

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- 2024

B.Tech-VI Semester (BT/BI)

COURSE CODE (CREDITS): 18B11BI511 (3)

MAX. MARKS: 25

COURSE NAME: Design and analysis of algorithms

COURSE INSTRUCTORS: Dr. Rakesh Kanji

MAX. TIME: 1 Hour 30 Minutes

Note: (a) All questions are compulsory.

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

Q.No	Question	CO	Marks
Q1	Identify the reasons for that below relation not in Recurrence relation. Perform to correct it. $T(n)=T(n+2)+O(n)$	3	1+1
Q2	(i) Classify the recurrence relation is suitable for master theorem. (ii) If $f(n)=\theta(n^{\log_b a})$ then derive $T(n)=\theta(f(n) \log_b n)$. (iii) Solve this recurrence relation $T(n)=3T(n/3)+cn$	3	1+2+1
Q3	(i) You have 5 items with 30,40,50,60,70 rupees as tax and 10, 20,25,20,35 kgs as weight. Choose the items which minimize the tax w.r.t 40 kgs. (ii) Proof your greedy choice for above problem.	2	2+2
Q4.	(i) Justify whether we could use start lately as greedy choice to maximize activity selection problem. (ii) What is the maximum number of activity selection for the set of Activity (1,3),(0,4),(1,2),(4,6),(2,9),(5,8),(3,5),(4,5). It implies (start time, end time)? (iii) Provide the complexity of this algorithm.	2	2+2+1
Q5.	(i) Find out the Longest common subsequence of GTAATCTAAC and GATTACA. (ii) Write down the objective function for longest common subsequence with length between a and b (iii) Examine the non-triviality of Longest common subsequence	3	2+1.5+1.5
Q6.	(i) Justify the claim that 0-1 knapsack is pseudo-polynomial. (ii) What is the maximum number of times that a sub-problem are shared in matrix chain multiplication problem? (iii) What is the requirement of having variable length and prefix free encoding?	3	1+2+2