**ST. Joseph’s College (Autonomous), Bangalore**

**Register No:**

**Date: 8-4-19**

**Date:**

**II Semester Examination, April 2019**

**B C A**

**CA 2115 : Data Structures Using C**

**Time 2.5 Hrs Max Marks 70**

**This paper contains 1 printed pages and 3 parts**

**PART-A**

**Answer all TEN questions 2 x10 = 20**

1. Define Data Structures? How are they classified?

2. Explain the process of calculating the complexity of linear search.

3. Give the memory representation of a STACK.

4. Give the memory representation of a QUEUE.

5. What is an expression? What are the different types of expression?

6. What is a linked List? What are the different types of linked list?

7. Define

 a) Root

 b) Leaf or Terminal Nodes

8. Define AVL rotation and explain it with the help of an example.

9. What is Blocking Factor? How can you calculate the blocking factor of a node?

10. What is sorting? List any three types of sorting techniques.

**PART-B**

**Answer any FIVE questions 6 x5 = 30**

11. Explain Primitive and Non-Primitive Data Structures in detail.

12. What are the operations possible on Primitive Data Type?

13. Write an algorithm to perform PUSH and POP operations.

14. Write an algorithm to add and delete an element from a Queue.

15. Write an algorithm to add a node at the end of the linked list.

16. Explain the process of converting an infix expression to its equivalent postfix expression.

17. Draw a Binary search tree for the following data and give its inorder and preorder traversals 65,34,12,45,78,57,85,81,9,93,37

**PART-C**

**Answer any TWO questions 10 x2 = 20**

18. What are the different types of linked list? Explain in detail

19. Construct a binary tree for the following inorder and postorder traversals

INORDER: D G B A E C H F

POSTORDER: G D B E H F C A

20. a) Write an algorithm to perform Binary search.

       b) Write an algorithm to sort a list of numbers using Bubble sort [5+5]

**CA-2112-A-17**