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**BRAINWARE UNIVERSITY****Term End Examination 2025-2026****Programme – B.Tech.(BT)-2024****Course Name – Microbiology****Course Code - BTB30107****(Semester III)**

Library
Brainware University
398, Ramkrishnapur Road, Barasat
Kolkata, West Bengal-700125

Full Marks : 60**Time : 2:30 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 15=15**

1. *Choose the correct alternative from the following :*

- (i) Recall in context of Pasteur, the correct statement
- | | |
|--|--------------------------------------|
| a) Living organisms discriminate between stereoisomers | b) Fermentation is a aerobic process |
| c) Living organisms doesn't discriminate between stereoisomers | d) Both a and b |
- (ii) Identify the father of microbiology
- | | |
|---------------------|----------------|
| a) Louis Pasteur | b) Lister |
| c) A.V. Leeuwenhock | d) Robert Koch |
- (iii) Define the term that is used to describe a disease that affects many people at different countries at the same time
- | | |
|-------------|-------------|
| a) Sporadic | b) Pandemic |
| c) Epidemic | d) Endemic |
- (iv) Select that what did Joseph Lister use to create antiseptic conditions during surgery?
- | | |
|------------------|-------------|
| a) Ethanol | b) Iodine |
| c) Carbolic acid | d) Chlorine |
- (v) Select the main principle behind tyndallization
- | | |
|---|---|
| a) Germination of endospores during heating | b) Rapid cooling of the sterilized material |
| c) Repeated exposure to high temperatures | d) Use of ionizing radiation |
- (vi) Cite the bacterial cell wall components as the primary target of Gram staining.
- | | |
|------------------|-------------|
| a) Lipid bilayer | b) Nucleus |
| c) Peptidoglycan | d) Ribosome |
- (vii) Choose what is the time interval required for a bacterial population to double during exponential growth called.
- | | |
|---------------------|--------------------|
| a) Replication time | b) Growth interval |
|---------------------|--------------------|

- c) Generation time
 d) Doubling period
- (viii) Predict the reason for bacteria entering the stationary phase.
 a) Nutrient depletion
 b) Accumulation of toxic waste products
 c) Oxygen limitation
 d) Increased nutrient availability
- (ix) Choose the microorganism involved in denitrification.
 a) Nitrobacter
 b) Pseudomonas
 c) Nitrosomonas
 d) Azotobacter
- (x) Identify the main product of biological nitrogen fixation.
 a) Nitrite
 b) Ammonia (NH₃)
 c) Nitrate
 d) Urea
- (xi) Endotoxin (LPS) indicates the important constituent of
 a) Gram positive bacteria
 b) Gram negative bacteria
 c) some protozoa
 d) fungi
- (xii) B subunits are present in cholera toxin classify?
 a) 1
 b) 2
 c) 3
 d) 5
- (xiii) Choose the test that is used to diagnose diphtheria by detecting the presence of the diphtheria toxin
 a) Elek test
 b) Agglutination test
 c) Immunofluorescence assay
 d) Polymerase chain reaction (PCR)
- (xiv) The cell walls of many gram positive bacteria can be easily destroyed by the enzyme known as
 a) lipase
 b) lysozyme
 c) pectinase
 d) peroxidase
- (xv) Different preservation techniques are
 a) Dehydration
 b) Frozen storage
 c) Both a and b
 d) Discontinuous growth

Group-B

(Short Answer Type Questions)

3 x 5=15

2. Describe the meaning of pure culture method and write the purpose of pure culture bacteria. (3)
3. Explain the structure of bacterial cell with the aid of a neatly labelled diagram. (3)
4. Explain the difference between in situ and ex situ bioremediation. (3)
5. Define the carbon cycle and its main reservoirs. List the processes through which carbon is returned to the atmosphere. (3)
6. Illustrate the constituents of cell membrane. (3)

OR

State the locomotory organs present in bacterial cells.

(3)

Group-C

(Long Answer Type Questions)

5 x 6=30

7. Recall the scientist who disproved spontaneous regeneration theory and give a brief outline of the theory (5)
8. Elaborate the principle of gram staining in both gram positive and gram negative bacteria. (5)
9. Explain the difference between solid, semi-solid, and liquid culture media based on their physical consistency. (5)
10. Write the activity of Cholera enterotoxin. (5)
11. Discuss the factors that influence the pathogenicity of microorganisms, including host-related factors, environmental factors, and the microbial factors themselves (5)

12. Analyze the distinct features of lag and log phase of bacterial growth cycle. (5)

OR

State the characteristics of stationary and death phase. (5)

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