Code No: **R32053** **R10** **Set No. 1**

III B.Tech II Semester Supplementary Examinations, Dec - 2015
DESIGN AND ANALYSIS OF ALGORITHMS
(Common to CSE and IT)

Time: 3 hours **Max. Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks
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1 a) Define and explain the terms "Time complexity" and "Space complexity" of algorithms.
b) Explain about Amortized Analysis.

2 What are Sets? How are they represented? Explain various operations on Disjoint Sets.

3 a) Write and explain the control abstraction for Divide and Conquer.
b) Briefly explain Merge Sort Algorithm with suitable example and Derive its Time Complexity.

4 a) Define Greedy Method. Explain about Knapsack Problem with an example.
b) Consider the following instance of Knapsack problem
N=3, M=20, (p1,p2,p3)=(25,24,15), (w1,w2,w3)=(18,15,10)
Calculate Maximum profit, Minimum weight and Maximum profit per unit weight.

5 a) Solve the following 0/1 Knapsack problem using dynamic programming P= (11, 21, 31, 33), W= (2, 11, 22, 15), C=40, n=4.
b) Consider three stages of a system with r1=0.3, r2=0.5, r3=0.2 and c1=30, c2=20, c3=30 Where the total cost of the system is C=80 and u1=2, u2=3, u3=2 find the reliability design.

6 a) Briefly explain n-queen problem using Backtracking. Explain its applications.
b) Briefly explain Hamiltonian cycles using backtracking.

7 a) Define the terms Branch and Bound. Explain about its general method.
b) Solve 0/1 knapsack problem using Branch and Bound.

8 Explain the principles of:
(a) Control Abstraction for LC-search, (b) Bounding and (c) FIFO Branch & Bound.

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