

OHI-1156 Programming II

Class Exam

Saturday 19 May 2012

Imed Hammouda

Make sure you read the questions carefully before giving your answer. Put your name and student number on each answer sheet.

This exam consists of 4 pages. The maximum amount of points is 70 (40 points for part A and 30 points for part B).

Written material, mobile phones and calculators are NOT allowed in the exam.

Good luck!

Part A

Give the right answer, in the form of:

1. A

2. A

3. A

...

1. The best form of coupling is _____

A. Complete

B. Tight

C. Loose

D. Free

2. Paying attention to the important properties while ignoring inessential details is known as _____

A. Selectiveness

B. Polymorphism

C. Abstraction

D. Summarizing

3. The #ifndef directive tests to see whether _____

A. a class has been defined.

B. a variable has been given a value.

C. a class has no variable definitions.

D. any objects of the class have been instantiated.

4. A function that is called automatically each time an object is destroyed is a

A. Constructor

B. Destructor

C. Destroyer

D. Terminator

5. STL container classes are available to work with structures that are not _____

A. valid without container classes.

B. programmer-defined.

C. type-specific.

D. Public.

6. A default catch block catches

- A. all thrown objects.
- B. no thrown objects.
- C. any thrown object that has not been caught by an earlier catch block.
- D. all thrown objects that have been caught by an earlier catch block.

7. Can constructors be overloaded?

- A. No
- B. Yes

8. What is shallow copy?

- A. A shallow copy creates a copy of the dynamically allocated objects too.
- B. A shallow copy just copies the values of the data as they are.
- C. A shallow copy creates a copy of the statically allocated objects too.
- D. Both b and c above.

9. What is the Difference between struct and class in terms of Access Modifier?

- A. By default all the struct members are private while by default class members are public.
- B. By default all the struct members are public while by default class members are private.
- C. None of the above.

10. Under what conditions a destructor destroys an object?

- A. Scope of existence has finished.
- B. Object dynamically assigned and it is released using the operator delete.
- C. Program terminated.
- D. Both a and b.

11. The return value of the following code is

```
Class1& test(Class1 obj)
{
    Class1 *ptr = new Class1();
    .....
    return ptr;
}
```

- A. object of Class1
- B. reference to ptr
- C. reference of Class1
- D. object pointed by ptr

12. Which of the following is NOT true regarding recursion and iteration?

- A. Any recursive method can be rewritten in an iterative form.
- B. In general, recursive algorithms lead to better performance than iterative algorithms.
- C. A recursive method is a method that calls itself.
- D. To terminate, a recursive algorithm must have a base case.

13. Operator overloading is

- A. Making C++ operators work with objects.
- B. Giving new meaning to existing C++ operators.
- C. Making new C++ operators.
- D. Both A and B above.

14. Is this tail recursive?

```
void prog(int i) {  
    if (i>0) {  
        prog(i-1);  
        cout << i << " ";  
        prog(i-1);  
    }  
}
```

A. Yes

B. No

15. What is the difference between a structure and a union?

A. We can define functions within structures but not within a union.

B. We can define functions within union but not within a structure.

C. The way memory is allocated.

D. They have no difference.

16. Explain the feature of stack.

A. Stack cannot reuse its memory.

B. All elements are of different data types.

C. All operations are at one end.

D. Any element can be accessed from it directly.

17. void main()

```
{  
struct  
{  
int i;  
}abc;  
(*abc)->i=10;  
cout << abc.i;  
}
```

What is the output of this program?

A. Address of i.

B. 10

C. Program will not compile.

D. None of the above.

18. What is so unique about deque?

A. It is just another name for queue.

B. Elements can only be added to or removed from the back (tail).

C. Elements can only be added to or removed from the front.

D. Elements can only be added to or removed from the front (head) or back (tail).

19. A _____ is good for applications that require frequent insertion and deletion in the middle of it.

A. Vector

B. Deque

C. List

20. Arrays and vectors cannot be a return type of a function call.

A. No

B. Yes

Part B

A new low-fare airline operating from Tampere-Pirkkala is starting up. They need a system for keeping track of the booking situation on their flights. The following information on each flight needs to be available in the program: destination, departure time, amount of available seats and the booked tickets. There are three types of tickets: economy, business and flexible. Each ticket is identified with a unique reservation number. The passengers' name, date of birth and billing address are also stored into the program with the reservation information. The ticket information must be changeable based on the reservation number.

1. Help the airline to implement the program by sketching the needed modules. Note that the module(s) does not need to be perfect, just give the outline of the ADT, its interface, and the data it is going to contain. Describe also the other types possibly needed to make the module clear. Pay attention to information hiding.

One class should declare at least three constructors, two transformers, three observers and a destructor. Give example implementation of this ADT.

2. Give example client code using the identified abstract data types.

3. How would you protect your classes against the problem of multiple inclusion of header files?

4. How would you protect the use of private functions used in some of the class implementations?