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

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech I Year II Semester Supplementary Examinations Decemebr-2025
DATA STRUCTURES
(Common to CSE, CSIT, CSM, CIC, CAD, CCC & CAI)

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

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

1	a	What is a data structure?	CO1	L1	2M
	b	List some common data structures.	CO1	L2	2M
	c	What are the types of linked lists?	CO2	L1	2M
	d	How the doubly linked list can be represented?	CO2	L2	2M
	e	Define Stack.	CO3	L1	2M
	f	Write the postfix form for the expression -A+B-C+D?	CO3	L2	2M
	g	Define priority queue.	CO4	L1	2M
	h	Describe the properties of queues.	CO4	L2	2M
	i	What is Binary search tree?	CO5	L1	2M
	j	Explain the Representation of Trees in data structure.	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	Develop the algorithm to sort the elements using Bubble sort.	CO1	L3	5M
		OR			
3	a	Describe about ADT (Abstract Data Type) and Mention the advantages of ADT.	CO1	L1	5M
	b	Sort the following numbers using selection sort:45, 25, 10, 2, 9, 85, 102, 1	CO1	L3	5M

UNIT-II

4	a	List the operations of doubly linked lists.	CO2	L1	5M
	b	Discuss the applications of linked lists in detail.	CO2	L2	5M
		OR			
5	a	Explain the operations of circularly linked lists.	CO2	L1	5M
	b	Describe algorithm for insert and delete a node from doubly linked list.	CO2	L2	5M

UNIT-III

6	a	Explain how stacks are used in expression evaluation, specifically in converting infix to postfix notation. Provide an example.	CO3	L2	5M
	b	Develop an algorithm for converting an Infix to Postfix notation using stack.	CO3	L3	5M
		OR			
7	a	Describe how stacks can be made using arrays and linked lists. Explain how to add (push) and remove (pop) items from each type of stack.	CO3	L2	5M
	b	Illustrate the concepts of stack overflow and stack underflow with suitable examples.	CO3	L3	5M

UNIT-IV

8	a	Discuss about implementation of queues.	CO4	L2	5M
	b	Illustrate the operations on queues.	CO4	L3	5M
		OR			
9	a	Define queue and discuss about types of queues.	CO4	L2	5M
	b	Develop the implementation of a queue using linked lists and explain each operation with an example.	CO4	L3	5M

UNIT-V

10	a	Discuss about BST traversals.	CO5	L2	5M
	b	Demonstrate Depth First Traversal (DFT) on a given graph with a suitable example. Illustrate the steps clearly.	CO6	L3	5M
		OR			
11	a	Explain about Operations of AVL Tree.	CO5	L2	5M
	b	Demonstrate Breadth First Traversal (BFT) on a given graph with a suitable example. Illustrate the steps clearly.	CO6	L3	5M

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