



R25 Regulation

Subject code:F581PC2

**TKR COLLEGE OF ENGINEERING AND TECHNOLOGY**  
(Autonomous, Accredited by NAAC with 'A+' Grade)

**M.Tech I Semester Regular Examinations, March 2026**

**ADVANCED DATA STRUCTURES**  
(CSE)

Maximum Marks: 60

Date:04.03.2026

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=10Marks)		Marks	CO	BTL
1.a	Justify why Fibonacci Heaps improve amortized performance.	1M	1	BL1
b	Construct a simple Binomial Heap with two binomial trees.	1M	1	BL2
c	Explain why collisions occur in hash tables.	1M	2	BL2
d	Use a hash function to insert a key into a hash table.	1M	2	BL2
e	Define a multiway search tree.	1M	3	BL1
f	Decide which search structure is best for database indexing.	1M	3	BL2
g	Modify a standard trie to form a compressed trie.	1M	4	BL2
h	Distinguish between suffix trees and suffix arrays.	1M	4	BL2
i	Examine the role of the prefix table in KMP.	1M	5	BL2
j	Design a simple pattern matching algorithm for small texts.	1M	5	BL2

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
2	a) Describe the structure of a Min-Max Heap and explain	5M	1	BL3
	b) Compare Min-Heap and Min-Max Heap in terms of structure and operations.	5M		BL2
OR				
3	a) Define a Binomial Heap and list its structural properties.	5M	1	BL1
	b) Interpret the role of heap-ordered trees in advanced data structures.	5M		BL3
4	a) Explain the Folding Method of hashing and identify its advantages and limitations.	5M	2	BL4
	b) Compare open addressing and chaining methods for collision resolution.	5M		BL2
OR				
5	a) Describe separate chaining and show how it resolves collisions.	5M	2	BL3
	b) Justify the importance of collision handling techniques in large databases.	5M		BL2

6	a) Construct an AVL Tree with specified data: 10 15 9 12 13 79 45 36 22. b) Evaluate the suitability of different search structures for large-scale data storage.	5M 5M	3	BL1 BL3
OR				
7	a) Define a Red-Black Tree and list its properties. b) What is a B-Tree. Specify its properties and describe the construction of a B-Tree for the following elements. 5, 2, 13, 3, 45, 72, 4, 6, 9, 22	5M 5M	3	BL1 BL3
8	a) What is a Patricia Trie? Explain how it optimizes a Binary Trie. b) Explain the advantages and limitations of Patricia Tries.	5M 5M	4	BL1 BL2
OR				
9	a) What is a Suffix Tree? Explain its construction conceptually. b) Explain the time and space complexity of Tries used for digital searching.	5M 5M	4	BL1 BL2
10	a) What is pattern matching? Explain its importance in string processing applications. b) Compare Naïve string matching and Brute Force algorithm.	5M 5M	5	BL1 BL2
OR				
11	a) Explain the Rabin–Karp algorithm using hashing technique. b) Explain the Horspool algorithm. How does it simplify Boyer–Moore.	5M 5M	5	BL4 BL4