



CBCS SCHEME

18BT53

Fifth Semester B.E. Degree Examination, July/August 2021 Enzyme Technology and Biotransformation

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions.

- 1 a. Which is more plausible for application lock and key hypothesis or induced – fit hypothesis? Substantiate your answer with reasons. (10 Marks)
b. Marker proteins of size 93, 67 and 30kDa migrate to distances of 0.8, 1.5 and 3.1cm respectively on a 12.5% SDS – PAGE. Calculate the distance to which a protein of size 40kDa would migrate. Also what would be the size of a protein that has travelled a distance of 2.3cm? (10 Marks)
- 2 a. On a 10% SDS-PAGE, the distances travelled by marker proteins of size 67, 44, 29 and 14kDa were 1.2, 2.4, 3.8 and 5.7cm respectively. What is the molecular weight of a dimer whose sub-units have migrated to 1.5 and 3.0 cm respectively? (10 Marks)
b. Compare covalent catalysis with metal-dependent catalysis. What is substrate strain hypothesis? (10 Marks)
- 3 a. Distinguish between NAD^+ and FAD, highlighting the significance of both in catalysis. (10 Marks)
b. Distinguish between rapid reaction kinetics and initial velocity measurement methods of monitoring enzyme catalysis. (10 Marks)
- 4 a. How is PLP different from its mode of action when compared to biotin? (10 Marks)
b. Compare TPP with coenzyme A in its mode of action. (10 Marks)
- 5 a. Upon using enzyme 'A' in solution it yielded a K_m value of 0.2mM. When the enzyme was attached to matrix 'X', by using the microencapsulation approach, the value of K_m was found to be 0.08mM. However when covalently linked to matrix 'Y' the K_m value was observed to be 0.4mM. Analyze these differences in K_m and suggest which method and matrix (X or Y) is optimal for enzyme 'A' (10 Marks)
b. Which is a better approach for enzyme immobilization – covalent bonding or physical adsorption? Why? (10 Marks)
- 6 a. Structural analysis showed that the core of enzyme 'X' had more hydrophilic amino acids while enzyme 'Y' had more number of hydrophobic amino acids in its core. What are the temperatures at which X and Y are likely to be active and why? (05 Marks)
b. Are extremogymes easy to handle in the lab as compared to extremophilic microbes from where they are isolated? If yes/no, substantiate. (10 Marks)
c. Which form would enzymes be usable in reactors-free or immobilized? Why? (05 Marks)
- 7 a. What are synzymes? Can their performance be comparable to that of native enzymes? Justify whether yes/no. (10 Marks)
b. 'SOD is a protective enzyme and saves cells from damage'. Is this statement justified? What is your opinion? (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

- 8 a. AChE or acetylcholine esterase and pseudocholineesterase are similar in structure and function. Is this statement travel false? Substantiate with reasons. (10 Marks)
- b. Distinguish between SGOT and SGPT in disease diagnosis. (05 Marks)
- c. LDH has 2 types of subunits. Compare and contrast their roles as diagnostic tools. (05 Marks)
- 9 a. Distinguish between the merits and limitations of Rhzyme vs conventional approaches in the wool industry. (10 Marks)
- b. "Enzymes like glucose oxidase have significantly influenced the food and confectionery industry". Do you agree? Justify whether yes/no. (10 Marks)
- 10 a. Distinguish between creatine and creatinine. Which can be directly estimated and why? (06 Marks)
- b. 'ACE is a vital enzyme and ACE-I also has much significance in disease therapy'. Are these statements justified? Whether yes/no, offer reasons. (08 Marks)
- c. 'Proteases have revolutionized the leather industry'. Do you agree? Whether yes/no. substantiate. (06 Marks)

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