LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

THIRD SEMESTER – **APRIL 2023**

UCS 3503/UCA 3503 – DATA STRUCTURES

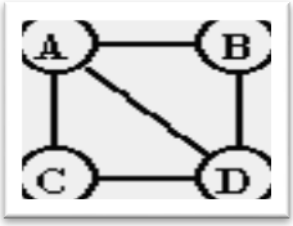
Date: 04-05-2023 Dept. No. Max. : 100 Marks

Time: 01:00 PM - 04:00 PM

PART-A

ANSWER ALL THE QUESTIONS: **(10x2=20)**

1. Define data structure. Mention its types.
2. What is an array?
3. Define the term: Recursion. Give example.
4. Change the expression in to prefix: (a+b) * c.
5. What is node?
6. Represent the node of double linked list.
7. Write the adjacency matrix and adjacency list of the graph given below.



8. State the properties of binary tree.
9. What is meant by bubble sort?
10. Classify the conditions for Linear search.

PART-B

ANSWER ALL THE QUESTIONS: **(5x8=40)**

11. Describe on the classification of data structures.

(or)

Write short note on the operations of Data structures.

12. Explain the operation of stack with example.

(or)

Write an algorithm to do the following operations on a queue.

i) insert an element ii) delete an element. Give example.

13. What is linked list? Explain the different operations and applications of the linked list.

(or)

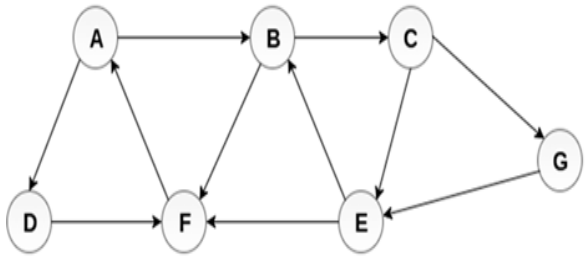
Explain the following insert algorithm in singly linked list with example for each.

a) At the beginning b) At a specified location

14. Explain the representation of tree in List order.

(or)

Describe the breath first search for the example with the source as A:



15. Illustrate the linear search algorithm. Give example

(or)

Experiment the binary search algorithm and find whether 25 is present in the given data using binary search algorithm

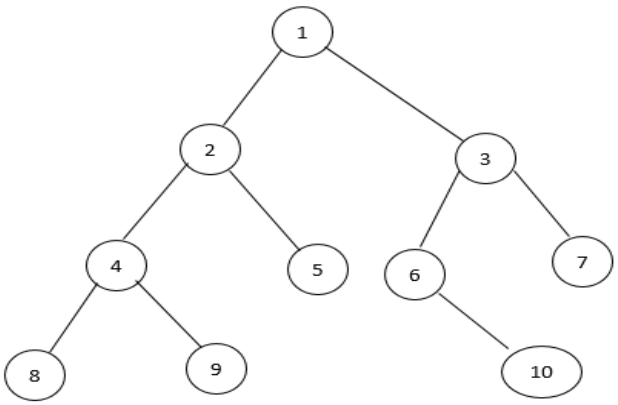
3, 4, 7, 12, 13, 16, 20, 25, 37, 45, 59, 77, 98, 111.

PART-C

ANSWER ANY TWO QUESTIONS: **(2x20=40)**

16. a) Explain the structure, representation and variable length of a record. **(10 marks)**
    b) Evaluate the expression using Stack (A+B*(C-D))/E. **(10 marks)**

17. a) Elaborate on the insertion, deletion operations of double linked list. **(10 marks)**
    b) Discuss various tree traversal rule on the tree and record the result **(10 marks)**



18. Explain bubble sort, merge sort algorithms with example. **(20 marks)**

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