Lab 8 **CLO 5**

Question: 1

Create a base class **Employee** with private member variables **name** and **salary**. Define a derived class **Manager** that inherits privately from **Employee** and has a member function **display()** to display the name and salary of the manager. Write a main function to demonstrate the usage of the **Manager** class.

```
Manager: Alice, Salary: 5000
```

Question: 2

Create a base class **Person** with private member variables **name** and **age**. Define a derived class **Student** that inherits publicly from **Person** and has a member function **displayInfo()** to display the name and age of the student. Write a main function to demonstrate the usage of the **Student** class.

```
Name: John, Age: 20
```

Question: 3

Define a base class **Animal** with a virtual function **sound()**. Derive two classes **Dog** and **Cat** publicly from **Animal**. Override the **sound()** function in each derived class to make the dog bark and the cat meow respectively. Write a main function to demonstrate polymorphic behavior by creating an array of pointers to **Animal** objects and calling the **sound()** function for each object.

```
Dog barks
Cat meows
```

Question: 4

Create a program to demonstrate constructor and destructor call order in multi-level inheritance in C++. Define a base class **Vehicle** with a constructor that prints "Vehicle Constructor" and a destructor that prints "Vehicle Destructor". Derive two classes, **Car** and **Bicycle**, from **Vehicle**. **Car** should have its constructor print "Car Constructor" and its destructor print "Car Destructor", while **Bicycle** should have its constructor print "Bicycle Constructor" and its destructor print "Bicycle Destructor". In the **main** function, create objects of both **Car** and **Bicycle** classes and observe the sequence of constructor and destructor calls.

```
Creating Car object:
Vehicle Constructor
Car Constructor

Creating Bicycle object:
Vehicle Constructor
Bicycle Constructor
Bicycle Destructor
Vehicle Destructor
Car Destructor
Vehicle Destructor
```

Question: 5

Write a C++ program that demonstrates polymorphism using a hierarchy of vehicle classes. The program should include a base class **Vehicle** with a virtual function **drive()**. Implement three derived classes **Car**, **Bus**, and **Truck**, each overriding the **drive()** function to display a message specific to its type. In the **main()** function, create an array of pointers to **Vehicle** objects, instantiate objects of each derived class, call the **drive()** function for each object using a loop, and deallocate memory.