C COMPUTER PROGRAMMING (II) (1042) : Final Exam

A

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June 16, 2016, 9:50 ~ 11:30

NAME: _____	Student ID Nr.: _____
Instructor: _____	

General instructions:

1. Do not open this exam until you are told to begin.
2. This exam has 8 pages including this cover.
3. Show an "appropriate amount" of work for each problem. Short answer is preferred.
4. No calculator nor translator can be used.
5. Do NOT use pencils but black or blue ball pens on your answer sheets.
6. Please hand in both of the exam and the answer sheets when you finish.
7. Please turn off all cell phones and remove all headphones.

	Part A	Part B				
		1	2	3	4	5
	30%	10%	15%	15%	10%	20%
Points						
TOTAL						

A. True or False: (30%, 2% for each,)

True **False** 1. Overloading a binary operator as a member always requires two arguments.

True **False** 2. You can assign a standard string to a C-string variable.

True **False** 3. When overloading an operator, you can create a new operator different from the more usual operators.

True **False** 4. C++ allows overloading of the function application operator ( ).

True **False** 5. The C-string library functions use the null terminator to decide when to stop processing.

True **False** 6. The declaration below declares three pointer variables of type pointer to `double` that is, a pointer of type (`double*`)

```
double* p1, p2, p3;
```

True **False** 7. A pointer is an address, an address is an integer, but a pointer is not an integer.

True **False** 8. One can use the & operator to extract the value that a pointer points to.

True **False** 9. You can have a name spelled the same in two different namespaces with no conflict in your program.

True **False** 10. A function can return an array.

True **False** 11. An unnamed namespace provides a facility for collecting names that are local to the file where the unnamed namespace is located. Such names are available in that file, and are unavailable in any other file.

True **False** 12. An input stream is a stream of data flowing from your program, either to a file, or to the keyboard.

True **False** 13. If class D is derived from class B then class D has only some of the members from B, and the additional members defined in D.

True **False** 14. When you use the open member function to tie a file name to a file stream, the file name is called the external file name, and the program refers to the file by the stream name.

True **False** 15. Both of constructors and destructors are inherited because they are required to initialize the inherited variables.

Go on to the next page.

B. Short answer questions:

1. (10%) What is the output produced by the following program?

```
#include <iostream>
using namespace std;

namespace Sun
{
    void message();
}

namespace
{
    void message();
}

int main()
{
    {
        message();
        using Sun::message;
        message();
    }
    message();
    cin.get();
    return 0;
}

namespace Sun
{
    void message()
    {
        cout << "Hello from Sun.\n";
    }
}

namespace
{
    void message()
    {
        cout << "Hello from Moon.\n";
    }
}
```

Answer:

2. (15%) Consider the class definition:

```
1  class IntPair
2  {
3  public:
4      IntPair(int firstValue, int secondValue);
5      //Prefix operator ++ here
6      //Postfix operator ++ here
7      void setFirst(int newValue);
8      void setSecond(int newValue);
9      int getFirst( ) const;
10     int getSecond( ) const;
11 private:
12     int first;
13     int second;
14 };
```

a) Give declarations for prefix and postfix versions of operator ++

b) Give definitions for prefix and postfix versions of operator ++

Answer:

3. (15%) What is the output of the following program? Assuming the computer allocates memory for variable number at the address of 0x22cd30 (0x means values in hexadecimal notation). The size of an int is 4 bytes.

```
1 int numbers[] = {11, 22, 33};
2 int * iPtr = numbers;
3 cout << iPtr << endl;
4 cout << iPtr + 1 << endl;
5 cout << *iPtr << endl;
6 cout << *(iPtr + 1) << endl;
7 cout << *iPtr + 1 << endl;
```

Answer:

Go on to the next page.

4. (10%) What is the output of the following program:

```
 1 #include <iostream>
 2 using namespace std;
 3
 4 int sum(const int *begin, const int *end);
 5
 6 int main()
 7 {
 8    int a[] = {8, 4, 5, 3, 2, 1, 4, 8};
 9    cout << sum(a, a+8) << endl;
10    cout << sum(a+2, a+5) << endl;
11    cout << sum(&a[2], &a[5]) << endl;
12 }
13
14 int sum(const int *begin, const int *end)
15 {
16    int sum = 0;
17    for (const int *p = begin; p != end; ++p)
18    {
19       sum += *p;
20    }
21    return sum;
22 }
```

Answer:

Go on to the next page.

5. (20%) Give a definition for a class `TemporaryStaff` that is a derived class of the base class `Staff` given below. Do not bother with `#include` directives or namespace details.

```
class Staff
{
  public:
      Staff();
      void printAnswer() const;
  protected:
      int StaffID;
      int BasicSal;
}
```

This class should have an additional data field, `Married`, of type `bool`; one additional member function that takes no arguments and returns a value of type `bool`, and suitable constructors. The new function is named `IsMarried`. You do not need to give any implementations, just the class definition.

Answer:

End of the exam.