

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

T1-EXAMINATION- 2026

B. Tech-VIII Semester [All except Bio]

COURSE CODE (CREDITS): 21B1WBT833 (3)

MAX. MARKS: 15

COURSE NAME: Computational Biology for Engineers

COURSE INSTRUCTOR: Dr. Raj Kumar

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

(c) Use of calculators is not allowed

Q.No	Question	CO	Marks
Q1	The % of Adenine (A) in a human DNA sample is observed to be 30%. What is the percentage of Cytosine (C) in that sample?	1	2
Q2	Create a literature search strategy from PubMed to retrieve peer-reviewed articles that discuss the long-term effects of cigarette smoking on cancer incidences in adults?	1	3
Q3	Describe the nucleotide sequences databases. Compare and contrast FASTA and GenBank formats.	2	3
Q4	What are chemical databases, and how do they serve as repositories for chemical compounds and their associated biological and physicochemical data? List some databases you know.	2	3
Q5	Align given sequences ('TCTACG' and 'CTACG') using the dynamic programming approach. Scoring system is as follows: Match = +1, Mismatch = -1, Gap = -2. Fill the matrix, do the back-tracing and generate alignment.	3	4