Seat No. : _____

MA-223

May-2025

M.Sc., Sem.-II

407 : Microbiology

(Fermentation Technology)

Time : 2:30 Hours] **[Max. Marks : 70**

1. Explain the strategies used for strain improvement in large-scale microbial product formation. **14**

OR

1. (A) Give a detailed account of the methods used to isolate industrially important microorganisms. **7**

   (B) Describe various nitrogen sources used in large-scale microbial product formation. **7**

2. Describe various types of fermenters in detail with illustrations. **14**

OR

2. (A) Explain the monitoring and control of temperature and microbial biomass in fermenters. **7**

   (B) Give a detailed account of monitoring and controlling inlet and exit gas in fermenters. **7**

3. Discuss the theory of filtration and describe various types of filters used for media sterilisation at industrial-scale fermentation processes. **14**

OR

3. (A) Describe the inoculum development program for any fungal inocula and the criteria for transferring inoculum. **7**

   (B) What is KLa ? Discuss factors affecting KLa. **7**

4. Discuss the objectives of fermentation economics, factors affecting the economy and recovery costs. **14**

OR

4. (A) Discuss methods of cell disruption in detail. **7**

   (B) Explain the methods used to concentrate fermentative products with examples. **7**

5. Write **1-2** line answers to any **seven** of the following : **14**

(a) What is corn-steep liquor ?

(b) What is the yield coefficient ?

(c) What are the major advantages of lyophilisation ?

(d) What is a Tachometer ?

(e) What is the main difference between in-line and off-line sensors ?

(f) What are thermistors ?

(g) Enlist basic types of spargers.

(h) What are pseudoplastic fluids ?

(i) Explain - Millard reaction.

(j) Enlist the methods used for cell separation.

(k) What is the role of Lysostaphin in the downstream process ?

(l) Define - liquid-liquid extraction.