H.T NO.			R	2						

R22

Course Code: A6CS05

MLR INSTITUTE OF TECHNOLOGY

(An Autonomous Institution)

II B.Tech I Semester Regular Examinations, February-2024

DATA STRUCTURES

(Common to CSM, CSD, CSE, CSIT & ECE)

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

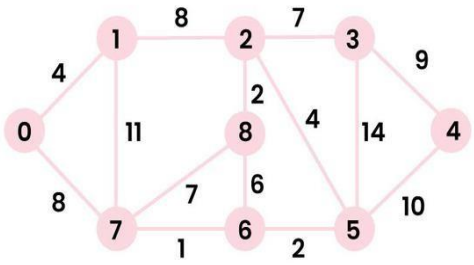
Note: 1. This question paper contains two parts A and B.
2. Part- A is Compulsory which carries 10 marks. Answer all Questions in part A.
3. Part – B consists 5 units. Answer any one question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART- A **10 x 1M=10Marks**

1.	a)	Classify the Data Structure.	1M	CO1	BL2
	b)	Which type of data structure is used to perform recursion?	1M	CO1	BL1
	c)	If you are using C language to implement the heterogeneous linked list, what pointer type will you use?	1M	CO2	BL1
	d)	Define structure for a node?	1M	CO2	BL1
	e)	Differentiate Linear search and Binary search.	1M	CO3	BL4
	f)	What is the importance of Heap sort?	1M	CO3	BL1
	g)	List out few of the Application of tree data structure?	1M	CO4	BL1
	h)	List the principles of Red Black Tree?	1M	CO4	BL1
	i)	What is the difference between Graph and Tree?	1M	CO5	BL4
	j)	Difference between BFS and DFS?	1M	CO5	BL4

PART- B **5 x 10M=50Marks**

2	a)	Implement queue in data structure using Array?	5M	CO1	BL3
	b)	Write an algorithm to evaluate postfix expression using Stack with an example.	5M	CO1	BL3
		OR			
3	a)	Convert the following infix expression into postfix expression **A + B – C * D * E $ F $ G**	5M	CO1	BL3
	b)	Describe the concept of representation of DEQUE in memory with the help of neat diagram.	5M	CO1	BL2
4	a)	Implement Single linked list in data structure?	5M	CO2	BL3
	b)	Implement Stack using Linked list?	5M	CO2	BL3
		OR			
5	a)	Implement Doubly linked list with an example?	5M	CO2	BL3
	b)	Write a C program to implement circular single list for i) Create ii) Insertion at the begin iii) Deletion at the end.	5M	CO2	BL3

6		What is sorting? Explain and write an algorithm for insertion sorting and trace the algorithm with an example: set of elements - 12, 34, 89, 15, 47, 76, 29, 53, 02, 91, 66.	10M	CO3	BL3
OR					
7	a)	Explain an algorithm for quick sort with suitable example.	5M	CO3	BL2
	b)	Implement Linear search with suitable example?	5M	CO3	BL3
8		Insert the following list of elements into the AVL tree. Delete the elements 18, 2 and 30 from the AVL tree 12, 30, 36, 18, 25, 9, 4, 2, 17, 14 , 20, 47.	10M	CO4	BL3
OR					
9	a)	What is a Tree? Explain about B-Trees with Example?	5M	CO4	BL2
	b)	Explain about splay Tree in Data Structure?	5M	CO4	BL2
10		Define the importance of Dijkistra's algorithm and Find the shortest path from 0 to 4 using Dijkistra's algorithm. 	10M	CO5	BL4
OR					
11	a)	Show the importance of Bellmen ford algorithm in Data structure	5M	CO5	BL2
	b)	Discuss about Knuth Morris-Pratt Algorithm in Data structure.	5M	CO5	BL2

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