



R18 Regulation

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

Subject code: 2P3EB & 2P3FB

B.Tech III Semester Supplementary Examinations, February 2024

DATA STRUCTURES
(Common to CSE & IT)

Maximum Marks: 70

Date: 19.02.2024 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	BTL
1	Define ADT.	1	L1
2	Define recursive algorithm and give an example.	1	L1
3	Explain node structure of double linked list.	2	L3
4	Differentiate queue and circular queue.	2	L4
5	Explain threaded binary tree.	3	L3
6	Explain about representing a binary tree using array.	3	L3
7	Discuss on linear search technique.	4	L3
8	Write about external sorting.	4	L1
9	What are the applications of graphs?	5	L1
10	Define red-black tree.	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		M	CO	BTL
11	Explain different asymptotic notations with examples.	10M	1	L5
	OR			
12	Define time complexity, space complexity and calculate for the matrix multiplication.	10M	1	L4
13	A. Define sparse matrix and represent it using an array.	5M	2	L1
	B. Explain insert and delete operations in single linked list.	5M		L5
	OR			
14	Explain Array and Linked list representation of Sparse Matrix.	10M	2	L5
15	A. Define Binary tree and explain its traversing techniques with examples.	5M	3	L5
	B. Explain priority queue ADT and give an example.	5M		L5
	OR			
16	A. Define Max heap. Construct a max heap for the following {56,34,78,23,90,77,65,19}.	5M	3	L4
	B. Explain smart union algorithm with an example.	5M		L5

17	A. Explain binary search with an example. B. Explain techniques to handle overflow in hashing.	5M 5M	4	L5 L5
	OR			
18	A. Demonstrate Quick sort using the following numbers – 50,23,34,87,44,20,67,16 B. Explain selection sort using the numbers – 33,29,54,66,76,25,17,89	5M 5M	4	L5 L5
19	A. Explain adjacency list representation of graph with a suitable example. B. Write BFS algorithm and illustrate it with an example.	5M 5M	5	L5 L4
	OR			
20	A. Construct a BST with the following numbers – 45,56,34,12,42,78,67,98 B. Explain insert, delete operations in AVL trees.	5M 5M	5	L4 L5