JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- 2025

Ph.D.-I Semester (BT/BI)

COURSE CODE (CREDITS): 24 P1WBT231 (2)   MAX. MARKS: 25

COURSE NAME: Biochemical Calculations

COURSE INSTRUCTORS: Dr. Poonam Sharma   MAX. TIME: 1 Hour 30 Min

Note: *(a) All questions are compulsory.*

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

Q.No	Question	Marks
Q1	Which is more concentrated solution and Why? (i) 1 M (ii) 1m	3
Q2(a)	Discuss hypertonic and hypotonic solutions	3
(b)	How the spontaneity of a reaction depends upon Gibbs Free Energy?	3
Q3(a).	The conduction of heat from a hot body to a cold body is reversible or irreversible process. Explain	3
(b).	For exothermic reactions, K decreases with increasing temperature while for endothermic reactions K increases with temperature. Justify the statement	3
Q4(a).	Discuss the variation Michaelis-Menten kinetics for high substrate and low substrate concentrations	3
(b).	An enzyme with a Km value of 5 mM has a reaction rate of 200 mmol/min at a substrate concentration of 0.5 mmol. What is the maximum reaction rate that this enzyme can achieve when it is saturated with substrate?	3
Q5.	Initial rate data is listed below. Calculate Vmax and Km Lactose concentration (mol l^{-1} X 10^{2}) Initial reaction velocity (mol l^{-1} min^{-1} X 10^{3}) 2.50 1.94 2.27 1.91 1.84 1.85 1.35 1.80 1.25 1.78 0.730 1.46	4