

**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) Volutin granules are composed of  
(a) Polyhydroxy butyrate (PHB) (b) Polyphosphate  
(c) Glycogen (d) Elemental sulphur.
- (ii) Some species of bacteria form chains or trichomes that are enclosed by a hollow tube known as  
(a) Sheath (b) Slime  
(c) Prosthecae (d) Stalk.
- (iii) Sabourand media is used for the growth of  
(a) Bacteria (b) Virus  
(c) Fungi (d) Protozoa.
- (iv) Which of the following microbe follow Phosphoketolase pathway?  
(a) E. coli (b) Lactobacillus sp  
(c) Clostridium sp (d) none of (a), (b) and (c).
- (v) The time required for a cell to divide into two is  
(a) Generation time (b) Growth rate  
(c) Total time (d) none of (a), (b) and (c).
- (vi) Mycorrhizal symbiosis is between  
(a) Fungi –yeast (b) Algae-fungi  
(c) Plant-fungi (d) Fungi-fungi.
- (vii) Antibiotics that inhibit cell wall synthesis include  
(a) Cefuroxime (b) Erythromycin  
(c) Sulphonamide (d) Benzyl penicillin.
- (viii) Which of the following is a causative agent of Botulism?  
(a) Escherichia coli (b) Clostridium botulinum  
(c) Klebsiella (d) Bacillus.

- (ix) Palisade arrangement of bacteria refers to  
(a) Cells occurring singly or in pairs  
(b) Cells forming chain  
(c) Cells lining side by side like matchstick  
(d) Cells forming groups of four cells.
- (x) Eyepiece in an Optical Microscope is also known as  
(a) Ocular Lens (b) Objective Lens  
(c) Condenser Lens (d) none of (a), (b) and (c).

**Group - B**

2. (a) Describe the structure of a Mold.  
(b) Describe the structure and function of bacterial capsule **6 + 6 = 12**
3. (a) Describe the structure of Bacteriophage.  
(b) Explain the importance of algae as food.  
(c) Write short notes on Classical taxonomy. **5 + 3 + 4 = 12**

**Group - C**

4. (a) Describe with a diagram, the working principle of Scanning Electron Microscope.  
(b) Write the differences between complex and synthetic media. Give examples. **6 + 6 = 12**
5. (a) Discuss the effect of pH on bacterial growth.  
(b) Differentiate antiseptic and disinfectant.  
(c) Write notes on fractional sterilization. **4 + 4 + 4 = 12**

**Group - D**

6. (a) Write notes on sulphate respiration.  
(b) Briefly discuss mechanism of symbiotic nitrogen fixation process. **4 + 8 = 12**

7. (a) Discuss four different phases of growth of bacteria.  
(b) What is photosystem and photophosphorylation?  
(c) What is heterolactic acid fermentation?

**4 + 4 + 4 = 12**

**Group – E**

8. (a) Schematically describe the process of nitrogen cycle and mention the role of bacteria in it.  
(b) Name two different air borne diseases with their causative agents.  
(c) What is VP test?

**6 + 3 + 3 = 12**

9. Write notes on:

**(3 × 4) = 12**

- (i) Biopesticide.  
(ii) Symbiotic relation.  
(iii) Nitrification and denitrification process.