

KAMARAJ COLLEGE (Autonomous)

Accredited with A+ Grade by NAAC

(Affiliated to Manonmaniam Sundaranar University, Tirunelveli)

THOOTHUKUDI – 628 003

(7 Pages)

Reg. No:

Question Code No : 25001601

Sub Code : 25PMMB11

PG Degree - End Semester Examinations, November 2025

First Semester

M.Sc. MICROBIOLOGY

General Microbiology and Microbial Diversity

(For those who joined in July 2025 onwards)

Time : 3 Hours

Maximum : 75 Marks

PART- A (10 × 1 = 10 Marks)

Answer ALL Questions

Choose the correct answer :

1. Which part of the compound microscope helps in gathering and focusing light rays on the specimen to be viewed?

(a) Condenser lens

(b) Magnifying lens

(c) Objective lens (d) Eyepiece lens

2. Select the bacteria having clusters of flagella at both poles of cells.

(a) Amphitrichous (b) Monotrichous

(c) Peritrichous (d) Lophotrichous

3. Which of the following is the most crucial rule regarding food and drink in a microbiology lab?

(a) Only consume sugary drinks

(b) Food and drinks are permitted in designated areas, not workstations

(c) No food or drink should be brought into the lab or consumed there

(d) Food can be consumed if the lab is clean

4. What is the primary difference between sterilization and disinfection?

(a) Disinfection kills all forms of microorganisms, while sterilization kills some

(b) Sterilization aims to kill all forms of microorganisms, whereas disinfection reduces or eliminates most pathogenic microorganisms.

(c) Sterilization is for surfaces, and disinfection is for instruments.

- (d) There is no significant difference between the two
5. An agar is obtained primarily from which species of algae?
- (a) *Chondrus* (b) *Gigartina*
(c) *Gelidium* (d) *Laminaria*
6. Which of the following species produces neurotoxin which causes the death of aquatic animals?
- (a) *Chlorella* (b) *Gonyaulax*
(c) *Prototheca* (d) *Cephaleuros*
7. What is the primary component of the bacterial cell wall that provides structural support and maintains cell shape?
- (a) Lipopolysaccharide(LPS) (b) Teichoic acid
(c) Peptidoglycan (d) Lipoteichoic acid
8. Choose the last major step involved in the biosynthesis of bacterial peptidoglycan.
- (a) Synthesis of sugar precursors in the cytoplasm
(b) Flipping of lipid-linked precursors into the periplasm
(c) Polymerization and cross-linking of peptidoglycan strands
(d) Attachment of teichoic acids
9. Which of the following is a major characteristic of *Archaeobacteria*?

- (a) They have peptidoglycan in their cell walls
- (b) They are found only in moderate environments.
- (c) They thrive in extreme environments such as high-temperature springs
- (d) They are photosynthetic

10. *Archaeobacteria* are important in evolutionary studies because:

- (a) They are the only prokaryotes that are photosynthetic
- (b) They represent an ancient lineage of life
- (c) They can be easily cultured in a laboratory setting
- (d) They contain the same genetic material as eukaryotes

PART - B (5 X 5 = 25 Marks)

Answer ALL Questions choosing either (a) or (b).

Answer should not exceed 250 words.

11. (a) Analyze the principles and applications of Bright field microscope.

(OR)

(b) Discuss the principles and applications of phase-contrast microscope.

12. (a) Summarize the Safety guidelines in Microbiology Laboratories.

(OR)

(b) Compare Sterilization Disinfection and its validation.

13. (a) Explain the morphology and classification of Algae.

(OR)

(b) Write a detail procedure of Isolation of algae from soil and water.

14. (a) Describe in detail the bacterial structure with a neat diagram.

(OR)

(b) Compare the features of *Actinomycetes* and Fungi.

15. (a) Provide a detailed Classification of the *Thermophiles* with examples and discuss their economic importance.

(OR)

(b) Infer the types of *Archaeobacteria* and its applications.

PART - C (5 X 8 = 40 Marks)

Answer ALL Questions choosing either (a) or (b).

Answer should not exceed 600 words.

16. (a) Outline the History and Scope of Microbiology.

(OR)

(b) Distinguish the Transmission electron microscope (TEM) and Scanning electron microscope with suitable diagram.

17. (a) Elaborate the different methods of cultivation of Anaerobic organisms.

(OR)

(b) Discuss the various types of pure cultures technique.

18. (a) Evaluate the different types of media and methods used for culturing algae with suitable examples.

(OR)

(b) Explain the morphology, economic importance and Life cycle of Sargassum.

19. (a) Analyze the various nutritional requirements of bacteria growth and evaluate the stages of Growth curve.

(OR)

(b) Describe the different methods of measurement of growth and factors affecting microbial growth.

20. (a) Compare the classification, cell wall and membrane of Alkaliphiles and Acidophiles.

(OR)

(b) Classify the methanogens and analyze its classification, habitats and its applications.