2016

BIOTECHNOLOGY

BIT 402
INDUSTRIAL FOOD BIOTECHNOLOGY

Full Marks : 80
Time : 3 Hrs

Figures in the right hand margin indicate full marks for the question

All questions are compulsory

1. Answer the following questions: 1×10= 10
   a. Name two filter media used during downstream processing.
   b. What is flocculation?
   c. What is the principle of sedimentation?
   d. Differentiate between a submerged culture system and solid state culture system.
   e. Write the equation for net specific growth rate during batch culture.
   f. State the function of antifoam in fermentation.
   g. What is OUR?
   h. Write the principle of liquid-liquid extraction.
   i. What is the basis of separation in filtration?
   j. State the principle of chromatography.

2. Answer in short the following questions: 2×5=10
   a. Write the steps of oxygen transfer from air to cell in a fermentation media. 2
   b. Write the equation for the rate of transfer of oxygen transfer from air bubble to liquid phase. 2

P.T.O.

c. Name the categories of filtration. 2

d. Differentiate between batch and fed-batch fermentation. 2

e. What is K_La? What does it signify? 1+1=2

3. Write short notes on any four of the following: 5×4=20

a. Nanotechnology in food processing

b. Centrifugation in downstream processing

c. Modes of fermentation

d. Biosensors in food processing

e. Industrial techniques used for sterilization of media

4. Answer any two of the following questions: 8×2=16

a. What are the basic components of an animal cell culture media? Describe the types of artificial media used for animal cell culture. 3+5=8

b. Draw a neat labelled diagram of a bioreactor. State the function of the different parts in the bioreactor. 5+3=8

c. Describe the basic and the additional components of a production media. 8

5. Answer any two of the following questions: 12×2=24

a. Name the five major groups of commercially important fermentations. Describe the different types of submerged culture fermenter system. 2+10=12

b. i. Derive the equation $X = X_0 e^{\mu net^t}$ for cell concentration at any instant in a batch culture. 6+1+5=12

ii. What is doubling time (t_d)? Derive the equation of doubling time for a batch culture.

c. Describe the different methods used for cell disruption. 12

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