Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.Tech/(BT-New)/SEM-6/BT-604E/2013

2013

BIOFERTILIZERS AND BIOPESTICIDES

Time Allotted : 3 Hours *Full Marks* : 70

The figures in the margin indicate full marks.

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

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following : 10 × 1 = 10

i) A nitrogen fixing cyanobacterium is

a) Nostoc b) Anabaena

c) Tolypothrix d) Gleocapsa.

ii) Aquatic fern which is an excellent biofertilizer is

a) BGA b) Azolla

c) Trichoderma d) Trichogramma.

iii) Biofertilizers include

a) Cow dung manure and farm yard waste

b) a quick growing crop ploughed back

c) BGA/Anabeana and Azolla

d) All of these.

iv) Farmers have reported 50% higher yield of rice by using biofertilizer

a) *Azolla pinnata*

b) Legume – Rhizobium symbiosis

c) Cyanobacteria

d) Mycorrhiza.

v) Heterocyst contains enzyme

a) Pectinase b) Cellulase

c) Nitrogenase d) Phosphorylase.

vi) Leghaemoglobin takes part in

a) Energy release

b) Stimulating growth of Rhizobium

c) Protecting nitrogenase

d) Supply of oxygen.

vii) Mycorrhiza is symbiotic association between

a) fungus and gymnosperm stem

b) fungus with angiosperm leaves

c) fungus with legume fruits

d) Fungus with gymnosperm and angiosperm roots.

viii) All biopesticides are basically pest pathogen.

a) True b) not true

c) partially true d) none of these.

ix) *Autophaga californica* belongs to Baculovirus of

a) C group b) NPV group

c) GV-group d) none of these.

x) 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.

xi) Anabaena found growing in association with fern Azolla represents

a) symbiotic heterocystous cyanobacteria

b) non-symbiotic cayanobacteria

c) non-heterocystous cyanobacteria

d) non-symbiotic heterocystous cyanobacteria.

xii) ..... genes are responsible for nitrogen fixing ability of Rhizobia.

a) Lac and trp genes

b) Lac and nod genes

c) Nif and trp genes

d) Nif and nod genes.

GROUP – B
(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. What is VAM ? Write the importance of leghaemoglobin. 2 + 3

3. Briefly explain Azolla-anabaena symbiosis. Explain the mechanism of N_2 fixation in specialized cells of cayanobacteria. 2 + 3

4. What is biopesticide ? Discuss about commercially available biopesticides in India. 1 + 4

5. How phosphobacteria is beneficial in crop production ?

6. How different cry proteins show insecticidal activities ?

7. Discuss the role of Trichoderma as biofertilizer. How is it applied to the field ? 3 + 2

GROUP – C
(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

8. How protoxin gene product of *B.thuringiensis* ultimately kills host pest ? Name three different strain types killing lepidoptera, diptera and coeleptera. Describe how BT spores are produced in large scale and formulated for application.

6 + 6 + 3

9. Describe efforts on improvement of biopesticidic baculovirus and fungi as more effective biopesticides by genetic engineering. 10 + 5

10. Discuss how a symbiotic relationship is established between the nodule-forming bacteria and specific plant by a flow chart. Describe the arrangement of *nif* genes in both free living and symbiotic nitrogen fixers. Mention their function.

6 + 5 + 4

11. What are cyanobacteria ? Where are they found ? How do they fix N_2 ? Are there common characteristics shared with other nitrogen fixing bacteria ? Explain why biofertilizers offers a distinct advantage over the use of chemical fertilizers. 2 + 1 + 4 + 2 + 6

12. a) What is composting ? Discuss different methods of composting.

    b) What is C : N ratio ? How is it linked to composting ?

    c) Discuss the role of microorganisms in composting process. 2 + 4 + 2 + 3 + 4

13. Write short notes on any *three* of the following : 3 × 5

    a) Integrated Pest Management (IPM)

    b) Vermicompost

    c) Symbiotic nitrogen fixation

    d) Organic ferlilizer.