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Sr. No: 009504

December, 2023
B.Tech(EIC) Re-Appear 5th Sem.
Data Structure (OE-502)

Time: 3 Hours

Max. Marks:75

- Instructions:**
1. It is compulsory to answer all the questions (1.5 marks each) of Part -A in short.
 2. Answer any four questions from Part -B in detail.
 3. Different sub-parts of a question are to be attempted adjacent to each other.

PART -A		
Q1	(a)	Write the logic to find trace of a matrix. (The complexity should not exceed order of n) (1.5)
	(b)	Differentiate between bubble and selection sort (1.5)
	(c)	Write the time complexity of linear and binary search. (1.5)
	(d)	Write two applications of stack (1.5)
	(e)	Differentiate between header and grounded link list (1.5)
	(f)	What are the conditions for queue to be empty using array form (1.5)
	(g)	Write a program to add two numbers using pointers. (1.5)
	(h)	Give the formula for calculating out-degree of a graph (1.5)
	(i)	Differentiate between sequential and index sequential file organizations (1.5)
	(j)	Write the steps to find immediate successor of a node in BST (1.5)
PART -B		
Q2	(a)	Write and explain the code of Insertion sort in C language (7.5)
	(b)	Explain various asymptotic notation to calculate time complexities of algorithm (7.5)
Q3	(a)	What is hashing. How it reduces time complexity explain with the help of a program. (7.5)
	(b)	Write the algorithm for insertion of an element in a Stack using Link list form (7.5)
Q4	(a)	Write an algorithm to insert a node with given info value in Heap tree (10)
	(b)	Explain various properties of graph (5)
Q5	(a)	Explain with the help of an algorithm that how an element is deleted in a graph using link list form (7.5)
	(b)	Explain how an element can be inserted in a Queue using Array form (7.5)
Q6	(a)	Explain how an element is deleted in a BST. Also, calculate its time complexity (7.5)
	(b)	Explain DFS algorithm with the help of an example (7.5)
Q7		Write the short note on following (15) <ul style="list-style-type: none"> • AVL trees • Skip List

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