R25 Regulation *Subject code:5ES2AJ*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech II Semester Regular Examinations, June 2026

DATA STRUCTURES

(Common to EEE, CSE, CSE(AI&ML), CSE(DS) & IT)

Maximum Marks: 60 Date: 19.06.2026 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 (5X2M=10Marks)		Marks	CO	BTL
1.a	Define Abstract Data Type (ADT)	2M	1	BTL1
b	What is tree traversal?	2M	2	BTL1
c	Mention any two applications of heaps	2M	3	BTL1
d	Define graph traversal.	2M	4	BTL1
e	What is a collision in hashing?	2M	5	BTL1
	Part-B			
Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
2	a) Explain stack operations with algorithms for PUSH and POP operations. b) Outline various operations of queues with examples.	5M 5M	1	BTL2
	OR			
3	a) Classify different types of data structures and explain their characteristics. b) Compare singly linked list, doubly linked list, and circular linked list.	5M 5M	1	BTL2
4	a) Explain the insertion operation in a Binary Search Tree (BST) with suitable examples: 12,34,65,33,4,67,5,98,24,87,22,7,13 b) Write about Threaded Binary Trees and its advantages.	5M 5M	2	BTL2
	OR			
5	a) Discuss Red-Black Trees and their properties. b) Describe binary tree traversal techniques with examples.	5M 5M	2	BTL2 BTL1
6	Illustrate the structure and features of B+ Trees with an example.	10M	3	BTL2
	OR			
7	a) Explain binomial heaps. b) Compare binary heaps, binomial heaps, and Fibonacci heaps.	5M 5M	3	BTL2 BTL2

8	Outline graph traversal algorithms with the help of an example: BFS and DFS.	10M	4	BTL2
	OR			
9	a) Describe the Quick Sort algorithm with an example. b) Explain Heap Sort and compare it with Merge Sort.	5M 5M	4	BTL1
10	Describe various File Organization techniques and their advantages and disadvantages.	10M	5	BTL2
	OR			
11	a) Discuss the mid-square and folding methods of hashing. b) Explain indexing and basic file operations.	5M 5M	5	BTL2