

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

**AF-113**

**April-2015**

**B.Sc., Sem.-VI**

**MI-310 : Microbiology  
(Fermentation Technology)**

**Time : 3 Hours]**

**[Max. Marks : 70**

- Instructions :** (1) All questions carry equal marks.  
(2) Mention your answer number clearly in margin.  
(3) Draw diagrams wherever necessary.

1. Answer any **two** : **14**
- (i) What is the need for strain improvement ? Briefly describe the strategies for the same.
  - (ii) Explain strain improvement by modification of cell permeability.
  - (iii) Describe isolation of analogue resistant mutants and give their applications.
  - (iv) Describe strain improvement for selection of stable strains and non foaming strains.
2. Answer any **two** : **14**
- (i) Enlist methods for removal of microbial cells and suspended solids. Describe foam separation.
  - (ii) Why cell disruption is required ? Describe physico-mechanical methods for the same.
  - (iii) Describe membrane processes for product recovery.
  - (iv) Describe drying of the fermentation products.
3. Answer any **two** : **14**
- (i) How is bioassay superior to chemical assay ? Describe penicillin bioassay.
  - (ii) What is containment ? How is it determined for a fermentation process ?
  - (iii) Explain significance of clean room environment in a fermentation industry.
  - (iv) Explain the problems encountered during scale up of a fermentation process.

4. Describe any **two** : **14**
- (i) Selection of Strains, Media and Recovery for citric acid fermentation.
  - (ii) Lysine fermentation by DAP method.
  - (iii) Fermentative production of Vitamin B<sub>12</sub>.
  - (iv) Ethanol production by *Zymomonasmobilis*.
5. Answer the following in one / two lines only : **14**
- (i) What are auxotrophic mutants ?
  - (ii) What are cryoprotective agents ? Give two examples.
  - (iii) What is strain degeneration ?
  - (iv) Name two recombinant products with their therapeutic applications.
  - (v) Name two precipitants used for product recovery.
  - (vi) What are filter aids ? Give example.
  - (vii) What is HPLC ? Give its application.
  - (viii) What is dielectric constant ?
  - (ix) Name the organic solvents used for penicillin recovery.
  - (x) What is LAL test ? Give its application.
  - (xi) What is the importance of negative controls in sterility testing ?
  - (xii) Name two aerobic and two anaerobic processes used for biological treatment of effluent.
  - (xiii) Give structure for 6APA.
  - (xiv) Give two industrial applications of amylase.
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