


Philadelphia University Faculty of Engineering Department of Computer Engineering		Date:- 31/03/2016 Allowed time:- 50 Minutes
Object Oriented Programming (630221)		First Exam
Student Name: - ID: -		

Question 1: Mark the following statements as true or false. 5 points

1. A function cannot return a value of type struct. **False**
2. A member of a struct can be another struct. **True**
3. An array can be a member of a class. **True**
4. The member functions of a class must be public. **False**
5. A class can have more than one constructor. **True**

Question 2: Given the following definition of structures: 5 points

<pre>struct name { string fname; string lname; };</pre>	<pre>struct date { int Day; int Month; int Year; };</pre>	<pre>struct address { int Num; string street; string Town; };</pre>
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1. Define a structure type “Employee” which will contain Number, name, address, Birth date, hiring date and salary (use the appropriate data type for each variable).

```
struct Employee
{
    long ID;
    name ename;
    address eaddress;
    date hiring_date;
    date birth_date;
    float salary;
};
```

2. Define a pointer of type Employee then use it allocates a dynamic array that contain a number of elements entered by the user.

```
Employee* E;
int size;
cin>>size;
E=new Employee[size];
```

3. Write a function that inputs the information contained in the struct Employee in a single Employee element then use this function to initialize the array declared in the previous question.

```
void Insert(Employee& E)
{
    cin>>E.ID;
    cin>>E.ename.fname>>E.ename.lname;
    cin>>E.eaddress.Num>>E.eaddress.street>>E.eaddress.Town;
    cin>>E.hiring_date.Day>>E.hiring_date.Month>>E.hiring_date.Year;
    cin>>E.birth_date.Day>>E.birth_date.Month>>E.birth_date.Year;
    cin>>E.salary;
}
```

Question 3: Consider the definition of the following class:

4 points

```
class testClass
{
    public:
        int sum();
            //Returns the sum of the private member variables
        void print() const;
            //Prints the values of the private member variables
        testClass();
            //Initializes the private member variables to 0
        testClass(int a, int b);
            //initializes the private member variables as x = a and y = b
    private:
        int x;
        int y;
};
```

Write the definitions of the member methods as described in the definition of the class testClass.

```
int testClass::sum
{
    return x+y;
}

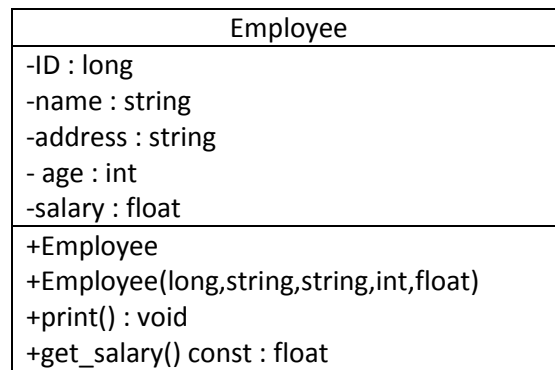
void testClass::print() const
{
    cout<<"x="<<x<<"\ty="<<y<<endl;
}

testClass::testClass()
{
    x=y=0;
}

testClass::testClass(int a,int b)
{
    x=a;
    y=b;
}
```

Question 4: Given the following UML diagram for a class Employee

4 points



Write a definition for class Employee and all member methods of the class.

```
class Employee
{
public:
    Employee();
    Employee(long,string,string,int,float);
    void print();
    float get_salary()const;
private:
    long ID;
    string name;
    string address;
    int age;
    float salary;
};
Employee::Employee()
{
    ID=0;
    name= address="";
    age=0;
    salary=0.0;
}
Employee::Employee(long d,string n,string a,int x,float s)
{
    ID=d;
    name=n;
    address=a;
    age=x;
    salary=s;
}
void Employee::print()
{
    cout<<ID;
    cout<<name;
    cout<<address;
    cout<<age;
    cout<<salary;
}
float Employee::get_salary()const
{
    return salary;
}
```

Question 5: Given the following code

2 points

```
#include<iostream>
using namespace std;
class test
{
public:
    static int get_cnt();
    test(int);
    void display();
private:
    static int cnt;
    int value;
};
int test::get_cnt()
{
    return cnt;
}
test::test(int a)
{
    value=a;
    cnt++;
}
void test::display()
{
    cout<<"value="<<value<<endl;
}

int main()
{

```

1. Write a C++ statement that initializes the static variable count to 3.

```
int test::cnt=3;
```

2. Write a cout statement that display the static value cnt.

```
cout<<test::get_cnt()<<endl;
```

Good Luck

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