



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

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

**THIRD SEMESTER – NOVEMBER 2022**

**17/18UCS3MC01 – DATA STRUCTURES**

Date: 24-11-2022

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 List down any four applications of data structures.
- 2 What are the basic operations on data structure?
- 3 Write the advantages of Queue.
- 4 Define s stack.
- 5 Write the node structure of a doubly linked list.
- 6 Write the uses of a linked list.
- 7 Define adjacency matrix.
- 8 What is height of a tree?
- 9 Write the uses of sorting.
- 10 Write the advantages of a linear search.

**PART – B**

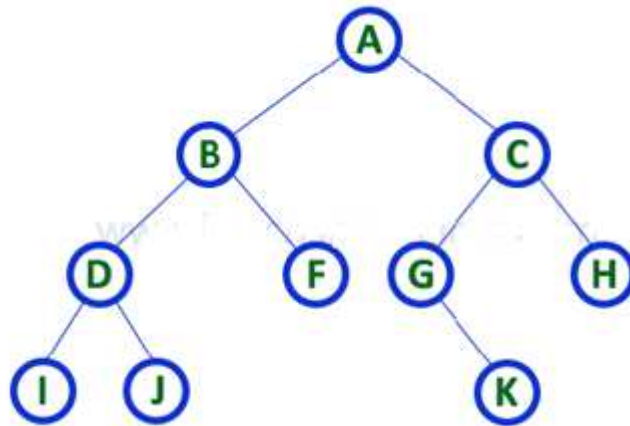
**(5 x 8 = 40 Marks)**

**Answer ALL the questions**

- 11 a) Write an algorithm to insert a new element in an array. Give example  
OR  
b) Write the steps to identify the location of a particular element in an array.
- 12 a) Discuss on Recursion with example  
OR  
b) Write an algorithm to evaluate the postfix expression. Identify the result of the postfix expression  $2\ 3\ 1\ * + 9 - .$
- 13 a) Write an algorithm to count the number of nodes in a doubly linked list.  
OR  
b) Describe the storage representation of a singly linked list.
- 14 a) Define a tree. Explain any one storage representation of a tree with example.  
OR  
b) Explain Depth First Search algorithm with example.
- 15 a) Explain Binary 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 Insertion sort algorithm.

Answer any TWO questions

- 16 a) Describe the different types of storage representation of a multidimensional array.
- b) Explain the insertion and deletion operations in a queue.
- 17 a) Write an algorithm to
  - i) Insert a new node as a first node in a singly linked list.
  - ii) Insert a new node as a last node in a doubly linked list.
- b) Find the in order, preorder and post order traversal of the following tree. Write the steps.



- 18 a) Explain Merge Sort algorithm with example.
- b) Explain the data structure stack with example.

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