

2021

MICROBIOLOGY — GENERAL

Paper : SEC-A-1

(Biofertilizers and Biopesticides)

Full Marks : 80

The figures in the margin indicate full marks.

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

Question nos. 1 and 2 are compulsory and answer **any four** questions from the rest.

1. Answer **any ten** questions : 2×10
- (a) Name two non-symbiotic nitrogen fixing bacteria.
 - (b) Justify leghaemoglobin as oxygen scavenger.
 - (c) What is endomycorrhizae?
 - (d) Give two examples of phosphate solubilising microbes.
 - (e) What are lichens?
 - (f) Soil acts as good medium for microbial growth– Justify.
 - (g) What is humus?
 - (h) What is bioremediation?
 - (i) What is PSM?
 - (j) What is Biological control agent?
 - (k) What is chemical insecticide?
 - (l) What is the role of *Azolla* in rice cultivation?
 - (m) What is antagonism?
2. Write short notes on (**any four**) : 5×4
- (a) Siderophore
 - (b) Mycorrhizae
 - (c) Field application of Bt-toxin
 - (d) Nitrogen fixation in cyanobacteria
 - (e) Field application of VAM
 - (f) Free living *Azospirillum* sp.
 - (g) Nitrogenase enzyme.

Please Turn Over

3. (a) Differentiate between chemical pesticide and biopesticide.
(b) Write down the disadvantages of bioinsecticide.
(c) Write down the application of virus as bioinsecticide. 3+3+4
4. (a) What are the different types of mycorrhizae?
(b) Write down the field application of ectomycorrhizae.
(c) What do you mean by non-symbiotic nitrogen fixing bacteria? Give example. 3+5+2
5. (a) What is Bt-cotton?
(b) Write down the mode of action of Bt-toxin.
(c) What is nif gene? 3+5+2
6. (a) Write about symbiotic nitrogen fixation by *Rhizobium sp.*
(b) Why biofertilizers are preferred over chemical fertilizers?
(c) Discuss the field application of *Azotobacter sp.* 4+3+3
7. (a) Discuss the isolation and characteristics of *Frankia sp.*
(b) Write about the field application of PSM.
(c) Give two examples of phosphate solubilizers. 4+4+2
8. (a) What are the factors affecting nodulation in leguminous plant?
(b) Discuss about *Azolla-Anabaena* association.
(c) Name three microbial products influencing plant growth. 4+3+3
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