BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION SP2023)

CLASS: BTECH **SEMESTER : IV**
BRANCH: BIOTECH **SESSION : SP2023**

SUBJECT: BE216 ENZYME TECHNOLOGY

TIME: 02 Hours **FULL MARKS: 25**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates**

				CO	BL
Q1	(a)	Explain with diagram: Fischer's Lock & Key model for enzyme-substrate reaction.	[2]	CO1	BL2
Q1	(b)	Define specific activity of an enzyme. An enzyme of 1 µg, catalyzed a reaction at a rate of 0.166 µmol/min under optimum condition. Calculate the specific activity in IU/mg.	[3]	CO1	BL4
Q2	(a)	Differentiate multi-enzyme complex and multifunctional enzyme.	[2]	CO2	BL2
Q2	(b)	Derive Michaelis-Menten equation for single-substrate reaction.	[3]	CO2	BL3
Q3		Calculate Km and Vmax from the following table: (Graph not needed)	[5]	CO2	BL5

S (M)	V (nmole/L/min)
7×10^{-6}	20
8×10^{-5}	48
1×10^{-5}	60
1×10^{-3}	80
1×10^{-2}	80

Q4		For an enzyme preparation, Vmax = 22 µmole/L/min and Km = 4×10^{-5} M. what would be the velocity at 1.6 $\times10^{-5}$ M substrate and 5 $\times10^{-4}$ M uncompetitive inhibitor at Ki = 3×10^{-4} M?	[5]	CO2	BL5
Q5	(a)	An enzyme catalyzed the reaction at a velocity of 11 µmole/L/min. when the reaction is inhibited by non-competitive inhibitor, velocity reduced to 6 µmole/L/min. calculate the degree of inhibition.	[2]	CO2	BL3
Q5	(b)	Write a short note on Isoenzymes.	[3]	CO1	BL2

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