

Total No. of Questions : 8]

SEAT No. :

P2009

[Total No. of Pages : 2

[4859]-1070

B. E. (Computer Engineering)

DESIGN AND ANALYSIS OF ALGORITHMS

(2012 Pattern)

Time : 2.30 Hours]

[Max. Marks :70

Instructions to the candidates:

- 1) Attempt Q1 OR Q.2 , Q.3 , OR Q.4 , Q.5 OR Q.6 , Q.7 OR Q.8
- 2) Figures to the right indicate full marks.
- 3) Draw neat diagram wherever necessary.
- 4) Make suitable assumptions wherever necessary.

- Q1)** a) Write control abstraction for Divide and Conquer Strategy and comment on its generalized recurrence equation. [6]
- b) Find an optimal solution for following 0/1 Knapsack problem using dynamic programming: Number of Objects $n = 4$, Knapsack Capacity $M = 5$, Weights $(W_1, W_2, W_3, W_4) = (2, 3, 4, 5)$ and profits $(P_1, P_2, P_3, P_4) = (3, 4, 5, 6)$. [6]
- c) Write a short note on graph coloring problem. Write algorithm for the same. [8]

OR

- Q2)** a) Calculate the worst case time complexity of $f(n) = 6n(n^3 - n) + 9n$ using running time complexity. [6]
- b) Write an algorithm for optimum binary search tree. [6]
- c) Explain in detail with one example Travelling Salesperson Problem using branch and bound method. [8]

OR

- Q3)** a) Write non deterministic algorithm for Clique decision problem. [8]
- b) Prove that Vertex cover problem is NP Complete. [8]

OR

- Q4)** a) Write a short note on Randomized algorithm. [8]
- b) Write non deterministic algorithm for sorting elements in non-decreasing order. [8]

P.T.O.

- Q5)** a) Explain how graph problems can be solved using parallel algorithm. [8]
b) Write Kruskal's algorithm using parallel computing to find minimum spanning tree. Explain with a suitable example. [8]

OR

- Q6)** a) Write an algorithm for finding Parallel shortest paths. Also comment on the time complexity of this algorithm. [8]
b) Write an odd-even merge sort algorithm. Explain with a suitable example. [8]
- Q7)** a) Give and explain Dijkstra-Scholten algorithm. [9]
b) What is Embedded system? Explain Embedded system Scheduling. [9]

OR

- Q8)** a) Define Internet of things (IoT). Explain elements of IoT. [9]
b) Give and explain Algorithms in Software Engineering with example. [9]

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