

CMR ENGINEERING COLLEGE:: HYDERABAD
UGC AUTONOMOUS
I-B.TECH-II-Semester End Examinations (Supply) -June- 2025
DATA STRUCTURES
(Common for all)

[Time: 3 Hours]**[Max. Marks: 70]****Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 20 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**(20 Marks)**

1. a) What are the differences between Array and Linked List? [2M]
- b) Write an algorithm for PUSH operation of stack. [2M]
- c) List the types of collision resolution techniques. [2M]
- d) What do you mean by hash function? [2M]
- e) State the properties of AVL tree. [2M]
- f) Write various applications of SPLAY trees. [2M]
- g) Differentiate between internal and external sorting. [2M]
- h) What are the differences between Tree and Graph? [2M]
- i) Write about the Boyer-Moore Algorithm. [2M]
- j) Write the function for Suffix Tries with an example. [2M]

PART-B**(50 Marks)**

2. Explain with an algorithm to implement the following operations of a Single Linked List. [10M]
 (i) insertatend() (ii) insertatbegin() (iii) display() (iv) deleteatend()

OR

3. Consider the following infix expression and convert into postfix notation using stack. [10M]
 $A + (B * C - (D / E \wedge F) * H)$

4. Explain about various operations of Dictionaries represented using skip list. [10M]

OR

5. What is chaining? Explain about separate chaining and open addressing technique with a suitable example. [10M]

6. Write algorithms for deleting an element from a Binary Search Tree and construct the BST for the following elements: 98, 2, 48, 12, 56, 32, 4, 67, 87, 23, 55, 46 [10M]
 Then delete 23, 56, 2, 48.

OR

7. Construct the AVL Tree for the following elements: 20, 12, 5, 31, 40, 2, 4, 26, 24, 28, 50. Do appropriate rotations if any imbalance occurs. [10M]

8. Explain in detail about the Depth First Search graph traversal technique with an example. [10M]

OR

9. Explain Merge Sort technique to sort the elements 88, 74, 98, 54, 67, 32, 34, 56, 90 in ascending order. [10M]

10. Explain the Knuth-Morris-Pratt pattern algorithm with a suitable example. [10M]

OR

11. Explain Standard Tries with an example. [10M]
