

THE KAVERY ENGINEERING COLLEGE*(An Autonomous Institution)***B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV /DEC 2024***Second Semester**Artificial Intelligence and Data Science***AD3251 - Data Structures Design***Regulations - 2021**Duration : 3 Hrs**Maximum : 100 Marks***PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)**

<i>Q.No</i>	<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
1.	What is a data structure?	RE	1	2
2.	Differentiate is shallow and deep copying?	UN	1	2
3.	What are the types of linked lists?	RE	2	2
4.	List out the basic operations that can be performed on a stack.	RE	2	2
5.	Define sorting.	RE	3	2
6.	What do you mean by probing and linear probing?	UN	3	2
7.	Define depth and height of a tree.	RE	4	2
8.	State the properties of a binary tree.	RE	4	2
9.	Name two algorithms to find minimum spanning tree.	RE	5	2
10.	Differentiate BFS and DFS.	UN	5	2

PART – B (ANSWER ALL QUESTIONS) (Marks 5*13 = 65)

<i>Q.No</i>	<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
11.	a i Explain about Inheritance in detail.	UN	1	7
	ii Explain in detail about classes and object with example programs.	UN	1	6
	Or			
	b i Outline about the various ADT.	UN	1	7
	ii Demonstrate in detail about divide and conquer with example.	UN	1	6
12.	a Develop the singly linked list with program.	AP	2	13
	Or			
	b i Construct the ADT to perform insertion and deletion in a singly linked list.	AP	2	8
	ii Develop array-based implementation of a list.	AP	2	5
13.	a i Explain about selection sort in detail.	UN	3	4
	ii Explain in detail bubble sort with example.	UN	3	9
	Or			
	b What are the different types of hashing techniques? Explain them in detail with example.	UN	3	13

14.	a	Write an algorithm to insert, delete, Find minimum and maximum element from a binary search tree.	AP	4	13
		Or			
	b	Develop a binary tree ADT with example?	AP	4	13
15.	a	What is graph traversal? Explain about depth first traversal with algorithm.	UN	5	13
		Or			
	b i	Explain in detail about minimum spanning trees.	UN	5	8
	ii	Explain about DAG.	UN	5	5

*PART – C (Marks 1*15 = 15)*

<i>Q.No</i>		<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
16.	a	Construct the topological sort with suitable example?	AP	5	15
		Or			
	b	Explain about quick sort. Sort the following integer elements using quick Sort 40,20,70,14,60,61,97,30.	AP	4	15