GALGOTIAS UNIVERSITY

ADMISSION NUMBER

School of Computing Science and Engineering

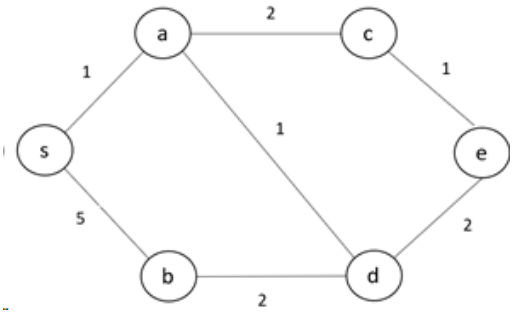
Bachelor of Computer Applications
Summer Term Examination – July - August 2024

Duration : 180 Minutes
Max Marks : 100

Sem IV - E1UA404B - Design and Analysis of Algorithms

General Instructions
Answer to the specific question asked
Draw neat, labelled diagrams wherever necessary
Approved data hand books are allowed subject to verification by the Invigilator

1)	Explain various characteristics of a good algorithm.	K1(2)
2)	Explain how dynamic programming differs from divide and conquer.	K2(4)
3)	If the maximum height of binary tree is N, then explain how many number of nodes there be.	K2(6)
4)	Demonstrate the different types of binary tree with suitable examples.	K3(9)
5)	Apply Dijkstra's Algorithm to find the shortest path from a specific source vertex to all other vertices in the given weighted graph. Assume vertex s as source node.	K3(9)



6)	Evaluate the impact of the graph topology on the performance of Kruskal's algorithm and Prim's algorithm for finding the Minimum Spanning Tree. Justify your answer by taking suitable examples.	K5(10)
7)	Discuss the applications of Huffman coding. Write an algorithm analyse the time and space complexity of it.	K4(12)
8)	Write algorithms to perform following traversals in a Binary Tree: a) Preorder b) Postorder Also explain above traversals with suitable example.	K5(15)
9)	Explain the Strassen's matrix multiplication algorithm. Provide a step-by-step explanation of how it works and discuss its efficiency compared to the standard matrix multiplication algorithm.	K5(15)
10)	Illustrate the process of deletion operation in a Binary Search Tree (BST) in the following scenarios with suitable examples. a) Deletion of a Leaf Node b) Deletion of a Node with One Child c) Deletion of a Node with Two Children d) Deletion of the Root Node	K6(18)