PG Odd Semester (CBCS) Exam., December—2018

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)* Define bioreactors.

(b) Write a note on continuous fermentation.

(c) What is scaling-up of a bioprocess? 3+7+4=14

OR

2. *(a)* Give the construction and design of a generalized bioreactor.

(b) What are the different types of bioreactors? 6+8=14

3. *(a)* Distinguish between true yield and observed yield in a bioreactor.

(b) Discuss about the kinetics of product formation directly coupled to energy metabolism and indirectly coupled to energy metabolism. 4+10=14

OR

4. *(a)* Discuss the factors influencing cell growth in a bioreactor.

(b) How does the rate of an enzyme catalysed reaction vary when (*i*) S K_m, (*ii*) S K_m and (*iii*) S K_m? 7+7=14

5. *(a)* What is mass transfer? Why is it important in bioprocessing?

(b) Discuss the mechanism of liquid-solid mass transfer. (2+3)+9=14

OR

6. *(a)* Why is heat transfer important in a bioreactor?

(b) Explain how heat transfer is transferred in a bioreactor between two fluids through a solid wall.

(c) Discuss the significance of power in mixing. 3+7+4=14

7. *(a)* Chalk out the steps of spermatogenesis.

(b) Differentiate between spermatogenesis and spermiogenesis.

(c) State the importance of blood tests barrier. 7+4+3=14

OR

8. *(a)* Briefly state how hormonal fluctuations relate to changes in the ovaries and uterus during a menstrual cycle.

(b) Write short notes on the following :

(i) Acrosomal reaction

(ii) Embryonic induction 8+(3+3)=14

9. *(a)* What is stem cell? Write about the properties and applications of stem cells.

(b) Write about the modes of cell commitment. (2+6)+6=14

OR

10. Write notes on the following : 7+7=14

(a) Embryonic stem cell differentiation

(b) Human cloning

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