



**LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034**

**M.Sc. DEGREE EXAMINATION – BIOTECHNOLOGY**

**SECOND SEMESTER – APRIL 2015**

**BT 2825 - ENZYMOLOGY & ENZYME TECHNOLOGY**

Date : 21/04/2015  
Time : 01:00-04:00

Dept. No.

Max. : 100 Marks

**PART – A**

**Answer all the questions:**

**(20 marks)**

**I. Choose the correct answer:**

**(5 x 1 = 5 marks)**

- (1) The type of inhibition caused by suicide inhibitors is  
(a) Competitive (b) Non-competitive (c) Uncompetitive (d) Irreversible
- (2) The number of moles of substrate converted to product per unit time is  
(a) Enzyme activity (b) Specific activity  
(c) Turnover number (d) Michaelis constant
- (3) Enzyme immobilization by crosslinking can be done by  
(a) Calcium alginate (b) Glutaraldehyde  
(c) Hydroxyapatite (d) Carrageenan
- (4) Which one of the following enzymes is used in detergents?  
(a) Pectinase (b) Xylanase (c) Laccase (d) Protease
- (5) Diagnostic enzymes that are released into the serum due to organ damage are known as  
(a) Primary enzymes (b) Secondary enzymes  
(c) Isozymes (d) Tertiary enzymes

**II. State whether the following statements are true or false, if false give reason**

**(5 x 1 = 5 marks)**

- (6) Only the amino acids present at the active site of an enzyme are involved in product formation.
- (7) Replacement of the glutamate at the 35<sup>th</sup> position in lysozyme with serine would inactivate lysozyme.
- (8) Introduction of proline residues at specific positions in an enzyme structure improves its activity.
- (9) Bromelain is used to treat cornea scar formation after eye surgery.
- (10) Alpha amylase is a diagnostic marker enzyme for pancreas.

**III. Complete the following:**

**(5 x 1 = 5 marks)**

- (11) Ethanol acts as a \_\_\_\_\_ inhibitor of alcohol dehydrogenase when used in methanol poisoning.
- (12) \_\_\_\_\_ is a naturally occurring ribozyme.
- (13) Stability of an enzyme can be improved by introducing \_\_\_\_\_ bonds in the enzyme structure.
- (14) \_\_\_\_\_ enzyme is used in the textile industry for biopolishing.
- (15) The marker enzyme for mitochondrial inner membrane is \_\_\_\_\_.

**IV. Answer the following questions, each within 50 words only (5 x 1 = 5marks)**

- (16) What is the role of nicotinamide adenine dinucleotide in an enzyme reaction?
- (17) Why is it important to maintain a specific pH for each enzyme reaction?
- (18) Explain P.C. Stemmer's first experiment with *in vitro* recombination.
- (19) What is the application of alkaline phosphatase in genetic engineering?
- (20) What is the role of CYP2D6 enzyme polymorphism in tamoxifen response of breast cancer patients?

**PART – B**

**Answer the following, each in about 500 words only.**

**(5×8 = 40 marks)**

**Draw diagrams wherever necessary.**

21(a) Explain the importance of the active site and the changes that the substrate undergoes at the active site.

**OR**

(b) Discuss the following: (i) Coenzymes (ii) Substrate specificity

22(a) Write a note on the following: (i) Isozymes of creatine kinase (ii) Artificial enzymes

**OR**

(b) Explain ribozymes giving suitable examples.

23(a) Describe oligonucleotide-directed mutagenesis with plasmid DNA for producing novel enzymes.

**OR**

(b) Explain the natural isolate and proteomic screening methods for novel enzymes.

24(a) Give an account of the enzyme therapy for severe combined immunodeficiency and Fabry's disease.

**OR**

(b) Discuss the reporter enzymes used in genetic engineering.

25(a) Discuss the following enzyme deficiency disorders: (i) Phenylketonuria (ii) Tay Sachs disease

**OR**

(b) Write a note on the diagnostic enzymes in heart and neurological disorders.

**PART – C**

**Answer any TWO of the following, each in about 1500 words; (2×20 = 40 marks)**

**Draw diagrams wherever necessary.**

26. Write notes on:

- (i) Catalytic strategies of enzymes
- (ii) Regulation of enzymes
- (iii) Coupled reactions

27. Explain the following:

- (i) Catalytic mechanism of serine protease
- (ii) Tryptophan synthase multienzyme complex

28. Discuss the following:

- (i) Enzymes in the diagnosis of hepatic disorders
- (ii) Increasing the activity of t-RNA tyrosyl transferase by mutagenesis

29. Write notes on the enzymes used in the following:

- (i) Alcohol and starch industry
- (ii) Egg processing
- (iii) Dairy industry

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