

GSM/D-21**946****DATA STRUCTURE****Paper-I**

Time Allowed : 3 Hours]

[Maximum Marks : 40

Note : Attempt **five** questions in all, selecting **one** question from each unit. Question No. **1** is compulsory. All questions carry equal marks.

Compulsory Question

1. (i) What are the various application of data structures? 1½
- (ii) What is big-O Notation? 1½
- (iii) What are the applications of linked list? 1½
- (iv) What is circular linked list? Write its advantages. 1½
- (v) Define Priority Queue and Circular Queue with example. 1
- (vi) Define Directed and Undirected Graphs with Suitable example. 1

UNIT-I

2. (a) Discuss different classifications of data structures. 5
- (b) What is time space trade off of an algorithm? 3
3. Define Data Structure and Strings. Explain Pattern Matching Algorithms in detail. 8

UNIT-II

4. (a) What is an Array? How can two dimensional array be stored in computer memory. 4
- (b) Write an Algorithm to delete an element from a linear array. 4
5. (a) Write an Algorithm to insert an element in a linked list at the beginning. 4
- (b) Garbage collection in linked list. 4

UNIT-III

6. What is Stock Data Structure? When is it used? Discuss PUSH and POP operations on Stack using linked list. 8

7. (a) Write an Algorithm to evaluate an expression in Prefix Notation using STACK. 4
- (b) What is Priority Queue? Discuss. How is it different from Simple Queue? 4

UNIT-IV

8. What is Binary Tree? If a Binary Tree has 8 nodes. The pre-order and in-order traversal of tree are given below :
- Pre-order : Z, D, C, N, M, H, G, W
- In-order : C, D, M, Z, G, H, N, W
- Draw the corresponding Binary Tree. 8
9. Explain in detail :
- (a) Adjacency Matrix. 4
- (b) Weighted Graph. 4