



FACULTY OF INFORMATION TECHNOLOGY

SOFTWARE DEVELOPMENT 2A:

ISOF 212

TEST 2 – April 2012

MEMORANDUM

INTERNAL EXAMINER:	Ayong Kenneth
TOTAL MARKS:	65
DURATION:	60 Minutes

SECTION A:	Multiple Choice	15 Marks
SECTION B:	Short Questions	15 Marks
SECTION C:	Coding	16 Marks
SECTION D:	Discussion Questions	19 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 12 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 – e) that you have chosen for each question. There is only one right answer. There is no negative marking.

QUESTION 1

If you define a function in the derived class that has the same function signature as a function in the base class, this is known as

- a. overloading
- b. redefinition
- c. overwriting
- d. a syntax error

ANSWER :B

QUESTION 2

Who can access private data in a class?

- a. members of the class
- b. friends of the class
- c. everyone
- d. a and b
- e. no one

ANSWER: D

QUESTION 3

If the member variables in the base class are listed as protected, then who can access or modify those variables?

- a. friends functions of the base class
- b. all members of the base class
- c. all members of the derived class
- d. All of the above

ANSWER :d

QUESTION 4

If we have a full selection of accessor and mutator functions, why would we have friend functions?

- a. You should not have them
- b. More efficient access to the private data members.
- c. The friend function must call the accessor or mutator functions anyway.

- d. none of the above

ANSWER: B

QUESTION 5

If a base class has public member functions that are not listed by a derived class, then these functions

- a. are not available to the derived class
- b. are inherited unchanged in the derived class
- c. are private to the derived class
- d. do not exist in the derived class

ANSWER :B

QUESTION 6

Given the following class and array declaration, how would you print out the age of the 10th person in the array?

```
class personClass
{
public:
    void setAge(int nAge);
    void setGender( char nGender);
    void setSalary(float nSalary);

    int getAge();
    char getGender();
    float getSalary();
private:
    int age;
    char gender;
    float salary;
};

personClass  people[100];
```

- a. cout << people[10];
- b. cout << people[9];
- c. cout << people[9].age;
- d. cout << people[9].getAge();

ANSWER: D

QUESTION 7

When deriving a class, you should

- a. list only base class functions that will be redefined
- b. list all the member functions of the base class
- c. make every function a virtual function
- d. overload all the base class member functions

ANSWER :a

QUESTION 8

In the derived class definition, you list from the base class

- a. all the member functions every time
- b. only those member functions that need to be redefined
- c. only those member functions that were in the public section
- d. only those member functions you want to overload.

ANSWER :B

QUESTION 9

When a dynamic array with a class for a base type is declared, which constructor is called?

- a. the copy constructor
- b. the destructor
- c. the default constructor
- d. an explicit constructor

ANSWER: C

QUESTION 10

Another name for the base class is

- e. parent class
- f. super class
- g. ancestor class
- h. all of the above
- i. none of the above

ANSWER :D

QUESTION 11

The destructor for a class is called

- a. explicitly from the main program
- b. when the class is instantiated
- c. when the object of the class goes out of scope
- d. Only at the end of main

ANSWER: C

QUESTION 12

We use the #ifndef, #define, and #endif

- a. to prevent multiple definitions of a class
- b. when we use separate files
- c. whenever we use a class
- d. none of the above
- e. A and B

ANSWER: E

QUESTION 13

- If the member variables in a base class are private, then
- a. they can be directly accessed or changed in the derived class
 - b. the derived class must use any accessor or modifier functions from the base class
 - c. making them private causes a syntax error.
 - d. you must declare them in the derived class also.

ANSWER :B

QUESTION 14

Which file name will end in a .cpp?

- a. Implementation File
- b. Application File
- c. All input files
- d. Interface File
- e. A and B

ANSWER: E

QUESTION 15

Which is the correct way to tell the compiler that the class being declared (ChildClass) is derived from the base class (BaseClass)?

- a. class ChildClass::public BaseClass
- b. class ChildClass:public BaseClass
- c. class ChildClass childOf public BaseClass
- d. class ChildClass derived BaseClass

ANSWER :B

SUBTOTAL: [15]

Section B

Short Questions

1 mark(s) per question

15 Marks

Answer the following questions in your answer book.

1. The C++ code template <class T> is called the

ANSWER: template prefix

2 Using template functions is an example of _____ abstraction.

ANSWER: Algorithm

3 Putting the keyword const in front of a pass by reference parameter guarantees _____

ANSWER: that the function will not modify that parameter.

4 C++ signals an error or unusual situation by _____.

ANSWER: throwing an exception.

5 A throw statement passes which type of value to the catch block?

ANSWER: any valid data type.

6 The catch block is also known as the _____.

ANSWER: exception handler

7 The following catch block catches all _____ exceptions.

```
catch ( string e)
```

```
{
```

```
}
```

ANSWER: string

8 If no exception is thrown, then the _____ is ignored.

ANSWER: catch block

9 When the derived class gets all the member variables from the base class, we say that they are _____ from the base class.

ANSWER: inherited

10 A constructor of the base class is _____ inherited in the derived class (is or is not)

ANSWER: is not

11 If the member variables in a base class are marked as private, can a derived class directly access those variables?

ANSWER: No

12 If the member variables of the base class are marked as protected, who can access those variables?

ANSWER: members, friends, and classes derived from that base class

13 If two functions (in the same scope) have the same name, but a different function signature, this means that the functions are _____.

ANSWER: overloaded

14 The ability to associate multiple meanings to one function name using dynamic binding is called _____.

ANSWER: polymorphism.

15 C++ implements polymorphism by waiting until run-time to determine which version of a function to use. This is also known as _____.

ANSWER: late or dynamic binding

SUBTOTAL: [15]

Section C

Code Questions

16 Marks

Answer the following questions in your answer book.

QUESTION 1

Consider the following C++ code?

Given the following classes and code, what is the output of the last statement shown?

```
class Pet
{
public:
    virtual void print();
    string name;
private:
```

```

};
class Dog: public Pet
{
public:
    void print();
    string breed;
};
void Pet::print()
{
    cout << "My name is " << name;
}
void Dog::print()
{
    Pet::print();
    cout << ", and my breed is a " << breed << endl;
}

    Pet pPtr;
    Dog dPtr;
    dPtr->name= "Rover";
    dPtr->breed="Weiner";
    pPtr= dPtr;
    pPtr->print();

```

ANSWER : My name is Rover

[2]

QUESTION 2

Answer the questions (i) to (iv) based on the following:

```

class PUBLISHER
{
    char Pub[12];
    double Turnover;
protected:
    void Register();
public:
    PUBLISHER();
    void Enter();
    void Display();
};
class BRANCH
{

```



```

    char CITY[20];
    protected:
    float Employees;
public:
    BRANCH();
    void Haveit();
    void Giveit();
};

class AUTHOR : private BRANCH, public PUBLISHER
{
    intAcode;
    char Aname[20];
    float Amount;
public:
    AUTHOR();
    void Start();
    void Show();
};

```

2.1 Write the names of data members, which are accessible from objects belonging to class AUTHOR.

[2]

2.2 Write the names of all the member functions which are accessible from objects belonging to class BRANCH.

[2]

[4]

QUESTION 3

Consider the following code below.

```

class Loan
{
public:
    Loan();
    Friend Loan operator+(Loan, Loan) const;

private:
    float amount;

```

```
        string loanName;  
};
```

Write the code that implement the function that **operator +** to perform the addition of two loan amounts. **[4]**

QUESTION 4

Provide code for a catch block that catches exceptions of all types. **[3]**

Question 5

If you have the following class definitions, which of the following is the proper way to construct an object of the derived class?

```
class Pet  
{  
public:  
    Pet();  
    void printPet();  
    string getName();  
    void setName(string newName);  
private:  
    string name;  
};
```

```
class Dog:public Pet  
{  
public:  
    Dog();  
    void printPet();  
    void setType(string newType);  
    string getType();  
private:  
    string type;  
};
```

Answer: Dog::Dog():Pet(),type("MUTT")

[3]

SUBTOTAL: [16]

Section D

Discussion Questions

19 Marks

Answer the following questions in your answer book. **Use code to demonstrate your answers.**

QUESTION 1

Discuss the difference between inheritance and composition. [4]

Answer:

Composition of a class refers to using one class to declare members of another class; inheritance refers to deriving a subclass from a base class

QUESTION 2

Define or characterize the template facility for C++. [3]

Answer: Templates provide a facility to allow the definition of functions and classes that have parameters for type names.

QUESTION 3

Explain and demonstrate the difference between a friend function of a class and a member function of a class. [6]

Answer: A friend of a class can be a function, operator or another class, A friend of a class can access all of that class's data members.

QUESTION 4

Explain and demonstrate dynamic memory allocation. List some of the advantages and disadvantages dynamic memory allocation versus stack memory allocation. [6]

SUBTOTAL: [19]

Section D

Coding

10 Marks

Answer the following questions in your answer book.

SUBTOTAL: [10]

TOTAL: [65]