



**LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034**

**B.Sc. DEGREE EXAMINATION – COMPUTER SCIENCE**

**THIRD SEMESTER – NOVEMBER 2022**

**UCS 3503 – DATA STRUCTURES**

Date: 03-12-2022

Dept. No.

Max. : 100 Marks

Time: 09:00 AM - 12:00 NOON

**PART – A**

**(10x 2 = 20 Marks)**

**Q. No**

**Answer ALL the questions**

- 1 Define an array.
- 2 What are the uses of pointers?
- 3 What is polish notation?
- 4 Write the advantages of recursion.
- 5 Write the node structure of a singly linked list.
- 6 Write the advantages of a Doubly linked list.
- 7 Define an Adjacency matrix.
- 8 Define a binary tree.
- 9 What is sorting?
- 10 Write the advantages linear search.

**PART – B**

**(5 x 8 = 40 Marks)**

**Answer ALL the questions**

- 11 a) Explain the representation of a two-dimensional array in a memory.  
OR  
b) Write an algorithm to insert an element at a particular location in a linear array.
- 12 a) Explain the procedure to solve the towers of Hanoi problem with n=4.  
OR  
b) Describe the algorithm to convert infix expression into postfix
- 13 a) Write an algorithm to delete an element at a particular location in a singly linked list with example.  
OR  
b) Describe the storage representation of a doubly linked list.
- 14 a) Explain Post order traversal with example.  
OR  
b) Explain Depth First Search algorithm with example.
- 15 a) Explain Linear search algorithm. Find the presence of 38 in the list using linear search algorithm  
2, 5, 8, 12, 14, 16, 19, 23, 38, 48, 56.

OR

b) Describe the Bubble sort algorithm.

**PART – C**

**(2 x 20 = 40 Marks)**

**Answer any TWO questions**

- 16 a) Describe the different types of storage representation of a linear array.  
b) Explain the different ways of inserting an element in a queue.
- 17 a) Write an algorithm to  
i) delete the first node in a doubly linked list.  
ii) delete the node at the location 'X' in a doubly linked list.  
b) Define a binary tree. Explain the storage representation of a binary tree with example.
- 18 a) Explain Merge Sort algorithm with example.  
b) Write an algorithm to evaluate the postfix expression. Identify the result of the postfix expression  $2\ 3\ 1\ * + 9 - .$

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