

Reg. No. :

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R 3235

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2007.

Third Semester

(Regulation 2004)

Computer Science and Engineering

CS 1201 — DESIGN AND ANALYSIS OF ALGORITHMS

(Common to BE (Part-Time) Second Semester Regulation 2005)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is meant by stepwise refinement?
2. How is the efficiency of an algorithm defined?
3. Give the smoothness rule applied for recurrence relation.
4. What is algorithm visualization?
5. State the time complexity of bubble sort algorithm.
6. List out any two drawbacks of binary search algorithm.
7. What is mathematical modeling?
8. What is pre-structuring? Give examples.
9. What is heuristics?
10. What is the metric used to measure the accuracy of approximation of algorithms?

PART B — (5 × 16 = 80 marks)

11. (a) (i) What are the important problem types focused by the researchers? Explain any two with example. (10)
- (ii) What is empirical analysis of an algorithm? Discuss its strength and weakness. (6)

Or

- (b) (i) Discuss the fundamentals of analysis framework. (10)
- (ii) Explain the various asymptotic notations used in algorithm design. (6)
12. (a) (i) Discuss the general plan for analyzing the efficiency of Nonrecursive algorithms. (6)
- (ii) Write an algorithm to find the number of binary digits in the binary representation of a positive decimal integer and analyse its efficiency. (10)

Or

- (b) What is the principal alternative to mathematical analysis of an algorithm? Explain the steps in analyzing the efficiency of this analysis with example. (16)
13. (a) Find the number of comparisons made by the sentinel version of sequential search algorithm for (i) in worst case and (ii) in average case. (16)

Or

- (b) Give a suitable example and explain the Depth-First search algorithm. (16)
14. (a) (i) Define Heap. Explain the properties of heap. (6)
- (ii) With a simple example explain heap sort algorithm. (10)

Or

- (b) Define spanning tree. Discuss the design steps in Kruskal's algorithm to construct minimum spanning tree with an example. (16)
15. (a) Explain subset – sum problem and discuss the possible solution strategies using backtracking. (16)

Or

- (b) Discuss the solution for Knapsack problem using branch and bound technique. (16)