Reg. No ....　　　　　　　　Name ....　　　　　　**23U222**

B. Sc. DEGREE END SEMESTER EXAMINATION : MARCH 2023
SEMESTER 2 : COMPUTER APPLICATION
COURSE : **19U2CRCAP4: DATA STRUCTURES USING 'C'**
(For Regular - 2022 Admission and Improvement / Supplementary – 2021 / 2020 / 2019 Admissions)

Time : Three Hours　　　　　　　　　　　　　　　　　　　　　　Max. Marks: 75

PART A
Answer All (1 mark each)

1. Name any two sorting techniques.
2. An example for primitive data structure is ----------------.
3. What is Enqueue?
4. Give the syntax of conditional operator.
5. What is static memory allocation?
6. What is a node?
7. What is degree of a tree?
8. What is BFS?
9. What will be the postfix equivalent of the infix expression (a+b)*(c-d)?
10. What is a conditional operator?

(1 x 10 = 10)

PART B
Answer any 8 (2 marks each)

11. What is depth of a tree?
12. Differentiate between arithmetic and relational operators.
13. How to calculate the address of an element of a single dimensional array?
14. You have a linked list that need not be sorted. You need to insert a new node to it. Where will you insert this node? Why?
15. What is the difference between terminal nodes and non-terminal nodes?
16. Enlist different format specifier in C.
17. What are the applications of stacks?
18. Develop the PUSH operation procedure in a stack organization.
19. List any two limitations of linear queue.
20. What are dynamic data structures?

(2 x 8 = 16)

PART C
Answer any 5 (5 marks each)

21. Differentiate between linked list and an array.
22. Explain the applications of queues.
23. Write a in-order traversal program in non-recursive manner.
24. What is mean by the equality operator? How do this differ from an assignment operator?
25. Write an algorithm to perform bubble sort.
26. What is tree traversal? Develop the procedure for in-order tree traversal. Trace with a suitable example.

27. A two-dimensional array defined as X[3.....6, -2......2] requires 2 bytes of storage space for each element. Determine the address of X[5][1], given the base address is 1200., when the array is stored in (1) row major wise and (2) column major wise.

(5 x 5 = 25)

PART D
Answer any 2 (12 marks each)

28. A binary tree has 9 nodes. The in - order and pre -order traversals yield the following sequence of nodes.
    In-order: E A C K F H D B G
    Pre-order   F A E K C D H G B
    Construct the binary tree.

29. Explain both insertion and deletion of a node in a singly linked list with suitable diagram.

30. Explain the procedure of bubble sort with an example.

31. How do you convert an infix expression to postfix form?

(12 x 2 = 24)