

www.FirstRanker.com

www.FirstRanker.com

Code No: 821AF

Time: 3 Hours

R15

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD MCA II Semester Examinations, July/August - 2021 DATA STRUCTURES AND ALGORITHMS

Max.Marks:75

Answer any five questions All questions carry equal marks

- 1. Define a list. Describe the fundamental operations performed on a double linked list data structure with pseudo codes. [15]
- 2.a) What are the applications of queue data structure?
 - b) Write down the algorithms for enqueue and dequeue operations using list ADT.
- c) How does a Queue data structure differs from a stack data structure? [5+5+5]
- 3.a) Write an algorithm for insertion and deletion of a node into a Binary Tree and illustrate with an example.
 - b) Construct an expression tree for the following expression: $(a / b^* c) + ((d^* e+f)^* g) + h.$ [8+7]
- 4.a) Write the procedure to insert into a binary heap and illustrate with an example.
- b) Show the result at each pass of inserting the following elements in to an empty min heap: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15. [8+7]
- 5.a) Explain briefly about linear probing and quadratic probing collision resolution strategies.
- b) What are the advantages and disadvantages of the various collision resolution strategies? [8+7]
- 6. What is quick sort? Write an algorithm for quick sort and derive its run time complexity with an illustrative example. [15]
- 7.a) Write down the algorithms for insertion and deletion operations of Red-Black Tree and illustrate with an example.
 - b) State the applications of B-Trees and AVL Trees. [8+7]
- 8. With an illustrative example, explain Optimal Binary Search Tree using Dynamic Programming approach. [15]

---00000----