BACHELOR OF TECHNOLOGY (CBCS) (2021-COURSE)

B. Tech. Sem - IV COMPUTER SCIENCE & ENGINEERING-A&M : SUMMER : 2024

SUBJECT: ALGORITHMS ANALYSIS & DESIGN

Day : Wednesday
Date : 29/05/2024

S-23948-2024

Time : 10:00 AM-01:00 PM
Max. Marks : 60

N.B.

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Use of non programmable **CALCULATOR** is allowed.

Q.1 Define master theorem. Solve the following using master method. **(10)**

$T(n) = 2T(n/2)+n/\log n$

OR

Q.1 **a)** Write a note on Asymptotic Notations. **(05)**

b) With suitable example explain Recursive Algorithms. **(05)**

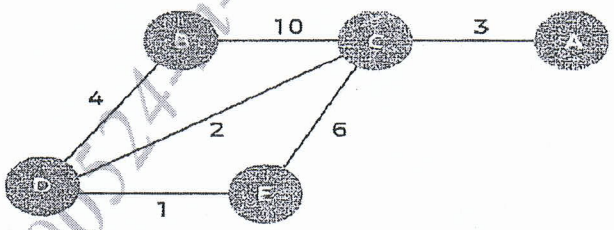
Q.2 Explain Quicksort and find its worst case, average and best-case complexity. **(10)**

OR

Q.2 Write the binary search algorithm and apply it on following dataset to search the key element: 56 **(10)**

10, 2, 24, 29, 39, 40, 51, 56, 69.

Q.3 Apply Prims algorithm on following graph to find MST. **(10)**



OR

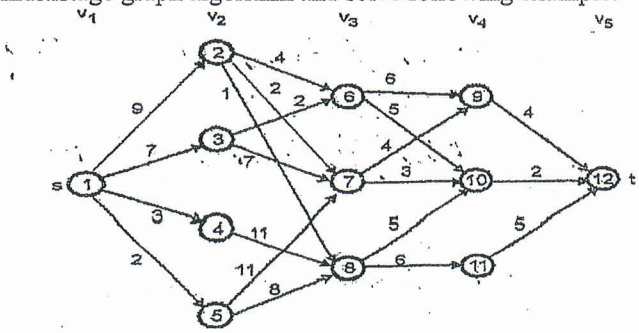
Q.3 Differentiate between Prims and Kruskals algorithm. Explain Dynamic programming with example. **(10)**

Q.4 **a)** What are multistage graphs? Give examples. **(05)**

b) What is Travelling Salesperson problem and what are its applications? **(05)**

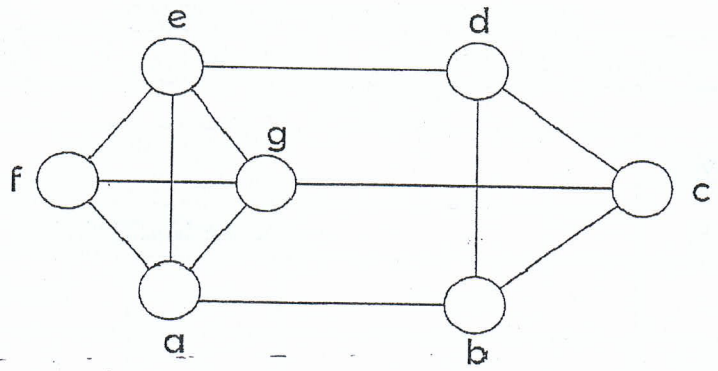
OR

Q.4 Write multistage graph algorithm and solve following example. **(10)**



P.T.O.

Q.5 What is Graph Coloring Problem? Find the Chromatic number of following Graph. (10)



OR

Q.5 Rewrite KMP algorithm and explain with example. (10)

Q.6 Write a detailed note on Randomized and Parallel algorithms. (10)

OR

Q.6 Discuss the P, NP and NPC Classes. (10)

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