R22 Regulation *Subject code:4E3FC*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech III Semester Supplementary Examinations, June 2026

DATA STRUCTURES

(IT)

Maximum Marks: 60 Date:18.06.2026 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)		Marks	CO	BTL
1.a)	Define polynomial ADT.	1M	1	L1
b)	List any four applications of stack	1M	1	L1
c)	Define tree– traversal and mention the type of traversals	1M	2	L1
d)	What do you mean by generic programming?	1M	2	L1
e)	Define a priority queue.	1M	3	L1
f)	How do you delete an element from heap?	1M	3	L1
g)	Give example for hash function.	1M	4	L1
h)	Name the applications of linear each technique	1M	4	L1
i)	List any two differences between graphs and trees	1M	5	L1
j)	What is Kruskal's algorithm?	1M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
2	Develop a program to perform operations on a circular linked list.	10M	1	L2
	OR			
3	a) Discuss the advantages and disadvantages of single-linked lists. b) Inspect the mechanism for the representation of queues using arrays.	5M 5M	1	L2
4	a) Explain, in detail, deletion of a node from a binary tree with one suitable example. b) Describe the various operations applicable to binary trees and elaborate on each.	5M 5M	2	L2
	OR			
5	a) Build an AVL tree with the following values: {15, 20, 24, 10, 13, 7, 30, 36, 25, 42, 29} b) Explain the properties of a binary search tree in detail.	5M 5M	2	L3
6	a) Differentiate between splay tree and red-black tree. b) Illustrate B-Trees with appropriate examples.	5M 5M	3	L2

	OR			
7	a) Discuss differences between leftist and skew heaps. b) Describe applications of priority queues.	5M 5M	3	L2
8	Summarize the following hashing techniques: i. Linear Probing ii. Quadratic Probing iii. Double Hashing.	10M	4	L2
	OR			
9	a) Describe binary search with steps and example. b) Explain the disjoint set ADT operations.	5M 5M	4	L2
10	a) Differentiate between BFS and DFS. b) Write prims algorithm for finding minimum cost spanning tree.	5M 5M	5	L2
	OR			
11	a) Explain the concept of a connected graph, directed graph and un-directed graph. Give one example for each. b) Discuss applications of network flow problems.	5M 5M	5	L2