Programming Paradigms and Pragmatics (CS202)

LAB - 2

1. Design a C++ program to demonstrate inheritance, object slicing, and virtual functions. Create a base class Employee with attributes for name and salary, a parameterized constructor, and a virtual function displayDetails to display employee details. Derive a class Manager from Employee, adding attributes for teamSize and bonus, and override the displayDetails function to include these attributes. In the main function, illustrate object slicing by assigning a Manager object to an Employee object, showing how derived class-specific attributes are lost. Additionally, use a base class pointer to point to the Manager object and call the displayDetails function to demonstrate runtime polymorphism and ensure the derived class version is invoked. Provide clear output to distinguish object slicing from runtime polymorphism.

2. Write a C++ program to demonstrate the use of friend functions for accessing private data in a class. Create a class BankAccount with private attributes accountNumber (a string representing the account number), owner (a string for the account holder's name), and balance (a double representing the current account balance). Implement a constructor to initialize these attributes and a member function display to print the account details. Write a friend function transfer that allows transferring a specified amount from one BankAccount object to another. Ensure the transfer function performs input validation, such as checking if the source account has sufficient balance before transferring the money. Use meaningful test cases in the main function to demonstrate successful and failed transfers, and display the state of both accounts before and after each transfer operation. The output should clearly show the results of the transfer attempts and the updated balances.