MIDRAND
GRADUATE INSTITUTE

FACULTY OF INFORMATION TECHNOLOGY

SOFTWARE DEVELOPMENT 2A: OBJECT-ORIENTED PROGRAMMING

ISOF 212

TEST 1 – 19 March 2012

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

SECTION A:	Multiple Choice	**15 Marks**
SECTION B:	Short Questions	**25 Marks**
SECTION C:	Coding Questions	**20 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 9 pages

This test contributes 10% towards the final mark.

Section A

Multiple Choice **1 mark(s) per question** **15 Marks**

On the MCQ answer sheet provided, make a cross (X) over the alternative (A – D) that you have chosen for each question. There is only one right answer. There is no negative marking.

QUESTION 1

Given the following class, what would be the best declaration for a mutator function that allows the user of the class to change the age?

```
class Wine
{
public:
        Wine();
        int getAge();
        float getCost();
private:
        int age;
        float cost;
}
```

a. int getAge(int newAge);
b. Wine();
c. void setAge();
d. void setAge(int newAge);

ANSWER: D

QUESTION 2

Given the following class, what would be the best declaration for a constructor that would allow the user to initialize the object with an initial age and cost?

```
class Wine
{
public:
        Wine();
        int getAge();
        float getCost();
private:
        int age;
        float cost;
}
```

a. int getAge(int newAge);
b. Wine();
c. Wine(int age);
d. Wine(int newAge, float newCost);

ANSWER: D

QUESTION 3

Which of the following statements correctly returns the memory from the dynamic array pointer to by p1 to the freestore?

a. delete [] p1;
b. delete p1[];
c. delete *p1;
d. delete p1;

ANSWER: A

QUESTION 4

Which of the following functions is a properly overloaded function of the following?

int doSomething(int first, float second);

a. float doSomething(int first, float second);
b. int doSomething(int next, float last);
c. int doSomething(int first, int second, float third);
d. int doSome(int first, float second);

ANSWER: C

QUESTION 5

Which of the following assigns to p1 the pointer to the address of value?

a. *p1=&value;
b. p1=value;
c. p1=&value;
d. &p1 = *value;

ANSWER: C

QUESTION 6

Which of the following statements correctly prints out the value that is in the memory address that the pointer p1 is pointing to?

a. cout << &p1;
b. cout << p1;
c. cout << int* p1;
d. cout << *p1;

ANSWER: D

QUESTION 7

When the function below is called, the _____ of the actual parameters is passed to the function definition.

double sqrt(double value);

a. name
b. value

c. address
d. scope

ANSWER: B

QUESTION 8

Member functions of a class

a. may not be in the private section
b. must be in the private section
c. may be in either section
d. can not be called in the main program

ANSWER: C

QUESTION 9

If a function needs to modify more than one variable, it must

a. be pass by value
b. be a void function
c. return all values needed
d. be a call by reference function

ANSWER: D

QUESTION 10

In a struct, all members are ____________ by default

e. public
f. private
g. global
h. all of the above

ANSWER: A

QUESTION 11

Given the following function definitions and program fragments, what is the output?

```
void f1(int& z, int &q)
{
        int temp;
        temp=q;
        q=z;
        z=temp;
}

void f2( int& a, int& b)
{
        if( a<b)
                f1(a,b);
        else
                a=b;
}

int x=3, y=4;
f2(y,x);
cout << x <<" " << y << endl;
```

a. 3 3
b. 4 3
c. 3 4
d. 4 4

ANSWER: A

QUESTION 12

A simplified version of a function which is used to test the main program is called

a. A stub
b. Abstraction
c. Polymorphism
d. A driver

ANSWER: A

QUESTION 13

A simplified main program used to test functions is called

a. A stub
b. Abstraction
c. Polymorphism
d. A driver

ANSWER: D

QUESTION 14

Call-by-reference should be used

a. For all variables
b. When the function needs to change the value of one or more arguments
c. Never
d. only in void functions

ANSWER: B

QUESTION 15

In which case would you consider using a dynamic array?

a. If the array is small, and the size is known before the program runs.
b. If the program needs to get the size of the array from the user

c. If the array size is big, but known at compile time
d. You should always use a dynamic array

ANSWER: B

Section B

Short Questions **25 Marks**

Answer the following questions in your answer book.

QUESTION 1 (2 marks each)

1.1 A _________ function is not a member of the class, but has access to the private members of the class.

ANSWER: friend

1.2 Dynamic variables are created from the stack or the heap?___________.**Answer : freestore or heap**

1.3 The & operator is called the _______________**ANSWER: address of operator**

1.4 Declare a pointer variable named ptr to an integer.________**ANSWER: int *ptr**

1.5 Write the code that assigns to p1 (an integer pointer variable) the pointer to a dynamically created integer.**ANSWER: p1 = new int**

[10]

QUESTION 2 (2 marks each)

2.1 Given the following class and object declaration, how would you print out the age and cost of a bottle of wine?

```
class Wine
{
public:
        Wine();
        int getAge();
        float getCost();
private:
        int age;
        float cost;
}

Wine bottle;
```

Answer: cout << bottle.getAge() << bottle.getCost();

2.2 What is the output of the following code fragment?

```
int v1=2, v2=-1, *p1, *p2;
p1 = & v1;
p2= & v2;
p2=p1;
cout << *p2 << endl;
```

Answer: 2

2.3 What is the output of the following code?

```
int *p1, *p2;
p1 = new int;
p2 = new int;
*p1=11;
*p2=0;
p2=p1;
cout  << *p1 <<" " << *p2 << endl;
```

Answer: 11 11

2.4 If p1 is an integer pointer that is pointing to memory location 1001, and an integer takes 4 bytes, then (p1+1) evaluates to what address:

Answer: 1005.

2.5 If two pointer variables point to the same memory location, what happens when one of the pointers is freed**? Answer: If you attempt to free the other pointer a run-time error will occur.**

[10]

QUESTION 3

Write a function declaration and a function definition for a function that takes one arguments of type *int* and one argument of type *double*, and that returns a value of type *double* that is the average of the two arguments. **[5]**

Section C

Coding Question **20 Marks**

Answer the following questions in your answer book.

QUESTION 1

Create a Book class with three member variables (int noOfPages, string title and float bookCost), one constructor method to initialise the member variables, three assessor or get methods and three mutator or set methods.

Write a driver program that creates a dynamic array of any number of books entered by the user. Capture the title of books, number of pages and cost of books. Display using a loop the content of the dynamic array.

Create three separate files:

Book.h (which defines the class), Book.cpp (which implements the member functions of the class) and myBooks.cpp (with the main function).

Marking Rubric for question 5

Topic	**Mark**
Declare a class with #ifndef	3
Demonstrate Public and Private specifier with all members	2
Implement all member functions correctly	4
Declare the dynamic array of Books and later delete the array	3
Test application: Populate and display the contents of the dynamic array of Books	5
Separate the three files appropriately	3

SUBTOTAL: [20]

QUESTION 1

Refer and use the code provided below to create a Unified Modeling Language (UML) class diagram.

```
class Package //Base Class
{

public:
      Package();//Default constructor
      Package(string name,string add, string city, string code,
      double weight,double costPerOunce);
      double calculateCost(double the_weight,double
      the_costPerOunce);

private:
      string theName;
      string addres;
      string theCity;
      string ZipCode;

      double packageWeight;
      double cost;

};

class TwoDayPackage: public Package //Derived Class
{

public:
      TwoDayPackage();//Default constructor
      TwoDayPackage(string name,string add, string city, string code,
      double weight,double costPerOunce,double flatFee);
      double calculateCost(double the_weight, double
      the_costPerOunce, double fee);

private:
      double twoDayFee;
};
```

```
class OverNightPackage: public Package //Derived Class
{

public:
      OverNightPackage();//Default constructor
      OverNightPackage(string name,string add, string city, string
      code, double weight, double costPerOunce,double
      OverNightFee);//
      double calculateCost(double the_weight, double
      the_costPerOunce, double nightServFee);

private:
      double NightFee;
};
```

SUBTOTAL [20]

TOTAL: [65]