

2020

MICROBIOLOGY — HONOURS

Paper : DSE-B-2

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** questions from the rest.

1. Answer **any ten** of the following questions : 2×10
- (a) What is SAR?
 - (b) Write any two disadvantages of GM crops.
 - (c) With the suitable examples state the importance of Cyanobacteria as fertilizer.
 - (d) Define suppressive soil.
 - (e) What is the role of detritivores in soil?
 - (f) Why lignin is highly resistant to microbial degradation?
 - (g) What are the advantages for plants in having mycorrhizal association?
 - (h) What is hemicellulose?
 - (i) Name the key factors that control greenhouse gas emission from soil.
 - (j) State the importance of fungi in biocontrol of soil-borne pathogen.
 - (k) What are methanogens? State their importance as biofuel.
 - (l) Give an example of non-legume nitrogen-fixer association stating the name of both partners.
 - (m) What is golden rice?
 - (n) What is meant by silage?
 - (o) Define denitrification with an example.
2. (a) How does soil pH control greenhouse gas production by soil microorganisms?
(b) How are textural classes of a soil determined?
(c) Differentiate among :
 - (i) Kaolinite, montmorillonite and illite of soil
 - (ii) Sand, clay and silt of soil. 3+3+(2+2)

Please Turn Over

3. What do you mean by Humus? In which soil horizon you can detect its presence? State the role of humus in maintenance of soil health and hence crop productivity. What are the characteristics of the microbial population in the rhizosphere region as compared with the non-rhizosphere region? State the role of mineralization in soil formation. 1+1+3+3+2
4. (a) Give a suitable method for production of a BGA biofertilizer.
(b) Write the expected characteristics in an inoculant carrier in biofertilizer production.
(c) What is algalization? Describe its role in crop yield.
(d) Briefly describe the role of MHBs in soil fertility. 3+2+3+2
5. (a) How do you differentiate between phosphate solubilising biofertilisers and phosphorous mobilising biofertilisers?
(b) Name the media in which *Rhizobium* can be cultivated.
(c) How can you differentiate *Rhizobium* from *Bradyrhizobium*?
(d) What are PGPRs?
(e) Write a flow chart for isolation of *Azotobacter* from Rhizospheric soil. 3+1+1+2+3
6. Write short notes on : 2½×4
- (a) BT Cotton
(b) CO₂ as greenhouse gas
(c) Bioethanol
(d) VAM.
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