

2022

MICROBIOLOGY — HONOURS

Paper : DSE-B-2

(Microbes in Sustainable Agriculture and Development)

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 *question no. 1* and *any three* from the rest.

1. Answer *any ten* of the following questions : 2×10
- (a) Define denitrification.
 - (b) What is biomanure?
 - (c) What are the microbes that produce CH₄ in the soil?
 - (d) What is the difference between mineralization and immobilization of nitrogen?
 - (e) Give example of a novel combination of microbes as biofertilizers.
 - (f) What do you mean by humus?
 - (g) What is cellobiose?
 - (h) What factors affect soil microbial activity?
 - (i) Who is known as founder/father of soil microbiology and why?
 - (j) What do you mean by soil profile?
 - (k) Why is soil regarded as 'biologic fire'?
 - (l) How does ammonia released from decomposition of proteins in the soil behave?
 - (m) Why Azolla used as biofertilizer?
 - (n) What is the significans of rhizosphere?
 - (o) Give example of two bio-weedicide.
2. (a) '*Trichoderma* sp. is used as a biocontrol agent.'— Explain it.
- (b) How is *Bacillus thuringiensis* used as a biocontrol agent?
- (c) Define mycorrhizae. How the mycorrhizae plays a role of biofertilizer in agriculture? 3+3+(1+3)

Please Turn Over

3. (a) What is soil profile? What are the steps of soil formation? Why soil is a good habitat for the growth of microbes? (2+3+2)+3
- (b) How is lignin broken down?
4. (a) What causes mineralization in soil?
- (b) What factors influence the occurrence of mineralization?
- (c) Write down how mineralization occurs in soil.
- (d) Does mineralization release nutrients to soil?
- (e) How do you measure mineralization? 2+2+2+2+2
5. (a) What is nitrification? Name the two bacterial species associated with nitrification.
- (b) Write down the steps in the formation of root nodules.
- (c) What is Greenhouse Effect? (2+2)+4+2
6. Write short notes : 2½×4
- (a) PGPRs
- (b) Golden rice
- (c) Biogas
- (d) Leghaemoglobin.
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