Date : 19/7/2023

Date of Submission : 8/8/2023 before 1.00 p.m.

Assignment 1

Q. 1. Use of inheritance in designing and implementing a collection of logic gates. A logic gate is a simple device that receives one or more Boolean values as inputs and produces a Boolean result by combining the inputs using a simple Boolean function. The most common logic gates compute simple Boolean operations. Logic gates may be connected together, using wires, to form larger circuits that compute more complex Boolean functions and even arithmetic results.
Initially, we will consider a small set of logic gates, implementing the Boolean operations NOT, AND, and OR.
Develop sensible abstract types for an inheritance hierarchy

Q. 2. List attributes and behavior of the following objects

- Sales
- Bank Account
- Calculate Salary Scenario

Q.3. Define multiplicities, for following examples mention the multiplicity.

- The relationship between a country and its capital city.
- The relationship between a book and the individual chapters that are part of it.
- The relationship between students and courses
- Parent and Child with respect to human being.
- The annual volleyball competition between the Math and CS wings of our department involves up to 5 games. In each game, at least 12 but no more than 30 students can participate.
- The relationship between a customer and the orders he/she has placed with a company. Assuming a person can register as a customer before placing an order.

Q.4. Give examples of association relationships of different degrees

- Unary relationships
- Binary relationships
- Ternary relationships

Q.5. The ODL schema corresponding to the class diagram is given below: Prepare the class diagram

```
class Employee {
( extent employees)
attribute short empName;
attribute string empNumber;
attribute Address address;
attribute Date dateHired;
void printLabel( );
};
class HourlyEmployee extends Employee {
( extent hrly_emps)
attribute float hourlyRate;
```

```
float computeWages( );
};
class SalariedEmployee extends Employee {
( extent salaried_emps)
attribute float annualSalary;
attribute boolean stockOptions;
void contributePension( );
};
class Consultant extends Employee {
( extent consultants)
attribute short contractNumber;
attribute float billingRate;
float computeFees( );
};
```