

Total No. of Questions : 8]

SEAT No. :

**P3847**

**[5561]-275**

[Total No. of Pages : 2

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

*Time : 2½ Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.
- 2) Neat diagram must be drawn whenever necessary.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data if necessary.

- Q1)** a) What is Amortized analysis and how it differs from Average Case analysis? [8]  
b) Write an algorithm to solve Knapsack problem using greedy strategies. [8]  
c) Explain in details in control abstraction for LC Search. [4]

OR

- Q2)** a) Write the algorithm for Merge Sort. Derive the time complexity for the same. [8]  
b) Find an optimal solution for the following instance using job sequencing with Scheduling: Number of jobs  $n = 4$ , profits = (100, 27, 15, 10), deadlines = (2, 1, 2, 1). [8]  
c) State the Principle of backtracking algorithm. [4]

OR

- Q3)** a) What do you mean by P, NP, NP - Hard and NP - Complete Problems? Give an example of each category. [8]  
b) What is Non-deterministic algorithm? Write the Non-deterministic algorithm for sorting the element of an array. [8]
- Q4)** a) What is NP-Complete problem explain in detail with example. [8]  
b) Explain complexity classes P and NP also differentiate between NP complete and NP hard class. [8]

**P.T.O.**

- Q5) a)** Explain how parallel computations are possible using complete binary tree. **[8]**  
**b)** Write short note on optimal parallel algorithms. **[8]**

OR

- Q6) a)** How parallel computing can be applied to obtain minimum spanning tree? **[8]**  
**b)** Explain in detail the models for parallel computing. **[8]**

- Q7) a)** Illustrate with example Floyd - Warshall Algorithm. **[9]**  
**b)** State different software engineering algorithms and explain in brief. **[9]**

OR

- Q8) a)** Write a short note on following wrt IoT. **[9]**  
i) Cryptography algorithms  
ii) Data management algorithms and clustering  
**b)** Explain in detail Bully algorithm for dynamically selecting a coordinator in Distributed system. **[9]**