

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

Term-End Examination

June, 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) What is meant by *Big-O* notation ? Explain with an example. 10
- (b) Write an algorithm for Quick Sort. Sort the following set of data in ascending order using Quick Sort. Show all steps of application of algorithm : 10
- 110, 50, 60, 70, 150, 80
- (c) Define "Queue". Explain the operations that can be performed on a Queue. 10
- (d) Write an algorithm that accepts two strings, S1 and S2, as input and then find whether S1 is a substring of S2. 10

- 2.** (a) Write an algorithm to delete an element from a Singly Linked List. Make necessary assumptions. *10*
- (b) Explain the process of converting a Tree to a Binary Tree with an example. *10*
- 3.** (a) What is meant by Minimum Cost Spanning Tree (MCST) ? How can you find it ? *10*
- (b) What is Linear Search ? How does it differ from Binary Search ? *10*
- 4.** (a) Write an algorithm for multiplication of two matrices. *10*
- (b) What is Breadth-First Search ? Explain it with an example. *10*
- 5.** (a) What is a Dequeue ? How does it differ from a Queue ? *10*
- (b) Write an algorithm for inorder traversal of a Binary Tree. *10*
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