

AC-234810

**M.Sc. (Semester-III)
Examination, Dec.-Jan. (2025-26)**

MICROBIOLOGY

(Environmental Microbiology)

Time Allowed : Three Hours

Maximum Marks : 70

Note : Question paper is divided into four sections. Attempt questions of all four sections as per direction. Distribution of marks is given in each section.

SECTION-A

(Objective Type Questions)

1. Attempt any **ten** questions. Each question carries **1** mark.

[10×1=10]

(A) Fill in the blanks :

- (i) The main source of airborne microbes indoors is _____.

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(1)

[P.T.O.]

- (ii) Soil bacteria that convert atmospheric nitrogen into ammonia are called _____ bacteria.
- (iii) The main gas produced during anaerobic digestion of agricultural waste is _____.
- (iv) Microorganisms that are resistant to multiple antibiotics are known as _____.
- (v) The process of using microorganisms to extract metals from ores is called _____.
- (vi) Mycorrhiza is an association between plant roots and _____.

(B) Choose the correct answer :

- (vii) Which of the following is not an abiotic factor influencing microbial distribution?
- (a) Temperature
- (b) pH
- (c) Enzyme activity
- (d) Light intensity

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(2)

- (viii) The first step of the nitrogen cycle, involving conversion of organic nitrogen into ammonia, is called :

- (a) Nitrification
- (b) Denitrification
- (c) Ammonification
- (d) Nitrogen fixation

- (ix) The most common method to test water for microbial contamination is detection of :

- (a) Salmonella typhi
- (b) Escherichia coli
- (c) Clostridium botulinum
- (d) Staphylococcus aureus

- (x) The microbial breakdown of xenobiotics into simpler substances is called _____.

- (xi) The standard test used to detect coliform in drinking water :

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(3)

[P.T.O.]



- (a) MPN test
 - (b) Coagulase test
 - (c) Catalase test
 - (d) IMVic
- (xii) Azotobacter is an example of :
- (a) Symbiotic nitrogen fixer
 - (b) Non-symbiotic nitrogen fixer
 - (c) Pathogenic bacteria
 - (d) Algae

SECTION-B

(Very Short Answer Type Questions)

Note: Attempt **any five** questions. Each question carries **2** marks. (word limit : **25-30** words) [5×2=10]

2. (i) Define bioaerosol.
- (ii) What is mutualism?
- (iii) What is primary sewage treatment?

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- (iv) Define bioaugmentation.
- (v) What are bioindicators?
- (vi) What are the sources of airborne microorganisms?
- (vii) Define nutrient cycling.

SECTION-C

(Short Answer Type Questions)

Note: Attempt **any five** questions. Each question carries **4** marks. (word limit : **250** words) [5×4=20]

3. (i) Describe potability of water.
- (ii) Describe symbiotic nitrogen fixation.
- (iii) Describe landfill leachate process.
- (iv) Describe pollutants and associated risks.
- (v) Write short note on microbial degradation of xenobiotics.

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[P.T.O.]



- (vi) Describe secondary sewage treatment.
- (vii) Write a note on assessment of air quality.

SECTION-D

(Long Answer Type Questions)

Note: Attempt any three questions. Each question carries 10 marks. (word limit : 500 words) [3×10=30]

4. (i) Discuss aquatic microbiology and diseases caused by waterborne microorganisms.
- (ii) Describe the nitrogen cycle with all major microbial steps.
- (iii) Describe in -situ bioremediation in detail.
- (iv) Explain bioleaching with reference to copper and iron extraction.

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