R22 Regulation *Subject code: 4E2AQ*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech II Semester Regular Examinations, September 2023

DATA STRUCTURES

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

Maximum Marks: 60 Date:25.09.2023 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)

1a. Define the term algorithm.
b. List linear and nonlinear data structures.
c. List out the basic operations that can be performed on a queue.
d. What is a stack?
e. Define path in a tree.
f. Define Circularly Queue.
g. Define linear probing.
h. State different types of collision resolving techniques.
i. State the operations on binary search tree.
j. Which data structures are used for BFS and DFS of a graph?

Part-B

Answer All the following questions. (10M X 5=50Marks)

2 Define recursion? Explain with its Fibonacci series and factorial of a number. 10

OR

3 A) Explain about ADTs. 2
B) Explain time and space complexities with suitable examples. 8

4 Explain the procedure to evaluate postfix expression and evaluate the given expression 623 + - 382 / + * 2 / 3 + 10

OR

5 Explain Array and Linked representation of Sparse Matrix. 10

6 Define Max heap. Construct a max heap for the following elements {12,15,9,8,10,18,7,20,25}. 10

OR

7 Construct a binary tree from a given pre order and in order sequence 10

Pre order: ABDGCEHIF In order: DGBAHEICF

8	Explain Insertion sort algorithm and simulate it for the following data {5,3,8,1,4,6,2,7}.	10
	OR	
9	Give the step by step procedure to sort the following elements using merge sort 39,9,81,45,90,27,72,18.	10
10	Explain about binary search tree ADT. Construct a binary search tree for the following elements 100, 50, 200, 25, 90, 80, 150.	10
	OR	
11	Explain different types of AVL rotations with suitable examples.	10