S.Y.B.Pharm
Sem-III

Time: 3 Hours

02/04/2025

Total Marks:75

Semester Exam

ATKT

N.B. : (1) Draw diagrams wherever necessary

Answer the following **(20)**

Q. 1 MCQ

1. Which of the following bacteria can use oxygen when it is available but also thrive in anaerobic environments?
   a) Obligate aerobes
   b) Facultative anaerobes
   c) Obligate anaerobes
   d) Microaerophiles
2. Which of the following structures in bacteria is responsible for attachment to surfaces or host tissues?
   a) Flagella
   b) Pilus
   c) Capsule
   d) Ribosome
3. Which factor primarily limits bacterial growth during the stationary phase of the growth curve?
   a) Nutrient depletion
   b) Oxygen depletion
   c) Accumulation of waste products
   d) Both a and c
4. The greatest resolution in light microscopy can be obtained with _____
   a) Longest wavelength of visible light used
   b) An objective with minimum numerical aperture
   c) Shortest wavelength of visible light used
   d) Shortest wavelength of visible light used and an objective with the maximum numerical aperture
5. Mycobacterial cell wall contains a waxy substance composed of
   a) Picric acid
   b) Mycolic acid
   c) Myristic acid
   d) Carbonic acid
6. Which of the following is true regarding the difference between sterilization and disinfection?
   a) Sterilization kills all microorganisms, while disinfection only reduces microbial load.
   b) Disinfection kills all microorganisms, while sterilization reduces microbial load.
   c) Both sterilization and disinfection kill all microorganisms.
   d) Sterilization and disinfection are interchangeable processes.
7. Which sterilization method is commonly used for sterilizing the air in an operating room or cleanroom environment?
   a) Ozone sterilization
   b) UV (ultraviolet) light
   c) Ethylene oxide gas
   d) Dry heat sterilization
8. At what temperature and pressure is autoclaving typically performed to sterilize medical instruments?
   a) 121.6°C at 15 psi for 15 minutes
   b) 100°C at 10 psi for 30 minutes
   c) 150°C at 25 psi for 10 minutes
   d) 110°C at 5 psi for 20 minutes
9. Which of the following process does not kill bacterial endospores?
   a) Hot air sterilization
   b) Pasteurization
   c) Autoclave
   d) Incineration
10. The lowest temperature that kills all microorganisms in a liquid suspension in 10 minutes is known as the
    a) thermal death time
    b) thermal death point
    c) decimal reduction time
    d) thermal death temperature

11. Which of the following is a characteristic feature of fungi?
a) They are prokaryotic organisms.
b) They have cell walls made of cellulose.
c) They are heterotrophic and obtain nutrients through absorption.
d) They reproduce only by binary fission.

12. Which of the following is a common derivative of phenol used in medical applications as an antiseptic?
a) Cresol
b) Alcohol
c) Formaldehyde
d) Acetone

13. Which of the following best describes a turbidometric bioassay?
a) It measures the turbidity of a sample as a reflection of microbial growth.
b) It measures the pH of a sample to assess the antimicrobial effectiveness.
c) It involves using a fluorescent dye to detect bacteria in a sample.
d) It measures the size of microbial colonies formed on a solid medium.

14. In an aseptic area, what should be the ideal air pressure relative to the surrounding areas to minimize contamination risk?
a) Positive pressure
b) Negative pressure
c) Neutral pressure
d) Variable pressure

15. Which of the following is the primary purpose of designing an aseptic area with unidirectional airflow pattern?
a) To enhance ventilation efficiency
b) To reduce the risk of contamination by ensuring clean air flows in one direction
c) To maintain constant humidity levels
d) To provide adequate lighting for workstations

16. Parenteral preparations are prepared in _____ area.
a) Grade A
b)Grade B
c) Grade C
d) Grade D

17. Which of the following types of culture medium is most commonly used for growing animal cells in the laboratory?
a) Nutrient agar
b) Dulbecco's Modified Eagle Medium
c) Sabouraud agar
d) MacConkey agar

18. In a microbial limit test, which of the following is typically tested for in a non-sterile pharmaceutical product?
a) Total viable count of microorganisms
b) Specific bacterial species
c) Presence of endotoxins
d) Presence of heavy metals

19. Which of the following environmental factors can significantly affect the spoilage of pharmaceutical products?
a) Temperature
b) Humidity
c) Light exposure
d) All of the above

20. Which of the following is a commonly used preservative in ophthalmic formulations?
a)Sorbitol
b) Benzalkonium chloride
c) Lactose
d) Glycerol

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

1. Classify counting methods of bacterial cell and add a note on viable counting methods of bacteria with its advantages, disadvantages and applications
2. Discuss moist heat sterilisation with its mechanism of action ,types, advantages and applications
3. Distinguish between lytic and lysogenic cycle and Explain lytic cycle using a labelled diagram

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

1. Distinguish between diffusion and turbidometric bioassay
2. Describe working of Scanning electron microscope and its application
3. Enlist various methods of disinfectant evaluation and explain Kelsey-Sykes test
4. Write a note on principle and procedure of acid fast staining
5. What are the essential requirements, techniques, and challenges associated with animal cell culture, and how is it applied in research?
6. Explain design of aseptic area using a neat labelled diagram
7. What are the critical methods used in sterility testing of pharmaceutical products
8. Write a note on composition of gram positive cell wall and its role
9. What are the key factors influencing the efficiency of preservatives, and how do they impact their effectiveness in preserving pharmaceutical products?

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