Code No: R201218 **R20** SET - 1

I B. Tech II Semester Regular Examinations, September- 2021

DATA STRUCTURES

(Com. to CSE, IT, CSE-AI&ML, CSE-AI, CSE-DS, CSE-AI&DS, AI&DS)

Time: 3 hours Max. Marks: 70

Answer any five Questions one Question from Each Unit
All Questions Carry Equal Marks

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UNIT-I

1 a) Define Sorting? Sort the following elements using Quick Sort? Give the time complexity of quicksort? (7M)
9, 17, 5, 28, 3, 11, 7, 78, 1, 33, 8, 45, 2, 4, 12, 6, 34

b) Compare and Contrast the Linear and Binary Search algorithms. (7M)

Or

2 a) Outline the concept of divide and conquer. Give an algorithm for Merge Sort & trace the steps for sorting the following list with time complexity. (7M)
39, 9, 81, 45, 90, 27, 72, 18

b) Demonstrate the advantages of binary search over Fibonacci search with an example. (7M)

UNIT-II

3 a) Define Single Linked List. Write algorithms to insert a node at the beginning, ending, and at a given position. (7M)

b) Discuss the advantages and disadvantages of single-linked lists. (7M)

Or

4 a) Define Single Linked List. Write algorithms to delete a node at the beginning, ending, and at a given position. (7M)

b) Discuss the implementation of a circular linked list. (7M)

UNIT-III

5 a) Discuss various Applications of Queues. (7M)

b) Define stack and give one application? Convert the given infix expression to its postfix Expression ((A+((B^C)-D))*(E-(A/C))) (7M)

Or

6 a) Explain the implementation of Stack Operations using Linked List (7M)

b) Define queue and give one application and Implement the queue using arrays? (7M)

UNIT-IV

7 a) What is a Binary Search Tree? Draw a binary search tree when the following keys are inserted in order 43, 75, 19, 36, 8, 62, 49, 84, 12, 18, 29. How can a binary search tree be used for sorting the keys? (7M)

b) Explain the Binary Tree representation using Linked List. (7M)

Or

8 a) Write a C program to implement Binary Tree Traversals in a recursive approach. (7M)

b) What are the differences between a binary tree and a complete binary tree? (7M)
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UNIT-V

9	a)	Write short notes on Graph terminology and outline the properties of a Graph.	(7M)
	b)	Explain the implementation of BFT with an example.	(7M)
		Or	
10	a)	Illustrate Linked List representation and matrix representation of Graphs with an example.	(7M)
	b)	Explain the implementation of DFT with an example.	(7M)