JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST -1 EXAMINATION- FEB-2023
BTech-VI Semester [BI]

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

COURSE NAME: Advanced Algorithms for Bioinformatics

COURSE INSTRUCTOR: Dr. Tiratha Raj Singh   MAX. TIME: 1 Hour

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

Q.1. Discuss 5 important characteristics of algorithms. Explain how an $O(n^2)$ algorithm can be faster than an $O(n)$ algorithm? Justify your answer with an example.   (CO-1,2) [3]

Q.2. What are similarity based approaches for gene prediction? Elaborate Exon chaining problem and write algorithm for solving the Exon chaining problem. Solve the following weighted intervals using appropriate approach: (1, 2, 1), (10, 12, 3), (8, 9, 2), (2, 6, 4), (4, 9, 6), (3, 5, 2).

(CO-2) [4]

Q.3. Write pseudocode to generate distinct sub-strings. How many distinct sub-strings will be generated from the sequence 'AGACCAGAT'?   (CO-2) [3]

Q.4. Realize the mathematical parameters of distances and similarities. What is the significance of similarity in biological sequence analysis?   (CO-1-3) [2.5]

Q.5. Write pseudocode to generate palindromes and reverse compliments together. Pen down the implication of reverse compliments in molecular biology and genetic engineering. (CO-2) [2.5]