Printed page: 02 Subject Code: ACSE0301

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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute)

Affiliated to Dr. A.P. J. Abdul Kalam Technical University, Uttar Pradesh, Lucknow

Course: B Tech Branch: CSE

Semester - III Sessional Examination - III Year- (2021 -2022)

Subject Name: DATA STRUCTURES

Time: 1.15 Hours [SET- B] Max. Marks:30

General Instructions:

- This Question paper consists of 2 pages & 5 questions. It comprises of three Sections, A, B, and C
- **Section A** -Question No- 1 is objective type questions carrying 1 mark each, Question No- 2 is very short answer type carrying 2 mark each. You are expected to answer them as directed.
- **Section B** - Question No-3 is Short answer type questions carrying 5 marks each. Attempt any two out of three questions given.
- **Section C** - Question No. 4 & 5are Long answer type (within unit choice) questions carrying 6 marks each. Attempt any one part *a* or *b*.

		SECTION – A	[08Marks]	
1.	All questions are compulsory		(4×1=4)	CO
	a.	You are given pointers to first and last nodes of a singly linked list, which of the following operations are dependent on the length of the linked list? (A) Delete the first element (B) Insert a new element as a first element (C) Delete the last element of the list (D) Add a new element at the end of the list	(1)	CO2
	b.	What is common in three different types of traversals (Inorder, Preorder and Postorder)? (A) Root is visited before right subtree (B) Left subtree is always visited before right subtree (C) Root is visited after left subtree (D) All of the above	(1)	CO1
	c.	The pre-order traversal of a binary search tree is 15, 10, 12, 11, 20, 18, 16, 19. Which one of the following is the post order traversal of the tree? (A) 10, 11, 12, 15, 16, 18, 19, 20 (B) 11, 12, 10, 16, 19, 18, 20, 15 (C) 20, 19, 18, 16, 15, 12, 11, 10 (D) 19, 16, 18, 20, 11, 12, 10, 15	(1)	CO3
	d.	What is the maximum number of children that a node can have in a binary tree? (A) 3 (B) 1 (C) 4 (D) 2	(1)	CO1
2.	All questions are compulsory		(2×2=4)	CO
	a.	Calculate the minimum numbers of nodes in AVL tree with height 8.	(2)	CO3
	b.	Differentiate between singly linked list and doubly linked list.	(2)	CO4

		SECTION – B	[10Marks]	
3.	Answer any two of the following-		(2×5=10)	CO
	a.	Explain In Order, Pre Order and Post Order with diagrams	(5)	CO2
	b.	Describe binary tree along with its representation. How will you search an element in a binary tree? Explain	(5)	CO4
	c.	What are the advantages of linked list over arrays? Implement singly linked list and insert an element at given position in this linked list.	(5)	CO3
		SECTION – C	[12Marks]	
4	Answer any one of the following-		(1×6=6)	CO
	a.	Explain the following: (a) Binary Tree and Binary Search Tree (b) Complete Binary Tree	(6)	CO3
	b.	Write a functional code for deleting a desired node in a single linked list.	(6)	CO5
5.	Answer any one of the following-		(1×6=6)	CO
	a.	Can you find a unique tree when any two traversals are given? Using the following traversals construct the corresponding binary tree: INORDER: H K D B I L E A F C M J G PREORDER: A B D H K E I L C F G J M Also find the Post Order traversal of obtained tree.	(6)	CO5
	b.	Write a program or algorithm to implement linear linked list, showing all the operations that can be performed on a linked list.	(6)	CO3