

Please check whether you have got the right question paper.

- N.B:
1. **All questions are compulsory.**
 2. **All questions carry equal marks.**
 3. Draw neat labelled diagrams wherever necessary.

Q.1 What is the need and criteria for improvement of strain? Enumerate various methods of strain improvement. 12

OR

Q.1 a) Describe various components of a fermenter. 06
b) Write a note on rheology of various components of media. 06

Q.2 Describe cheese fermentation and its applications. 12

OR

Q.2 a) Explain commercial ethanol production from fusel oils. 06
b) Write a note on biomass production of bacteria. 06

Q.3 Describe how to obtain polymers from microbes. 12

OR

Q.3 a) Write note on oxidoreductases as an example of biotransformation. 06
b) Describe any two bioreactor types used in secondary metabolite production from plants. 06

Q.4 Enumerate the various physical, chemical and biological methods used in effluent treatment. 12

OR

Q.4 a) Describe various methods of extraction and purification of the fermentation product. 06
b) Write a note on economics of upstream and downstream fermentation processing. 06

Q.5 Write a short note on **ANY THREE** 12

- a) Sterilization
- b) Isolation of microorganisms from various sources
- c) Lactic acid industrial production
- d) Immobilization
- e) Medicinal mushrooms
- f) Selection of callus cultures for secondary metabolite production.
