Code: R7310506

R7

B.Tech III Year I Semester (R07) Supplementary Examinations, May 2013

DESIGN ANALYSIS OF ALGORITHMS

(Computer Science and Engineering)

Time: 3 hours Max Marks: 80

Answer any FIVE questions

All questions carry equal marks

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1 (a) If S is a set of n elements, the power of set S is the set of all possible subsets of S. Write a recursive algorithm to compute power set(S).

(b) Give the step table for the following algorithm.

```
algorithm sum( a, n)
{
        S := 0.0;
        for i := 1 to n do
        S := S  + a[ i ]
        return S;
}
```

2 (a) Write a short note on spanning trees.

(b) What are connected and bi-connected components? Explain.

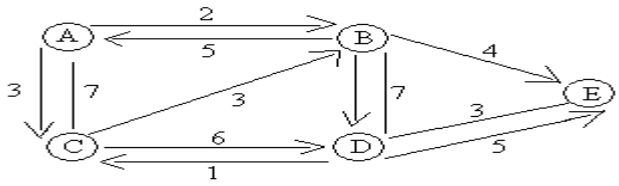
3 (a) Explain the sorting of elements by using merge sort technique.

(b) Present a Iterative algorithm for binary search.

4 (a) What are the differences between greedy method and divide-and-conquer method?

(b) Give brief description about the following terms:
(i) Feasible solution. (ii) Optimal solution. (iii) Object function.

5 Find the shortest path b/w all pairs of nodes in the following graph:



6 (a) Write a back-tracking program for the sum of subsets problem using the state space tree corresponding to the variable tuple size formulations.

(b) Prove that the size of the set of all subsets of n elements is 2^n.

7 (a) Explain the properties of LC-search.

(b) Device an algorithm for least cost answer node using FIFOBB.

8 (a) Show that the SET-COVER problem is in NP.

(b) Show that the SUBSET-SUM problem is in NP.

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