PG Odd Semester Examination, 2022

BIOTECHNOLOGY

(3rd Semester)

Course No.: BTYCC-303

(Biochemical Engineering & Cell Technologies)

Full Marks: 70

Pass Marks: 28

Time: 3 hours

The figures in the margin indicate full marks for the questions.

1. What is a bioreactor? Discuss the design of a bioreactor. 2+12=14

Or

2. What is fermentation? Compare and contrast between batch fed batch and continuous fermentation. 2+4+4+4=14

3. State the Michaeles- Mention equation of enzume kinetics. Explain how the velocity of an enzyme catalysed reaction changes with the Km value of the enzyme. 6+8=14

Or

4. (a) What is reaction rate? How does it differ from volumetric rate of a reaction? 2+2=14

   (b) How is the product fermation in a bioreactor linked to ATP production of the cells catalysing the reaction? Explain. 10

5. Why is heat tranfer required in a bioreactor? Explain the different bioreactor designs which help in heat transfer, with the aid of suitable diagram. 4+10=14

Or

6. What is mass transfer in a bioreactor? Distinguish between solid-liquid and gas-liquid mass transfer. 4+10=14

7. Write about the technique and applications of embryo transfer technology. 14

Or

8. Write notes on the following : 7x2=14

   (i) Homeobox gene expression and pattern formation

   (ii) DNA methylation and epigenetic gene regulation.

9. What are embryonic stem cells? Write a note on ES cell technologies and their applications. 2+12=14

Or

10. Write notes on the following : 7x2=14

    (i) Regenerative medicine

    (ii) Human cloning and bioethics

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