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C23-CM/CCB/CAI/AI–304

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BOARD DIPLOMA EXAMINATION, (C-23)

OCTOBER/NOVEMBER—2024

DCME– THIRD SEMESTER EXAMINATION

DATA STRUCTURES THROUGH C

Time : 3 Hours] [*Total Marks* : 80

PART—A 3×10=30

Instructions : (1) Answer **all** questions.

(2) Each question carries **three** marks.

(3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1. Define Space and Time complexity.

2. Define abstract data type. Give one example.

3. State the disadvantages of linked list compared to an array.

4. Define circular double linked list.

5. State the effect of stack overflow on a program's functionality.

6. Mention rules for Postfix Expression Evaluation using Stack Data Structure.

7. Define Circular Queue.

8. List three applications of Queue.

9. Define the terms degree, level, height of a tree.

10. List three differences between general tree and binary tree.

PART—B

10×5=50

Instructions : (1) Answer *any* **five** questions.

(2) Each question carries **ten** marks.

(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

11. Explain insertion sort with an example and write a program to implement insertion sort.

12. Explain how insertion is performed in doubly linked list.

13. Explain the implementation of a stack using linked list.

14. Convert infix expression A + (B*C – (D/E ^ F) * G) * H to postfix expression using a stack.

15. Explain the implementation of a queue with various operations using an array.

16. Explain the implementation of a circular queue with various operations using linked list.

17. Explain the linear representation and the linked list representation of a Binary Tree.

18. Construct a binary tree for the following In-order and Postorder traversals.

In-order Traversal : B, A, D, C, F, E, G

Postorder Traversal : B, D, F, G, E, C, A

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