

Sardar Patel University

M.Sc. (Integrated) Biotechnology, Seven Semester Examination

Wednesday, 13th April, 2016

02:30 p.m. to 05:30 p.m.

PS07CIGIB3: Fermentation Technology

Note:

1. Figures to the right indicate marks. Total Marks: 70
2. Draw neat and labeled diagram, wherever necessary.

Q1. Attempt the followings. [8]

1. Which of the following components of fermentation medium help to regulate the production rather than growth of microorganisms?
A. Precursors B. Inducers C. Inhibitors D. All of these
2. _____ of the following has much higher energy as carbon source
A. Carbohydrate B. Vegetable oil C. Hydrocarbon D. Fire
3. Which of the following methods is used for sterilization of air?
A. Steam B. Filtration C. Dry Heat D. Chemicals
4. Increasing the Molybdenum content _____ resistant to salt corrosion properties.
A. Enhances B. induces C. impulses D. reduces
5. A continuous reactor in which only a turbidity is used to control the rate of cell growth or product formation is called _____.
A. Turbidostat B. pH stat C. Chemostat D. Compostat
6. If agitation rate is increased at fixed aeration,
A. K_L and a increase B. K_L increase and a decrease C. K_L decrease and a increase D. K_L and a decrease
7. If out put signal is equal to the input signal, the controller is _____.
A. Proportional B. Disproportional C. Integral D. Dereivative
8. _____ can be used to measure flow rate of liquid.
A. Magnetic flow meter B. thermal mass flow meter C. Paramagnetic gas analyzer D. pH meter

Q2. Attempt any seven of the followings [14]

1. Enlist chronological developments of fermentation processes.
2. Enlist factors affecting selection of carbon sources.
3. Write about advantages of continuous sterilization process.
4. Describe calculation of ∇ holding in 10dm^3 volume of medium.
5. Define batch, continuous and fed batch fermentation.
6. Enlist type of seals of agitation shaft.
7. Describe construction and measurement of flow rate of liquid by rotameter.
8. Enlist different types of equipments used to measure pressure.
9. Describe manual control system with suitable example.

- Q3. (a) Write a note on medium optimization, comparing different methods. [06]**
(b) Describe three ways in which medium may influence the oxygen requirement [06]
 by the organisms.

OR

- (b) Enlist properties of antifoam agents. [06]**

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(P.T.O.)

- Q4. (a) Derive the kinetics for air sterilization. [06]
(b) Describe ∇ and its significance in scale up of sterilization process. [06]
OR
(b) Draw a schematic diagram of cylindroconical vessel and waldhoff fermenter. [06]
- Q5. (a) Write a note on kinetics of fedbatch culture. [06]
(b) Define K_{La} . Enlist various parameters affecting K_{La} and explain any three of them? [06]
OR
(b) What is Newton's law of fluid rheology? Explain fluid rheology in detail. [06]
- Q6. (a) Write a note on equipments for temperature measurement and control. [06]
(b) Enlist different types of automatic control systems. [06]
OR
(b) Draw a schematic diagram of paramagnetic gas analyzer and pH control system. [06]

