REV-01
BOT/16/21

2025/11

SET A

B.Sc. OPERATION THEATRE TECHNOLOGY
THIRD SEMESTER
MICROBIOLOGY
BOT-301

[USE OMR SHEET FOR OBJECTIVE PART]

Duration: 3 hrs. **Full Marks: 70**

Objective

Time: 30 mins. **Marks: 20**

Choose the correct answer from the following: ***1×20=20***

1. Round shaped bacteria are called as:
   a. Rods b. Comma
   c. Cocci d. All of the above
2. Bacteria that can make their own food in presence of light are called as:
   a. Autotrophs b. Photoautotrophs
   c. Photoheterotrophs d. None of the above
3. Bacteria lacking cell wall are called as:
   a. Cyanobacteria b. Algae
   c. Spirochetes d. Mycoplasma
4. Which of the following is the counter staining in Gram staining?
   a. Safranin b. Crystal violet
   c. Malachite green d. All of the above
5. Acid fast staining is used to identify which type of bacteria?
   a. *Mycobacterium tuberculae* b. *Mycobacterium laprae*
   c. *E.coli* d. Both a and b
6. Why are acid-fast bacteria resistant to decolorization by acid-alcohol?
   a. They lack a cell wall b. They have a thin peptidoglycan layer
   c. They have a thick outer membrane d. None of the above
7. The phase of the growth curve where there is an exponential growth of the bacteria is:
   a. Lag phase b. Log phase
   c. Stationary phase d. Death phase
8. What type of bacteria uses CO_2 as a soul source of energy?
   a. Autotrophs b. Chemotrophs
   c. Heterotrophs d. None of the above
9. Bacteria surviving high temperature zones are called as:
   a. Psychrophile b. Halophiles
   c. Thermophiles d. Acidophiles
10. How does autoclave achieve sterilization?
   a. High temperature b. Low temperature
   c. High temperature, moist heat d. Low temperature, high moisture

11. Which of the following is the minimum exposure time in autoclave at 121°C?
    a. 5 mins
    b. 15 mins
    c. 25 mins
    d. None of the above

12. Which of the following is a valid temperature/time combination for pasteurization?
    a. 63°C
    b. 70°C
    c. 53°C
    d. 75°C

13. Which of the following is the most common capsid shape of the virus?
    a. Icosahedron
    b. Cone
    c. Rods
    d. Cube

14. The protein coat of viruses that enclose the genetic material is called:
    a. Virion
    b. Capsomeres
    c. Capsid
    d. None of the above

15. Which of the following statements are true about the capsomeres?
    a. It is an individual unit of the capsid
    b. It is a viral protein for replication
    c. It is a unit of nucleic acid in viruses
    d. All of the above

16. According to the Baltimore classification system, viruses are grouped based on:
    a. Size and shape
    b. Nucleic acid type and replication strategy
    c. Host and mode of transmission
    d. Both a and b

17. Viruses that attack bacteria are called:
    a. Mycoviruses
    b. Retroviruses
    c. HIV
    d. Bacteriophages

18. HIV can also spread through:
    a. Sharing water
    b. Sharing needles
    c. Kissing
    d. All of the above

19. What is the main function of agar in a culture medium?
    a. An indicator dye
    b. A solidifying agent
    c. An enzyme
    d. All of the above

20. Which of the following is not a laboratory technique for bacterial growth?
    a. Autoclave
    b. Streak plate
    c. Pour plate
    d. Broth

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Descriptive

Time : 2 hr. 30 mins. Marks : 50

[Answer question no.1 & any four (4) from the rest]

1. Explain the structure of a bacterial cell with a suitable diagram. Classify bacteria based on structure and nutrition. 5+5=10

2. Who discovered Gram staining and what is the importance of the technique? Explain the principle and procedure of acid-fast staining. Explain the bacterial growth curve and write in brief what we learn from such a curve. 1+4+5=10

3. What is the difference between bactericidal and bacteriostatic? Explain how and where phenol and alcohol are used antibacterial agents? Explain the types of sterilization techniques with suitable examples. 1+3+6=10

4. What is the use and significance of autoclave? Explain its functioning. Write in brief about pasteurization. Explain the use of antibiotics and sterilization. 4+3+3=10

5. What are the differences between virus and bacteria? Why viruses are not included in the term 'Microbes'? Explain. Explain in details the morphology of virus with a suitable diagram. 2+2+6=10

6. Write a note on Herpes virus and HIV. 5+5=10

7. Classify virus based on Baltimore classification and based on genome. What are the usual precautions we have to take to avoid infection from airborne virus? Justify your answer. 7+3=10

8. Explain in brief the different methods of laboratory culture techniques and give their significance as well. Define a host and a pathogen. Write a short note on host-pathogen interaction. 4+2+4=10

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