TB242242V

Reg. No :.....

Name :.....

BACHELOR'S DEGREE (C.B.C.S) EXAMINATION, MARCH 2024

2023 ADMISSIONS REGULAR

SEMESTER II -BCA (Cloud Technology and Information Security Management) CORE COURSE

BC2C04B23 - Data Structures Using C

**Time : 3 Hours** **Maximum Marks : 80**

## Part A

**I. Answer any Ten questions. Each question carries 2 marks** **(10x2=20)**

1. Define non-linear data structure.
2. Discuss about the different operations that can be performed on arrays.
3. Explain different searching techniques in data structure.
4. State comparisons between sequential search and binary search.
5. Define the terms Overflow and Underflow in the context of a stack.
6. Differentiate stack and a queue.
7. Differentiate enqueue and dequeue opertaions.
8. State any 2 advantages and disadvantages of Linked List.
9. Differentiate Singly Linked List and Circular Linked List.
10. Define terminal and non-terminal nodes with example.
11. Summarize the different ways in which a binary tree can be traversed.
12. Define binary search tree.



## Part B

**II. Answer any Six questions. Each question carries 5 marks** **(6x5=30)**

13. Write a program to insert an integer into an array at a specified position.
14. Write a short note on (i) Big O Notation (ii) Omega Notation.
15. Illustrate how you will perform selection sort in the given array. 40, 90, 60, 5, 13, 10, 20, 45, 50
16. Write an algorithm to convert the arithmetic expression from Infix to Postfix.
17. Write a program to implement Push and Pop operations in Stack using array.
18. Write a program to demonstrate traversing in a Linked List.
19. Write an algorithm to insert an element at the end of a doubly linked list.
20. Explain any two ways of sequential graph representation with examples.
21. Explain the steps in Depth First Search with an example.

## Part C

**III. Answer any Two questions. Each question carries 15 marks** **(2x15=30)**

22. Explain recursion in C and state its advantages. Develop a C program using recursive function to find the GCD of 2 numbers.
23. Discuss about searching operation. Write a C program to implement linear search using recursion and explain with an example.
24. Write a C program to implement a circular queue using array and perform its common operations.
25. Discuss on Linked Lists. Illustrate deletion from beginning, deletion from end and deletion from a specified position in a singly linked list.