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

Code No. : 10895 E **Sub. Code : EFMI 11/ FFMI 11**

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

First Semester

Microbiology

Foundation Course — BASIC MICROBIOLOGY

(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. Which of these is a characteristic of prokaryotic cells?
   (a) Absence of cell organelles
   (b) Absence of nucleus
   (c) Presence of 70s ribosomes
   (d) All of the above

2. Common vegetative reproduction in bacteria is by _____.
   (a) Conjugation (b) Budding
   (c) Sporulation (d) Binary fission

3. Sir Alexander Fleming extracted penicillin from _____.
   (a) *Pencillium citrinum*
   (b) *Pencillium notatum*
   (c) *Pencillium chrysogenum*
   (d) *Bacillus brevis*

4. *Saccharomyces cerevisiae* is used primarily for _____.
   (a) Backing
   (b) Bleaching
   (c) Biofuel
   (d) None of the above

5. According to Bergey's manual of systematic bacteriology, prokaryotes that lack of cell wall belong to the group
   (a) Gracilicutes (b) Firmicutes
   (c) Tenericutes (d) Mendosicutes

6. All of the following are used to characterize prokaryotic organisms for the first edition of Bergey's manual of systematic bacteriology except?

(a) Gram-staining properties

(b) Presence of endospores

(c) Phylogenetic information

(d) Motility

7. Which of the following is commonly used as Gram's decolorizer

(a) Ethyl alcohol

(b) Methyl alcohol

(c) Acetone

(d) A mixture of ethyl alcohol and acetone

8. Dark ground microscopy is used to see _____.

(a) Refractile organism

(b) Flagella

(c) Capsule

(d) Fimbriae

9. Fungi like Mucor, Asperigillus and Ergot are common contaminants of _____.

(a) Pork and Beef (b) Coffee and Tea

(c) Rice flour (d) Bread and Cereals

10. Which of the following is a free living aerobic nitrogen-fixing bacterium?

(a) *Azotobacter* (b) *Rhizobium*

(c) Cyanobacteria (d) *B.Circulans*

PART B — (5 × 5 = 25 marks)

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

11. (a) List and describe the external structures of bacterial cell and their functions.

Or

(b) Explain the process of budding in microbial cell division. Highlight how it differs from binary fission?

12. (a) What are the applications of microbes in agriculture?

Or

(b) Describe the significance of microbes in food industry.

13. (a) Explain the role of Bergey's manual in bacterial classification.

Or

(b) Briefly describe the hierarchical structure of microbial taxonomy.

14. (a) Define culture media and describe its importance in microbiology.

Or

(b) Explain the role of biochemical tests to identify microbes, with two examples.

15. (a) What are extremophiles and where they can be found?

Or

(b) How do probiotic benefit human health?

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 prokaryotic and eukaryotic cells in detail.

Or

(b) Examine the difference in cell wall composition between Gram-positive and Gram-negative bacteria and their implications.

17. (a) Evaluate the importance of microbial genetics in advancing life sciences.

Or

(b) Explain the applications of microbes in environmental sustainability.

18. (a) Discuss the difference between phenotypic and genotypic methods of microbial classification.

Or

(b) Explain the principles and methodologies used in molecular phylogenetic for bacteria classification.

19. (a) Explain the principle and process of Gram staining technique.

Or

(b) Discuss the role of serological methods in identification of microbes. Explain at least two techniques with their applications.

20. (a) Discuss the sources and types of air borne microbes and their ecological significance.

Or

(b) List some beneficial microbes used in industrial applications.

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