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B.E. Semester III Examination

(May 2024)

Data Structures and Algorithms

Branch : CE/IT/CSE **Subject Code : CT 303 N**

DATE:2/5/2024 **TIME: 12:00 PM to 3:00 PM** **TOTAL MARKS: 70**

Instructions:

1. Answer each section in separate answer sheet.
2. All questions are **Compulsory.**
3. Indicate **clearly,** the options you attempt along with its respective question number.
4. Use the last page of main supplementary for **rough work.**

SECTION –I

Q-1	A	Define Data Structure and explain the general operations of data structure.	5
	B	Explain application of recursion in Tower of Hanoi with 3 disks.	5
	C	Explain PUSH and PEEP operations of stack.	5
		OR	
	C	Explain the difference between Queue and Linked List.	5
Q-2	A	State the types of queue. Explain Circular & Priority queue in detail.	5
	B	Explain the algorithm of Bubble sort by sorting following numbers in an array : 3,2,7,10,15,1	5
		OR	
	A	Explain the algorithm of Infix to Postfix conversion of an arithmetic expression with an example.	5
	B	Explain the algorithm of Selection sort by sorting following numbers in an array : 30,20,7,10,15,12	5
Q-3	A	Explain Binary Search algorithm with an example.	5
	B	Explain the algorithm of deletion of a node at a given address 'X' in Doubly linked list.	5
		OR	
	A	Parse Linear Search algorithm on the following array : 10,20,40,2,3,5,19,22 with search target =5.	5
	B	Explain the algorithm for insertion of a new node at the end of the Singly linked list.	5

SECTION – II

Q-4	A	Explain Sequential and Indexed file organization technique.	5
	B	Define and explain Binary Tree and Binary Search Tree.	5
	C	What is an AVL tree? Explain the rotations in AVL tree.	5
		OR	

	C	Explain Weight balance tree with an example.	5
Q-5	A	Can a graph have more than 1 minimum spanning tree? Explain Minimum spanning tree in detail with an example.	5
	B	Define and explain 1) Graph, 2)Threaded binary tree.	5
		OR	
	A	Explain the recursion algorithm of Post Order Traversal in a Binary tree.	5
	B	Differentiate Breadth First Search vs Depth First Search.	5
Q-6	A	Explain Hashing and its benefits.	5
	B	Apply Quick sort algorithm on following array : 40,20,44,43,60,14,2,100	5
		OR	
	A	Explain Collision resolution technique "Linear probing" in Hashing, with an example.	5
	B	Explain Merge sort algorithm by sorting following array : 4,2,44,43,6,14,20	5

BEST OF LUCK