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2903N1179

Candidate's Seat No :_____

B.Sc. Sem.-5 Examination

CC-304

Biotechnology

March-2025

Time : 2-30 Hours] [Max. Marks : 70

Question 1: How is the Michaelis-Menten equation derived, and what is its significance? (14 Marks)

OR

Question 1(A): What is the significance of an Enzyme Commission (EC) number, and how is it assigned to enzymes? (7 Marks)

Question 1(B): How do the lock-and-key and induced-fit models explain the interaction between enzymes and substrates? (7 Marks)

Question 2: How does enzyme inhibition affect biological reactions, and what are the different types of enzyme inhibition mechanisms? (14 Marks)

OR

Question 2(A): Explain the structure, function, and significance of multi-enzyme complexes in cellular metabolism. Include examples to illustrate their role in biological systems. (7 Marks)

Question 2(B): Explain the concept of isozymes. Discuss their significance in biochemical processes and provide examples of how they differ in structure and function. (7 Marks)

Question 3: Explain how can various purification techniques, which utilize protein characteristics like size, mass, and solubility, be applied to isolate and purify specific proteins? (14 Marks)

OR

Question 3(A): Explain the production of amylase and Taq polymerase. (7 Marks)

Question 3(B): What are some key industries and their specific applications where enzymes play a crucial role, and how do enzymes benefit these industries? (7 Marks)

Question 4: How is protein engineering used to modify proteins, and what are some of the methods and examples of enzyme engineering techniques applied in this field? (14 Marks)

OR

Question 4(A): What are the various methods and advantages of enzyme immobilizations. (7 Marks)

Question 4(B): Explain the working principle of biosensors and discuss their applications in various fields. (7 Marks)

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Question 5: Attempt any seven questions (2 Mark each) (14 Marks)

1. Define turnover number of an enzyme?
2. All enzymes are protein in nature. (True/False)
3. Define Km and Vmax of an enzyme.
4. What are abzymes?
5. What is the full form of NAD and PLP?
6. What are Allosteric regulators?
7. What is the difference between coenzyme and cofactor.
8. What are Isozymes?
9. Write any one commercial application of Glucose isomerase.
10. What is the function of T4 DNA ligase.
11. What is salting in and salting out?
12. Write two advantages and disadvantages of immobilization of cells.
13. What is the role of transducer in biosensor?
14. What is an example of a supercritical fluid?