

D. Tinku Pat Singh

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT  
TEST -2 EXAMINATIONS April 2019

B.Tech VI Semester (BI)

Course Code: 10B11BI614

Course Name: Advanced Algorithms for Bioinformatics

Course Credits: 03

MAX. MARKS: 25

MAX. TIME: 1.5 hrs

*Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. Use of calculator is allowed.*

Q1. Find P most probable  $l$ -mer for the given sequence: **ATACTAGCTACT** from the given profile:

	1	2	3	4	5
A	1/5	0	2/5	1/5	3/5
T	0	2/5	1/5	1/5	2/5
G	2/5	3/5	1/5	2/5	0
C	2/5	0	1/5	1/5	0

(CO2-4) [4]

Q2. What are motifs? Explain motif finding problem formulation for nucleotide sequences. Justify the need of motifs analysis in genomic context. (CO2-4) [3]

Q3. What are various approaches of motif finding? Write Brute Force Motif Search algorithm and its enhanced versions. (CO2-4) [3]

Q4. Define properties and types of algorithms along with their bioinformatic applications. (CO1- 3) [3]

Q5. Discuss and prove application of linked lists and search trees for motif finding. (CO2-4) [3]

Q6. Discuss comparative analysis of two major gene prediction algorithms. (CO1-4) [3]

Q7. Differentiate between the following:

(a) Distance and similarity based approaches for motifs  
sampling (c) Quick sort and Merge sort

(b) Greedy profile motif search and Gibbs  
(CO1-4) [2\*3=6]