



TKRCEET
M. E. R. O. C. E. T.
Innovation in Character | Individuality in Excellence

R22 Regulation *Subject code:4E3FC*
TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
 (Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech III Semester Regular/Supplementary Examinations, December 2025
DATA STRUCTURES
 (IT)

Maximum Marks: 60

Date:22.12.2025

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)	Classify the data structures.	1M	1	L1
b)	List the advantages of circular linked list over single linked list	1M	1	L1
c)	Define complete binary tree	1M	2	L1
d)	Define AVL tree.	1M	2	L1
e)	Define skew heap.	1M	3	L1
f)	What are the applications of priority queues?	1M	3	L1
g)	Differentiate linear search and binary search with respect to their respective time complexity.	1M	4	L4
h)	List out the characteristics of Good Hash Function.	1M	4	L2
i)	How do you find the degree of a graph?	1M	5	L1
j)	State the properties of Minimum Cost Spanning Tree	1M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
2	Develop a program to perform operations on a doubly linked list.	10M	1	L4
OR				
3	a) Illustrate the procedure for performing basic operations on a stack. b) Write a program using arrays to implement the queue operations.	5M 5M	1	L2
4	a) How to represent binary tree using arrays and linked list? b) Write in-order; pre-order and post-order traversal of a binary tree.	5M 5M	2	L2
OR				
5	a) Illustrate threaded binary tree with an example. b) Create binary search tree for the following elements (23, 12, 45, 36, 5, 15, 39, 2, 19). Discuss about the height of the above binary search tree.	5M 5M	2	L3
6	Write short notes on: a) Red-Black trees b) splay trees c) b-trees.	(5+3+2)M	3	L2
OR				

7	a) Define priority queue. Discuss briefly the heap representation of priority queue. b) Describe min-heap and its applications.	5M 5M	3	L2
8	a) Explain linear search technique with an example. b) Define hashing. List the two principal criteria in deciding a hash function. Explain some of the hash function methods.	5M 5M	4	L2
OR				
9	a) Compare separate chaining and open addressing with suitable examples. b) Explain smart union algorithms.	5M 5M	4	L4
10	a) Construct a program to implement the breadth first search traversal. b) What is a graph? Explain the properties of graphs.	5M 5M	5	L3
OR				
11	a) Explain Kruskal's algorithm to find the minimum cost spanning tree with an example. b) State Euler's theorems with examples and graph diagrams.	6M 4M	5	L2