

2021

MICROBIOLOGY — HONOURS

Paper : CC-9

(Environmental Microbiology)

Full Marks : 50

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

Answer **any ten (10) questions from question no. 1** and **any three (3)** from the rest.

1. Answer **any ten** questions : 2×10
- (a) Why is soil considered as a good medium for microbial growth?
 - (b) State the significance of C/N ratio in waste water treatment process.
 - (c) What is synergism? State its significance in agriculture.
 - (d) Define biosurfactant.
 - (e) What are the three 'R's of solid waste management? What is the significance of the first 'R'?
 - (f) Why does *E. coli* given green metallic sheen on EMB agar medium?
 - (g) What do you mean by potable water and what should be the standard coliform content of potable water?
 - (h) Describe the beneficial role of nematophagous fungi.
 - (i) Mention two disadvantages of membrane filter technique.
 - (j) Write down two important roles of gut microorganisms in ruminants.
 - (k) What is compost? Name two predominant microorganisms commonly found in compost.
 - (l) What is the significance of nitrification in soil?
 - (m) What is siderophore?
 - (n) What are psychrophiles? Mention special features of their cell wall to survive in extreme environment.
 - (o) What are xerobiotics? Give a suitable example and one bacterial genera that can degrade it.
2. What do you mean by Phosphate solubilization? What is its significance in agricultural ecosystem? How microbes differentially solubilizes organic and inorganic phosphates? Briefly describe how lignocellulosic materials are degraded in forest ecosystem. What are sulphur bacteria? What is their role in sulphur cycle? 1+1+2+3+1+2

Please Turn Over

3. Define commensalism and amensalism with suitable example. What do you mean by microbiomics? Describe the roles of gut microflora in human body. What is eutrophication? (2+2)+1+3+2
4. Distinguish between BOD and COD. Give a brief account of any secondary treatment process. What do you mean by assimilatory and dissimilatory nitrate reduction? State their significance. 3+3+2+2
5. How food chain differs from food web? How soil can be classified based on soil texture? State the significance of MPN Test. What is microbial bioluminescence? Mention its role in benthic ecology. 2+2+3+1+2
6. Write short notes on the following (*any four*) : 2½×4
- (a) Sanitary landfill
 - (b) Activated sludge process
 - (c) Nitrogenase
 - (d) Citrate Utilization test
 - (e) Rhizospheric soil.
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