

**QP Code : 76999**

**(2½ Hours)**

**[Total Marks : 75]**

- Note :** (1) All questions are compulsory  
(2) All questions carry equal marks  
(3) Draw labelled diagrams wherever necessary

1. a. Attempt the following (Any three) 3
- i) What is the aspect ratio for a tower fermenter?
  - ii) Which type of fermenters are used for long term culture of attached dependent cell lines?
  - iii) State one basic construction principle for gas entrainer nozzle in a deep jet fermenter
  - iv) State an advantage of using an airlift fermenter?
  - v) State an application of tower fermenter
  - vi) What is a packed bed fermenter used for?
1. b. Answer the following (Any two) 12
- i) State the significance and methods of pH control in a fermenter.
  - ii) Elaborate on the working and application of an airlift fermenter with an outer loop.
  - iii) What is the significance of foam in a fermenter? How is it controlled?
  - iv) Diagrammatically explain the working of a bubble column fermenter
2. a. Do as directed (Any three) 3
- i) State any one criterion essential to be satisfied by a culture to be inoculated in a fermenter
  - ii) State one application of middle skimmings
  - iii) Define primary screening
  - iv) What is inoculum development?
  - v) What does the scale up window define?
  - vi) What is pitching?
2. b. Answer the following (Any two) 12
- i) Discuss the use of secondary screening in search for novel metabolites
  - ii) Elaborate on the various aspects to be considered in the context of scale down
  - iii) Explain the development of inocula for mycelia processes.
  - iv) Write a note on primary screening

- 3 a. Name them (**any three**) 3
- i) Starter culture used in beer manufacture
  - ii) Inoculum in Streptomycin production
  - iii) Fungi used in Citric acid production
  - iv) Edible mushroom
  - v) Precursor used in Penicillin production
  - vi) Inert support used in an acetator
- 3 b. Discuss (**any two**) 12
- i) The production of red wine
  - ii) The fermentation of beta lactum antibiotic
  - iii) Acetic acid production
  - iv) Mushroom as SCP
- 4 a. Give examples of (**any three**) 3
- i) Salts used in recovery of proteins by precipitation
  - ii) Filter aids
  - iii) Batch filters
  - iv) Flocculating agents
  - v) Detergents used in cell disruption
  - vi) Inorganic adsorbants used in Chromatography
- 4 b. Elaborate on (**any two**) 12
- i). Any two types of continuous filters
  - ii) Cell aggregation and flocculation
  - iii) Cell disruption by liquid and solid shear
  - iv) Membrane processes in DSP
- 5 Write short notes on (**any three**) 15
- i) Scale up window
  - ii) Pressure measurement in a fermenter
  - iii) Inlet and exit gas analysis
  - iv) Animal cell culture
  - v) Beer production
  - vi) Whole broth processing
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