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M.Sc. (CBCS) DEGREE EXAMINATION,
APRIL 2020.

Fourth Semester

Microbiology — Core

**FERMENTATION AND INDUSTRIAL
MICROBIOLOGY**

(For those who joined in July 2017 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Which of the following is a downstream process?
 - (a) Product recovery
 - (b) Screening
 - (c) Media formulation
 - (d) Sterilization of media

2. _____ screening allow the determination of capability of micro organism to produce an industrially important product.
- (a) Primary
 - (b) Secondary
 - (c) Tertiary
 - (d) All of these
3. The length of the lag phase is affected by
- (a) The size of the inoculums
 - (b) Physiological condition
 - (c) Both (a) and (b)
 - (d) None of the above
4. Which of the following disrupt vortex and provide better mixing?
- (a) Baffles
 - (b) Sparger
 - (c) Impeller
 - (d) Foam breaker
5. Bubble column reactor cannot be used for
- (a) Highly viscous medium
 - (b) Low viscous medium
 - (c) Solid state medium
 - (d) Liquid state medium

6. The degree of agitation affects in fermentation process except
- (a) It increase the contact time for bubbles in the medium
 - (b) It plays a vital role in the oxygen transfer rate in agitated fermentor
 - (c) It influence coalesces of air bubbles
 - (d) It decreases thickness of liquid film at gas — liquid interface
7. Chromatography is based on the
- (a) Different rate of movement of the solute in the column
 - (b) Separation of one solute from other constituents by being captured on the adsorbent
 - (c) Different rate of movement of the solvent in the column
 - (d) None of the above
8. Which methods is used to separate compounds on the basis of their relative solubilities in two different immisible liquids
- (a) Filtration
 - (b) Liquid—liquid extraction
 - (c) Centrifugation
 - (d) Chromatography

9. Enzyme one responsible for alcoholic fermentation
- (a) Ketoloase
 - (b) Zymase
 - (c) Peroxidase
 - (d) Oxidase
10. Industrial production of streptomycin involves
- (a) Anaerobic submerged technique
 - (b) Aerobic submerged technique
 - (c) Anaerobic surface culture
 - (d) Aerobic surface culture

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Give an account on secondary screening method.

Or

- (b) Write short on role of corn steep liquor and malt extract in fermentation.

12. (a) Describe about inoculums developments.

Or

- (b) Explain basic principles of bioreactors.

13. (a) Write about solid state fermentation with uses.

Or

- (b) Give short notes on aerators and anti foaming agents.

14. (a) Write about the process, types and applications of filtration.

Or

- (b) Write note on lyophilization.

15. (a) Detail the industrial production of L glutamic acid.

Or

- (b) Discuss how vitamin B₁₂ produced in industry.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Give a detailed notes on preservation of culture.

Or

- (b) Discuss about media for industrial fermentation.

17. (a) Write about basic components and functions of fermentor.

Or

(b) Explain about microbial growth on fermentation process.

18. (a) Write about submerge state fermentation.

Or

(b) Describe different types of bioreactors.

19. (a) Explain the methods employed for extraction and purification of fermentation products.

Or

(b) Write the notes on

(i) Cell disruption

(ii) Gravity settling

20. (a) Briefly describe about principle and types of immobilization methods.

Or

(b) Explain how ethanol produced industrially.