

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION MAY 2026
(Second Semester)

Branch - BIOCHEMISTRY

ENZYMOLGY

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	List one coenzyme involved in oxidation-reduction reactions. a) ATP b) NAD ⁺ c) Coenzyme A d) TPP	K1	CO1
	2	Compare the holoenzyme and apoenzyme. Which statement is true? a) Holoenzyme is inactive without cofactor b) Apoenzyme includes the cofactor c) Holoenzyme is the complete active enzyme d) Apoenzyme is the complete enzyme	K2	CO1
2	3	Who proposed the lock and key hypothesis? a) Koshland b) Fischer c) Michaelis d) Lineweaver	K1	CO2
	4	Explain the role of the pyruvate dehydrogenase complex. It: a) Converts pyruvate to lactate b) Converts pyruvate to acetyl-CoA c) Breaks down glucose d) Synthesizes ATP	K2	CO2
3	5	How does competitive inhibition affect enzyme kinetics? a) Decreases Km, no change in Vmax b) Increases Km, no change in Vmax c) Decreases Vmax, no change in Km d) No effect on Km or Vmax	K1	CO3
	6	Name the hormone associated with breast cancer. a) Estrogen b) Testosterone c) Insulin d) Cortisol	K2	CO3
4	7	Choose the enzyme used in leather processing. a) Cellulase b) Protease c) Lipase d) Amylase	K1	CO4
	8	Infer why creatine kinase is measured in patients suspected of myocardial infarction ? a) It increases due to muscle cell damage b) It decreases in heart disease c) It reflects kidney function d) It indicates liver health	K2	CO4
5	9	Why are immobilized enzymes preferred in industrial processes? a) Increased stability and easy separation b) Reduced activity c) Difficult handling d) Low specificity	K1	CO5
	10	Extend the application of immobilized enzymes in biotechnology. a) Drug delivery b) Wastewater treatment c) DNA sequencing d) Vaccine development	K2	CO5

Cont...

SECTION - B (35 Marks)Answer **ALL** questions**ALL** questions carry **EQUAL** Marks

(5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Organize the steps involved in the purification and isolation of enzymes.	K3	CO1
	(OR)			
	11.b.	Apply the Michaelis-Menton equation to calculate the reaction velocity at different substrate concentrations, given the values of Km and Vmax.		
2	12.a.	Identify the key features of the active site of carboxypeptidase and describe how stereochemistry influences its substrate specificity.	K3	CO2
	(OR)			
	12.b.	Organize the components and sequential reactions of the Pyruvate dehydrogenase multienzyme complex and explain how its organization enhances catalytic efficiency.		
3	13.a.	Distinguish between reversible and irreversible enzyme inhibition, give an example.	K4	CO3
	(OR)			
	13.b.	Examine the case studies of testosterone in prostate cancer and estrogen in breast cancer, and describe how enzyme modulation is used in treatment strategies?		
4	14.a.	Classify the factors that regulate enzyme levels in blood and explain their roles with suitable examples	K4	CO4
	(OR)			
	14.b.	Compare the use of enzymes in medical diagnostics and their industrial applications with appropriate examples.		
5	15.a.	Explain the structure and catalytic action of ribozymes and how they differ from protein based enzymes?	K5	CO5
	(OR)			
	15.b.	Evaluate the role of enzymes in the biodegradation of plastics and waste, and discuss their potential in solving environmental problems.		

SECTION -C (30 Marks)Answer **ANY THREE** questions**ALL** questions carry **EQUAL** Marks

(3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Distinguish between coenzymes, cofactors, activators and inhibitors by explaining their structural features	K4	CO1
2	17	Compare the Lock-and-Key and Induced-Fit hypotheses of enzyme action with respect to enzyme specificity and substrate binding	K4	CO2
3	18	Discover the role of enzymes in the metabolism of alcohol and mushrooms, and explain how inhibition or malfunction of these enzymes can lead to toxicity.	K4	CO3
4	19	Explain how enzymes function as antioxidants and their role in preventing oxidative stress related diseases?	K5	CO4
5	20	Choose one method of enzyme immobilization and explain its principle, advantages and industrial application.	K5	CO5