1104

Code : 15CS53T

PART – A

1.   Define :   5

    (a)   Algorithm

    (b)   Queue

    (c)   Graph

    (d)   Ordered Tree

    (e)   Sets

2.   Explain Euclid's algorithm for computing GCD of two numbers.   5

3.   Write an algorithm for sequential search.   5

4.   Explain basic Asymptotic efficiency classes.   5

5.   Consider Knapsack for the instance given below :   5

    $N = 3$

    $[W1, W2, W3] = [100, 10, 10]$

    $[P1, P2, P3] = [20, 15, 15]$

    $M = 105$

    Find all feasible and infeasible solutions.

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6. Explain Divide and Conquer technique with neat diagram.   5
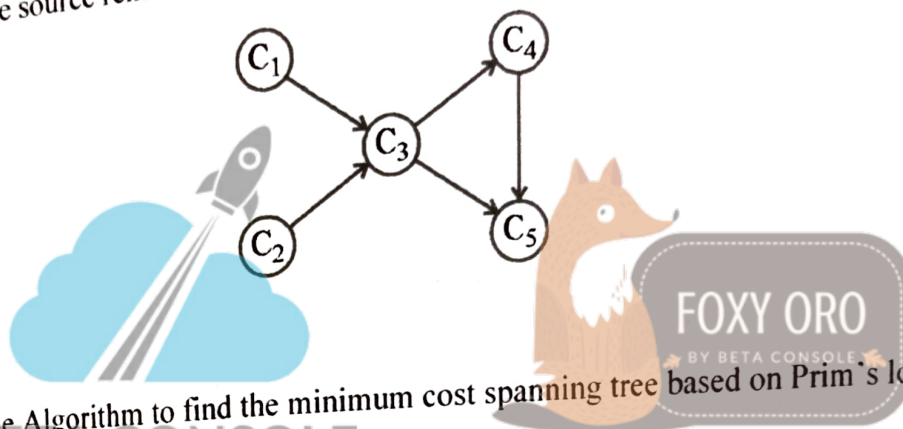
7. Define binary tree. Explain its traversals.   5

8. Apply the source removal method to find the topological order for the below graph.   5

9. Write the Algorithm to find the minimum cost spanning tree based on Prim's logic.   5

PART – B

10. Explain the steps involved in designing and analyzing an algorithm.   10

11. (a) List the important problem types.   5

    (b) Differentiate undirected and directed graphs with examples.   5

12. List the steps to be followed while analyzing recursive algorithms. Write a recursive algorithm for computing the factorial function for an arbitrary non-negative integer.   10

13. Explain Big-oh notation, Big-omega notation and Big-theta notation along with its graph.   10
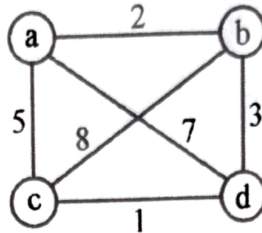
14. Write an algorithm for selection sort and apply the same for the following array :   10

89, 45, 68, 90, 29, 34, 17

15. (a) Define Brute force and explain it with example. **5**

(b) Illustrate Travelling Salesman Problem (TSP) with the following example : **5**

16. Explain Breadth First search algorithm. **10**

17. Write an algorithm for Quicksort and apply the same for the following array : **10**

5 3 1 9 8 2 4 7

18. Write an algorithm for insertion sort and apply it for the following array : **10**

45, 23, 89, 10, 11, 27, 38

19. Apply Kruskal's algorithm to find the minimum spanning tree for the graph shown below : **10**

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