

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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