BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: B. TECH **SEMESTER: IV**
BRANCH: BIOTECH **SESSION: SP/2023**

SUBJECT: BE216 ENZYME TECHNOLOGY

TIME: 3 HOURS **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

				CO	BL
Q1	(a)	With suitable diagram, differentiate between lock and key and induced fit hypothesis of enzyme-substrate reaction.	[5]	CO1	BL2
Q1	(b)	Suppose you are determining enzyme specific activity. The sample contains 20 mg of total protein estimated by Bradford method. After incubating with substrate for 30 min you obtained the product with OD500 value of 0.87. The equation of standard plot prepared separately (OD vs. concentration) with product is Y = 0.29X. Concentration is measured in mg/mL. Calculate the specific activity of the enzyme.	[5]	CO1	BL4
Q2		Calculate graphically the value of Km and Vmax from the following data	[10]	CO2	BL5

S (M)	V (nmole/L/min)
7×10^{-6}	20
8×10^{-5}	45
1×10^{-5}	60
1×10^{-3}	75
1×10^{-2}	80

Q3	(a)	Write the schematic flow steps for purification of an intracellular enzyme.	[5]	CO3	BL2
Q3	(b)	An enzyme has a Km value of 4.7×10–5 M, and Vmax value of 25 mole/L/min. a. What will be the velocity in the presence of substrate concentration of 2.5×10–4 M and non-competitive inhibitor concentration of 3.5×10–4 M (Ki = 3×10–4 M) b. Calculate the degree of inhibition in this case.	[5]	CO3	BL5
Q4	(a)	Explain any one enzyme immobilization method. What are the advantages and disadvantages of that method?	[5]	CO4	BL3
Q4	(b)	Define effectiveness factor. Explain why do you prefer reaction rate limited regime over mass transfer rate limited regime?	[5]	CO4	BL3
Q5	(a)	With example, briefly describe multifunctional enzymes.	[5]	CO5	BL2
Q5	(b)	With reaction, explain any two enzymes that can be used for Analytical purpose.	[5]	CO5	BL3

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