a) Safranin   (b) Methylene blue

   (c) Carbol fuchsine   (d) Malachite green

9. What is the principle of autoclaving?

   (a) Dehydration

   (b) Coagulation of proteins by steam under pressure

   (c) Oxidation

   (d) Dissolving lipids

10. Which class of antibiotics works by inhibiting bacterial cell wall synthesis?

   (a) Amino glycosides   (b) Tetracycline

   (c) Beta-lactams   (d) Macrolides

PART B — (5 × 5 = 25 marks)

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

11. (a) Explain the contribution of

      (i) Antony van Leeuwenhoek and

      (ii) Alexander flemming.

   Or

   (b) What is an ecological niche and why is it important in understanding microbial ecology?

12. (a) Describe the structure and function of bacterial flagella.

   Or

   (b) Explain the basic structure of a virus and its replication cycle.

13. (a) What are selective media, and how are they different from differential media? Provide one example of each.

   Or

   (b) Explain the process of binary fission in bacteria.

14. (a) With neat diagram explain the parts and working principle of bright-field microscopy.

Or

(b) What are the differences between acidic and basic stains? Give examples.

15. (a) What are antimicrobial agents, and how do they function?

Or

(b) Explain the principle of membrane filtration 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) Discuss the historical development of microbiology, highlighting the key discoveries and scientists.

Or

(b) Compare and contrast the three-kingdom, five-kingdom and eight-kingdom classification systems, emphasizing the criteria used for classification in each.

17. (a) Differentiate between prokaryotic and eukaryotic micro organisms.

Or

(b) Compare and contrast the cell wall structure of Gram-positive and Gram- negative bacteria.

18. (a) Discuss the different methods used to obtain pure bacterial cultures.

Or

(b) Describe the different methods used to quantitatively measure bacterial growth, compare their advantages and limitations.

19. (a) Explain the working principle, parts and applications of phase-contrast microscopy.

Or

(b) Compare and contrast Gram's staining and Acid-fast staining techniques.

20. (a) Compare autoclaving with other methods of moist heat sterilization.

Or

(b) Explain the mechanism of action of common disinfectants and their applications.

———————