[5154]-671

B.E.(Computer Engineering)
DESIGN AND ANALYSIS OF ALGORITHMS
(2012 Course) (Semester-I) (410441)

Time : 2½ Hours]   *[Max. Marks : 70*

Instructions to the candidates:

1)   Attempt Q.1 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 diagrams wherever necessary.

4)   Make suitable assumptions wherever necessary.

Q1) a)   Explain Big Oh (O), Omega (Ω) and Theta (θ) notations in detail along with suitable examples.   **[6]**

b)   Write an algorithm for Knapsack problem using Greedy Strategy.   **[6]**

c)   Write a short note on 8-queens problem. Write algorithm for the same.**[8]**

OR

Q2) a)   Calculate the Average case time complexity of $f(n) = 3n(n^2-n)+ 2n + 5$ using running time complexity.   **[6]**

b)   Write an algorithm for optimum binary search tree.   **[6]**

c)   Explain in detail backtracking strategy and give control abstraction for the same.   **[8]**

Q3) a)   Give and explain relationship between P, NP, NP complete and NP Hard.   **[8]**

b)   Explain Non-Deterministic clique problem along with algorithm.   **[8]**

OR

Q4) a)   Give and Explain Non-Deterministic sorting algorithm.   **[8]**

b)   Prove that Vertex cover problem is NP-complete.   **[8]**

Q5) a) Explain in detail Dining philosopher's problem. **[8]**

b) Give and explain Minimum Spanning Tree algorithm. **[8]**

<div align="center">OR</div>

Q6) a) Write an algorithm for finding Parallel shortest paths. Also comment on the time complexity of this algorithm. **[8]**

b) Explain in detail with example Sequential and Parallel computing. **[8]**

Q7) a) Give and explain Dijkstra-Scholten algorithm. **[9]**

b) Explain in detail Sorting algorithm for embedded Systems. **[9]**

<div align="center">OR</div>

Q8) a) Write a short note on Internet of Things Algorithm. **[9]**

b) Give and explain String matching algorithm. **[9]**

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