

**CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS**

I–M.TECH–I–Semester End Examinations (Regular) - February- 2026

ADVANCED DATA STRUCTURES

(CSE)

[Time: 3 Hours]

[Max. Marks: 60]

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 10 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A

(10 Marks)

1. a) Define a heap data structure with example. [2M]
- b) What is a hash function? [2M]
- c) Define Balance Factor in an AVL tree? [2M]
- d) Difference between Trie and BST. [2M]
- e) What is Boyer–Moore algorithm? [2M]

PART-B

(50 Marks)

2. Explain Heap structure & construct a Min Heap by inserting the elements 10, 4, 15, 20, 0, 8. Show all intermediate steps. [10M]
- OR**
3. Explain Leftist Heaps with insertion and deletion algorithms and diagrams. [10M]
 4. Construct a hash table using Division Method ($h(k) = k \text{ mod } 10$) for keys 23, 43, 13, 27, 53. [10M]
- OR**
5. Compare Open Addressing and Chaining techniques in hash tables with examples. [10M]
 6. Insert the following keys into a Red-Black Tree: 7, 3, 18, 10, 22, 8, 11. [10M]
- OR**
7. Compare AVL Trees and Red-Black Trees with suitable examples. [10M]
 8. Explain Tries and its types and construct a Tries for the words: cat, cap, can. [10M]
- OR**
9. Compare Standard Tries and Compressed Tries with representations. [10M]
 10. Explain Naïve String Matching and apply it to find pattern "aba" in "ababa". [10M]
- OR**
11. Analyze best, worst, and average-case complexities of all pattern matching algorithms. [10M]
