

Dr. Raj Kumar

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATIONS-2022

B.Tech-IV Semester (BT)

COURSE CODE: 18B11BI413

MAX. MARKS: 25

COURSE NAME: Structural Biology

COURSE CREDITS: 3

MAX. TIME: 1 Hour 30 Min

Note: All questions are compulsory. Marks are indicated against each question in square brackets.

- Q1. What will be the effect of a cis-conformation on energetics of a dipeptide containing arginine and phenylalanine residues? [2 Marks]
- Q2. Discuss about some differences between a motif and domain. [2 Marks]
- Q3. There are different levels of protein structures. What are possible bonded and non-bonded interactions at the tertiary level of protein structure? [2 Marks]
- Q4. There are specific and non-specific DNA binding motifs. Explain citing an example of a helix supersecondary structure specifically binding to DNA. [3 Marks]
- Q5. Describe the motif that efficiently binds to the dinucleotide coenzymes? [3 Marks]
- Q6. How will you distinguish loops from other secondary structure elements? Discuss their important characteristics. [3 Marks]
- Q7. Determine charge on following polypeptides at physiological pH. Explain your answer. [3 Marks]
- ${}^2\text{NH-ARRGAHLFKP-COOH}$
 - ${}^2\text{HN-RRGAFKLFKL-CO-NH}_2$
 - Ac-HN-KKAFLHKKF-COOH
- Q8. Discuss role of free energy in secondary conformation of proteins. Explain briefly solvent interaction with protein. [3 Marks]
- Q9. Answer/explain the followings.
- Principle of Circular dichroism spectroscopy [1 Mark]
 - Design a study to check TFE induced folding of polypeptides [1.5 Marks]
 - Draw standard CD curve for a) alpha helical conformation b) beta sheet conformation [1.5 Marks]