KAMARAJ COLLEGE (Autonomous)

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(Affiliated to Manonmaniam Sundaranar University, Tirunelveli)

(4 Pages) **Reg. No:……**

Question Code: 26E00912 **Course Code : 24USBO42**

UG Degree - End Semester Examinations, April 2026

Fourth Semester

B.Sc., BOTANY

Fermentation 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. State the common method used for sterilizing fermentation media in industries:

(a) Drying (b) Autoclaving

(c) Shaking (d) Filtration by cotton plug

CO:1 K:2 2. What is the role of carbon sources in fermentation media?

(a) To serve as a primary energy source for microbial growth

(b) To reduce bacterial contamination

(c) To sterilize the medium

(d) To provide structural support

CO:2 K:1 3. Submerged fermentation is carried out in

(a) Solid substrate without free water (b) Liquid nutrient medium

(c) Agar plates (d) Soil medium

CO:2 K:2 4. Fed-batch fermentation helps to

(a) Stop microbial growth (b) Prevent substrate inhibition

(c) Reduce aeration (d) Decrease product formation

CO:3 K:1 5. The microorganism primarily involved in bread fermentation is:

(a) *Lactobacillus bulgaricus* (b) *Penicillium roqueforti*

(c) *Saccharomyces cerevisiae* (d) *Aspergillus niger*

CO:3 K:2 6. Maintenance of pure cultures is important to:

(a) Increase contamination (b) Maintain genetic stability

(c) Reduce fermentation rate (d) Alter pH

CO:4 K:1 7. Gluconic acid is industrially produced using:

(a) *Rhizopus* (b) *Clostridium*

(c) *Aspergillus niger* (d) *Bacillus subtilis*

CO:4 K:2 8. The primary raw material for beer production is:

(a) Malted barley (b) Molasses

(c) Milk (d) Soybean

CO:5 K:1 9. Amylase is an enzyme that hydrolyses

(a) Lipids (b) Proteins

(c) Starch (d) Cellulose

CO:5 K:2 10. During bioproduct recovery, centrifugation is mainly used for

(a) Cell separation (b) Enzyme denaturation

(c) Enzyme synthesis (d) Substrate preparation

PART – B (5 X 5 = 25 Marks)

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

Answer should not exceed 250 words.

CO:1 K:3 11. (a) Describe the steps involved in the preparation of a sterile microbial culture medium.

(OR)

(b) Explain how contamination can affect microbial culture preparation and suggest preventive measures.

CO:2 K:3 12. (a) Illustrate the growth curve of microorganisms in batch fermentation and explain each phase.

(OR)

(b) Explain the principles of submerged fermentation with its advantages and applications.

CO:3 K:3 13. (a) Outline the stages involved in curd formation in cheese production.

(OR)

(b) Describe how contamination can affect fermented food products.

CO:4 K:4 14. (a) Discuss the role of streptomycin in medicine and its method of production.

(OR)

(b) Examine the factors affecting yield in industrial fermentation of vinegar.

CO:5 K:4 15. (a) Describe the process of protease production under submerged fermentation.

(OR)

(b) Illustrate the major steps involved in bioproduct recovery of enzymes.

PART – C (5 X 8 = 40 Marks)

Answer ALL Questions choosing either (a) or (b).
Answer should not exceed 500 words.

CO:1 K:3 16. (a) Demonstrate the procedure for sterilizing fermentation media using moist heat and explain its significance.

(OR)

(b) Outline the steps required to maintain a pure culture of yeast for continuous industrial production.

CO:2 K:3 17. (a) Describe fed-batch fermentation process and state its advantages in industrial production.

(OR)

(b) Explain continuous fermentation process and discuss its importance in large-scale production.

CO:3 K:4 18. (a) Explain the step-by-step process of bread production using yeast fermentation.

(OR)

(b) Discuss various methods used for preservation of industrially important microorganisms.

CO:4 K:5 19. (a) Explain the process of beer production and its importance in the food industry.

(OR)

(b) Describe the uses of gluconic acid in industry and suggest methods to increase its production.

CO:5 K:5 20. (a) Elaborate the complete industrial process for microbial production of amylase.

(OR)

(b) Evaluate the challenges involved in large-scale enzyme production and suggest solutions.