

Code No. : 30419 E Sub. Code : AMMI 52

B.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2022.

Fifth Semester

Microbiology – Core

INDUSTRIAL MICROBIOLOGY AND BIOPROCESS
TECHNOLOGY

(For those who joined in July 2020 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Which growth phase is usually longer in continuous fermentation?
- (a) Log (b) Exponential
(c) Stationary (d) Death

5. Magnesium is required in the medium for _____.
- (a) Membrane stabilization
(b) Production of ATP
(c) Membrane structure and function
(d) Amino acid synthesis
6. The long exposure of batch sterilization may lead to
- (a) Purification of media
(b) Recovery of media
(c) Degradation
(d) Good quality of product
7. The separation of solid particles from the fermentation broth can be accomplished by
- (a) Centrifugation (b) Filtration
(c) Both (a) and (b) (d) None of the above
8. Which of the following is the reason for the increased surface area for oxygen transfer in a sparged bioreactor?
- (a) Bubbles (b) Turbidity
(c) Cells (d) Protein

2. Which of the following method is not used for the improvement of bacterial strain?
- (a) The parasexual cycle
(b) Conjugation
(c) Transformation
(d) Transduction
3. Which of the following is not the component of aeration and agitation system?
- (a) Impeller
(b) Baffles
(c) Stirrer gland bearing
(d) Thermometer
4. Which of the following fermentors are characterized by height to diameter ratio?
- (a) Tower fermentor
(b) Airlift fermentor
(c) Hollow fiber bioreactor
(d) Perfusion bioreactor

9. Which of the following is not used for the production of citric acid?
- (a) *Aspergillus wentii*
(b) *Bacillus licheniformis*
(c) *Candida oleophilis*
(d) *Saccharomyces cerevisiae*
10. The pH of molasses solution in the manufacture of ethanol should be
- (a) 1-2 (b) 2-3
(c) 7-9 (d) 4-5

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).
Each answer should not exceed 250 words.

11. (a) Describe the types of fermentation process.
- Or
- (b) Write in brief about strain improvement methods.
12. (a) Enlist basic functions of a fermentor.
- Or
- (b) Draw a neat and labeled diagram of a bioreactor.

13. (a) Write about sterilization methods in fermentation process.

Or

(b) Give brief note on types of fermentation media.

14. (a) Give an outline of the downstream processing operation.

Or

(b) Give a brief note on factors affecting microbial growth.

15. (a) Explain the microbial production of ethanol.

Or

(b) Write briefly about the microbial production of vitamin B₁₂.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b)
Each answer should not exceed 600 words.

16. (a) Write a brief essay on history and developments in industrial microbiology.

Or

(b) Give an account on the industrially important micro organisms.

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17. (a) Describe various methods of enzyme immobilization. Give its applications.

Or

(b) Discuss the role of aeration and agitation in large scale fermentations.

18. (a) Write in detail about the constituents of fermentation media.

Or

(b) Explain about inoculum development for yeast.

19. (a) Describe about the separation of microbial cells in down stream processing.

Or

(b) Discuss the methods and techniques used for purification of products during product recovery.

20. (a) Explain the industrial production of citric acid. Add a note on its application.

Or

(b) Explain the industrial production penicillin.

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