

## M.Sc. Semester-3 Examination

501

Microbiology

March-2024

Time : 2-30 Hours]

[Max. Marks : 70

**Q.1. (A)** Discuss the role of various microorganisms based on their direct mechanisms in agriculture. **07**

**(B)** Describe various types of mycorrhizae and give their agricultural significance. **07**

**OR**

**Q.1. (A)** Describe the stepwise process of vermicomposting and write its advantages and applications. **07**

**(B)** Explain the role and importance of nitrogen-fixing bacteria in agriculture. **07**

**Q.2. (A)** Narrate the significance of biofertilisers. How do biofertilisers differ from chemical fertilisers? **07**

**(B)** Discuss the *in vivo* production of *Baculovirus* insecticide in detail. **07**

**OR**

**Q.2. (A)** Discuss strategies used in IPM and write their importance. **07**

**(B)** Describe the mass production of *Rhizobium* inoculant for the production of fertiliser. **07**

**Q.3. (A)** Discuss the role of *Agrobacterium* in genetic engineering with suitable illustrations. **07**

**(B)** Explain the production of pharmaceutical products using molecular pharming. **07**

**OR**

**Q.3. (A)** Describe the structure of Ti plasmid in detail. How does Ti plasmid differ from Ri plasmid? **07**

**(B)** Give a detailed note on QTL mapping. Write its significance. **07**

**Q.4. (A)** Explain the foundational elements and rationale behind setting up a plant tissue culture laboratory. What are the key considerations? **07**

**(B)** Explain cell suspension culture and establishment of cell suspension culture in PTC. **07**

**OR**

**Q.4. (A)** Provide an in-depth discussion on the media composition used in PTC. What is the significance of each component in the medium? **07**

**(B)** Explain callus initiation, callus culture, and its uses with advantages and disadvantages. **07**

P.T.O.

**Q.5.** Write 1-2 line answers to **any seven** of the following

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- a. Write the major characteristic of *Azospirillum*.
- b. What is the role of siderophores in plant growth?
- c. What is 'Azolla'?
- d. Define – 'entomopathogen'
- e. Give names of microbes used in the preparation of phosphatic fertiliser.
- f. Write limitations of protozoal insecticides.
- g. What is electroporation?
- h. Enlist chemical methods of gene transfer.
- i. What is STS?
- j. Enlist the hormones commonly used in PTC and write their function.
- k. What is totipotency?
- l. Explain the purpose of sub-culturing in plant tissue culture.

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