TB252261X

Reg. No :.....

Name :.....

BACHELOR'S DEGREE (C.B.C.S) EXAMINATION, MARCH 2025

2023 ADMISSIONS SUPPLEMENTARY

B.C.A SEMESTER II - 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. State the difference between primitive and non-primitive data structure.
2. Define non-linear data structure.
3. Cite the best case and worst case complexities of insertion sort and merge sort.
4. Define sorting. Discuss about the 2 main operations involved in sorting.
5. Convert a+b*c into postfix notation.
6. Define the terms (i) top (ii) front (iii) rear (iv) enque.
7. Define the terms Overflow and Underflow in the context of a queue.
8. List the disadvantages of a singly Linked List.
9. Explain doubly linked list.
10. Define graph and its types.
11. Define terminal and non-terminal nodes with example.
12. Represent the heap order property.

Part B

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

13. Write a short note on (i) Big O Notation (ii) Theta Notation.
14. Write a short note on memory management functions.
15. Explain bubble sort with an e.g.
16. Write an algorithm to perform push() and show() operations in a stack.
17. Discuss about dequeue and priority queue.
18. Write an algorithm to insert an element at the end of a circular linked list.
19. State the advantages and disadvantages of linked list.
20. Sketch a binary tree of height 3 and write its Preorder, Inorder and Postorder Traversal sequence.
21. Illustrate how will you insert an element into a Binary Search Tree?

Part C

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

22. Examine the time and space complexity of algorithm. Explain the various types of Asymptotic notations.
23. Discuss about searching. Write a C program to implement binary search using iteration and binary search using recursion.
24. Explain the different types of queue. Discuss about the operations performed on all types of queue.
25. Write a brief note on Linked Lists. Write a program to insert elemnts into a linked list. Illustrate with example.