



Seat No. : \_\_\_\_\_

# OE-107

October-2025

B.Sc., Sem.-VI

## MI-310 : Microbiology (Bioprocess Technology)

Time : 2:30 Hours]

[Max. Marks : 70

- Instructions :**
- (1) All questions are compulsory.
  - (2) Figures on the right indicates marks.
  - (3) Mention correct question number against the answer.
  - (4) Draw figures wherever necessary.

1. What is submerged fermentation ? Explain difference between fed batch and continuous fermentation with advantages and disadvantages. 14

**OR**

1. (A) How scale up can be achieved in fermentation ? 7  
1. (B) Write a note on foam and pH control in fermentation. 7

2. Explain cell disruption methods in detail. 14

**OR**

2. (A) Describe the removal of microbial cells by centrifugation. 7  
2. (B) Write a note on liquid - liquid extraction. 7

3. Discuss the considerable factors in fermentation economics. 14

**OR**

3. (A) Explain the detection of fermentation product by physical methods. 7  
3. (B) Define bacterial endotoxin. How it can be detected in pharmaceutical products ? 7

4. Describe the fermentative production and industrial importance of citric acid in detail. 14

**OR**

4. (A) Describe the fermentative production of amylase from fungi. 7  
4. (B) Define antibiotic. Explain the production of penicillin. 7

5. Give short and specific answers in **1-2** lines only : (any **seven**)

**14**

- (1) What is containment ?
  - (2) Define volumetric mass transfer coefficient.
  - (3) What is solid substrate fermentation ?
  - (4) Give the names of two biological methods for effluent treatment.
  - (5) What is crystallization in DSP ?
  - (6) Write principle of depth filter.
  - (7) Justify – Biological assay is better than chemical assay.
  - (8) What is the need of controls in sterility testing ?
  - (9) Write the principle of chromatography.
  - (10) Mention two industrial uses of lysine.
  - (11) Write two names of ethanol producing organisms.
  - (12) Draw the structure of penicillin.
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