LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

THIRD SEMESTER – **NOVEMBER 2023**

UCS 3503 – DATA STRUCTURES

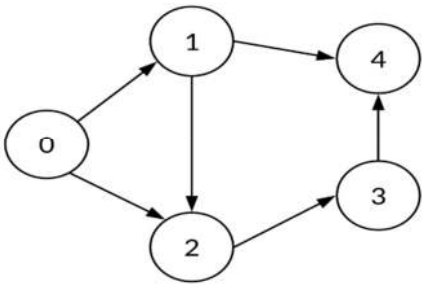
Date: 04-11-2023 Dept. No. Max. : 100 Marks

Time: 09:00 AM - 12:00 NOON

PART- A

Answer ALL the Questions **(10 x 2 = 20)**

1. Define Data structures.
2. Differentiate linear and non-linear data structure.
3. Define Stack.
4. List the applications of Queue.
5. Define Tree.
6. Write the postfix and prefix forms of the expression A+B*(C-D)/ (P-R).
7. What is Linked list?
8. What are the advantages of Linked list?
9. Write the adjacency matrix of the given graph



10. List the various sorting techniques.

PART- B

Answer ALL the Questions **(5 x 8 = 40)**

11. a) Illustrate the Insertion and deletion algorithm for linear array.

(or)

b) Analyze the representation of Record structure with an example.

12. a) Compute the Infix to post fix conversion of the given expression using stack

A + (B * C- (D / (E ^ F) * G)* H)

(or)

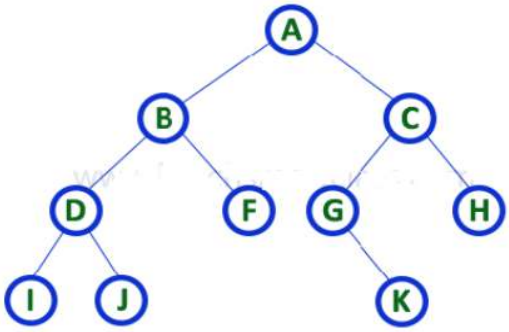
b) Explain the concept of Recursion with an example.

13. a) Explain the insertion and deletion algorithm for single linked list.

(or)

b) Determine the deletion concept of doubly linked list with an example.

14. a) Determine the Pre-order, Post-order and In-order traversal for the given binary tree



(or)

b) Illustrate the Breadth first search algorithm.

15. a) Explain the Linear search algorithm.

(or)

b) Describe the concept of binary search algorithm with an example.

PART- C

Answer any TWO Questions **(2 x 20 = 40)**

16. a) Asses the algorithms of Stack operations.

b) Discuss insertion and deletion algorithms of Queue.

17. a) Summarize the algorithms for

i) Insertion at the beginning of a doubly linked list.

ii) Insertion at the given location of a doubly linked list.

b) Illustrate the Depth first search algorithm with an example.

18. Discuss the algorithms for Bubble sort and Merge sort with an example.
