2021

MICROBIOLOGY — HONOURS

Paper : SEC-A-2

(Biofertilizers and Biopesticides)

Full Marks : 80

The figures in the margin indicate full marks.

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

Question no. **1** is compulsory and answer ***any six*** questions from the rest.

1. Answer ***any ten*** questions : 2×10

(a) State two advantages of biofertilizers over chemical fertilizers.

(b) Give examples of one viral and one bacterial biopesticides.

(c) Name two nitrogen fixing leguminous plants.

(d) What are 'nod' factors?

(e) State two limitations of biopesticides.

(f) Explain the mode of transmission of plant viruses.

(g) Why is there a need to switch to organic farming?

(h) How will you select efficient VAM fungi?

(i) What do you mean by mycobeads?

(j) Mention two characteristic features of *Frankia*.

(k) Which nitrogen fixing bacteria is suitable for rice cultivation? Name one inert carrier suitable for commercial production of biofertilizer.

(l) What is seed priming?

(m) What is the function of *Bacillus popillia*?

(n) Name any two complex forms present in soil from which phosphate is obtained by plants.

(o) Name two fungi used as bioinsecticides.

2. (a) Explain the mechanism of nitrogen fixation.

(b) Based on the mode of nutrition classify diazotrophs with suitable examples for each.

(c) Name two cyanobacteria who can fix atmospheric nitrogen. 4+4+2

3. (a) What is BNF Technology?

(b) '*Azospirillum* is a biofertiliser'. Explain this statement.

(c) State the benefits imparted by *Azospirillum*. 2+4+4

4. (a) Discuss 'PSM being used as a Biofertiliser for Future Prospects'.

(b) Explain any one mode of plant growth promoted by PSM. 5+5

5. (a) Classify Mycorrhiza based on the types of relationship with hosts, name and specificity.

(b) State any five benefits from mycorrhizas to plants. 5+5

6. (a) What are the three main categories of biopesticides?

(b) Discuss PIPs.

(c) Mention any three advantages of using bioinsecticides. 3+4+3

7. (a) How does EPA encourage the development and use of bioinsecticides?

(b) Explain the mechanism by which *Bacillus thuringiensis* attacks and irradicates insect attack. 5+5

8. (a) How *Azolla* can be produced in mass?

(b) Write a note on 'Importance of Application of *Azolla* in rice cultivation'. 5+5

9. (a) State the method of isolation of *Rhizobium*.

(b) What is the significance of lime pelleting? Explain the procedure briefly. 5+5

10. (a) What are the five variables that impact composting?

(b) Name two things that can not be composted.

(c) Explain different types of composting techniques. 3+2+5