Code: 13A05406 **R13**

B.Tech II Year II Semester (R13) Supplementary Examinations December/January 2015/2016

DESIGN & ANALYSIS OF ALGORITHMS

(Common to CSE and IT)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

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1 Answer the following: (10 X 02 = 20 Marks)

(a) What is meant by space and time complexity?
(b) Mention the characteristics of algorithm.
(c) Define the terms merging and purging.
(d) Write the control abstraction for greedy method.
(e) Distinguish between traversal and search.
(f) Define backtracking and mention the areas where it can be applied.
(g) Compare the backtracking method with branch and bound technique.
(h) Define dominance relation.
(i) Write an algorithm to solve towers of Hanoi problem.
(j) What is optimization problem? Describe it.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2 (a) Write the procedure for locating an element by using Binary Search and find element -4 from the below set by using the above technique: { -12, -10, -8, -6, -3, 0, 10, 20, 30}.

(b) Explain sorting of elements by using the merge sort technique. Explain it with a suitable example.

OR

3 Discuss in detail about the various asymptotic notations with suitable examples.

UNIT – II

4 (a) Find the feasible and optimal solutions for the following knapsack problem. Let n = 3, m = 20, (p_1, p_2, p_3) = (25, 24, 15) and (w_1, w_2, w_3) = (18, 15, 10).

(b) Write and explain the steps for finding the minimum spanning tree by using prim's algorithm.

OR

5 Construct the optimal binary search tree for the following data. Let n = 4, (a_1, a_2, a_3, a_4) = (do, if, int, while), p(1:4)= (3, 3, 1, 1) and q (0:4) = (2, 3, 1, 1, 1)

UNIT – III

6 Explain how to measure the efficiency of backtracking techniques.

OR

7 (a) Explain in detail about the sum of sub sets problem by using dynamic programming.

(b) Describe in detail how to traverse a graph by using breadth first traversal.

UNIT – IV

8 (a) Give brief description about the general method of branch and bound.

(b) Write and explain the properties of LC search.

OR

9 (a) Explain the steps in finding the solution to a travelling sales person problem by using branch and bound.

(b) Explain the principles of FIFO branch and bound algorithm.

UNIT – V

10 (a) Write short notes on the non deterministic algorithms.

(b) Explain the classes of NP – hard and NP – complete.

OR

11 Explain the following:

(a) Clique.
(b) Satisfiability.
(c) Decision problem.

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