

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)

- 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 $n = 4$, $(a_1, a_2, a_3, a_4) = (\text{do}, \text{if}, \text{int}, \text{while})$, $p(1:4) = (3, 3, 1, 1)$ 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.