

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- FEB-2024

B. Tech-VIII Semester [All Except Bio]

COURSE CODE(CREDITS): 21B1WBT833 (3)

MAX. MARKS: 15

COURSE NAME: Computational Biology for Engineers

MAX. TIME: 1 Hour

COURSE INSTRUCTOR: Dr. Raj Kumar, Dr. Tiratha Raj Singh, Dr. Shikha Mittal.

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

- Q.1. Discuss the significance of central dogma of molecular biology. Explain in your own terms how it is crucial for the development of Computational biology domain? (CO-1,2) [1.5]
- Q.2. How many distinct sub-strings will be generated from the sequence 'GACAGT'? (CO-2) [1]
- Q.3. Realize the mathematical parameters of distances and similarities. Align given 2 sequences ('AGTACTG' and 'AGAG') using the scoring system as follows: Match = +2, Mismatch = 0, GOP = -2, GEP = -1. (CO-2) [2.5]
- Q4. Differentiate between - (CO-1) [2]
- a) Nucleoside and Nucleotide
 - b) Transition and Transversion
- Q5. Define biological databases. Explain nucleic acid, protein and structural databases with examples (CO-1,2) [3]
- Q6. Write down the single letter codes for the given amino acids: (CO-1) [2]
- a) Alanine, c) Leucine, e) Glutamic acid, and
 - b) Cysteine, d) Aspartic acid, f) Phenylalanine
- Q7. Write the general structure of an amino acid. Write down the general equation for used to describe the polypeptide formation. (CO-1,2) [3]