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CSE303 Enrol. No. ...../...../

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END SEMESTER EXAMINATION : APRIL – MAY, 2018

ANALYSIS AND DESIGN OF ALGORITHMS

Time : 3 Hrs. *Maximum Marks : 70*

Note: ***Attempt questions from all sections as directed.***

SECTION – A (30 Marks)

Attempt any **five** *questions out of* **six.**

Each question carries **06** *marks.*

1. Give asymptotic bounds for the following recurrences.

   (a) $T(n) = 8T(n-1) - 15T(n-2)$

   (b) $T(n) = 4T(n/2) + n^3$

   (c) $T(n) = T(n/3) + T(2n/3) + O(n)$

2. Discuss travelling salesman problem. Give branch and bound strategy to solve the problem.

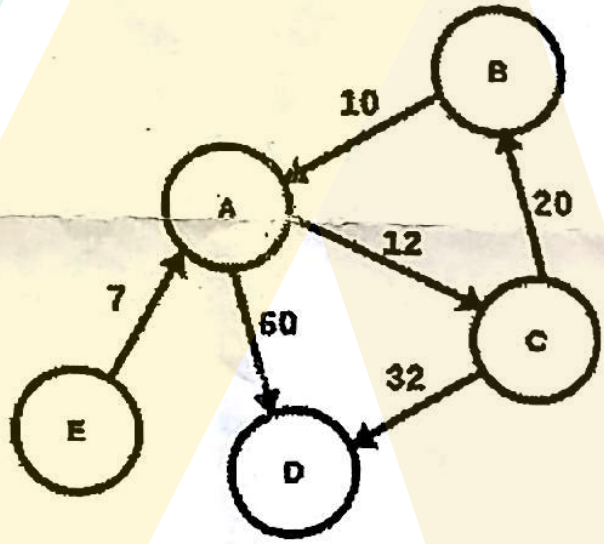
3. Differentiate divide and conquer and dynamic programming.

P.T.O.

4. Derive the complexity of Merge Sort algorithm. Give its application areas.

5. Explain dynamic programming method of problem solving. What type of problems can be solved by dynamic programming?

6. Use prim's algorithm to find minimum spanning tree for the following graph.

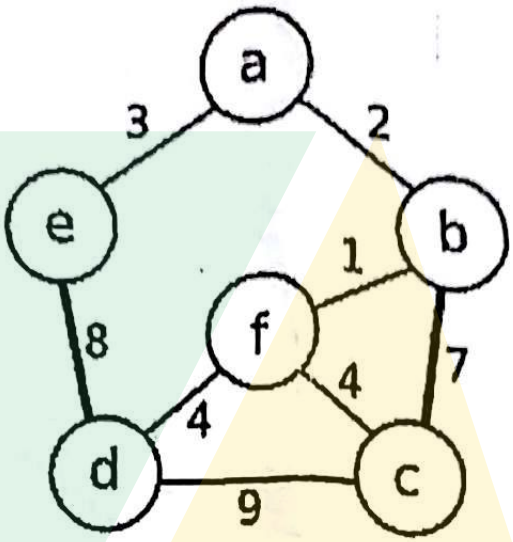


SECTION – B (20 Marks)

Attempt any **two** *questions out of* **three.**

Each question carries **10** *marks.*

7. Write Dijkstra's algorithm for single source shortest path. Find shortest paths to each node from node 'a'.



8. Write algorithm to find longest common subsequence in two strings.

9. Show that while multiply chain of matrices, order of multiplication significantly changes the required number of multiplications.

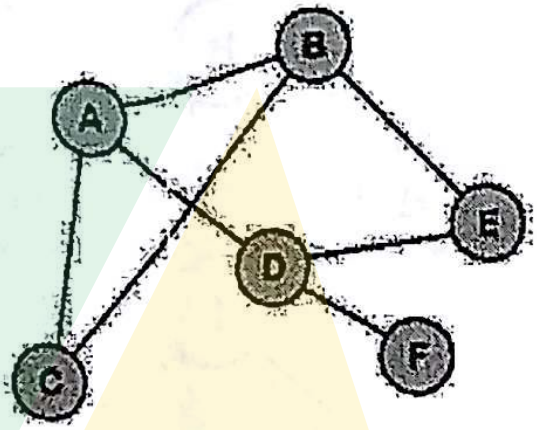
Find parenthesization for following chain of matrices.

A_1 : 5×3, A_2 : 3×3, A_3 : 3×5, A_4 : 5×5

SECTION – C (20 Marks)

(Compulsory)

10. (a) Write Breath First Search algorithm. Traverse following graph using BFS. Give its complexity. (8)



(b) Discuss 8-queen problem. Write the steps to solve 8-queen problem by backtracking. Write its complexity. (7)

(c) Prove that SAT problem is NP- Completeness problem. (5)

(1100)