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**BRAINWARE UNIVERSITY**

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Term End Examination 2025-2026**Programme – B.Pharm-2021/B.Pharm-2022/B.Pharm-2023/B.Pharm-2024****Course Name – Pharmaceutical Microbiology****Course Code - BP303T****(Semester III)****Full Marks : 75****Time : 3:0 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A**(Multiple Choice Type Question)****1 x 20=20**

1. Choose the correct alternative from the following :

- (i) Which of the following is not an example of spherical-shaped bacteria?
 - a) Diplococcus pneumonia
 - b) Streptococcus lactis
 - c) Klebbisella pneumonia
 - d) Staphylococcus aureus
- (ii) Which of the following option is the correct phase for the rapid growth of bacteria?
 - a) Lag phase
 - b) Generation phase
 - c) Exponential phase
 - d) Stationary phase
- (iii) Predict the bacteria that will appear purple-violet color after the completion of the gram staining method.
 - a) Gram-positive bacteria
 - b) Gram-negative bacteria
 - c) Both Gram-positive and Gram-negative bacteria
 - d) Both Gram-positive and Gram-negative bacteria
- (iv) Identify the correct nominal porosity of the membrane filter.
 - a) 0.45µm
 - b) 0.60µm
 - c) 0.60µm
 - d) 0.78µm
- (v) Which of the following agents is not recognized cause of diarrhea?
 - a) Clostridium perfringens
 - b) Vibrio cholerae
 - c) Enterococcus faecalis
 - d) Escherichia coli
- (vi) Choose the correct biological indicator for dry heat sterilization:
 - a) B. atrophaeus
 - b) B. pumilus
 - c) B. cereus
 - d) B. anthracis
- (vii) Choose the correct option "the process of removal and killing of all microorganisms" is known as:
 - a) Destruction
 - b) Sterilization
 - c) Pasteurization
 - d) Removal

- (viii) What is/are the conditions established for culture in direct inoculation method?
- Aerobic conditions
 - Anaerobic conditions
 - Both of these
 - None of these
- (ix) Choose the correct primary objective of microbiological assays for amino acids :
- To measure the total protein content
 - To determine the specific amino acid composition
 - To assess the purity of amino acid samples
 - To quantify the vitamin content
- (x) Which regulatory agency is responsible for approving new antibiotics for use in the United States?
- World Health Organization (WHO)
 - European Medicines Agency (EMA)
 - Food and Drug Administration (FDA)
 - Centers for Disease Control and Prevention (CDC)
- (xi) Which of the following is an example of chemical spoilage in food?
- Formation of ice crystals in frozen food
 - Rancidity in fats and oils
 - Mold growth on bread
 - Loss of color in vegetables
- (xii) Which type of pharmaceutical product is most susceptible to microbial spoilage?
- Tablets
 - Injectable liquids
 - Capsules
 - Ointments
- (xiii) Select the characteristic feature of bacterial spore:
- Highly refractile
 - Usually dehydrated
 - Sensitive to formaldehyde
 - All of these
- (xiv) Select the correct option: Pasteurization is the heat treatment designed primarily to kill
- Vegetable forms of microorganisms
 - Spore
 - All form of microorganisms
 - None of these
- (xv) Select the correct option: Chick-embryo method is suitable for cultivation of
- Virus
 - Bacteria
 - Fungus
 - Protozoa
- (xvi) Select the correct growth period of the culture:
- Inoculation
 - Incubation
 - Incineration
 - Isolation
- (xvii) Choose the correct pH of Soybean casein digest media after sterilization:
- 7.3 ± 0.2
 - 8.2 ± 0.2
 - 3.5 ± 0.2
 - 2.5 ± 0.2
- (xviii) Predict which of the following is a limitation of the autoclave:
- It cannot be used with glassware
 - It takes too long to sterilize
 - It lacks the ability to inactivate viruses
 - It will destroy heat labile materials
- (xix) Select the correct option: All of the following are sporicidal except
- Glutaraldehyde
 - Formaldehyde
 - Ethylene oxide
 - Alcohol
- (xx) A microbiology lab needs to sterilize nutrient agar media in bulk. The media contains heat-stable ingredients. Which method is MOST appropriate?
- A) Membrane filtration
 - B) Dry heat oven at 160°C for 2 hours
 - C) Autoclaving at 121°C for 15 minutes under 15 psi
 - D) UV irradiation

Group-B

(Short Answer Type Questions)

5 x 7=35

2. The angle of light collection by an objective is 60° , and the medium is oil ($n = 1.51$). Estimate the NA. (5)

3. Report the different applications of cell culture in the pharmaceutical industry and research. (5)
4. Classify virus according to nucleic acid with proper example. (5)
5. List the different types of culture media. (5)
6. Describe the physical parameters required for the growth of bacteria. (5)
7. Illustrate the structural and chemical differences in bacterial cell walls that account for Gram reaction outcomes. (5)

OR

- Deduce the different biochemical tests for the identification of microbes belonging to the Enterobacteriaceae family. (5)
8. Compare between moist heat and dry heat sterilization to determine which is a better sterilization technique. (5)

OR

- Explain how the chemical nature of bacterial cell walls affects dye uptake in simple staining. (5)

Group-C

(Long Answer Type Questions)

10 x 2 = 20

9. Write a short note on cultivation of virus. (10)
10. Explain the role of mycolic acids and cell wall lipids in acid-fastness and compare the Ziehl-Neelsen and Gram staining methods. (10)

OR

- Illustrate the sterility indicator correlating with the equipment used in large-scale industry. (10)
