KAMARAJ COLLEGE (Autonomous)

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(Affiliated to Manonmaniam Sundaranar University, Tirunelveli)

(4 Pages) **Reg. No:……**

Question Code: 26E01511 **Course Code : 24USMB31**

UG Degree - End Semester Examinations, April 2026

Third Semester

B.Sc., MICROBIOLOGY

Organic Farming and Bio Fertilizer Technology

(For those who joined in July 2024 onwards)

Time : 3Hours **Maximum : 75 Marks**

PART – A (10 × 1 = 10 Marks)

Answer ALL Questions

Choose the correct answer :

CO:1 K:1 1. Which of the following is not one of the four principles of organic farming?

(a) Health (b) Profit

(c) Fairness (d) Care

CO:1 K:2 2. The organic farming helps reduce the use of non-renewable energy by:

(a) Increasing pesticide use (b) Decreasing the need for agrochemicals

(c) Using GMOs (d) Promoting monoculture

CO:2 K:2 3. What is the main benefit of square foot gardening in urban organic farming?

(a) Promotes chemical use (b) Reduces plant diversity

(c) Maximizes yield in small spaces (d) Requires large land areas

CO:3 K:1 4. The vermicomposting uses which organism to break down organic waste:

(a) Bacteria (b) Earthworms

(c) Fungi (d) Nematodes

CO:3 K:1 5. Which of the following is a nitrogen-fixing bacterium that forms a symbiotic relationship with legumes?

(a) *Azotobacter* (b) *Frankia*

(c) *Rhizobium* (d) *Nostoc*

CO:3 K:2 6. A key advantage of using bacterial biofertilizers is:

(a) Increased dependency on synthetic fertilizers (b) Soil acidification

(c) Improved soil fertility and reduced pollution (d) Reduced crop yield

CO:4 K:1 7. Which of the following cyanobacteria is commonly used as a biofertilizer in rice fields?

(a) *Nostoc* (b) *Anabaena*

(c) *Rhizobium* (d) *Azospirillum*

CO:4 K:1 8. Select the Vesicular Arbuscular Mycorrhiza (VAM) is an example of:

(a) Cyanobacteria (b) Free-living bacteria

(c) Endomycorrhizal fungi (d) Actinomycetes

CO:5 K:2 9. Which condition is critical for storing biofertilizers to maintain shelf life?

(a) High humidity and temperature (b) Exposure to direct sunlight

(c) Cool and dry conditions (d) Freezing temperatures

CO:3 K:1 10. Which organism is commonly mass-produced as a commercial biofertilizer for cereals?

(a) *Nostoc* (b) *Rhizobium*

(c) *Azotobacter* (d) VAM

PART – B (5 X 5 = 25 Marks)

Answer ALL Questions choosing either (a) or (b).

Answer should not exceed 250 words.

CO:1 K:4 11. (a) Analyze how organic farming reduces the use of non-renewable energy resources. Provide examples.

(OR)

(b) Evaluate the role of ecological services like biological control and nutrient cycling in maintaining soil fertility.

CO:2 K:3 12. (a) Describe how square foot gardening can be used to promote sustainable organic farming in urban backyards.

(OR)

(b) Design a basic layout for a mini organic farm in an urban balcony or terrace.

CO:2 K:3 13. (a) Develop a composting model using kitchen waste suitable for a small household.

(OR)

(b) Explain the vermicomposting process and its advantages in an urban organic farming system.

CO:3 K:4 14. (a) Explain the structure and function of *Rhizobium* in nitrogen fixation.

(OR)

(b) Compare *Azospirillum* and *Azotobacter* in terms of their characteristics and role in plant growth.

CO:3 K:4 15. (a) Evaluate the advantages and future potential of bacterial biofertilizers over chemical fertilizers.

(OR)

(b) Suggest ways to integrate biofertilizers into traditional agricultural practices for improved sustainability.

PART – C (5 X 8 = 40 Marks)

Answer ALL Questions choosing either (a) or (b).

Answer should not exceed 500 words.

CO:1 K:2 16. (a) Explain in detail the four principles of organic farming — health, fairness, ecological balance and care.

(OR)

(b) Discuss how crop rotation and intercropping serve as effective techniques in organic farming.

CO:2 K:6 17. (a) Explain how square foot gardening and mini farming can be implemented in small urban spaces.

(OR)

(b) Design a detailed model for a vermicomposting unit suitable for an urban household. Include required materials.

CO:3 K:2 18. (a) Describe the structure and characteristic features of any two bacterial biofertilizers.

(OR)

(b) Analyze the advantages and future perspectives of bacterial biofertilizers in sustainable agriculture.

CO:4 K:3 19. (a) Explain the structure and nitrogen-fixing capability of cyanobacterial biofertilizers like *Anabaena* and *Nostoc*.

(OR)

(b) Illustrate the structural features of endo-mycorrhizal fungi (VAM).

CO:5 K:5 20. (a) Analyze the process involved in the mass production of *Rhizobium* and *Azotobacter*

(OR)

(b) Evaluate the challenges in storage, shelf life and marketing of biofertilizers.