JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2025

B.Tech-VI Semester (BI)

COURSE CODE (CREDITS): 18B1WBI631(3) MAX. MARKS: 15

COURSE NAME: Advanced Algorithms for Bioinformatics

COURSE INSTRUCTORS: Dr. Tiratha Raj Singh 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.

Q.No	Question	CO	Marks
Q1	Explain the concepts of distances and similarities. How these two terms can be represented mathematically? What are various mathematical properties of distance and similarity in sequence alignment and analysis? Prove these with suitable examples of biological sequences.	2	3
Q2	Realize the significance of algorithm complexities through asymptotic notations. Deduce a comparative analysis of all three notations with an example.	1	3
Q3	Depict the difference between nucleotide and amino acid sequence alignments. What are the criteria's on which basis we can clearly distinguish their comparisons? Give any disease-based example where this comparison was utilized.	1	2
Q4	Discuss all the basic characteristics of an algorithm. Explain how algorithms be classified on various basis. Give example of each.	1	2
Q5	What is biological sequence alignment problem? Solve it for the given two RNA sequences using ESF alignment approach, Seq 1: AUCGGTAC ; Seq 2: AUCG. Use scoring systems as Match = 1, Mismatch = 0, Gap penalty = -1.	2	5 (1+4)