

Code No: 153AK**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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