

THE KAVERY ENGINEERING COLLEGE*(An Autonomous Institution)***B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV/DEC 2025***Fifth Semester**Chemical Engineering***CH3015 – Enzyme Immobilisation Technology***Regulations - 2021**Duration : 3 Hrs**Maximum : 100 Marks***PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)**

<i>Q.No</i>	<i>Questions</i>	<i>BTL</i>	<i>CO</i>	<i>Marks</i>
1.	What is catalyst?	L1	1	2
2.	List the various methods to study enzyme active site.	L4	1	2
3.	What is lock and key hypothesis?	L1	2	2
4.	What is enzyme inhibition?	L1	2	2
5.	What is enzyme immobilization? List any two methods?	L1	3	2
6.	What is matrix entrapment in enzyme immobilization?	L1	3	2
7.	List any two difference between internal and external mass transfer.	L4	4	2
8.	What is meant by electrostatic in the micro environment of an enzyme? how does electrostatic potential influence enzyme activity?	L1	4	2
9.	List two advantages of using immobilized enzyme in biosensors.	L1	5	2
10.	List any two immobilized enzymes used in the pharmaceutical industries.	L4	5	2

PART – B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)

<i>Q.No</i>	<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
11.	a i What is enzyme? explain the classification of enzyme in detail.	L2	1	8
	ii Explain the source and strategy of purification of enzyme.	L2	1	8
	Or			
	b i Explain the advantages of biocatalyst over chemical catalyst.	L2	1	8
	ii Explain the diverse mechanisms involved in enzyme catalyzed reactions.	L2	1	8
12.	a i Evaluate rapid equilibrium and steady state hypothesis in enzyme kinetics.	L5	2	8
	ii Explain the fixed incubation and kinetic methods.	L5	2	8
	Or			
	b i Explain in detail about the determination of kinetic parameters in enzyme catalyzed reactions.	L5	2	8
	ii Explain the various types of enzyme inhibition kinetics.	L5	2	8

13.	a	Outline immobilized enzyme explain the various techniques of immobilization in detail.	L1	3	16
		Or			
	b i	List the selection and characterization of matrices for enzyme immobilization.	L1	3	8
	ii	Show the effect of physical and chemical parameter on immobilized enzyme.	L1	3	8
14.	a i	Illustrate the analysis of film and pore diffusion effect in enzyme immobilization in porous matrix.	L2	4	8
	ii	Explain the mass transfer effects in heterogeneous catalyst.	L2	4	8
		Or			
	b i	Outline the significance of Thiele modulus in porous catalyst and derive the expression for effectiveness factor.	L2	4	8
	ii	Illustrate the effect of electrostatic potential of the micro environment in immobilized enzymes.	L2	4	8
15.	a i	List the different types of reactors used for immobilized enzymes, comparing their advantages and disadvantages based on substrate properties and process.	L4	5	8
	ii	Examine the crucial factors to considered during the design of an immobilized enzyme reactor, such as the choice of support material, immobilization method, management of mass transfer limitation and operational parameters.	L4	5	8
		Or			
	b i	Categorize the role of enzyme in food industry.	L4	5	8
	ii	Analyze how enzymes are applied in wool processing.	L4	5	8