GALGOTIAS UNIVERSITY

ADMISSION NUMBER

School of Computing Science and Engineering

Bachelor of Computer Applications
Semester End Examination - Jun 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)	Discuss minimum spanning tree briefly.	K1(2)
2)	Describe various Asymptotic Notations used for the analysis of Algorithm.	K2(4)
3)	Make a Binary Search Tree by inserting given numbers 7, 5, 1, 8, 3, 6, 0, 9, 4, 2 into an initially empty binary search tree. Find the in-order and pre-order traversal sequence of the resultant tree.	K2(6)
4)	A file contains the following characters with the frequencies a:10, e: 15, i:12, o: 3, u :4, s:13, t : 1. If Huffman Coding is used for data compression then Solve the following using 1.Huffman Code for each character 2.Average code length 3.Length of Huffman encoded message (in bits)Characters.	K3(9)
5)	For string matching, working module q = 11, how many spurious hits does the Rabin-Karp matcher encounters in Text T = 31415926535.....	K3(9)
6)	Define what stability means in the context of sorting algorithms. Is Quick Sort a stable sorting algorithm? Jutify your answer by taking a suitable example.	K5(10)
7)	Find the inorder and postorder traversal of Binary Search Tree when preorder traversal of binary search tree is 38, 14, 8, 23, 18, 20, 56, 45, 82, 70, 90, 95, 85, 100.	K4(12)
8)	Rewrite Prim's Algorithm to start with a random vertex as the initial vertex for constructing the Minimum Spanning Tree, rather than the traditional approach of selecting the vertex with the minimum key value.	K5(15)
9)	Discuss about the Longest Common Subsequence problem. Generate any one Longest Common Subsequence of given two strings using Dynamic Programming. X=abbacdcba, Y=bcdbbcaac	K5(15)
10)	Write algorithms to perform the following operations in a Binary Search Tree (BST): a) Search an element b) Insert an element Analyze its time complexity in different scenarios with suitable examples.	K6(18)