Roll No ....

CS/IT-404
B.E. IV Semester
Examination, June 2016
Analysis And Design of Algorithms

Time : Three Hours

Maximum Marks : 70

Note: i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.

ii) All parts of each questions are to be attempted at one place.

iii) All questions carry equal marks, out of which part A and B (Max.50 words) carry 2 marks, part C (Max.100 words) carry 3 marks, part D (Max.400 words) carry 7 marks.

iv) Except numericals, Derivation, Design and Drawing etc.

1. a) Discuss in which condition binary search is better than linear search.
   b) Give the definition of Big "oh" with example.
   c) Define algorithm. Discuss how to analyse algorithms.
   d) Write the procedure of Merge sort and sort the given array of 8 elements step-by-step using merge Sort 35, 18, 7, 12, 5, 23, 16, 3.

OR

Discuss Strassen's algorithm for matrix multiplication with example.

2. a) What is greedy approach?
   b) How to way merge pattern can be represented by binary merge tree?
   c) Discuss job sequencing problem by an example.

   d) Find an optimal solution to the knapsack instance $n = 3$, $m = 20$, $(p_1, p_2, p_3) = (25, 24, 15)$ and $(w_1, w_2, w_3) = (18, 15, 10)$.

OR

Given E is the set of edges in graph G. G has n vertices. Cost [u, v] is the cost of edge (u, v). T is the set of edges in the minimum-cost spanning tree. Write the pseudocode for Kruskal Algorithm by considering parameters mentioned above.

3. a) Write short note on dynamic programming.
   b) How reliability of a system is calculated?
   c) Discuss 0/1 knapsack problem.
   d) Explain multistage graphs. Discuss its applications.

OR

Discuss Floyd-Warshall algorithm. Write its pseudocode.

4. a) Define branch and bound method.
   b) Give the definition of Hamiltonian cycle.
   c) Discuss graph colouring for complete graphs.
   d) What do you understand by travelling salesman problem? Discuss with suitable example.

OR

Explain eight queen's problem and apply back tracking to solve this problem.

5. a) Write the rules to construct binary search tree.
   b) Compare DFS and BFS.
   c) Discuss polynomial time and non-polynomial time algorithms.
   d) Define height balanced tree. Explain all the rotations perform to balance the tree with example.

OR

The post order traversal of a binary tree T is D F E B G L J K H C A and inorder traversal of T is D B F E A G C L J H K. Construct the binary tree T and also writes the steps to construct the binary tree in postorder-inorder combination.

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