O.P.Code: 23CS0504	R23	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech. I Year II Semester Regular & Supplementary Examinations June-2025

DATA STRUCTURES

(Common to CAD, CSM, CCC, CIC, CAI, CIA, CSE & CSIT)

Time: 3 Hours **Max. Marks: 70**

PART-A

(Answer all the Questions **10 x 2 = 20** Marks)

1	a	Define ADT (Abstract Data Type).	CO1	L1	2M
	b	Compare binary search and linear search techniques.	CO1	L2	2M
	c	What are the ways of implementing linked list?	CO2	L1	2M
	d	How the singly linked lists can be represented?	CO2	L2	2M
	e	Define Stack.	CO3	L1	2M
	f	Give one example of a problem where backtracking algorithms are used.	CO3	L2	2M
	g	Define queue.	CO4	L1	2M
	h	Explain any two types of queues with a brief description.	CO4	L2	2M
	i	Define trees in data structure.	CO5	L1	2M
	j	Give any Two Applications of Graph.	CO5	L2	2M

PART-B

(Answer all Five Units **5 x 10 = 50** Marks)

UNIT-I

2	a	Define sorting. Explain any one sorting techniques.	CO1	L1	5M
	b	Explain about binary search.	CO1	L2	5M
		OR			
3	a	Define searching. What is sequential search?	CO1	L1	5M
	b	Differentiate linear and non-linear data structure.	CO1	L2	5M

UNIT-II

4	a	Differentiate linked list and Array.	CO2	L2	5M
	b	Explain the operations of singly linked lists.	CO2	L2	5M
		OR			
5	a	Explain the applications of linked lists in detail.	CO2	L2	5M
	b	Discuss about circular linked list in detail.	CO2	L2	5M

UNIT-III

6	a	Explain the algorithm for Push and Pop operations on a Stack using Arrays with suitable examples.	CO3	L2	5M
	b	Describe the algorithm for converting an infix expression to postfix notation using a stack with a suitable example.	CO3	L2	5M
		OR			
7	a	Explain the algorithm for Push and Pop operations on a Stack using Linked List with suitable examples.	CO3	L2	6M
	b	Convert the following Infix into Postfix expression: A+(B*C)/D.	CO3	L2	4M

UNIT-IV

8	a	Describe the implementation of queues using arrays.	CO4	L2	6M
	b	Discuss about Deques.	CO4	L2	4M
		OR			
9	a	Discuss the applications of queues in breadth first search.	CO4	L2	5M
	b	Discuss about implementation of queues.	CO4	L2	5M

UNIT-V

10	a	Build a Binary search Tree for the following values 45, 15, 79, 90, 10, 55, 12, 20, 50.	CO5	L3	5M
	b	Explain Breadth First Traversal with Example.	CO6	L2	5M
		OR			
11	a	Examine Operations of AVL Tree.	CO5	L3	5M
	b	Explain Minimum Spanning tree with simple example.	CO6	L2	5M

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