

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- 2025

B.Tech-IV Semester (BI)

COURSE CODE (CREDITS): 18B11BI413 (3)

MAX. MARKS: 25

COURSE NAME: Structural Biology

MAX. TIME: 1 Hour 30 Min

COURSE INSTRUCTORS: Dr. Raj Kumar, Dr. Poonam Sharma.

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

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

Q.No	Question	CO	Marks
Q1	What is Lambert-Beer Law? Express it mathematically and give significance of each term involved.	2	3
Q2	Explain why a polar solvent usually shifts the $\pi - \pi^*$ transition to longer wavelength and $n - \pi^*$ transition to shorter wavelength.	2	3
Q3	Explain: (i) Chromophores (ii) Auxochromes (iii) Hyperchromic shift (iv) Hypochromic shift	1,2,3	4
Q4	Protein forming 20 amino acids can be classified into various groups depending on their chemical properties. Discuss some details of their classification criteria with examples.	1,3	4
Q5	Explain the role of receptor proteins in cellular signaling pathways. How do they help in transducing extracellular signals into cellular responses?	1,3	2
Q6	Hydrogen bonding plays an important role in maintaining the regularity of secondary structures in proteins. Discuss how hydrogen bonds contribute to the formation of different types of helical structures.	1,3	3
Q7	Short notes: (i) $\phi$ and $\psi$ angles (ii) Beta turns (iii) Hydrogen bond	1,3,4	$2 \times 3 = 6$