

Total No. of Questions : 10]

SEAT No. :

**P3189**

[Total No. of Pages : 2

**[5670]-291**

**B.E. (Computer Engineering)**  
**DESIGN & ANALYSIS OF ALGORITHM**  
**(2012 Pattern) (Semester - I)**

*Time : 2½ Hours]*

*/Max. Marks :70*

*Instructions to the candidates:*

- 1) Answer any four questions Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8 and Q9 or Q10.
- 2) Assume Suitable data wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Draw neat & labelled diagram wherever necessary.

- Q1)** a) Write the control abstraction for Greedy Algorithm. [4]  
b) Write an algorithm for Merge Sort. Derive the time complexity of Merge sort algorithm. [6]

OR

- Q2)** a) Define asymptotic notations. Explain their significance in analyzing algorithms [6]  
b) With respect to dynamic programming, Explain in brief the following: [4]  
i) Optimal Substructure.  
ii) Overlapping Subproblem.

- Q3)** a) Write an algorithm for solving the problem of optimal binary search tree. Give its Time Complexity. [6]  
b) Write a scheme for an iterative backtracking method. [4]

OR

- Q4)** a) Write the Control Abstraction for backtracking. What are the constraints that must be satisfied while solving any problem using backtracking? [6]  
b) What is n-Queen's problem? Generate the state space tree for n=4. [4]

**P.T.O.**

- Q5)** a) What is the basic difference between deterministic and non deterministic algorithm. [4]  
b) Prove that vertex cover problem is NP complete. [6]  
c) When do you say that an algorithm is of a polynomial complexity? [6]

OR

- Q6)** a) Explain in brief NP complete problem. Prove that the clique decision problem (CDP) is NP-complete. [8]  
b) Prove that the problem of determining whether there is a Hamiltonian circuit in an undirected graph is NP complete. [8]

- Q7)** a) Explain Amdahl's law & Brent's theorem. [6]  
b) Differentiate between the modules of computation for parallel computation. [4]  
c) Explain Concurrent Algorithms for Dining philosopher's problem. [6]

OR

- Q8)** a) When the parallel algorithms are work optimal". Explain performance parameters for parallel algorithms. [8]  
b) Explain in brief how parallel algorithm can be used for finding shortest paths of a given graph. [8]

- Q9)** a) Explain method for dynamically selecting a coordinator Bully Election algorithm. [9]  
b) Explain Boyer-Moore String Matching Algorithm. [9]

OR

- Q10)** a) Explain Power optimized scheduling i.e. embedded sorting algorithm for embedded systems. [9]  
b) Write a short note on wrt IoT. [9]  
i) Context Management.  
ii) Data management algorithms and clustering.  
iii) Data Science project life Cycle (DSPLC).



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