Code No.: R22CS203ES

R22	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 ECE, CSE, IT)

[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)	What is an abstract data type?	[1M]
b)	List any two programming applications of stacks.	[1M]
c)	What is a dictionary?	[1M]
d)	What are the collision resolution techniques?	[1M]
e)	Differentiate a binary search tree and AVL tree.	[1M]
f)	What are the AVL tree rotations?	[1M]
g)	What are the different methods of graph representations?	[1M]
h)	What is an external sorting method? Give an example.	[1M]
i)	What is pattern matching?	[1M]
j)	What is a Standard Trie?	[1M]

PART-B   (50 Marks)

2. What is a Linked list? Explain insertion and deletion of elements from singly linked list. [10M] Also give the limitations of a singly linked list over the doubly linked list.

OR

3. State the operating principle of queue data structure. Write C implementation of a queue [10M] using arrays? Also give it's applications.

4. What is a skip list? Explain the operations on skip lists with an example? [10M]

OR

5. Explain the importance of a Hash function and discuss any one collision resolution [10M] techniques used in hashing?

6. Define binary search tree and its properties. construct a binary search tree for given list [10M] { 30, 40, 50, 25, 28, 75, 26, 17, 4 }

OR

7. What is an AVL tree? Write an example to create, insert into and delete elements from an [10M] AVL tree.

8. Demonstrate with an example the DFS and BFS traversals of a graph. Which of these [10M] methods use a stack data structure during the application process?

OR

9. What do you mean by minimum heap? Design an algorithm for construction of a minimum [10M] heap and apply the same on the list {12, 105, 405, 136, 15, 390, 430, 29, 440}. Use the constructed mini-heap in sorting the given list.

10. What is the use of pattern matching? Explain the Boyer-Moore algorithm with an example. [10M]

OR

11. What are tries? Differentiate the Standard Trie and Suffix Tries in pattern matching. [10M]

****