

2020

MICROBIOLOGY — GENERAL

Paper : SEC-A-2

(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 no. 1 & 2 are compulsory and answer **any four** questions from the rest.

1. Answer **any ten** questions : 2×10
- (a) What is mycorrhizae?
 - (b) Give an example each of symbiotic and non-symbiotic nitrogen fixing bacteria.
 - (c) State the advantages of bioinsecticides over synthetic pesticides.
 - (d) What is biopesticides?
 - (e) What is VAM?
 - (f) What is phosphate solubilizing microbes (PSM)?
 - (g) What is bioinsecticide?
 - (h) State the application of microbial biofertilizer.
 - (i) What is leghaemoglobin?
 - (j) What is the role of Azolla in rice cultivation?
 - (k) What is soil organic matter?
 - (l) Write the characteristics of a symbiotic nitrogen fixer.
 - (m) What is ectomycorrhizae?
2. Write short notes on (**any four**) : 5×4
- (a) Application of viruses as bioinsecticides.
 - (b) Azotobacter
 - (c) Nitrogen fixation by *Rhizobium* sp.
 - (d) Disadvantage of bioinsecticides
 - (e) Field application of ectomycorrhizae
 - (f) Bt-toxin
 - (g) Algae as biofertilizer.

Please Turn Over

3. (a) Differentiate between nitrification and denitrification.
(b) Leg-haemoglobin is an oxygen scavenger– justify.
(c) Write short note on nitrogenase enzyme and briefly describe its function. 3+3+4
4. (a) Differentiate between Ecto and endomycorrhizae.
(b) Discuss on the mass inoculum production of VAM and state its application.
(c) Give two examples of associated plants in mycorrhizae. 3+5+2
5. (a) What are lichens?
(b) Discuss the root nodule formation in leguminous plant.
(c) Discuss the field application of *Azospirillum* sp. 2+5+3
6. (a) Write a note on nitrogen fixation in cyanobacteria.
(b) Discuss the mass inoculum production of *Azotobacter* sp.
(c) What is *nif* gene? 5+3+2
7. (a) What is chemical insecticide?
(b) How will you apply the biofertilizer *Rhizobium* to plants?
(c) How will you select efficient VAM fungi?
(d) List out the steps involved in production of VAM inoculum by pot culture. 1+3+3+3
8. (a) What is biofertilizer?
(b) Mention its differences with that of chemical fertilizer?
(c) How biofertilizers are applied to crops?
(d) What precautions to be taken for using biofertilizer? 2+3+3+2
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