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M.C.A. DEGREE EXAMINATION, AUGUST/SEPTEMBER 2008.

Second Semester

DMC 1653 — DESIGN AND ANALYSIS OF ALGORITHMS

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Give examples of different types of Asymptotic notations and its equivalent function.

2. Define Big-Oh Notation.

3. Differentiate Prim's algorithm and Dijkstra's algorithm. Give example.

4. Sort the given N elements using merge sort and draw the tree structure for the Same.

5. State the "Knapsack Problem".

6. Define Optimal Solution.

7. Define subset sum problem.

8. What is meant by Backtracking and gives its application?

9. Differentiate P-Class and NP Class.

10. Define the class NP of problems.

PART B — (5 × 16 = 80 marks)

11. (a) Define Asymptotic notation and Explain the methods used to measure the efficiency of an algorithm with example. (16)

Or

(b) (i) Explain the components of Space Complexity which affect the program performance with example. (8)

(ii) Describe briefly about the worst case and average case analysis. (8)

12. (a) (i) Briefly explain about Quick Sort and analyze the same. (8)

(ii) Briefly explain about Merge sort with an algorithm and analyze the same. (8)

Or

(b) (i) Explain Prim's MST with an example. (8)

(ii) Explain single source shortest path algorithm with an example. (8)

13. (a) (i) Explain the concepts of computing a binomial coefficient. (8)

(ii) Describe the Warshall's and Floyd algorithm with example. (8)

Or

(b) (i) Explain Knapsack problem with example. (8)

(ii) Explain the concept of binary search tree with algorithm. (8)

14. (a) Explain N-Queens problem with example. (16)

Or

(b) (i) Explain the Optimality in an algorithm with example. (8)

(ii) Explain in detail about Hamiltonian circuit problem. (8)

15. (a) What are "Hard Problem" Discuss clearly, some properties of them give two examples of hard problems? (16)

Or

(b) Define an approximation algorithm for a problem. State any one classical problem and give an approximation algorithm for it. (16)

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