



Name :

Roll No. :

Invigilator's Signature :

CS/B.TECH(BT)/SEM-8/BT-803E/2012

2012

BIO-FERTILIZER AND BIO-PESTICIDES

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) *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.
- ii) *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.
- iii) 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.



- iv) Hydrogenase enzyme found in several diazotrophs
 - a) recycles H_2 produced by nitrogenase
 - b) adds H_2 for nitrogen fixation
 - c) removes H_2 from ammonia
 - d) wastes cellular ATP.
- v) Microaerophilic prokaryote fixing nitrogen is
 - a) *Escherichia* b) *Klebsiella*
 - c) *Streptococcus* d) *Bacillus*.
- vi) Photosynthetic and nitrogen fixing genes reside side by side in
 - a) *Alcaligenes* b) *Klebsiella*
 - c) *Rhodospirillum* d) *Thiobacillus*.
- vii) Which of the following compounds inhibits nitrogen fixation ?
 - a) Only oxygen
 - b) Only ammonia
 - c) Only photosystem II apparatus
 - d) Only photosystem I apparatus.
- viii) Non-gene is found in
 - a) pine b) legume
 - c) rice d) barley.
- ix) LUBILOSA programme is made
 - a) to demonstrate the harmful effect of biopesticides
 - b) to demonstrate the harmful effect of chemical pesticides
 - c) to cause long term effect of biopesticides
 - d) to cause short term effect of biopesticides.
- x) Chitosan that allow the plant to defend itself against disease due to
 - a) naturally induced systemic resistance
 - b) artificially induced resistance
 - c) biologically induced selective resistance
 - d) none of these.



- xi) PIP stands for
 a) Polymer Induced Particle
 b) Pathogen Induced Particle
 c) Plant Incorporated Protectants
 d) none of these.
- xii) Entomo pathogenic is the product of
 a) bacteria
 b) fungi
 c) bacteria, fungi and viruses
 d) bacteria, fungi, viruses and nematodes.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. State point-wise the important features for which bio-pesticides are preferred over chemical pesticides. Name the crop cultivation process in which chemicals are not used for crop nutrition and protection. $4 + 1$
3. Give an idea on the kind of plant nutrition that is provided by using the common bio-fertilizers. Can it be possible to substitute the chemical fertilizer use in totality ? State the reasons of your conclusion. $2 + 1 + 2$
4. Write short note on any *one* of the following :
 a) Pesticidal poisoning
 b) Silent spring
 c) Environmental estrogen
 d) Chitosan.
5. Briefly explain Azolla-Anabaena symbiosis. Explain the mechanism of N_2 fixation in specialized cells of cyanobacteria. $2 + 3$
6. Describe the most modern theory for host specificity.
7. State the method of production of VAM-biofertiliser.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

8. What types of different viruses are considered as potential biopesticides ? Give short description of each of them along with their target pest ranges. Describe life cycle of NPN baculovirus in target pest. How viruses are applied in the field as pesticide ? $2 + 4 + 6 + 3$



9. Describe efforts on improvement of biopesticidal Baculovirus and fungi as more effective biopesticides by genetic engineering. 10 + 5
10. Give an outline of bulk production procedure of *Rhizobium* biofertilizer with sketches. Mention the points of care and control to have optimum production. 10 + 5
11. What are *nif*-genes ? Indicate the location of NIF genes in the diagrammatic genome of a known Nitrogen fixer bacterium like *Klebsiella pneumoniae*. How many of known discrete units together make the NIF-gene complex ? Make general comments on these gene units having specific role in N_2 fixation process. 2 + 3 + 2 + 8
12. Write short notes on any *three* of the following : 3 × 5
 - a) *Anabeana-Azolla* symbiosis
 - b) Green-manuring
 - c) Advantages of using biofertiliser
 - d) Role of enzyme hydrogenase
 - e) The process through which cyanobacteria fix atmospheric nitrogen.
13. Describe the nitrogenase enzyme system responsible for nitrogen fixation. Write the mechanism of nitrogen fixation in root nodules. Name the genes responsible for nitrogen fixation. Write their regulation. 3 + 6 + 2 + 4

=====