PG Odd Semester (CBCS) Exam., December—2016

BIOTECHNOLOGY

(3rd Semester)

Course No. : BTYCC–303

(Biochemical Engineering and Cell Technologies)

Full Marks : 70
Pass Marks : 28

Time : 3 hours

The figures in the margin indicate full marks for the questions

1. *(a)* What is fermentation? Distinguish between batch and continuous modes of fermentation. 2+8=10

(b) What is a bioreactor? 4

OR

2. *(a)* Describe the design of a stirred tank bioreactor. 7

(b) Write a note on scaling up of processes in a bioreactor. 7

3. Why are enzymes required for a reaction taking place in a bioreactor? Write about the kinetics of enzyme-catalyzed reactions in a bioreactor. 4+10=14

OR

4. Write briefly on the following : 3+4+4+3=14

(a) Rate of a reaction in a bioreactor

(b) Effect of substrate on reaction rate

(c) Factors inhibiting a reaction in a bioreactor

(d) Importance of simulation of reaction kinetics

5. *(a)* What do you mean by heat transfer in a bioreactor? 3

(b) State the factors determining the rate of heat transfer in a bioreactor. 6

(c) With the help of a diagram, explain one type of heat transfer device in a bioreactor. 5

OR

6. Explain the steps involved in liquid-solid and gas-liquid mass transfer in a bioreactor. Why is mixing important for mass transfer? 5+5+4=14

7. Write short notes on the following : 5+5+4=14

(a) Embryo transfer technology

(b) Homeobox gene expression and pattern formation

(c) Epigenetic regulation of gene expression

OR

8. *(a)* What is embryonic induction? 4

(b) Explain the molecular basis of development in animals. 10

9. Write short notes on any *two* of the following : 7×2=14

(a) ES cell technologies

(b) Applications of knockouts

(c) Regenerative medicine

(d) Human cloning and bioethics

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