

Code No: **R32053**

R10

Set No. 1

III B.Tech II Semester Supplementary Examinations, November – 2017

DESIGN AND ANALYSIS OF ALGORITHMS

(Common to Computer Science and Engineering and Information Technology)

Time: 3 hours

Max. Marks: 75

Answer any FIVE Questions
All Questions carry equal marks

- 1 a) Compare Big-oh notation and Little-oh notation. Illustrate with an example. [8M]
b) Describe best case, average case and worst case efficiency of an algorithm. [7M]
- 2 a) Describe the adjacency list representation of the graphs. [6M]
b) What is Hamiltonian cycle? Discuss a backtracking algorithm that finds all the Hamiltonian cycles in a graph [9M]
- 3 a) Analyze the time complexity of merge sort for best, average and worst cases. [8M]
b) Discuss in detail about Greedy methods. [7M]
- 4 a) What is minimum spanning tree? Explain the kruskal's algorithm to find the minimum spanning by taking an illustrative graph. [10M]
b) Write a short note on BFS. [5M]
- 5 a) Write an algorithm for 0/1 Knapsack Problem using Dynamic Programming. [7M]
b) Consider three stages of a system with $r_1=0.3, r_2=0.5, r_3=0.2$ and $c_1=30, c_2=20, c_3=30$ Where the total cost of the system is $C=80$ and $u_1=2, u_2=3, u_3=2$ find the reliability design. [8M]
- 6 a) Write dynamic programming solution for the traveling sales person problem for the network with the cost adjacency matrix. Assume node 1 as the home city. [8M]

0	10	15	30
4	0	9	11
5	13	0	10
7	7	8	0

b) Explain the matrix chain multiplication with an example [7M]
- 7 a) Describe the Backtracking technique to m-coloring graph. Explain with an example. [7M]
b) Let $w=(5,10,10,25)$ and $m=25$. Find all possible subsets of W that sum to M using fixed tuple length and variable tuple length. [8M]
- 8 a) Give brief description about the cooks theorem. [8M]
b) Briefly explain NP-hard and NP-completeness with example. [7M]
