JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST -1 EXAMINATION- FEB-2024
BTech-VI Semester [BI]

COURSE CODE(CREDITS): 18B1WBI631(3)

COURSE NAME: Advanced Algorithms for Bioinformatics

COURSE INSTRUCTOR: Dr. Tiratha Raj Singh

MAX. MARKS: 15

MAX. TIME: 1 Hour

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

Q.1. Solve the alignment problem for 2 given DNA sequences, Seq 1: TAGCCTTGC ; Seq 2: TACCTC. Use scoring systems as Match = 2, Mismatch = -1, Gap opening penalty = -3, Gap extension penalty = -2. Explain why GOP ≥ GEP?

(CO-1,2) [2]

Q.2. Discuss the significance of similarity based approach for gene prediction? Write Exon chaining problem algorithm.

(CO-2) [3]

Q.3. What is semi-global alignment? Explain it through the implementation of dynamic programming with an example.

(CO-2) [3]

Q.4. Represent distances and similarities mathematically. What arte various mathematical properties of these two terms while using in sequence analysis? Prove how scoring system is additive in nature?

(CO-1-3) [3]

Q.5. Find the solution for the given weighted intervals: [(4, 7, 5), (8, 9, 1), (11, 14, 7), (2, 4, 3), (1, 3, 3), (5, 9, 6), (10, 13, 6)]. Generate graphical solution along with the vector for the same.

(CO-2) [4]