O.P.Code: 25CS5801	R25	H.T.No.									

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

M.Tech I Year I Semester Regular Examinations January-2026

ADVANCED DATA STRUCTURES & ALGORITHMS

(Computer Science & Engineering)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	Write a detailed notes on Dynamic representation of Single Linked List.	CO1	L2	6M
	b	Write an algorithm to Insert a node on to a single linked list.	CO1	L3	6M

OR

2		Explain the following operations in a doubly linked list: (i) Create an empty list. (ii) Insert the elements 10 and 20 at the front of the list. (iii) Insert the elements 30 at the middle of the list. (iv) Insert the elements 15, 45 at the end of the list.	CO1	L3	12M

UNIT-II

3		State and explain algorithm to perform Radix sort? Sort the following numbers using radix sort: 170, 45, 75, 90, 802, 24, 2, 66.	CO2	L3	12M

OR

4		Write and explain linear search procedure or algorithm with a suitable example.	CO2	L2	12M

UNIT-III

5		Explain how dictionaries are implemented using hashing with an example.	CO3	L3	12M

OR

6		Which are the different methods of implementing hash function? Explain any two in detail.	CO3	L2	12M

UNIT-IV

7	a	Explain the concept of priority queue with suitable example	CO4	L2	6M
	b	Explain in detail how a binary heap can be used to implement a priority queue.	CO4	L2	6M

OR

8		Construct a binary search tree for given values. consider the first value as root node 45,23,29,85,92,7,11,35,49,51.	CO4	L3	12M

UNIT-V

9		What is an AVL Tree? Insert the following elements into AVL tree: 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15	CO5	L3	12M

OR

10	a	List out the properties of Red-Black trees.	CO5	L1	6M
	b	Explain Red-Black trees in detail.	CO5	L2	6M

***** END *****