

Name:

Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, May 2023

Course: Bioenergetics and Enzyme Technology

Program: B.Tech. Biotechnology

Course Code: HSBT 2007

Semester : IV

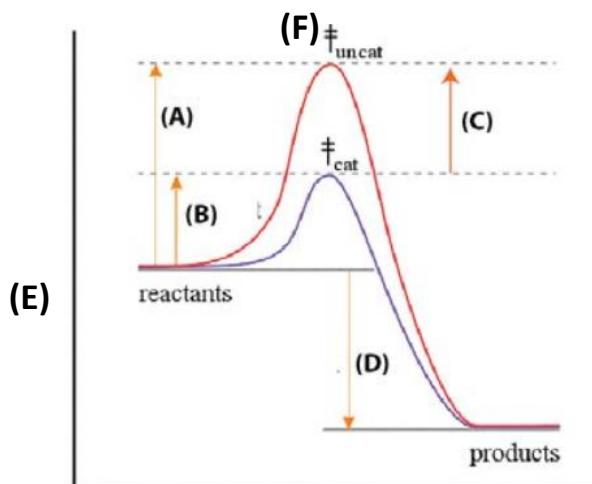
Duration : 3 Hours

Max. Marks: 100

Instructions:

S. No.	Section A Short answer questions/ MCQ/T&F (20Qx1.5M= 30 Marks)	Marks	Cos
Q 1	Which inactivates an enzyme by occupying its active site? (A) Competitive inhibitor (B) Allosteric inhibitor (C) Non-competitive inhibitor (D) All of these	1.5	CO1
Q 2	Feedback inhibition of enzyme action is affected by (A) Enzyme (B) Substrate (C) End products (D) None of these	1.5	CO1
Q 3	A sigmoidal curve of substrate concentration [S] Vs reaction velocity (V) may indicate: (A) Michaelis -Menten kinetics (B) Co-operativity binding (C) Competitive inhibition (D) Non-competitive inhibition	1.5	CO1
Q 4	Which one of the following reactions is used for recycling of enzymes in bioprocess (A) Phosphorylation (B) Isomerization (C) Immobilization (E) Acetylation	1.5	CO1
Q 5	Induced fit model of enzyme action was proposed by (A) Emil Fischer (B) Daniel Koshland (C) Peter Mitchel (D) Marie Curie	1.5	CO1
Q 6	When the velocity of enzyme reaction equals to V_{max} , substrate concentration [S] is (A) Half of K_m	1.5	CO1

	(B) Equal to K_m (C) Twice the K_m (E) Far above the K_m		
Q 7	Regulation of some enzymes by covalent modification involves addition or removal of (A) Acetate (B) Sulfate (C) Phosphate (D) Nitrogen	1.5	CO1
Q 8	Enlist biomarker enzymes for myocardial infarction.	1.5	CO1
Q 9	Recall the name of enzyme which was first crystalized.	1.5	CO1
Q 10	List the name of any enzyme with its coenzyme.	1.5	CO1
Q 11	Define Entropy.	1.5	CO2
Q 12	Isozymes are the enzymes that catalyze different reactions but are encoded by same gene (True/False).	1.5	CO2
Q 13	Explain Endergonic reaction with an example.	1.5	CO2
Q 14	Define 1 unit (1U) of enzyme activity.	1.5	CO2
Q 15	Enlist name of enzyme and its microbial source used in detergent industry.	1.5	CO2
Q 16	Enlist different factors affecting enzyme activity.	1.5	CO2
Q 17	Define Allosteric enzymes.	1.5	CO2
Q 18	Define catalytic antibodies with an example.	1.5	CO2
Q 19	Briefly explain steady state theory.	1.5	CO2
Q 20	Define turnover number.	1.5	CO2
Section B (4Qx5M=20 Marks)			
Q 1	Define immobilization and discuss its industrial importance.	2+3	CO1
Q 2	Explain the role of enzymes in diagnostics with an example.	5	CO1
Q 3	Derive the Lineweaver-Burk plot equation and explain its significance.	3+2	CO2
Q 4	Define Biosensor. Explain how biosensors can be used for detection of target analyte.	2+3	CO2
Section C (2Qx15M=30 Marks)			
Q 1	Classify enzymes in different categories with examples. Explain concerted model with a schematic.	10+5	CO3
Q 2	What enzyme does. How enzymes operate. On the diagram shown comparing the same reaction in the presence (catalyzed) and absence (uncatalyzed) of an enzyme, Label A, B, C, D, E and F.	2+4+3+6	CO4



Section D
(2Qx10M=20 Marks)

Q 1	Define reversible and irreversible inhibition and describe the followings in detail with examples about: (i) Competitive inhibition (ii) Non-competitive inhibition (iii) Reversible inhibition	2+8	CO3
Q 2	Derive Michaelis-Menten equation and explain the significance of K_m , V_{max} .	7+3	CO4