

B.Sc. (Honours) Examination, 2019

Semester – VI

Botany

**Paper: BBE–63 (Elective)
(Biofertilizers and Biopesticides)**

Time: Three Hours

Full Marks: 40

Questions are of value as indicated in the margin

Answer question **No. 1** and **any four** from the rest

1. Answer any **eight** from the following questions:

1×8=8

- (a) Name two bacterial bio-pesticides used to protect plants from pest attack.
- (b) Name the symbiotic partners which are most effective in contributing nitrogen to the forest ecosystem.
- (c) Name a non-leguminous plant and its family which can make symbiotic association with rhizobia.
- (d) Name one organophosphate compound used in agriculture.
- (e) What are the steps followed during N₂ estimation through Kjeldahl method?
- (f) State two major roles of Mg in biological system.
- (g) Characterize the genus *Azotobacter* morphologically.
- (h) What is siderophore?
- (i) Why are *Azospirillum* spp. more effective than *Azotobacter* spp. in rice field?
- (j) Why do we consider ACC deaminase a positive marker for an effective plant growth promoting organism?
- (k) What are strobilurins?
- (l) What are plantibodies?

2. Describe the protocol of isolating *Rhizobium* from root nodules. Describe the process of nodulation.

4+4=8

3. Name two earthworm species used in vermicomposting. Describe the process of vermicomposting. How can we add value to a vermicompost?

2+4+2=8

4. Write notes on:

4+4=8

- (a) Green manure
- (b) Acetylene reduction assay

5. What is Bt-toxin? How can it help to control insect attack in plants? State two drawbacks in using Bt crops.

2+4+2=8

6. What is meant by biological control? Describe the role of PGP organisms in control of plant pathogens. How do they differ from hyperparasites?

1+6+1=8

7. What is meant by biological nitrogen fixation? Describe the process mediated by classical nitrogenase enzyme? What is 'nif' gene cluster? How it is regulated in *Klebsiella pneumoniae*?

1+3+1+3=8
