

**LMDQ/D-23**

**MICROBIAL BIOTECHNOLOGY**

Paper : BT-302

Time : Three Hours]

[Maximum Marks : 80

**Note :** Attempt *five* questions in all, selecting *one* question from each unit. Question No. 1 is compulsory.

**Compulsory Question**

1. (a) Give importance of fed batch fermentation.  
(b) What are metallothionines?  
(c) Name two microbes involved in silage-making.  
(d) What are primary and secondary metabolites?  
(e) How baffles are important for a reactor?  
(f) What is bioseparation?  
(g) Differentiate between wine and beer.  
(h) Two phase extraction. (8×2=16)

**UNIT-I**

2. Write notes on :  
(a) Lyophilization.  
(b) Continuous fermentation.

- (c) Multistage fermentation.
  - (d) Compare and contrast batch and continuous liquid enrichment technique. (4×4=16)
3. (a) Describe continuous enrichment as a technique for isolation of industrially important microorganisms.
- (b) Discuss the scope of microbial biotechnology in the field of Health care. (8,8)

### UNIT-II

4. Write short notes on :
- (a) CSTR.
  - (b) Packed bed reactor.
  - (c) Antifoaming agents. (5,5,6)
5. (a) Explain how decrease in concentration of repressor can be used for overproduction of enzymes.
- (b) How isolation of resistant mutants can be used for overproduction of secondary metabolites? (8,8)

### UNIT-III

6. (a) Describe the enzymatic pretreatments required to use lignocelluloses as substrate for ethanol fermentation.
- (b) Under what conditions *Aspergillus niger* produces citric acid?
- (c) Give the raw materials needed for beer fermentation.

7. Write short notes on :

- (a) Glycerol.
- (b) How genetic engineering can help improving filterability and decreasing diacetyl concentration during beer fermentation?
- (c) Glutamic acid fermentation. (5,6,5)

#### UNIT- IV

8. (a) What is pretreatment of fermentation broth ? Briefly describe the chemical methods of cell disruption.
- (b) Explain the basic theory of crystallization and application in purification of bioproducts. (8,8)

9. Write short on :

- (a) SCP.
  - (b) Biotransformation of steroids.
  - (c) Baker's yeast. (5,6,5)
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