

- (vii) The membrane protein bacteriorhodopsin is characteristic of
(a) *Halobacterium* (b) *Escherichia coli*
(c) *Actinomyces* (d) None of these.
- (viii) Obligate aerobic microbes grow
(a) in presence of oxygen,
(b) in absence of oxygen,
(c) both in presence and absence of oxygen,
(d) none of these.
- (ix) Which of the following organisms belongs to archebacteria?
(a) *Nitrosomonas* (b) *Streptococcus*
(c) *Mycoplasma* (d) *Thermoplasma*.
- (x) Which of the following is sequenced during the study of phylogenetic analysis?
(a) mRNA (b) tRNA, (c) rRNA (d) DNA.

Group - B

2. (a) Classify the bacterial viruses based on their morphology.
(b) Describe the morphology and economic importance of algae.
 $4 + (4 + 4) = 12$
3. (a) Describe with diagram, the structure of bacterial flagella.
(b) Write notes on Whittaker classification.
 $7 + 5 = 12$

Group - C

4. (a) Describe with diagram, the working principle of Transmission 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 between antiseptics and disinfectants.
(c) Write notes on fractional sterilization.
 $4 + 4 + 4 = 12$

Group - D

6. (a) Write explanatory notes on anoxygenic photosynthesis.
(b) What is anaerobic respiration? How does it differ from fermentation?
 $7 + (3 + 2) = 12$
7. (a) Write notes on sulphate respiration.
(b) Distinguish between cyclic and non cyclic photophosphorylation.
(c) What is Stickland reaction?
 $4 + 4 + 4 = 12$

Group - E

8. (a) Schematically describe the process of sulphur cycle and mention the role of bacteria in it.
(b) Name two different water borne diseases with their causative agent.
(c) What is IMViC test?
 $5 + 2 + 5 = 12$
9. Write notes on:
(i) Biopesticide
(ii) Symbiosis
(iii) Leghaemoglobin.
 $4 \times 3 = 12$

**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 (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) Which one of the following antibiotics inhibit cell wall synthesis in bacteria?
(a) Cefuroxime (b) Erythromycin
(c) Sulphonamide (d) Benzyl penicillin.
- (iv) Which of the following is a causative agent of Botulism?
(a) *Escherichia coli* (b) *Clostridium botulinum*
(c) *Klebsiella sp.* (d) *Bacillus subtilis*.
- (v) Teichoic acid is present in :
(a) Gram-positive bacteria (b) Gram-negative bacteria
(c) Acid fast bacteria (d) Yeast.
- (vi) Methyl red indicator is used to detect
(a) Lactic acid fermentation (b) Mixed acid fermentation
(c) Acetic acid fermentation (d) None of these.