

## Data Structure Using 'C' (CSE-201-F)

Q1. What is an abstract data type? Differentiate between linear and non-linear data structure by taking two example of each.

Q2. What are the sparse matrices? Mention two of its kinds and discuss how they are stored in memory?

Q3. Discuss the advantages and disadvantages of linked list over arrays and write an algorithm to find out the second maximum element in array.

Q4. What is a priority QUEUE? Discuss two of their applications and mention how they are represented in memory?

Q5. Convert the following expression into reverse polish (postfix) from using stack. Show the simulation of stack at every step:  $a+(b^c-d)*(e+f)/g$

Q6. Evaluate the postfix expression  $6,2,3,\wedge,+,7,2,/,5,*,-,3,+$  and also convert it into infix.

Q7. What is a circular queue? Write an algorithm to implement circular queues using array for enqueue(), dequeue() and display() operation.

Q8. What is stack? Explain the basic operation (Push, Pop & display) performed on stack using linked list.

Q9. Write an algorithm to swap two consecutive nodes of a linked list having location LOC and LOCN.

Q10. Write an algorithm to reverse a linked list.

Q11. Write an algorithm to delete an element from a binary search tree.

Q12. Write non-recursive algorithm for pre order of a binary tree.

Q13. Draw an expression tree for the following expression and write the post order for the same.

$(a + b * c) ^ ((d * e - f) / g)$

Q14. Write an algorithm to find the sum of all nodes of binary tree.

Q15. Insert the following entries into an initially empty B-tree of order 5.

{ 1,7,6,11,3,8,14,10,4,18,9,19,24,5,12,13,20,21,22}

Q16. What are threaded binary trees. Discuss with some examples.

Q17. Differentiate between

- 1) High balanced tree and weighted balanced tree.
- 2) Complete binary tree and extended binary tree.

Q18. Describe the following brief with two examples each

- 1) Primitive DTs
- 2) Abstract DTs
- 3) Linear DSs

Q19. What do you mean by priority queue? What problems arise when data elements are stored on one sequential priority Q? How do you overcome it?

Q20. Differentiate between linear and non-linear DSs by citing two examples. Explain advantages of non-linear DSs.

Q21. What is heap? Sort the following list L in ascending order using heap sort:  
 $L = \{56, 65, 92, 38, 44, 90, 61, 16, 73, 37\}$