Roll No. .....

23068

M. Tech. 1st Semester (Computer Engg.) Examination – December, 2014

ANALYSIS & DESIGN OF ALGORITHMS

Paper : MTCE-605 - A

Time : Three Hours] *[Maximum Marks : 100*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt any *five* questions. All questions carry equal marks.

1. Explain Master method in detail. Also solve following recurrence relation using Master method : 20

(i) $T(n) = 3T(n/4) + n \lg n$

(ii) $T(n) = 2T(n/2) + n \lg n$

2. (a) What is Hashing ? Write the advantages of it over direct addressing. 10

(b) Write and explain Dijkastra's algorithm with the help of example. 10

3. (a) Differentiate between greedy method and dynamic programming. 8

(b) Find the optimal solution of Traveling Salesman problem using dynamic approach whose adjacency matrix is given below. 12

$$\begin{bmatrix} 0 & 10 & 15 & 20 \\ 5 & 0 & 9 & 10 \\ 6 & 13 & 0 & 12 \\ 8 & 8 & 9 & 0 \end{bmatrix}$$

4. What is 8-Queen problem ? How it can be solved using backtracking ? Explain in detail. 20

5. (a) State and Prove cook's theorem. 10

(b) Differentiate the following : 10

(i) Differentiate fractional and 0/1 knapsack problem.

(ii) NP hard and NP Complete Problem.

6. (a) Explain fully polynomial time approximation scheme. 10

(b) Write and explain Naive string matching algorithm. 10

7. (a) Discuss the process of insertion in Red-Black tree along with its complexity. 10

(b) Explain LC branch and bound techniques. 10

8. Describe the following : 20

(i) Amortized time analysis,

(ii) Priority Queue,

(iii) Hamilton Cycle,

(iv) PRAM Model.
