MCS–208

POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS (PGDCA) (NEW)

Term-End Examination

June, 2024

MCS-208 : DATA STRUCTURES AND ALGORITHMS

Time : 3 Hours   *Maximum Marks : 100*

Weightage : 70%

Note : *Question No. **1** is compulsory. Attempt any **three** questions from the rest. All algorithms should be written nearer to 'C' language.*

1. (a) Write an algorithm for implementation of a Stack using Arrays.   10

(b) Write an algorithm for multiplication of two matrices.   10

(c) Write an association for implementation of Quick Sort.   10

(d) Convert the following expression to postfix :   10

$$a + b * c - d / e * f$$

2. (a) Explain the process of implementing two queues in an array.   10

(b) Explain the process of calculation of storage complexity with an example.   10

3. (a) What are circular linked lists ? Write an algorithm for insertion of an element into a circular linked list.   10

(b) What is a full tree ? What is a complete tree ? Explain the implementation of a tree using linked list.   10

4. (a) What are Tries ? List the main characteristics of tries. 10

(b) Write Prim's Algorithm to find minimum cost spanning tree (MCST). 10

5. (a) Write an algorithm for implementation of Insertion Sort. 10

(b) Write Dijkstra's algorithm to find the single source shortest path in a graph. 10