Reg. No. : | | | | | | | | | | | | |

Question Paper Code: UC101

B.E./B.Tech. DEGREE EXAMINATION, NOV 2024

Professional Elective

Biotechnology

21BTV101- ENZYME TECHNOLOGY

(Regulations 2021)

Duration: Three hours | Maximum: 100 Marks

Answer All Questions

PART A - (10 x 2 = 20 Marks)

1.	Define stereochemical specificity of an enzyme with an example.	CO1- U
2.	What are the two models to explain the active site of enzymes?	CO1- U
3.	Lipase has a Km value of 1.5mM is studied at an initial substrate concentration of 0.041 M. After a minute, it is found that 7.3 μM of product has been produced. Calculate the value of Vo and Vmax values.	CO2- App
4.	How Ks value is related to enzyme – substrate affinity?	CO1- U
5.	Why Coomassie brilliant blue R-250 is used in electrophoresis than Coomassie brilliant blue G-250 of same? Justify your answer	CO1- U
6.	In gel electrophoresis whether the compounds with low molecular size moves faster than the higher size compounds. Justify the statement.	CO2- App
7.	Define adsorption	CO1- U
8.	Differentiate Encapsulation and cross-linking methods of Enzyme immobilization	CO2- App
9.	Classify the enzymes based on its function and give some examples for each	CO1- U
10.	The water used in enzymatic studies contains high salinity which precipitates the enzymes easily. Now suggest a unit operation to overcome this drawback and justify it.	CO2- App

PART – B (5 x 16= 80 Marks)

11.	(a)	Describe in depth the many forms of specificity and the idea of an active site using a schematic diagram.	CO1– U	(16)

Or

(b) Describe in detail on different hypothesis by which enzyme is conjugated with substrate — CO1– U — (16)

12. (a) Illustrate various inhibition ways in which the enzymatic reaction is stopped. Derive the kinetic equation for each inhibition way and draw the plots for each — CO2- App — (16)

Or

(b) A group of students is studying an enzymatic hydrolysation represented by the data. — CO2- App — (16)

[S] / 10^{-4} M	4.1	8.2	17.3	35.6
Vo / 10^{-6} M min^{-1}	2.4	4.2	8.6	13.1

create a Hanes wolf plot, and determine the values of Vmax and Km.

13. (a) Explain in detail how proteins are studied by PAGE. List its advantages and applications. — CO3- App — (16)

Or

(b) Illustrate the application of pectinase enzyme in an industrial process such as food, fermentation, textile, paper, detergent, and pharmaceutical industries. — CO3- App — (16)

14. (a) Explain in detail about immobilized enzyme and various methods for enzyme immobilization. — CO1 - U — (16)

Or

(b) Explain in detail about the application of immobilized enzymes in various industrial purposes. — CO1 - U — (16)

15. (a) In a hospital for doing a routine checkup for the In-patient, the management has given us a project to design a biosensor for detecting glucose level. Suggest me an idea and design to develop it and justify it in detail. — CO5- Ana — (16)

Or

(b) I have planned to start an analytical laboratory for testing various biological samples. Suggest me some ideas and design for developing biosensors and explain the principle behind them in detail. — CO5- Ana — (16)