Registration No. : | | | | | | | | | | |

Total number of printed pages – 2

B. Tech

BCSE 3301

Fifth Semester (Special) Examination – 2013

DESIGN AND ANALYSIS OF ALGORITHMS

BRANCH : CSE, IT

QUESTION CODE : D271

Full Marks – 70

Time : 3 Hours

*Answer Question No. **1** which is compulsory and any **five** from the rest.*

The figures in the right-hand margin indicate marks.

1. Answer the following questions : 2×10

(a) What is Big 'Oh' notation ?

(b) What are the characteristics of an algorithm ?

(c) Define Big Omega Notations.

(d) Define the divide an conquer method.

(e) Describe the recurrence relation for merge sort.

(f) Explain the greedy method.

(g) Define dynamic programming.

(h) What is class P and NP ?

(i) Prove that 100n+5 Î O (n2).

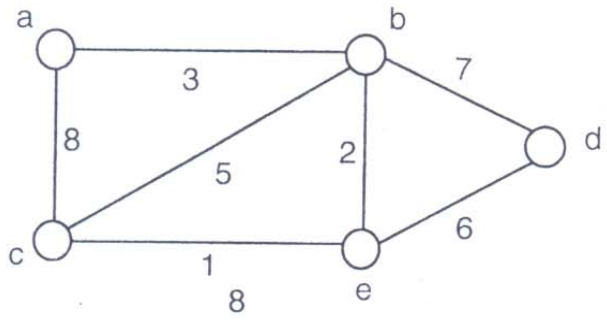
(j) What is the use of Asymptotic Notations ?

2. (a) Show that the solution of $T(n) = 2T\left(\left\lfloor \sqrt{n} \right\rfloor\right) + \lg n$ is O (lgn lg [(lgn).] 5

(b) What is heap property ? Illustrate the operation of MAX-HEAPIFY(A,3) on the array A=<27,17,3,16,13,10,1,5,7,12,4,8,9 >. 5

P.T.O.

3. Find all pair shortest path of the given grap G below : 10



4. (a) What is Knapsack problem ? What are it's constraints ? 5

(b) Write a recursive activity selector procedure for Activity Selection Problem. 5

5. (a) Prove that Kruskal algorithm is correct. 5

(b) Write an Approximation algorithm for Travelling salesman problem. 5

6. (a) What is Backtracking ? Explain Backtracking on 4-Queen Problem. 5

(b) Prove that

If $L_1, L_2 \subseteq \{0.1\}^-$ are languages such that $L_1 \leq_p L_2$, then $L_2 \in P$ implies $L_1 \in P$ 5

7. Define Dynamic Programming. Find an optimal parenthesization of matrix-chain product, whose sequence of dimensions is <20,15,5,10,8,12,25>. 10

8. (a) Prove that Hamilton Cycle decision problem in a graph G is NP Class. 5

(b) Prove that P P $\subseteq$ NP. 5