



AUTUMN MID SEMESTER EXAMINATION-2014

Object Oriented Programming[IT-301]

Full Marks: 25

Time: 2 Hours

Answer any four questions including question No.1 which is compulsory.

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable and all parts of a question should be answered at one place only.

Q1.i)Specify the advantages of object oriented programming over procedural language.[5x1=5]

ii) Is a protected class member public or private to the program? Is it available to all class functions? Explain.

lii) Find the output

```
class Code{
    int id;
    public:
    Code() {}
    Code(int a) { id=a;}
    Code(const Code &x)
    {cout<<10;}
    void display()
    {cout<<id;}
};

int main()
{Code A(100);Code B=A;
  Code D;D=A;
  A.display();
  D.display();
  return 0;
}
```

iv)Does constructor return a value. Justify your answer.

v)Find the output

```
class X1
{public:
  X1(){ cout<<"X1"; } Y () : X1(),X2()
};
class X2
{public:
  X2(){cout<<"X2";}
};
class X3
{public:
  X3(){cout<<"X3";}
};

class Y : public X1, virtual X2, public X3
{ public:
  { cout<<"Y"; }
};

int main()
{
  Y y;
  return 0; }
}
```

Q2.a) Explain any two principles of object oriented programming with illustrative example. [1]

b) Create two classes. The first named **Sale**, holds data for a sales transaction. Its private data member include the day of the month, amount of sale, and the salesperson's ID number. The second class, named **SalesPerson**, holds data for a salesperson, and its private member includes a constructor to which you can pass the field values. Add a function to both **Sale** and **SalesPerson** classes that returns private salesperson ID number. Write a **main()** function that contain an array of five **SalesPerson** objects and store appropriate data to it. For each **Sale** transaction entered, determine whether the salesperson's ID number is valid. Use **display()** to display the data as well as to display error message. [3]

Q3.a) Create a class named **ReverseString** which contain a data member to hold the name of the string. Initialize the name using constructor. Reverse the string name using suitable function and allocate memory. [3]

b) Create a class name **RealtorCommission**. Field includes the price of house, the sales commission rate, and the commission. Create member function **getdata()** to initialize the value which requires the sales price (expressed as a double) and the commission rate. Create another member function **find_value()** requires the commission rate to be a double, such as .06. The other **finalvalue()** requires the sale price and the commission rate expressed as a whole number, such as 6. Each function calculate the commission value based on the price of the house multiplied by commission rate. The difference is that the function that accepts the whole number must convert it to a percentage by dividing by 100. Also include a display function for the fields contained in the **RealtorCommission** class. Write a **main()** function that instantiates at least two **RealtorCommission** objects - one that uses a decimal and one that uses a whole number as the commission rate. Display the **RealtorCommission** object values. [2]

Q4. a) Is it mandatory to pass the object reference as an argument in a copy constructor. Justify. [2]

b) Consider a graphics system that has classes for various figures - rectangles, squares, triangles, circles, which are derived from **Figure** class. Each class has member functions **erase** and **draw**. Each function outputs a message telling what function has been called and what the class of the calling object is. [3]

Q5. Create a class **PersonToInvest** that contains Person name, Person ID and DOB. Include the constructor that requires initial and current values and a display function. Create an **Investment** class that contains fields to hold the initial value of an investment, the current value, the profit (calculated as the difference between current value and initial value), and the percent profit (the profit divided by the initial value). Include the constructor that requires initial and current values and a display function. Create a **House** class that includes fields for street address and square feet, a constructor that requires values for both fields, and a display function. Create a **HouseThatIsAnInvestment** class that inherits from **Investment** and **House**. It include a constructor and a display function that calls the display functions of the parents. Write a **main()** function that declares a **HouseThatIsAnInvestment** and displays its values. [5]

Q6. Write short notes on any two: [2.5x2= 5]

- a) Inline function.
- b) Reference Variable.
- c) Static members
- d) Default Argument