Code No: 153AK **R18**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech II Year I Semester Examinations, April/May - 2023
DATA STRUCTURES
(Common to CSE, IT, ECM, CSBS, CSIT, ITE, CE(SE), CSE(CS), CSE(DS), CSE(IOT), CSE(N), AI&DS, AI&ML, CSD)

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 examples for stack.	[2]
b)	How to construct a queue using stacks?	[3]
c)	What is a skip list?	[2]
d)	List the drawbacks of open addressing.	[3]
e)	What does the color notate in red-black tree?	[2]
f)	What operations are performed on Splay trees?	[3]
g)	What is a max heap?	[2]
h)	Give example for adjacency list of a graph.	[3]
i)	Define trie.	[2]
j)	What are the merits and demerits of brute force method for pattern matching?	[3]

PART – B

(50 Marks)

2. Write and explain algorithms for Push and pop operations of stack using linked list.[10]

OR

3.a) Describe the conditions of overflow and underflow in a queue.
b) Discuss the applications of queues. [5+5]

4.a) Demonstrate skip list representation of a dictionary.
b) How to perform reassign operation on a dictionary. [5+5]

OR

5. Explain the algorithm for implementing quadratic probing on a hash table. [10]

6.a) Illustrate search operation on binary search tree.
b) Discuss the importance of height balanced trees for searching. [5+5]

OR

7.a) With suitable examples, illustrate right-left rotation on AVL tree.
b) Differentiate between splay tree and red-black tree. [5+5]

8. Make a comparison of breadth first search and depth first search for a graph. [10]

OR

9. Write an algorithm for merge sort and explain with a suitable example. [10]

10. Describe the Knuth-Morris-Pratt algorithm for pattern matching. [10]

OR

11. "A compressed trie is an advanced version of the standard trie." Support or oppose this statement with necessary explanation. [10]

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