

KAMARAJ COLLEGE (Autonomous)

Accredited with A+ Grade by NAAC

(Affiliated to Manonmaniam Sundaranar University, Tirunelveli)

THOOTHUKUDI – 628 003

(5 Pages)

Reg. No:

Question. Code No : 25E01606

Sub Code : 24PMMB11

PG Degree - End Semester Examinations, April 2025

Second Semester

M.Sc. MICROBIOLOGY

Major - General Microbiology and Microbial Diversity

(For those who joined in July 2024 onwards)

Time : 3 Hours

Maximum : 75 Marks

PART – A (10 × 1 = 10 Marks)

Answer all questions

Choose the correct answer :

1. Which of the following microscope uses fluorescent dyes and UV light to visualize specimens?
 - (a) Bright field microscope
 - (b) Phase-contrast microscope
 - (c) Fluorescence microscope

- (d) Dark-field microscope
2. The measurement of microorganisms using a stage and ocular micrometer is called:
- (a) Photometry (b) Micrometry
(c) Spectrometry (d) Calorimetry
3. Which of the following is a differential staining technique?
- (a) Simple staining (b) Negative staining
(c) Gram staining (d) Capsule staining
4. Which of the following is used for the cultivation of anaerobic organisms?
- (a) Incubator (b) Candle jar
(c) Anaerobic jar (d) Shaker incubator
5. Which of the following is a member of red algae?
- (a) Nostoc (b) Volvox
(c) Polysiphonia (d) Spirogyra
6. The reproductive cycle of *Chlamydomonas* includes
- (a) Only asexual reproduction
(b) Only sexual reproduction
(c) Both asexual and sexual reproduction
(d) No reproduction
7. Which of the following best describes Actinomycetes?
- (a) Eukaryotic, unicellular organisms

- (b) Photosynthetic bacteria
 - (c) Filamentous, Gram-positive bacteria
 - (d) Obligate anaerobic fungi
8. In which phase of bacterial growth curve does the number of cells dividing equal the number of cells dying?
- (a) Lag phase
 - (b) Log phase
 - (c) Stationary phase
 - (d) Death phase
9. Purple membrane is found in which type of halophilic microorganism?
- (a) Thermophiles
 - (b) Methanogens
 - (c) Extreme halophiles
 - (d) Acidophiles
10. Methanogens belong to which group of microorganisms?
- (a) Fungi
 - (b) Bacteria
 - (c) Archaeobacteria
 - (d) Cyanobacteria

PART - B (5 X 5 = 25 Marks)

Answer all questions choosing either (a) or (b).

Answer should not exceed 250 words.

11. (a) Explain the working principle of a Phase-contrast microscope.

(OR)

- (b) Describe the preparation of samples for SEM and TEM.

12. (a) Write a note on safety guidelines in microbiology laboratories.

(OR)

(b) Explain simple and differential staining techniques.

13. (a) Describe the economic importance of algae.

(OR)

(b) Outline the method for isolation of algae from water samples.

14. (a) What are the stages of bacterial growth curve?

(OR)

(b) Describe the structure and function of bacterial cell wall.

15. (a) Write a short note on barophiles and their applications.

(OR)

(b) Describe the concept of osmoadaptation in halophiles.

PART - C (5 X 8 = 40 Marks)

Answer all questions choosing either (a) or (b).

Answer should not exceed 600 words.

16. (a) Compare and contrast different types of microscopes used in microbiology.

(OR)

(b) Discuss the principles and applications of micrometry in microbiology.

17. (a) Describe various sterilization and disinfection techniques with examples.

(OR)

(b) Explain cultivation and maintenance techniques of anaerobic organisms.

18. (a) Compare the morphology and reproduction of Green, Brown, and Red algae.

(OR)

(b) Describe the large-scale cultivation methods of algae.

19. (a) Explain the methods of measuring microbial growth and factors affecting it.

(OR)

(b) Discuss the morphology, reproduction, and significance of Actinomycetes and Fungi.

20. (a) Explain the classification and ecological role of thermophilic archaeobacteria.

(OR)

(b) Discuss the structural and functional adaptations of halophiles.