

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

# AF-129

April-2025

B.Sc., Sem.-VI

## CC-310 : Microbiology (Bioprocess Technology) (Theory)

Time : 2:30 Hours]

[Max. Marks : 70

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

1. Describe the methods used for monitoring and control of oxygen and pH of production media in a fermentation process. 14

**OR**

1. (A) Write a note on safety procedures for containment of genetically modified process organisms. 7  
(B) What is scale-up ? Elaborate on the key factors involved in scale-up. 7

2. Explain the various physico-chemical methods used for cell disruption in downstream processing. 14

**OR**

2. (A) Write a note on filtration methods used for cell separation from fermented broth. 7  
(B) Describe the membrane processes used for product concentration and recovery. 7

3. Explain in detail various approaches for bioassay of fermentation products. 14

**OR**

3. (A) Write a descriptive note on LAL test. 7  
(B) Elaborate on key points of fermentation economics. 7

4. Describe in detail the commercial production, recovery, and purification of penicillin. 14

**OR**

4. (A) Write a note on fermentative production and recovery of citric acid by *Aspergillus niger*. 7  
(B) Elaborate on the fermentative production and recovery of ethanol by *S. cerevisiae*. 7

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

**14**

- (1) What is a solid-substrate fermentation ?
  - (2) What is meant by cleanroom environment ?
  - (3) Write examples of any two antifoam agents used in foam control.
  - (4) Enlist any two liquid-liquid extraction systems used for product concentration and recovery.
  - (5) Name any two anaerobic processes used for biological treatment of industrial effluents.
  - (6) Write examples of any two fermentation products that are subjected to crystallization in finishing stage.
  - (7) Enlist any two methods used to measure cell yield in fermented broth.
  - (8) Name any two chromatographic techniques used for detection of fermentation products.
  - (9) What is the significance of positive control in sterility testing procedure ?
  - (10) Why cane molasses is the preferred carbon source in lysine fermentation ?
  - (11) Name any two bacteria that are used for commercial production of amylase.
  - (12) State any two commercial applications of citric acid.
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