Registration No. : | | | | | | | | | | |

Total number of printed pages – 2

B. Tech

PEBT 5304

Fifth Semester Back Examination – 2014

BIOCHEMICAL REACTION ENGINEERING

BRANCH : BIOTECH

QUESTION CODE : L 267

Full Marks – 70

Time – 3 Hours

*Answer Question No. **1** which is compulsory and any **five** from the rest.*
The figures in the right-hand margin indicate marks.

1. Answer the following questions : 2×10

   (a) Differentiate between order and molecularity of a reaction.

   (b) What is activation energy ?

   (c) What is a psychometric chart ?

   (d) What is enthalpy ?

   (e) Write the material balance equation.

   (f) What is adiabatic flame temperature ?

   (g) What do you understand by elementary and nonelementary reactions ?

   (h) What is a zero order reaction ?

   (i) Differentiate between homogeneous and heterogeneous reaction.

   (j) What are the different types of enzyme inhibitions ?

2. What are the different types of fermenters used for fermentation ? Write a note on batch fermenter and mixed flow fermenter. 10

P.T.O.

3. Write a note on Monod's model of growth kinetics. 5+5

The substrate concentration versus specific growth rate data were collected for growth of S. cerevisiae on glucose in a fermenter and represented as follows. Then calculate μ_m and K_s.

s (g/l)	15	12	9	6	2.5	1.7
$\mu(h^{-1})$	0.34	0.33	0.32	0.3	0.22	0.18

4. (a) Derive of Michaelis-Menten equation. 5

(b) Write a note on recycle reactor. 5

5. (a) Write the rate equation for variable volume batch following zero order rate kinetics. 5

(b) Write a note on Ideal batch reactor. 5

6. (a) Write the rate equation for constant volume batch reactor operating in 1st order reaction. 5

(b) How rate is depended upon temperature ? Derive the Arhenius's equation. 5

7. (a) Derive the expression for Briggs-Haldane relationship. 5

(b) Write a note on uncompetitive inhibition. 5

8. Write short notes on any **two** of the following : 5×2

(a) Auto catalytic reaction

(b) Eadie-Hofstee plot

(c) Fluidized bed catalytic reactors

(d) Packed bed reactors.