

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2023

B.Tech-V Semester (BIBT)

COURSE CODE(CREDITS): 18B1WBI531 (3)

MAX. MARKS: 15

COURSE NAME: Structural Bioinformatics

COURSE INSTRUCTORS: Dr. Raj Kumar

MAX. TIME: 1 Hour

Note: (a) All questions are compulsory.

(b) Marks are indicated against each question in square brackets.

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

Q1. Give a brief description of the availability and dissemination of macromolecular structural data within the global scientific community, emphasizing its open and unrestricted accessibility.

(CO-1) [2]

Q2. The primary information of macromolecular structural data is stored in the PDB archive. Describe the file format to store macromolecular structural data in the PDB database. (CO-1) [2]

Q3. Structural databases aim to provide a detailed and comprehensive description of the structural and evolutionary relationships between all proteins whose structure is known. Discuss two such databases and important differences in classifications by them. (CO-2) [2]

Q4. In a dataset comprising 200 alpha helix conformations, if the program accurately predicts 160 helices, what would be the resulting Q3 score? (CO-2) [2]

Q5. Homology modeling is an error prone method for tertiary structure prediction. Discuss potential sources and reasons for these errors. (CO-2) [2]

Q6. There are several model building steps in homology modelling. Discuss backbone generation and loop modeling steps. (CO-3) [2]

Q7. Calculate the statistical propensities of Alanine in helix conformation of the given sequence. (CO-2) [3]

10	20	30	40	50	60
ARTVVLITGCSSGIGLHLAVRLASDPSQSFKVYATLRDLKTQGRLWEAARALACPPGSLE					
70	80	90	100	110	120
TLQLDVRDSKSVAAARERVTEGRVDLVCNAGLGLLGPLEALGEDAVASVLDVNVVGTVR					
130	140	150	160	170	180
MLQAEFLPDMKRRGSGRVLVTGSGVGLMGLPFNDVYCASKFALEGLCESLAVLLLPGVHL					
190	200	210	220	230	240
SLIECGPVHTGSPEEVLDRTDIHTFHRFYQYLAHSKQVFREAAQNPEEVAEVFLTALRAP					
250	260	270	280	290	300
KPTLRYFTTERFLPLLRMLDDPSGSNYVTAMHREVFG					

MULTIPLE CHOICE EXAMINATION - SEPT 14