R22 Regulation *Subject code: 4E2AQ*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech II Semester Regular/Supplementary Examinations, June 2024

DATA STRUCTURES

(Common to CSE & CSE(AI&ML))

Maximum Marks: 60 Date:04.07.2024 Duration: 3 hours

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 of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10X1M=10 Marks)			CO	Bloom Tx
1.	a	Define Data objects?	1	L1
	b	Define data abstraction?	1	L1
	c	What are sparse matrices?	2	L1
	d	What are linked lists	2	L1
	e	Define binary tree?	3	L1
	f	Write applications of binary trees?	3	L1
	g	What is linear search?	4	L1
	h	What is hashing?	4	L1
	i	Define graph?	5	L1
	j	What are AVL trees?	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)			
2	a) Discuss about performance metrics of algorithms in detail? [5M] b) Explain linear and non-linear data structures? [5M]	1	L2
	OR		
3	a) Explain complexity analysis with examples? [5M] b) Discuss Asymptotic notations with examples? [5M]	1	L2
4	Explain representation of arrays along with their advantages and disadvantages? [10M]	2	L2
	OR		
5	Discuss the procedure to convert infix expression to postfix expression for the expression: ((A –(B+C) * D) / (E+F)) [10M]	2	L2
6	Create binary tree for the following elements (23, 12, 45, 36, 5, 15, 39, 2, 19). Discuss about the height of the above binary tree. [10M]	3	L6
	OR		

7	a) Explain about Disjoint sets. [5M] b) State the difference between min and max heap with suitable example. [5M]	3	L2
8	Write an algorithm to perform binary search on a given set of 'n' numbers. Using the algorithm search for the element 23 in the set [12, 23, 34, 44, 48, 53, 87, 99] [10M]	4	L3
	OR		
9	Write an algorithm for selection sort and explain with suitable example? [10M]	4	L5
10	Write a short notes on : A) Red-Black trees B) AVL Trees [5M+5M]	5	L2
	OR		
11	Differentiate DFS and BFS with examples. [10M]	5	L4