2017

BIOTECHNOLOGY

Paper : T-402

INDUSTRIAL FOOD BIOTECHNOLOGY

Full Marks: 80
Time: 3 hrs

The figures in the margin indicate full marks for the questions

1. Answer the following questions: (1×6=6)
   a. What is liquid-liquid extraction?
   b. What is fluccolation?
   c. Name one inducer used in fermentation media.
   d. State the principle of affinity chromatography.
   e. What is the significance of $K_L a$?
   f. Name one precursor used in fermentation media.
2. State the function of the following with respect to a fermentation process: (1×5=5)
   a. Baffle
   b. Sparger
   c. Antifoam
   d. Impeller
   e. Buffer
3. Answer the following questions: (2×2=4)
   a. What are the steps in the transfer of oxygen from air bubble to cell?
   b. How is a laboratory scale fermentation vessel aerated?

4. Draw a neat and labelled diagram of a fermentor / Bioreactor. (5)

5. Write shorts notes on the following: (any four) (5×4=20)
   a. Media for inoculum development
   b. Biosensors in food bio-processing
   c. Vessels/ fermentors used for animal cell culture
   d. Techniques used industrially for medium sterilization
   e. Nano-technological applications in food processing

6. Answer in brief to the following questions: (any two) (8×2=16)
   a. Describe the types of animal cell culture media. (8)
   b. What is doubling time (t_d)? Derive the expression $t_d = \frac{0.623}{\mu_{net}}$; where μ_{net} is net specific growth rate. (1+7=8)
   c. Describe the basic modes of fermentation. (8)

7. Answer elaborately to the following questions: (any two) (12×2=24)
   a. Describe the basic and additional components of a production media. (12)
   b. Describe four (4) chromatographic techniques used to separate metabolic products. (3×4=12)
   c. Describe the physico-mechanical methods and chemical methods of cell disruption. (12)