

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

(T-3 Examination May-2018)

B. Tech. 4TH Semester

COURSE CODE: 10B11CI411

MAX. MARKS: 35

COURSE NAME: Fundamental of Algorithms

COURSE CREDITS: 4

MAX. TIME: 2:00 Hrs

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

Q.1	<p>i. Explain the difference between greedy and dynamic programming approach.</p> <p>ii. Define algorithm and also specify the properties of a good algorithm.</p> <p>iii. Specify the difference between comparison based sorting and non-comparison based sorting with their merits and demerits in tabular format.</p>	3*2
Q.2	<p>i. Given a chain of 4 matrices A (5x4), B (4x6), C (6x2) and D (2x7). Find $m[1, 4]$ with dynamic programming.</p> <p>ii. Find LCS characters of a given sequence using dynamic programming and construct the solution. A = b a c a d, B = a c c b a d c b.</p>	3+3
Q.3	Write properties of Red-black tree and insert the following sequence in RB tree and shows the color and height of each node (1, 3, 4, 2, 5, 7, 9, 11, 13, 15).	1+4
Q.4	<p>Solve the followings:</p> <p>i. $T(n) = T(n/4) + T(3n/4) + n^2$</p> <p>ii. $T(n) = \sqrt{n} T(\sqrt{n}) + n$</p>	2+3
Q.5	In a given text: (abcbcadabbcdabbc), and find the pattern: (abbc) using BM algorithm or Rabin Karp and also show that how many comparisons are required to get the above pattern.	3
OR		
Differentiate P, NP, NP complete and NP hard.		
Q.6	Write an algorithm to find a shortest path for given two nodes in an un-weighted graph using BFS/DFS.	4
Q.7	Write an algorithm using Dynamic programming approach to solve modified (0, 0.5, 1) knapsack problem and also write recurrence relation.	6