

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

Term-End Examination

December, 2022

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) Explain the operations that are performed on Stacks. Write an algorithm to push an element to the stack. 10
- (b) What are Arrays ? Write an algorithm to multiply two matrices. 10
- (c) What is Binary Search ? Write an algorithm for it. 10
- (d) Convert the following expression to postfix : 10
 $(a + b) / (c - d)$

2. (a) What is a Stack ? Write an algorithm for implementation of a Stack. 10
- (b) What is Storage Complexity ? How does it differ from Time Complexity ? 10
3. (a) What are Singly Linked Lists ? Write an algorithm for implementation of a Singly Linked List. 10
- (b) What is a Binary Tree ? How does it differ from a tree ? Write an algorithm for traversal of a Binary Tree. 10
4. (a) What are the properties of an AVL tree ? Explain the possible rotations that are possible on an unbalanced AVL tree. 10
- (b) Write Dijkstra's algorithm. 10
5. (a) What is Breadth First Search ? How does it differ from Depth First Search ? 10
- (b) What is Hashing ? Write a short note on it. 10
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