Reg. No. :

T 3607

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2008.

Fourth Semester

Computer Science and Engineering

CS 1201 — DESIGN AND ANALYSIS OF ALGORITHMS

(Candidates admitted in 2006 only)

(Regulation 2004)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1.   Define Big oh notation.

2.   Enumerate some important types of problems.

3.   How will you measure Input size of algorithms?

4.   What is the average case complexity of linear search algorithm?

5.   Write the procedure for selection sort.

6.   Define depth first searching technique.

7.   What is the fundamental philosophy of transform and conquer method?

8.   What is AVL tree?

9.   State if backtracking always produces optimal solution.

10. Explain briefly branch and bound technique for solving problems.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Define the asymptotic notations used for best case average case and worst case analysis of algorithms.

    (ii) Write an algorithm for finding maximum element of an array, perform best, worst and average case complexity with appropriate order notations.

    Or

    (b) Write an algorithm to find mean and variance of an array perform best, worst and average case complexity, defining the notations used for each type of analysis.

12. (a) Derive the recurrence equation for Fibonnocci series. Perform complexity analysis for the same.

    Or

    (b) Explain in detail, the techniques for algorithm visulization.

13. (a) Explain in detail quick sorting method. Provide a complete analysis of quick sort.

    Or

    (b) Explain in detail merge sort. Illustrate the algorithm with a numeric example. Provide complete analysis of the same.

14. (a)
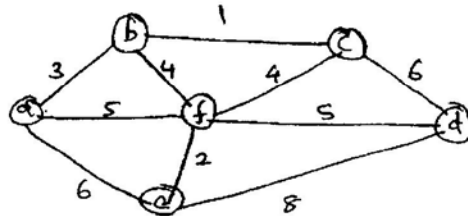
Apply Prim's algorithm and Kruskal algorithm to the graph to obtain minimum spanning tree. Do these algorithms always generate same output – Justify.

    Or

    (b) Solve the following instance of the single-source shortest-paths problem with vertex a as the source :
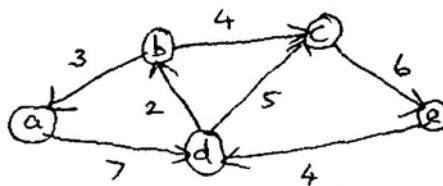
Write the algorithm, for the above problem.

15. (a) Explain N-queens problem with an algorithm. Explain why back tracking is defined as a default procedure of last resort for solving problems.

(10 + 6)

Or

(b)

	Job 1	Job 2	Job 3	Job 4
Person a	9	2	7	8
b	6	4	3	7
c	5	8	1	8
d	7	6	9	4

Consider the above matrix for assignment problem involving persons and jobs. Explain in detail how branch and bound technique is useful is solving assignment problems.

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