R20 Regulation *Subject code: 3P3EE*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech III Semester Supplementary Examinations, December 2024

DATA STRUCTURES

(Common to CSE & CSE(AIML))

Maximum Marks: 70 Date:11.12.2024 Duration: 3 hours

Note: 1.This question paper contains two parts A and B.
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
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 (10X2M=20) Marks)		CO	Bloom Tx
1	Define the term algorithm and state the criteria the algorithm should satisfy?	1	L1
2	What is meant by an abstract data type (ADT)?	1	L1
3	State the different types of linked lists.	2	L1
4	List out the basic operations that can be performed on a queue.	2	L1
5	Define Max heap.	3	L1
6	List the different tree traversals.	3	L1
7	Define collision.	4	L1
8	Define sorting.	4	L1
9	Define balance factor and what is the height of an AVL tree?	5	L1
10	What are the representations of a graph?	5	L1
	Part-B		
Answer All the following questions. (5X10M=50Marks)		CO	Bloom Tx
11	A. Calculate time complexity of $F(n) = 10x^3 - 4x^2 + 8x - 9$. [3M] B. Explain Asymptotic notations with suitable examples. [7M]	1	L2
	OR		
12	A. Define recursion. Write a recursive algorithm to calculate factorial of a number. [5M] B. Explain time and space complexity with suitable example. [5M]	1	L2
13	Explain the steps involved in insertion and deletion into a singly and doubly linked list with suitable example. [10M]	2	L2
	OR		
14	Explain Stack ADT and its operations. [10M]	2	L2

15	Explain binary search tree ADT in detail. [10M]	3	L2
	OR		
16	Explain Heap tree ADT in detail. [10M]	3	L2
17	Explain in detail multi-way merge with examples. [10M]	4	L2
	OR		
18	Explain Hashing with an example. [10M]	4	L2
19	Explain the various representation of graph with example in detail. [10M]	5	L2
	OR		
20	Define an AVL tree. Explain all operations with an example [10M]	5	L2