

KAMARAJ COLLEGE (Autonomous)

Accredited with A+ Grade by NAAC

(Affiliated to Manonmaniam Sundaranar University, Tirunelveli)

THOOTHUKUDI – 628 003

(6 Pages)

Reg. No:

Question. Code No : 25E03506

Sub Code : 24PSB021

PG Degree - End Semester Examinations, April 2025

Second Semester

M.Sc. BOTANY

SEC - Agriculture and Food Microbiology

(For those who joined in July 2024 onwards)

Time : 3 Hours

Maximum : 75 Marks

PART - A (10 × 1 = 10 Marks)

Answer ALL Questions

Choose the correct answer :

1. Which of the following is a symbiotic nitrogen-fixing bacterium?

(a) *Azotobacter*

(b) *Rhizobium*

(c) *Clostridium*

(d) *Cyanobacteria*

2. What is the primary function of Phosphate Solubilizing Microorganisms (PSMs)?
- (a) Fix atmospheric nitrogen
 - (b) Degrade organic matter
 - (c) Convert insoluble phosphate into soluble forms
 - (d) Protect plants from insects
3. Which of the following microorganisms is commonly used as a biocontrol agent against plant fungal pathogens?
- (a) *Rhizobium*
 - (b) *Azotobacter*
 - (c) *Trichoderma harzianum*
 - (d) *Anabaena*
4. Which of the following biofertilizers is effective in improving phosphorus availability to plants?
- (a) *Rhizobium*
 - (b) *Azotobacter*
 - (c) *Bacillus megaterium*
 - (d) *Frankia*
5. Which of the following is an intrinsic factor affecting microbial growth in food?
- (a) Temperature
 - (b) Relative humidity
 - (c) pH of the food
 - (d) Packaging material
6. Which organism is commonly used in the production of Single Cell Protein (SCP)?
- (a) *Penicillium*
 - (b) *Rhizobium*

- (c) *Spirulina*
(d) *Saccharomyces cerevisiae*
7. Which microorganism is commonly associated with the spoilage of dairy products?
(a) *Lactobacillus*
(b) *Clostridium botulinum*
(c) *Aspergillus niger*
(d) *Rhizopus stolonifer*
8. Which of the following causes food intoxication, not infection?
(a) *Salmonella typhi*
(b) *Staphylococcus aureus*
(c) *Escherichia coli*
(d) *Listeria monocytogenes*
9. Which of the following tools is commonly used to predict secondary structures of proteins?
(a) BLAST
(b) Clustal Omega
(c) PSIPRED
(d) ExPASy
10. Which property can be predicted using the amino acid composition of a protein?
(a) Codon usage
(b) Gene location
(c) Isoelectric point (pI)
(d) mRNA structure

PART - B (5 X 5 = 25 Marks)

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

Answer should not exceed 250 words.

11. (a) Explain the role of mycorrhizal fungi in plant growth.

(OR)

(b) What are Plant Growth Promoting Microorganisms (PGPM)? Give two examples.

12. (a) Define biocontrol and give two examples of biocontrol agents.

(OR)

(b) Write brief notes on vermicompost. Mention any five benefits.

13. (a) Write short notes on intrinsic factors influencing the growth of microorganisms in food.

(OR)

(b) List any three microbes used as a source of food and explain any one briefly.

14. (a) Explain the microbial spoilage of fish and dairy products.

(OR)

(b) Differentiate food poisoning and food intoxication.

15. (a) Explain how protein identity can be predicted based on amino acid composition.

(OR)

(b) Elucidate motifs and patterns in protein sequences.

PART – C (5 X 8 = 40 Marks)

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

Answer should not exceed 600 words.

16. (a) Discuss the role of symbiotic and free-living bacteria and cyanobacteria in agriculture.

(OR)

(b) Describe the role and importance of PGPMs and PSMs in sustainable agriculture.

17. (a) Explain the different types of biofertilizers and their application in agriculture.

(OR)

(b) Discuss the role of biocontrol agents in managing plant pests and diseases.

18. (a) Enumerate the nutritional and economic importance of mushrooms as a microbial source of food.

(OR)

(b) Elaborate Single Cell Protein (SCP)? Explain its advantages and give examples.

19. (a) Explain the spoilage of cereals, vegetables, and pickles by microorganisms.

(OR)

(b) Write notes on food preservation methods and the role of microbes in fermented foods like butter and cheese.

20. (a) Describe the prediction of physical properties of proteins based on sequence and composition.

(OR)

(b) Analyze the secondary structure prediction and folding classes of proteins.