

B.TECH/BT/6TH SEM/BIOT 3244/2018
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) Azolla is used in
 (a) rice field (b) cane sugar field
 (c) corn field (d) none of these.
- (ii) The genes responsible for nitrogen fixing ability in *Klesiella pneumoniae* are
 (a) *nif* and *nod* genes (b) *lac* and *hup* genes
 (c) only *nif* genes (d) all of these.
- (iii) The regulatory protein of *nif* operon is
 (a) *nif A* (b) *nif L*
 (c) *nif D* (d) none of these.
- (iv) Photosynthetic nitrogen fixer is
 (a) *Rhizobia* (b) *Azolla*
 (c) *Bacillus* (d) *Cyanobacteria*.
- (v) The *hup* genes found in several diazotrophs
 (a) wastes cellular ATP
 (b) recycles H₂ produced by nitrogenase
 (c) removes N₂ from ammonia
 (d) adds H₂ to N₂.
- (vi) The cofactor of dinitrogenase reductase is
 (a) Mo (b) Co
 (c) Fe (d) none of these.
- (vii) *nod* genes are arranged as
 (a) cassette (b) multigene family
 (c) operon (d) split genes.

- (viii) Fix ABCX operon is present in
 (a) Megaplasmid I of *Rhizobium*
 (b) Megaplasmid II of *Rhizobium*
 (c) cluster I of *Bradyrhizobium*
 (d) bacterial chromosome.
- (ix) The nitrogen fixing genes in *Bradyrhizobium japonicum* is present in
 (a) one megaplasmid (b) two different megaplasmsids
 (c) bacterial chromosome (d) two similar plasmids.
- (x) *B.thuringiensis var kurastaki* is used to control the attack of
 (a) mosquito (b) moth and butterfly
 (c) beetle (d) none of these.

Group - B

2. (a) Define biofertilizer. Give example.
 (b) What are bacteroids? How bacteroids protects their nitrogenase?
4 + 8 = 12
3. (a) How *Azospirillum* species are isolated from the soil?
 (b) Define cyanobacteria. What is their role on microbial inoculant?
6 + 6 = 12

Group - C

4. (a) What is bacterization? What types of microorganisms are used as microbial inoculants?
 (b) Write notes on Lichen.
(4 + 4) + 4 = 12
5. (a) Phosphate solubilising microbes act as biofertilizer-explain.
 (b) Give an account of rhizosphere engineering.
6 + 6 = 12

Group - D

6. (a) What is the most modern theory for host specificity?
 (b) Describe the step-by-step formation of symbiotic association between *Rhizobia* and leguminous plant.
3 + 9 = 12

7. (a) How the *nif* genes are arranged in symbiotic nitrogen fixers?

(b) Mention their function.

(3 + 3) + 6 = 12

Group - E

8. (a) What are the sub-classes *B. thurigiensis*? Write their use as biopesticide.

(b) What are their genetic make-up for toxic protein production?

(3 + 3) + 6 = 12

9. Describe genetic makeup of Baculovirus and genetically engineered baculoviruses.

(6 + 6) = 12