Course Code	**:**	**MCS-208**
Course Title	**:**	**Data Structures and Algorithms**
Assignment Number	**:**	**PGDCA_NEW(II)/208/Assign/2025**
Maximum Marks	**:**	**100**
Weightage	**:**	**25%**
Last Dates for Submission	**:**	**30th April 2025 (for January Session)**

There are four questions in this assignment, which carry 80 marks. Each question carries 20 marks. Rest 20 marks are for viva voce. All algorithms should be written nearer to C programming language. You may use illustrations and diagrams to enhance the explanation, if necessary. Please go through the guidelines regarding assignments given in the Programme Guide for the format of presentation.

Q1: What is a Doubly Linked Circular List? What are its advantages and disadvantages? Give a scenario where its application is appropriate. Justify your answer. **(20 Marks)**

Q2: What is a Tree? How does it differ from a Binary Tree? Is it possible to convert a Tree to a Binary Tree? If yes, then, explain the process with an example. **(20 Marks)**

Q3: What are Red Black Trees? How do they differ from Splay Trees? What are their applications? **(20 Marks)**

Q4: Write a short note on the recent developments in the area of finding shortest path between two nodes of a Graph. Make necessary assumptions. **(20 Marks)**