QP Code: U25C030

Reg. No : .....

Name : .....

ST MARY'S COLLEGE (AUTONOMOUS), THRISSUR-20

III SEMESTER (FYUGP) DEGREE EXAMINATIONS, OCTOBER 2025

BCA

BCA3CJ201 : DATA STRUCTURES AND ALGORITHMS

2024 Admission Onwards

(Credits: 4)

Time: 2 Hours **Maximum Marks: 70**

Section A

*Answer **all**. Each question carries **3** Marks* ***(Ceiling: 24 Marks)***

1. Define data structure.
2. Write a short note about singly linked list.
3. Define ADT
4. Discuss various operations on stack.
5. Discuss various tree representations.
6. Evaluate inorder traversal algorithm with example.
7. Write about non recursive post order traversal algorithm.
8. Which searching algorithm is used for searching an element in a sorted array? Justify your answer.
9. Define structures in C programming.
10. How does complete binary tree differ from full binary tree?

Section B

*Answer **all**. Each question carries **6** Marks* ***(Ceiling: 36 Marks)***

11. Write about sparse matrix and different types of matrix.
12. Write a program to implement array operations.
13. Define queue. Discuss various operations of queue data structure.
14. Write a short note about binary tree terminologies with suitable example.
15. Define a graph. Explain with suitable example.
16. Illustrate how self loops and parallel edges are represented in adjacency matrix and adjacency list.

Turn Over

17. Define hashing. Explain any two hashing techniques with suitable example.

18. Demonstrate the procedure to sort the given set of numbers 50, 20, 80, 60, 30 using any one of the internal sorting algorithm.

Section C

*Answer **any one**. Each question carries **10** Marks* ***(1x10=10marks)***

19. Implement stack using linked list.

20. Compare post order traversal algorithms of a binary tree with suitable example.

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