647510 **BSCmiMN352x-5C** **Seat No :_____**

B.Sc. Semester - 5 (NEP-2020) Examination

Oct/Nov - 2025

MIC: Environmental Microbiology (Theory) (Minor-5)

Time: 2:00 Hours **Marks: 50**

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate marks.

Que.1 (1) Describe the soil profile and explain how the distribution of soil microflora varies with soil depth. (05)

(2) Write short note on diversity of microflora in freshwater and marine habitats. (05)

OR

Que.1 (1) Explain the sources, types, and seasonal variation of aeromicroflora in the atmosphere. (05)

(2) Write detailed note on thermophiles. (05)

Que.2 (1) Explain the role of Rhizobium in nitrogen fixation and its benefits to plants. (05)

(2) Describe predation in microbial interactions with a suitable example. (05)

OR

Que.2 (1) Describe the mechanism by which nematophagous fungi capture and utilize nematodes. (05)

(2) Differentiate between mutualism, commensalism, and amensalism with one example each. (05)

Que.3 (1) Explain the microbial role in cellulose degradation with suitable examples of enzymes involved. (05)

(2) Outline the process of nitrification, specifying the microorganisms responsible for each step. (05)

OR

Que.3 (1) Describe the steps and microbial involvement in chitin degradation. (05)

(2) Write a short note on biological nitrogen fixation, naming any two nitrogen-fixing microorganisms and the enzyme complex involved. (05)

Que.4 (1) Outline the mechanisms of microbial pesticide degradation with an example. (05)

(2) What are biosurfactants? Explain their role in waste degradation. (05)

OR

Que.4 (1) Write short notes on the role of microorganisms in metal detoxification in inorganic waste management. (05)

(2) Explain the working principle of a trickling filter and mention one advantage over oxidation ponds. (05)

Que.5 (1) Outline the characteristics of microbial populations in the rumen of ruminant animals and their role in digestion. (05)

(2) Explain synergism in microbes and give one industrial or ecological example. (05)

OR

Que.5 (1) Explain the role of microorganisms in phosphate solubilization, mentioning at least two examples. (05)

(2) Discuss microbial degradation of hydrocarbons in oil spill bioremediation. (05)

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