PG Odd Semester (CBCS) Exam., December—2017

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

Answer **all** questions

1. *(a)* Discuss the design of a bioreactor with emphasis on ensuring safety and efficiency. 8

(b) Write a note on fed-batch fermentation. 6

OR

2. *(a)* Discuss the respective advantages and disadvantages of batch, fed-batch and continuous fermentations. 8

(b) What are photo-bioreactors? Describe how they function. 2+4=6

3. Write short notes on the following : 7×2=14

(a) Factors influencing enzyme activity in a bioreactor

(b) Monod equation and its relevance

OR

4. *(a)* Using Michaelis-Menten equation, explain how limiting substrate concentration affects the rate of a reaction in a bioreactor. 5

(b) Explain product inhibition with example. 5

(c) Explain substrate inhibition with example. 4

5. Write short notes on the following : 7×2=14

(a) Rheology and its importance in biochemical engineering

(b) Oxygen transfer in a bioreactor

OR

6. *(a)* Discuss the mechanism of heat transfer in a bioreactor. 7

(b) Write a note on the importance of heat transfer in biochemical engineering. 4

(c) How does a jacketed bioreactor help in heat transfer? 3

7. *(a)* Discuss the significance of metabolic activation and cytoplasmic rearrangement in development. 10

(b) Write about the role of DNA methylation in epigenetic regulation of gene expression. 4

OR

8. *(a)* Write about the molecular basis of development in plants. 7

(b) Discuss the applications of embryo transfer technology. 7

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

(a) Cell replacement therapy

(b) Stem cells and their applications

(c) Transgenic animals

(d) Committed cells and cellular differentiation

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