Code No.: CS203ES   R20   H.T.No. [ ] [8] [R] [ ] [ ] [ ] [ ]

CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS
I–B.TECH–II–Semester End Examinations (Supply) -February- 2024
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)	Write an algorithm for PUSH operation of stack.	[2M]
b)	What are the disadvantages of Arrays over Linked List?	[2M]
c)	What is hashing?	[2M]
d)	What is collision? explain with an example.	[2M]
e)	How AVL trees are advantageous over Binary Search Trees?	[2M]
f)	Write in-order, pre-order and post-order traversal of a binary tree.	[2M]
g)	What are the applications of Graphs.	[2M]
h)	Differentiate Heap Sort with Merge Sort.	[2M]
i)	List out different Tries.	[2M]
j)	Mention the working principle of Brute-Force algorithm.	[2M]

PART-B   (50 Marks)

2. Explain the following operations in a Single linked list: [10M]
    (i) Create an empty list.
    (ii) Insert the elements 10 and 20 at the front of the list.
    (iii) Insert the elements 30 at the middle of the list.
    (iv) Insert the elements 15, 45 at the end of the list.
    (v) Delete the middle element from the list.

OR

3. Explain in detail about the various operations on Queues with examples.   [10M]

4. a) What is skip list?   [2M]
   b) Explain the Operations Insertion, Deletion and Searching with a Skip List.   [8M]

OR

5. What is chaining? Explain about separate chaining and open addressing?   [10M]

6. Construct the binary search tree for the following data elements: 55, 64, 82, 23, 10,   [10M]
   62, 98, 33, 66, 18, 76 and 15.

OR

7. Define AVL Tree. Explain different height imbalances and it's rotations with an   [10M]
   example.

8. Explain the various graph traversals with example.   [10M]

OR

9. Explain Heap Sort technique to sort the elements 98, 2, 48, 12, 56, 32, 4, 67, 73, 87,   [10M]
   23, 55, 46 in ascending order.

10. Explain the Boyre-Moore pattern matching algorithm with a suitable example.   [10M]

OR

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

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