2/26 **1701E1176** Candidate's Seat No :_____

IMSc CS (Rep) Sem.-4 Examination

Data Structures

Time : 3-00 Hours] **January-2025**

Total Marks : 70

Instructions:

- **Write both the Sections in the separate answer book.**
- **Both Sections having equal weightage.**
- **Draw Diagrams wherever necessary.**
- **Make Assumptions wherever necessary.**

SECTION – I

Q-1 **Explain the following terms (Any three) with an appropriate example:** **[15]**

a) array
b) linked list
c) stack
d) queue

Q-2 **Attempt the following :** **[10]**

a) Explain sparse matrix.
b) Explain postfix evaluation with the help of stack.

OR

Q-2 **Attempt the following :** **[10]**

a) Explain linked list representation of a 2 variable polynomial.
b) Explain the concept of circular queue.

Q-3 **Attempt the following :** **[10]**

a) Explain doubly linked list.
b) Create a binary tree where

Inorder traversal is : 4, 2, 7, 5, 1, 8, 6, 3
preorder traversal is : 1, 2, 4, 5, 7, 3, 6, 8

OR

Q-3 **Attempt the following:** **[10]**

a) Explain the concept of priority queue.
b) Explain construction of expression tree.

(P.T.O)

SECTION – II

Q-4 **Define the following terms with an appropriate example. (Any 3)** **[15]**

a) Binary maximum heap
b) Adjacency matrix representation for a graph
c) Weighted graph
d) digraph

Q-5 **Attempt the following:** **[10]**

a) Explain insertion sort with suitable example.
b) Explain breadth first search algorithm with suitable example.

OR

Q-5 **Attempt the following:** **[10]**

a) Explain selection sort with suitable example.
b) List three properties of a good hash function. Explain any one method of hashing.

Q-6 **Attempt the following:** With suitable examples explain kruskal's algorithm to find minimum spanning. **[10]**

OR

Q-6 **Attempt the following:** Explain collision resolution techniques with respect to hashing. **[10]**