MIDRAND
GRADUATE INSTITUTE

FACULTY OF INFORMATION TECHNOLOGY

SOFTWARE DEVELOPMENT 2B: OBJECT-ORIENTED PROGRAMMING

ISOF 212 - Memorandum

TEST 1 – 18 March 2013

INTERNAL EXAMINER:	Ayong Kenneth
TOTAL MARKS:	60 Marks
DURATION:	60 Minutes

SECTION A:	Short Questions	**10 Marks**
SECTION B:	Application Questions	**50 Marks**

INSTRUCTIONS TO CANDIDATES:

1. Read each question carefully.
2. You must answer ALL sections.
3. Answer all questions in the answer book provided.
4. All rough work should be done in the back of the answer book and indicated as such.
5. This test paper should not be removed from the venue.
6. Indicate what resources could be used (e.g. calculator, dictionary, statistical tables)

NB This test paper consists of 6 pages

This test contributes 10% towards the final mark.

Section A

Fill in the blanks **1 mark(s) per question** **10 Marks**

1. The double colon (::) is known as ***the scope resolution operator*** operator.
2. Who can access private members in a class? ***Any member of that class***
3. A member function that allows the user of the class to find out the value of a private data type is called a ***getter/assessor***
4. Declare a pointer variable named ptr to an integer. ***Int * ptr***
5. In the statement cout << *p1;, the * is called the ***dereferece operator***
6. The & operator is called the ***addressOf operator***
7. Write the code that assigns to p1 (an integer pointer variable) the pointer to a dynamically created integer. ***p1 = new int***
8. Dynamic variables are created at ***the heap***
9. Dynamic variables are created from the part of memory called ***heap/free store***
10. Write the code to return the dynamic memory pointed to by p1 to the freestore. ***delete p1***

Section B

Application Questions **50 Marks**

Answer the following questions in your answer book.

QUESTION 1

What is the main difference between a struct and a class **[2]**

The difference between a struct and a class is that by default the members of a struct are public while those of a class are private

QUESTION 2

Define the following terms and state the benefits of using them in a program or how it is applied

2.1 Pointer

Pointer is a variable that holds addresses of other variables and allows us to create nameless variables in the heap

2.2 Dynamic variable

A variable declared in the heap

2.3 Operator new

The new operator creates space/new variable in the heap and assigns its address to a pointer **[2x3 = 6]**

QUESTION 3

3.1 What is the output of the following code?

```
int *p;
int * q;
p = new int;
q = p;
*p = 46;
*q = 39;
cout << *p << " " << *q << endl;
```

39, 39

[2]

QUESTION 4

Consider the following declarations:

```
class xClass

{

        int u;
        double w;

public:
        void func();
        void print() const;
        xClass ();
        int getU();
        void setU(int myU);
        xClass (int, double);

};

xClass   x;
```

4.1. How many members does class xClass have? (1)

8 members

4.2. How many private members does class xClass have? (1)

2

4.3. How many constructors does class xClass have? (1)

2

4.4. Write the definition of the member function func so that u is set to 10 and w is set to 15.3. (2)

```
void xclass::func()
{
  u = 10;
}
```

4.5. Write the definition of the member function print that prints the contents of u and w. (2)

```
void print::print()
{
  cout<<u<<"  "<<w<<endl;
}
```

4.6. Write the definition of the default constructor of the class xClass so that the private data members are initialized to 0. (2)

```
xclass::xclass()
{
  u=0;
  w = 0;
}
```

4.7. Write the function setU(int myU) that sets the value of U (2)

```
void xclass::setu(int uu)
```

```
{
  u  = uu;
}
```

[11]

QUESTION 5

5.1. Write the definition of a class that has the following properties:

a. The name of the class is secretType.

b. The class secretType has four member variables: name of type string, age and weight of type int, and height of type double.

c. The class secretType has the following member functions:

setName—Function to set the name

setAge—Function to set the age

getName—Value-returning function to return the name

Default constructor—Sets name to the empty string and age, weight, and height to 0

Constructor with parameter—Sets the values of the member variables to the values specified by the user

```
Class secretType
{
  String name;
  Int age;
  Int weight;
 Int height;
Public:
  Void setName(string);
  Void setAge(int);
  String getName();
};
```

5.2 Implement the above class by writing the definition of the member functions of the class secretType as described above

[14]

Marking Rubric for question 5

Topic	Mark
Declare a class	1
Demonstrate Public and Private specifier	2
Declare a private data member and public functions	2
Class Implementation	9

Question 6

Consider the following statements:

```
class yClass
{
public:
        void one();
        void two(int, int);
        yClass();
private:
        int a;
        int b;
};

class xClass: public yClass
{
public:
        void one();
        xClass();
private:
        int z;
};

yClass y;
xClass x;
```

6.1 Write the definition of the default constructor of yClass so that the private data members of yClass are initialized to 0. (2)

```
yclass::yclass()
{
   a = 0;
   b = 0;
}
```

6.2 Write the definition of the default constructor of xClass so that the private data members of xClass are initialized to 0 (4)

```
xClass::xClass()
    :yClass()
{
   z=0;
}
```

6.3 How many members does class xClass have? (1)

3

6.4 Write a C++ statement to use the object y to display the value of a (2)

y.one();

[9]

Question 7

Consider the following code:

```
class one
{
public:
        void print() const;
        //Outputs the values of x and y
protected:
        void setData(int u, int v);
        //Postcondition: x = u; y = v;
private:
        int x;
        int y;
};

class two: public one
{
public:
        void setData(int a, int b, int c);
        //Postcondition: x = a; y = b; z = c;
        void print() const;
        //Outputs the values of x, y, and z
private:
        int z;
};
```

7.1 Write the definition of the function setData of the class two. (3)

```
void two::setdata(int a,int b, int c)
    {
      one::setdata(a,b);
      z = c;
    }
```

7.2 Write the definition of the function print of the class two. (3)

```
void two::print()
{
    one::print();
    cout<<z<<endl;
 }
```

[6]

SUBTOTAL: [50]