Code No.: R22CS203ES	R22	H.T.No.			8	R						

CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS
I–B.TECH–II–Semester End Examinations Regular) - June- 2025
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)	Define Abstract Data Type (ADT).	[1M]
b)	List the different types of linear data structures.	[1M]
c)	List the different collision resolution strategies used in hash tables.	[1M]
d)	What is a skip list?	[1M]
e)	Give the properties of binary search tree.	[1M]
f)	What are the applications of splay trees?	[1M]
g)	What are the different ways to represent a graph?	[1M]
h)	Differentiate BFS and DFS.	[1M]
i)	What are the basic properties of a trie?	[1M]
j)	What meant by KMP algorithm?	[1M]

PART-B **(50 Marks)**

2.	Write an algorithm to evaluate a postfix expression and explain with an example.	[10M]
	OR	
3.	Given a singly linked list, illustrate with diagrams how the insertion and deletion operations work.	[10M]
4.	Explain the steps involved in inserting an element into a skip list.	[10M]
	OR	
5.	How linear probing works when inserting keys into a hash table with an example.	[10M]
6.	Construct an AVL Tree by inserting the following keys in sequence: 30, 20, 10, 25, 40, 50. Show intermediate steps.	[10M]
	OR	
7.	Explain how a B+ Tree differs from a B-Tree.	[10M]
8.	Describe the working of Heap Sort with an example.	[10M]
	OR	
9.	Sort the following array using Quick Sort and show each step:[45, 23, 89, 11, 77, 65]	[10M]
10.	Show how a trie is built for the following words: ["apple", "ape", "apex", "app"].	[10M]
	OR	
11.	What is the procedure for Brute Force pattern matching algorithm and explain with example.	[10M]

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