

- (vii) Anabaena found growing in association with fern Azolla represent
 (a) symbiotic heterocystous cyanobacteria
 (b) non-symbiotic cyanobacteria
 (c) non heterocystous cyanobacteria
 (d) non symbiotic heterocystous cyanobacteria.
- (viii) Chromatium and chlorobium are
 (a) non-photosynthetic nitrogen fixing bacteria
 (b) photosynthetic nitrogen fixing bacteria
 (c) anaerobic nitrogen fixing bacteria
 (d) symbiotic nitrogen fixing bacteria.
- (ix) The first chemical pesticide introduced commercially is
 (a) DDT (b) chlorinated hydrocarbon
 (c) Bt-protein (d) none of these.
- (x) Toxic protein of B. thuringiensis is a
 (a) alpha-toxin (b) delta toxin
 (c) exotoxin (d) none of these.

Group – B

2. (a) What is VAM? Why it is used as biofertilizer?
 (b) What is compost? How is it prepared?
6 + 6 = 12
3. (a) Explain why biofertilizers offer a distinct advantage over chemical fertilizers.
 (b) What is leghaemoglobin? State briefly how it facilitates the process of biological nitrogen fixation in symbiotic system.
5 + (2 + 5) = 12

Group – C

4. (a) Briefly explain Azolla-Anabaena symbiosis.
 (b) What are hetero cysts? Explain the mechanism of nitrogen fixation in hetero cysts. How are biofertilizers applied to soil?
4 + (2 + 4 + 2) = 12

5. (a) What is physical significance of vermicomposting?
 (b) Write notes on mycorrhizae.

6 + 6 = 12

Group – D

6. (a) What is Shepherd's cook? Describe the role of different nod factors in its formation.
 (b) Discuss the transcriptional regulation of nod operon.
(3 + 3) + 6 = 12
7. Write short note on the following
 (a) nif gene transfer AND
 (b) rhizosphere engineering.
(6 × 2) = 12

Group – E

8. (a) What is IDPM programme? Mention different steps of effective management of pests.
 (b) What is the causative fungus for Green Muscardin disease, produced commercially as biopesticide? Describe shortly their host range and method of application on crop.
(2 + 4) + (3 + 3) = 12
9. (a) What are cry and cyt genes? Write the mode of action of cry toxin.
 (b) Write short note on the useful genetic manipulation of BT strains reported for the production of a better biopesticide.
6 + 6 = 12

B.TECH/BT/6TH SEM/BIOT 3244/2017
BIOFERTILIZERS AND BIOPESTICIDES
(BIOT 3244)

Time Allotted : 3 hrs

Full Marks : 70

Figures out of the right margin indicate full marks.

*Candidates are required to answer Group A and
any 5 (five) from Group B to E, taking at least one from each group.*

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

Group – A
(Multiple Choice Type Questions)

1. Choose the correct alternative for the following: **10 × 1 = 10**
- (i) Glomalin protein is synthesized by:
 - (a) bacteria
 - (b) algae
 - (c) VAM
 - (d) all of these.
 - (ii) The genes responsible for nitrogen fixing ability in Rhizobium leguminosorum are
 - (a) nif and nod genes
 - (b) lac and hup genes
 - (c) nif and trp genes
 - (d) all of these.
 - (iii) All biopesticides are basically pest pathogen. This statement is
 - (a) true
 - (b) not true
 - (c) partially true
 - (d) none of these.
 - (iv) Photosynthetic and nitrogen fixing gene reside side by side in
 - (a) Alcaligenes
 - (b) Rhodospirillum
 - (c) Thiobacillus
 - (d) Klebsiella.
 - (v) nif genes are arranged as
 - (a) cassette
 - (b) multigene family
 - (c) operon
 - (d) split genes.
 - (vi) Autophaga californica belongs to Baculovirus of
 - (a) C group
 - (b) NPV group
 - (c) GV-group
 - (d) none.