JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2026

Ph.D.-Ist Semester (BT)

COURSE CODE (CREDITS): 24P1WBT231(2) MAX. MARKS: 15

COURSE NAME: Biochemical Calculations

COURSE INSTRUCTOR: Prof. Poonam Sharma MAX. TIME: 1 Hour

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

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

(c) Use of calculator is allowed

Q.No	Question	Marks
Q1(a)	Why do gases always tend to be less soluble in liquids as the temperature is raised?	1
(b)	Discuss the criteria for spontaneity of an reaction.	1
Q2(a)	Define isotonic, hypertonic, and hypotonic solutions based on their relative solute concentrations. Discuss the effect osmosis on cells.	2
Q3(a)	Concentrated nitric acid used in laboratory work is 68% nitric acid by mass inaqueous solution. What should be the molarity of such a sample of the acid ifthe density of the solution is 1.504 g/ mL? (Mol. Wt. of Nitric Acid =63.01 g/mol)	2
(b)	4.6 gm of ethanol dissolved in 100 g of water gave a solution of density 0.992g/mol. Find the molarity, molality, mass percentage and mole fraction	3
Q4(a)	Explain the reasons of positive and negative deviations for non-ideal solutions	2
(b)	In 250 ml of a 0.5 M NaCl solution, water is added to make the volume 500 ml. What is the concentration of resultant solution	2
Q5	Assertion (A) : A liquid crystallises into a solid and is accompanied by decrease in entropy. Reason (R) : In crystals, molecules organise in an ordered manner. (i) Both A and R are true and R is the correct explanation of A. (ii) Both A and R are true but R is not the correct explanation of A. (iii) A is true but R is false. (iv) A is false but R is true Give reasons	2

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT