

M/51/2110

10537/N

**Total Number of Sheets Used: 1**  
**Title of the Paper: Data Structures (PGDCA-201)**  
**Maximum Marks: 70**

**Total Number of Questions: 9**  
**Minimum Pass Marks: 35%**

Note: Candidates are required to attempt five questions in all, selecting two questions each from sections A and B and entire section C.

#### Section - A

Q1.	Explain different types of data structure with examples.	10.5
Q2.	Discuss the steps of Big O notation and time trade off.	10.5
Q3.	What is Stack? Why it is known as LIFO? Write an algorithm using PUSH and POP.	10.5
Q4.	What is sparse array? Discuss its implementation using arrays.	10.5

#### Section - B

Q5. (a)	What are the advantages of using linked lists over arrays?	5
(b)	Compare and contrast Quicksort and radix sort on the basis of their advantages and disadvantages.	5.5
Q6.	Write an algorithm to insert new node at the beginning, at middle position and at the end of a Singly Linked List.	10.5
Q7.	Consider the following list of numbers: 67, 12, 89, 26, 38, 45, 22, 79, 53, 9, 61 Sort these numbers using Insertion Sort.	10.5
Q8.	How does a linear search algorithm work? Give the syntax by taking an example.	10.5

#### Section - C

Q9. (a)	How linked list can be represented in a memory?	4
(b)	What is the significance of an array?	4
(c)	Define FIFO and LIFO	4
(d)	List various data structure operations.	4
(e)	How does bubble sort work?	4
(f)	Give some applications of stack.	4
(g)	Why insertion sort is better than selection sort?	4