

**MICROBIOLOGY  
(BIOT 2104)**

**Time Allotted : 3 hrs**

**Full Marks : 70**

*Figures out of the right margin indicate full marks.*

*Candidates are required to answer Group A and any 5 (five) from Group B to E, taking at least one from each group.*

*Candidates are required to give answer in their own words as far as practicable.*

**Group - A  
(Multiple Choice Type Questions)**

1. Choose the correct alternative for the following: **10 × 1 = 10**
- (i) Microbes utilize inorganic compound as source of electron known as
    - (a) Prototroph
    - (b) Auxotroph
    - (c) Autotroph
    - (d) Lithotroph
  - (ii) Cell wall inhibiting antibiotic is
    - (a) Penicillin
    - (b) Streptomycin
    - (c) Tetracycline
    - (d) None of these
  - (iii) Main source of non ionic radiation is
    - (a) X-ray
    - (b) UV-ray
    - (c) Gamma ray
    - (d) None of these
  - (iv) Nitrogen fixing bacteria present in soil is
    - (a) E. coli
    - (b) Lactobacillus sp
    - (c) Clostridium sp
    - (d) Azotobacter sp
  - (v) Mycorrhizae is a symbiotic association between
    - (a) Fungi and plant
    - (b) Fungi and bacteria
    - (c) Algae and bacteria
    - (d) None of these
  - (vi) Teichoic acid is present in
    - (a) Gram positive
    - (b) Gram negative
    - (c) Acid fast Bacteria
    - (d) Yeast
  - (vii) Spheroplast is a cell of
    - (a) Gram positive bacteria
    - (b) Gram negative bacteria
    - (c) Fungi
    - (d) Algae
  - (viii) Pseudomurein is present in
    - (a) Mould
    - (b) Archaeobacterium
    - (c) Protozoa
    - (d) Sea algae

- (ix) Which of the following organisms belongs to archaeobacteria?  
(a) Nitrosomona, (b) Streptomyces  
(c) Thermoplasma (d) None of these
- (x) Which one among the following is a motile spore?  
(a) Conidiospores (b) Zoospores  
(c) Blastospores (d) Chlamydo spores

### **Group - B**

2. (a) Explain the life cycle of Rhizopus stolonifer. Give diagram.  
(b) Briefly classify algae. Mention the criteria for algal classification.

**8 + 4 = 12**

3. (a) Describe how the bacteria move with the help of flagella?  
(b) Write notes on Lichens.  
(c) Write notes on Whittaker's classification.

**4 + 4 + 4 = 12**

### **Group - C**

4. (a) Briefly describe the sample preparation for Scanning Electron Microscope. State the differences between scanning electron microscope over optical microscope.  
(b) Define: synthetic media and complex media

**(4 + 4) + (2 + 2) = 12**

5. (a) Explain any one technique for pure culture isolation .  
(b) What is Gas pak jar and why it is important?  
(c) What is Oligodynamic action ?  
(d) Name one gaseous chemical sterilizing agent.

**3 + 5 + 3 + 1 = 12**

### **Group - D**

6. (a) What are diazotrophs? Give example.  
(b) Briefly describe lactic acid fermentation.  
(c) What is Stickland reaction and why it is important?

**2 + 6 + 4 = 12**

7. (a) What is generation time and growth rate of bacteria?  
(b) What is leghaemoglobin and write its mode of action.

(c) How free living nitrogen fixers protect their nitrogenase ?

**4 + 6 + 2 = 12**

**Group - E**

8. (a) Discuss the role of biofertilizer on soil.

(b) Explain any one mutualistic association in which one of the partner is fungi.

(c) What is indole production test?

**6 + 4 + 2 = 12**

9. (a) Briefly describe the denitrification process.

(b) Distinguish antagonism and competition.

(c) Briefly explain rhizosphere effect.

**4 + 4 + 4 = 12**

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