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Candidate's Seat No:___

IMSc (CA&IT) Sem.-3 Examination
Data Structure
December-2025

Time : 2.30 Hours] [Max.Marks : 70

Q.1 Answer the following Questions [14]

A. Define following terms (Any Four). 4

1. Weighted Graph
2. Priority Queue
3. Data Structure
4. Sparse Matrix
5. Stack

B. Explain 1d and 2d arrays with suitable examples. 5

C. What is recursion? Explain with a simple recursive example. 5

Q.2 Answer the following Questions [14]

A. Explain classification of data structures. 7

B. Write an algorithm to insert a node at a specific position in a singly linked list. 7

OR

A. What is a queue? Explain enqueue and dequeue operations with diagrams. 7

B. Explain circular queue with its advantages and disadvantages. 7

Q.3 Answer the following Questions (Any two) [14]

A. Convert the following infix expression into postfix expression. 7

1. A * (B + C * (D - E))

B. Write algorithms for enqueue and dequeue in circular queue. 7

C. Write an algorithm to insert a node at specific position in doubly linked list. 7

Q.4 Answer the following Questions (Any two). [14]

A. Construct an AVL tree from the given sequence: 7

14, 17, 11, 7, 53, 4, 13, 12, 8, 60, 19

Clearly indicate the balance factor and required rotations at each step.

B. Create a binary search tree for the given following elements. 7

M, N, O, L, Q, K, P, H, I, B, A, Z

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C. Explain Prim's algorithm with a simple example. 7

Q.5 Answer the following Questions (Any two) **[14]**

A. Explain **Linear Search** algorithm with an example. 7

B. Explain **Bubble Sort** algorithm with each step of example given below. 7
15, 16, 6, 8, 5, 9

C. Write the **Binary Search** algorithm with example. 7

—X—