BACHELOR OF TECHNOLOGY (CBCS) (2020 COURSE)

Computer Science & Engineering

B.Tech.Sem - IV :SUMMER : 2023

SUBJECT : DESIGN OF ALGORITHMS

Day : Wednesday | Time : 10:00 AM-01:00 PM

Date : 31-05-2023 | **S-24306-2023** | Max. Marks : 60

N.B.:

1) All questions are **COMPULSORY.**
2) Figures to the right indicate **FULL** marks.
3) Assume suitable data, if necessary.
4) Draw neat labeled diagrams **WHEREVER** necessary.

Q.1 Define and explain significance of Big-Oh (O), Big Omega (Ω) and Theta (θ) Notations. Assume suitable example. **(10)**

OR

Q.1 Write a detail note on: **(10)**

i) Algorithm specifications

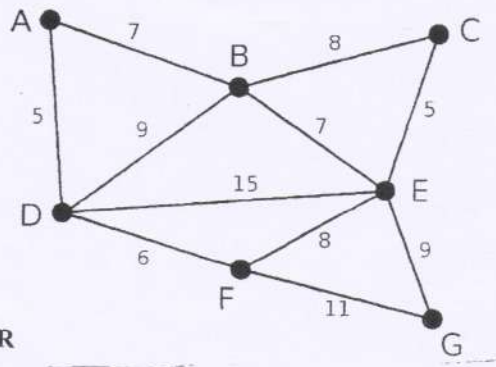
ii) Space and Time complexities

Q.2 Explain how Strassen's Matrix Multiplication is better than Naive and Divide and Conquer both matrix multiplications. **(10)**

OR

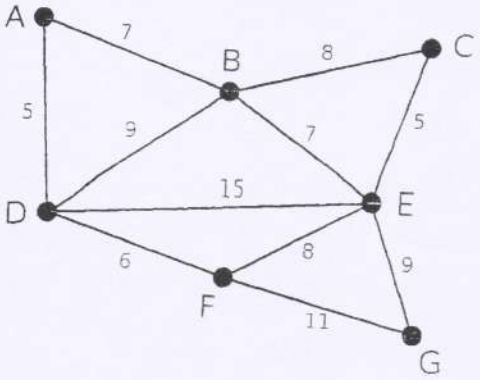
Q.2 Write algorithm of Merge sort. Analyze its best and worst case time complexities. Apply on 45, 20, 70, 38, 11, 31, 85, and 57. **(10)**

Q.3 Write Kruskal's algorithm along with its complexity. Compute MST cost on the given graph indicating each step clearly. **(10)**



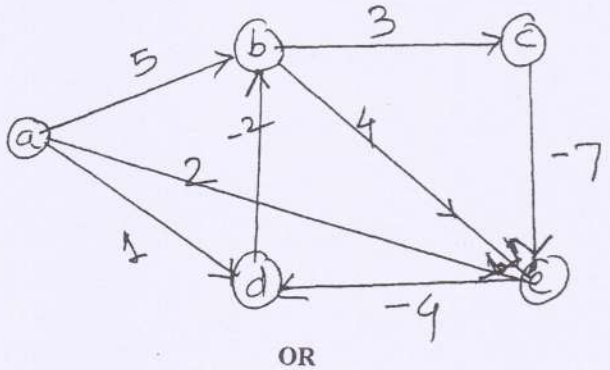
OR

Q.3 Write Prim's algorithm along with its complexity. Compute MST cost on the given graph indicating each step clearly. **(10)**



P.T.O.

Q.4 Write algorithm of Single Source Shortest Path that uses DP. Also analyze time complexity and apply on the given graph. **(10)**



OR

Q.4 Explain with algorithm and running time. Assume suitable examples for both **(10)**
i) DFS ii) BFS

Q.5 What is Backtracking? Demonstrate using Sum of Subsets and Graph Coloring problems. **(10)**

OR

Q.5 What is LCBB? Demonstrate on 15 puzzle problem. **(10)**

Q.6 Explain what is Polynomial time verification and Reduction with example. **(10)**

OR

Q.6 What are approximation algorithms? Explain any two in details. **(10)**

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