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M.E. / M.TECH. DEGREE EXAMINATIONS, MAY 2019

Second Semester

BY18014 – ENZYME TECHNOLOGY AND INDUSTRIAL APPLICATIONS*(Biotechnology)***(Regulation 2018)****Time: Three Hours****Maximum : 100 Marks**Answer **ALL** questions**PART A - (10 X 2 = 20 Marks)**

1. Illustrate the difference between monomeric and oligomeric enzymes.
2. What are CK isoforms and state their significances.
3. Define turnover number.
4. One microgram of a pure enzyme (MW – 92,000) catalyzed a reaction at a rate of 0.50 μ moles / min under optimum conditions. Calculate specific activity of enzyme.
5. List the disadvantages of entrapment technique used for enzyme immobilization.
6. What is an economic argument for immobilization?
7. Account on affinity chromatography for purification of enzyme proteins.
8. How are enzymes used for production of fine chemicals?
9. Outline the applications of enzymes in organic synthesis with an example.
10. What is enzyme electrode? Give example.

PART B - (5 X16 = 80 Marks)

11. (a) Write in detail notes on biological importance of Pseudocholinesterase, 5 – (16)
nucleotidase, glucose-6-phosphate dehydrogenase.

(OR)

- (b) How will you classify enzymes? What is the enzyme commission nomenclature (16)
for enzymes?

12. (a) Derive the rate equations for single and multiple substrate reactions. (16)

(OR)

- (b) The hydrolysis of urea by urease is an only partially understood reaction and shows inhibition. Data for hydrolysis of the reaction are given. **(16)**

Substrate Conc.:-	0.2M		0.02M	
	1/v	I	1/v	I
(Where v- moles/l- min and I is inhibitor molar concentration.)	0.2	0	0.68	0
	0.33	0.0012	1.02	0.0012
	0.51	0.027	1.50	0.0022
	0.76	0.0044	1.83	0.0032
	0.88	0.0061	2.04	0.0037
	1.10	0.0080	2.72	0.0044
	1.15	0.0093	3.46	0.0059

- a. Determine the Michaelis – Menten constant (k_m) for this reaction.
- b. What type of inhibition reaction is this?
- c. Based on the answer to part b, what is the value of k_i .
13. (a) Describe in detail the analysis of the effectiveness factor for internal mass transfer resistance in an immobilized enzyme system. **(16)**
- (OR)**
- (b) Describe in brief about design and configuration of immobilized enzyme reactors. **(16)**
14. (a) Illustrate the different methods used to characterize enzymes. **(16)**
- (OR)**
- (b) Write in detail about the design and construction any one novel enzyme. **(16)**
15. (a) With suitable examples explain the tannery and textile industrial process of enzymes. **(16)**
- (OR)**
- (b) Discuss about enzymes for analytical and diagnostic applications. **(16)**