

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) Mycorrhiza is a symbiotic association between
(a) Fungi and plant (b) Fungi and bacteria
(c) Algae and bacteria (d) None of these
- (ii) Gas pak jar is use to grow bacteria
(a) In presence of oxygen
(b) In absence of oxygen
(c) Both in presence and absence of oxygen
(d) None of these
- (iii) Lichens are composite organisms composed of
(a) Fungi and Algae (b) Fungi and Bacteria
(c) Algae and Bacteria (d) Bacteria and Virus
- (iv) Source for gamma radiation is radioactive
(a) Co (b) Ni
(c) Mo (d) None of these
- (v) 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
- (vi) Nitrogen fixing bacteria present in soil is
(a) E. coli (b) Lactobacillus sp.
(c) Clostridium sp (d) Azotobacter sp.
- (vii) Volutin granules are composed of
(a) Polyhydroxy butyrate (PHB) (b) Polyphosphate
(c) Glycogen (d) Elemental sulphur

- (viii) Which one among the following is a motile spore?
(a) Conidiospores (b) Zoospores
(c) Blastospores (d) Chlamydozoospores
- (ix) Which of the following organisms belongs to actinomycetes?
(a) Nitrosomonas, (b) Streptomyces
(c) Thermoplasma (d) None of these
- (x) Cord factor is present in
(a) Gram positive (b) Gram negative
(c) Acid fast Bacteria (d) Yeast.

Group - B

2. (a) Examine the functions of bacterial capsules. [(CO1) (Examine/IOCQ)]
(b) Comment on the fact that the small size of the bacteria have important consequences. [(CO1) (Comment/HOCQ)]
(c) Describe the microbial association that exists in a Lichen. [(CO1)(Remember/LOCQ)]

5 + 3 + 4 = 12

3. (a) Briefly explain the asexual reproduction of Fungi. [(CO1) (Explain/IOCQ)]
(b) Give a brief outline of the process of Bacteriophage infection in host cell. [(CO1) (Illustrate/HOCQ)]

6 + 6 = 12

Group - C

4. (a) Analyze the effects of increasing the Numerical Aperture of a microscope? [(CO2)(Analyze/IOCQ)]
(b) Discuss the ways in which microorganisms are classified based on their requirements for energy and electrons. [(CO3)(Analyze/IOCQ)]
(c) What are yeast extract and peptones? Why are they used in media? [(CO3)(Remember/LOCQ)]

5 + 4 + 3 = 12

5. (a) What is the importance of thioglycollate? [(CO4)(Remember/LOCQ)]
(b) What is the difference between antiseptic and disinfectant? [(CO3)(Analyze/IOCQ)]
(c) How aerobic bacteria can tolerate excess level of oxygen? [(CO3)(Analyze/IOCQ)]
(d) Define selective media with example. [(CO3)(Remember/LOCQ)]

3 + 4 + 3 + 2 = 12

Group - D

6. (a) Briefly explain Phosphoketolase pathway. [(CO4) (Remember/LOCQ)]

- (b) Distinguish fermentation and anaerobic respiration with example.
[[CO3] (Differentiate/IOCQ)]
- (c) Define photoautotrophs and classify them with example.
[[CO4] (Remember/LOCQ)]

5 + 3 + 4 = 12

7. (a) Discuss the mode of protection of nitrogenase of symbiotic N₂ fixing bacteria.
[[CO5] (Discuss/IOCQ)]
- (b) Design the process of sulphate incorporation by assimilatory sulphate reduction? [[CO6](Design/HOCQ)]
- (c) Illustrate cyclic photophosphorylation. [[CO5](Illustrate/IOCQ)]

4 + 4 + 4 = 12**Group - E**

8. (a) Briefly discuss sulphur cycle. [[CO4](Discuss/IOCQ)]
- (b) Name two different waterborne bacterial diseases and write their causative agents. [[CO5](Remember/LOCQ)]
- (c) Evaluate nitrification process and its importance. [[CO6](Evaluate/HOCQ)]

6 + 2 + 4 = 12

9. (a) Distinguish assimilatory and dissimilatory nitrate reduction.
[[CO5](Differentiate/HOCQ)]
- (b) What is the difference between commensalism and parasitism?
[[CO6](Differentiate/HOCQ)]
- (c) What is the mode of action of cholera toxin? [[CO6](Describe/IOCQ)]

5 + 4 + 3 = 12

Cognition Level	LOCQ	IOCQ	HOCQ
Percentage distribution	24%	49%	27%

Course Outcome (CO):

After the completion of the course students will be able to

1. Describe different cell structures with subcellular functional organelles.
2. Describe the working principles of different types of microscopes.
3. Isolate pure culture from different environmental sources.
4. Preserve and maintain pure culture.
5. Understand various microbial identification processes.
6. Apply their knowledge of microbes in different environmental aspects.

*LOCQ: Lower Order Cognitive Question; IOCQ: Intermediate Order Cognitive Question;
HOCQ: Higher Order Cognitive Question

Department & Section	Submission Link
BT	https://classroom.google.com/c/NDIwOTA5MTE5MDE4/a/NDc3MzYzODIxNDU5/details