



TKRCET
Institutes in Character International in Excellence

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 2025

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

Maximum Marks: 70

Date: 24.12.2025

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.
 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)		Marks	CO	BTL
1	Define an algorithm.	2M	1	L1
2	List linear and nonlinear data structures.	2M	1	L1
3	Define Linked list.	2M	2	L1
4	List out the basic operations that can be performed on a stack.	2M	2	L1
5	What is the function of find operation in disjoint sets?	2M	3	L1
6	Define degree of the node.	2M	3	L1
7	What Do You Mean By Disjoint Set ADT?	2M	4	L1
8	Mention the types of searching.	2M	4	L1
9	Define balance factor.	2M	5	L1
10	What are the representations of a graph?	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
11	Construct recursive definitions of Fibonacci series and factorial of a given number and analyse the running time and space complexities of the above recursive definitions.	10M	1	L2
OR				
12	Describe the role of time complexity and space complexity in measuring the performance of the algorithm. Define asymptotic notations of Big Oh, Big Theta, and Big Omega. Suppose that given function $F(n)=n/100$, show that $F(n)=\Omega(n)$.	10M	1	L2
13	Explain the various operations of the list ADT with examples.	10M	2	L2
OR				
14	Explain double ended queue and its operation with an example.	10M	2	L2
15	Write a program to implement Binary search tree traversals.	10M	3	L2
OR				
16	Explain Disjoint set 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