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Total No. of Pages : 02

Total No. of Questions : 18

**B.Tech. (CSE) (2018 Batch) (Sem.-4)**  
**DESIGN & ANALYSIS OF ALGORITHMS**  
Subject Code : BTCS-403-18  
M.Code : 77629

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTIONS TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

**Answer briefly :**

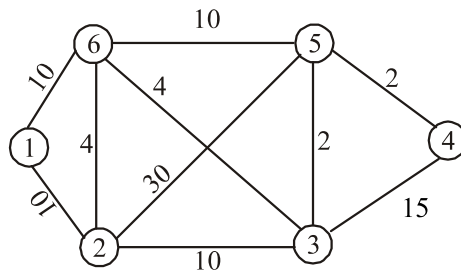
1. “Asymptotic notation  $\Omega$  is transitive”. Justify.
2. Define P and NP class problem.
3. Give recurrence relation in general for computing complexity of divide and conquer algorithm.
4. Define live node and dead node.
5. Solve the recurrence equation  $T(n)=9 T(n/3)+n$ .
6. What is flow network?
7. What is time and space complexity?
8. Define dynamic programming approach.
9. Write any algorithm to find shortest path.
10. What is Cook’s theorem?

### SECTION-B

11. Explain the term Algorithm with its characteristics.
12. What is Knapsack problem? Justify that “*All optimal solutions will fill the knapsack exactly*”.
13. Explain the general method of Branch and Bound.
14. Give a set  $S = \langle 1, 4, 5, 6, 7, 3 \rangle$  and  $W = 12$ . Obtain the sum of subset using backtracking approach.
15. Define flow network and write an iterative Ford-Fulkerson’s method for solving Max- Flow problem.

### SECTION-C

16. Explain Depth First Search and Breadth First Search method with example.
17. Explain Greedy method with suitable example.
18. Find the minimum spanning tree for the graph given below :



**FIG.1**

**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.**