

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- December-2018

B.Tech V Semester

COURSE CODE: 10B11CI411

MAX. MARKS:35

COURSE NAME: Fundamentals of Algorithm

COURSE CREDITS: 04

MAX. TIME: Two Hours

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

1. Define NP-class of problem. Justify, whether, $P \in NP$? Compare the recursive process of dynamic programming and divide and conquer. [1+3+3 Marks]
2. A contiguous subsequence of a list S is a subsequence made up of consecutive elements of S. For instance, if S is 5, 15, -30, 10, -5, 40, 10, then 15, -30, 10 is a contiguous subsequence but 5, 15, 40 is not. Compute the contiguous subsequence of maximum sum using dynamic programming. [7 Marks]
3. Consider two sequences X = UNIVERSITY and Y = UNIVERSAL. Find the longest common subsequence (LCS) of X and Y using Dynamic Programming. Also, write the recursive function for LCS(X, Y) and complexity. [7 Marks]
4. Write Dijkstra's algorithm on to find single source shortest path a connected weighted graph and explain its complexity. [7 Marks]
5. Suppose we want to find the minimum spanning tree of the following graph. Run Prim's algorithm: whenever there is a choice of nodes, always use alphabetic ordering (e.g., start from node A.). Draw a table showing the intermediate values of the priority queue. [7 Marks]

