

**Time : 3 Hours**

**Marks: 75**

Q.1 Answer the following MCQ

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- 1) Which bacterial structure is primarily involved in locomotion?
  - A) Flagellum
  - B) Capsule
  - C) Cell wall
  - D) Plasmid
- 2) Gram staining is based on differences in bacterial:
  - A) Shape
  - B) Size
  - C) Cell wall structure
  - D) Motility
- 3) Blood agar is an example of:
  - A) Selective medium
  - B) Differential medium
  - C) Enriched medium
  - D) Minimal medium
- 4) Psychrophilic bacteria live in:
  - A) High temperatures
  - B) Moderate temperatures
  - C) Low temperatures
  - D) Extreme pH levels
- 5) Lyophilization is also known as
  - A) Freeze-drying
  - B) Salting
  - C) Refrigeration
  - D) Canning
- 6) Autoclaves are commonly used in:
  - A) Chemical sterilization
  - B) Dry heat sterilization
  - C) Radiation sterilization
  - D) Steam sterilization
- 7) Biological indicators measure
  - A) Temperature
  - B) Pressure
  - C) Microbial death
  - D) Humidity

- 8) Which of the IMViC tests is associated with the ability of an organism to ferment glucose and produce acid and gas?
  - A) Indole test
  - B) Methyl Red test
  - C) Voges-Proskauer test
  - D) Citrate test
- 9) The principle of filtration for sterilization is based on the removal of microorganisms through:
  - A) Heat
  - B) Chemicals
  - C) Mechanical barriers
  - D) Radiation
- 10) What is the genetic material of a virus?
  - A) DNA only
  - B) RNA only
  - C) Both DNA and RNA
  - D) Neither DNA nor RNA
- 11) An agent that inhibits bacterial growth but doesn't kill bacteria is termed
  - A) Bacteriostatic
  - B) Bactericidal
  - C) Bacteriolytic
  - D) Bacteriogenic
- 12) The method primarily used for testing the sterility of heat-sensitive liquid products is
  - A) Membrane filtration
  - B) Direct transfer method
  - C) Immersion test
  - D) Dry-heat sterilization
- 13) Which source of contamination can occur due to improper gowning techniques?
  - A) Personnel
  - B) Air
  - C) Surfaces
  - D) Equipment
- 14) What is the primary purpose of using disinfectants in an aseptic area?
  - A) Remove particulate matter
  - B) Kill microorganisms
  - C) Reduce temperature
  - D) Control humidity
- 15) What principle is commonly used in microbiological assays for antibiotics?
  - A) Inhibition of bacterial growth
  - B) Promotion of bacterial growth
  - C) Formation of bacterial colonies
  - D) Bacterial motility

- 16) Microbiological assays for amino acids often involve the use of
  - A) Bacteria
  - B) Fungi
  - C) Algae
  - D) Protozoa
- 17) High humidity is a factor that contributes to microbial spoilage primarily by
  - A) Accelerating chemical degradation
  - B) Encouraging microbial growth
  - C) Reducing water activity
  - D) Enhancing product stability
- 18) The "Zone of Inhibition" in microbial testing measures
  - A) Microbial growth rate
  - B) Microbial resistance
  - C) Area of microbial inhibition around a test substance
  - D) Microbial features
- 19) Which factor is crucial for successful cell growth in culture?
  - A) High osmolarity
  - B) Low temperature
  - C) Proper nutrient supply
  - D) Increased light exposure
- 20) Primary cultures are derived directly from:
  - A) Established cell lines
  - B) In vitro cell fusion
  - C) Freshly isolated tissue
  - D) Cryopreserved stocks

II) Answer the following (any 2 out of 3) Long questions 20 Marks

1. Classify bacteria based on physicochemical requirements and add a note on cultivation of anaerobic bacteria
2. Classify Methods of sterilisation and explain radiation sterilisation in detail
3. Explain in detail Lytic cycle and add a note on cultivation of animal viruses

III) Answer the following (any 7 out of 9) Short questions 35 Marks

1. What is Microbiological assay? Explain Cup plate method in detail
2. What is SEM and TEM, Differentiate between SEM and TEM
3. Explain Phenol coefficient test in detail
4. Enlist differential staining techniques and add a note on Gram staining in detail
5. What is Animal Cell culture explain media used along with advantages and disadvantages
6. Explain layout of Sterile area for Pharmaceuticals with neat labelled diagram
7. What is Test for sterility explain in detail with interpretation
8. Explain in detail growth phases in bacteria along with growth curve
9. Explain the methods of preservation of bacteria

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