7237

BOARD DIPLOMA EXAMINATION, (C-20)

MAY—2023

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. What is Abstract Data Structure (ADT)?

2. Write the need for sorting.

3. Write about linear search method.

4. List the advantages of linked lists over arrays.

5. Write the purpose of dummy header.

6. Write about stack and its operations.

7. Convert the infix expression $A/(B + C) \times D$ into postfix notation.

8. List the applications of queues.

9. Define the terms *(a)* subtree, *(b)* degree of tree and *(c)* internal node.

10. What is a binary search tree?

PART—B

8×5=40

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

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

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

11. Write the algorithm and explain the method of insertion sort with an example.

(OR)

Explain binary search method with an example and write the program for it.

12. Explain how to perform insertion operation on single linked list.

(a) At the beginning of SLL

(b) At the end of SLL

(c) Before a given node

(OR)

Write the C program to create a double linked list.

13. Write a C program to implement stack and its operations using linked list.

(OR)

Write the algorithm for the conversion of infix notation of expression into postfix notation and explain it with an example.

14. Write a C program to implement queue and its operations using arrays.

(OR)

Explain the implementation of circular queue and its operations using linked list.

15. Explain various binary tree traversal algorithms with examples.

(OR)

Explain the construction of binary tree from the given inorder and preorder traversals.

INORDER : S Q T P R X

PREORDER : P Q S T R X

PART—C

10×1=10

Instructions : (1) Answer the following question.

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

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

16. Consider two single linked lists L1 and L2 with following nodes :

L1 : 10, 50, 30, 20, 40

L2 : 20, 35, 40, 45, 50

Write a program to display data of all the common elements of L1 and L2.

★★★