JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATIONS-2022

B.Tech-IV Semester (CS/IT/ECE/Civil/BT)

COURSE CODE (CREDITS): 18B11CI412 (3) MAX. MARKS: 35

COURSE NAME: Design & Analysis of Algorithms

COURSE INSTRUCTORS: *Dr. Amit/Aman/Shubham/Monika/Rakesh.* MAX. TIME: 2 Hours

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

Q1. Solve the given modified knapsack using dynamic programming approach, [7]
(0, 0.5, 1) knapsack problem when W=5 and also write recurrence relation with complexity.

Weight	2	5	1	8	3
Profit	10	15	6	32	21

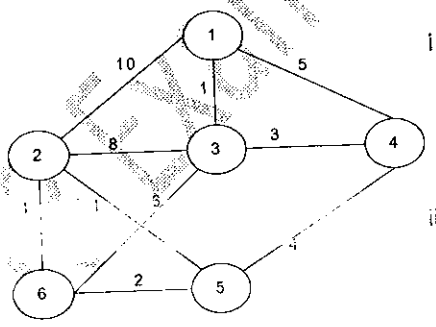
Q2. Find LCS characters of a given sequence using dynamic programming and [7]
construct the solution and also mention its recurrence and complexity to find LCS.

A = b a c a d,
B = a c c b a d c b.

Q3. Mention properties of a Red-black tree and insert the following sequence step by [7]
step in the RB tree and shows the color and height of each node and prove the complexity of the RBT is O (log n) in worst case.

Keys: (1, 3, 4, 2, 5, 7, 9, 11, 13, 15).

Q4. [5x2]



i. Differentiate between Kruskal's and Prim's algorithm for MST. Find out the MST of a given graph through the disjoint sets and also mention the complexity with different variants.

ii. If the weight "8" would be considered as "-8" the find the shortest path using a suitable algorithms

Q5. Given a chain of 6 matrices A (30x35), B (35x15), C (15x5), D (5x10), E (10x20), [4]
and F (20x25). Find m [1, 6] with dynamic programming and the write the order of multiplication.