

No. of Printed Pages : 2

**MCS-208**

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

**Term-End Examination**

**December, 2021**

**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) Define "Time Complexity" and "Space Complexity". What are the differences between them ? 10
- (b) Write an algorithm for bubble sort. Sort the following set of data in ascending order using bubble sort. Show all steps of application of algorithm : 10

100, 50, 60, 70, 150, 80

- (c) Define "Stack". Explain the operations that can be performed on a stack. 10
- (d) Write an algorithm to reverse a string. 10
2. (a) Write an algorithm to insert an element into a singly linked list. Make necessary assumptions. 10
- (b) What is a Tree ? How does it differ from a Binary Tree ? 10
3. (a) Write Kruskal's algorithm. 10
- (b) What is Binary Search ? Explain it with an example. 10
4. (a) Write an algorithm for addition of two matrices. 10
- (b) What is Depth First Search ? Explain it with an example. 10
5. (a) What is a Circular Queue ? How does it differ from a queue ? 10
- (b) Explain any *two* types of traversals of binary trees. 10

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