Code No: 153AK **R18**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech II Year I Semester Examinations, April/May - 2023
DATA STRUCTURES
(Computer Science and Engineering – Artificial Intelligence and Machine Learning)
Time: 3 Hours **Max. Marks: 75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

1.a)	Give array representation of stacks.	[2]
b)	What is the difference between stacks and queues?	[3]
c)	What is hashing?	[2]
d)	Distinguish between linked lists and skip lists.	[3]
e)	What is the full form of AVL?	[2]
f)	What is the significance of binary search tree?	[3]
g)	What is heap?	[2]
h)	What are the applications of breadth first search?	[3]
i)	Generate standard trie for following strings: S = {bear, bell, bid, bull, buy, sell, stock, stop}	[2]
j)	What is the space complexity of a suffix trie? Give example.	[3]

PART – B

(50 Marks)

2. Explain in detail the applications of stack. [10]

OR

3. What is singly linked list? Write algorithms for insertion, deletion and search operations on singly linked lists. [10]

4. What are skip lists? Write algorithms for insertion, deletion and search operations on skip lists. [10]

OR

5. What are the various methods for collision resolution in hashing? Explain them. [10]

6. Perform following operations on AVL tree:
Insert 3
Insert 7
Insert 10
Insert 23
Insert 67
Insert 21
Insert 30
Delete 67
Insert 52
Delete 30
Delete 23
Insert 98 [10]

OR

7. Explain red black tree in detail. [10]

8. Explain Depth first search with an example and write down algorithm for it. [10]

OR

9. Simulate merge sort on following data and write down algorithm for it.
11,55,23,12,81,44,23,45,64,31 [10]

10. Explain the Knuth-Morris-Pratt algorithm with an example. [10]

OR

11. What is a trie? List and explain different types of tries with examples. [10]

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