Administration

• Final Exam: Monday 12/15
  – 7-9 pm
  – Angell Hall B
Question 1

In C++, the value of the expression
3 + 2 * 6  is 30.

A) True    B) False

False -- it’s 3 + 12 = 15
Question 2

When a floating-point value is assigned to an integer variable, the fractional part is truncated.

A) True  B) False

True
Question 3

The function heading

```c
void SomeFunc(double x[])
```
causes a compile-time error because the size of the array is missing.

A) True  B) False

False – no compile error
**Question 4**

The array declared as

```c
int bowlingScore[4][10];
```

contains exactly 14 `int` components.

A) True  B) False

**False it contains 40**
**Question 5**

`string` is a reserved word.

A) True  B) False

False
Question 6

If a C++ class member function is declared `const`, the compiler prevents the function from modifying private member data.

A) True  B) False

True
Question 7

In C++, two different classes -- say, MyClass and YourClass -- can both have member functions named subtract.

A) True  B) False

True
Question 8

It is a good idea to make class member variables public so you have more flexibility.

A)True   B)False

False – you want the data members private and the member functions public
Question 9

A C++ class can have more than one constructor.
A)True   B)False

True
Question 10

The following code will correctly zero-out an array `arr` of 10 integers.

```java
for (int i = 1; i <= 10; i++)
    arr[i] = 0;
```

A) True  B) False

False – index needs to start at 0 rather than 1 and the last index should be 9

```java
for (int i = 0; i < 10; i++)
```
Question 11

Given the constant declaration
\begin{verbatim}
const int FACTOR = 95;
\end{verbatim}
which of the following is a valid use of FACTOR?
A) \texttt{cout \ll FACTOR * 3;}
B) \texttt{FACTOR = 24;}
C) \texttt{cin >> FACTOR;}
D) a and c above
E) b and c above

Ans: A – it cannot change the value
Question 12

Which of the following is **not** one of the things a programmer must do in order to use file I/O in a C++ program?

A) Use a preprocessor directive to include the header file **fstream**.
B) Declare each file stream in a variable declaration.
C) Prepare each file for reading or writing by calling the **open** function.
D) Specify the name of the file stream in each input or output statement that uses it.
E) none of the above

Ans: E – ALL must be there
Question 13

What is the missing condition in the following code fragment? The program is supposed to halt if the input file does not exist.

```cpp
ifstream inFile; 
inFile.open("myfile.dat");
if (_____________){
    cout << "Cannot open input file." << endl;
    return 1;
}
```

A) inFile.good()  
B) !inFile.eof()  
C) !inFile.good()  
D) !myfile.dat  
E) inFile != myfile.dat

C – could also have been  
!inFile or  
inFile.fail()
Question 14

How many times will the C++ program fragment below print "Hello"?

```
count = 1;
while (count < 10)
    count++;
cout << "Hello" << endl;
```

A) 1
B) 9
C) 10
D) None of the above

Ans: A
Question 15

What is the value of `loopCount` after control exits the following loop?

```cpp
loopCount = 0;
while (loopCount <= 144){
    alpha = alpha + 7;
    loopCount = loopCount + 2;
}
```

A) 0  B) 143  C) 146  D) 144

Ans: C: 146
Question 17

Given the declarations

```cpp
struct RecType1{
    int    length;
    float width;
};
RecType1 myRec;
RecType1 yourRec;
```

which of the following assignment(s) statements is(are) valid (compilable)?

A) myRec.length = yourRec.length;
B) myRec = yourRec;
C) myRec.length = yourRec;
D) a and b above
E) none of the above

D: both A and B
Question 18

A class SomeClass has a member function F that has no parameter list, returns an int value, and does not modify any of the private data. Which of the following would be the correct function definition header for F?

A) int F() const  { ...  
B) const int F()  { ...  
C) SomeClass::int F() const  { ...  
D) const int SomeClass::F()  { ...  
E) int SomeClass::F() const  { ...  

ANS:  E
Question 19

Suppose that the class declaration of SomeClass includes the following function prototype.

bool LessThan( SomeClass anotherObject );

Which of the following tests if the client code correctly compares two class objects alpha and beta?

A) if (alpha < beta)
B) if (alpha.LessThan(beta))
C) if (LessThan(alpha, beta))
D) if (alpha.LessThan.beta)
E) if (LessThan(alpha).beta)

Ans:  B
if (alpha.LessThan(beta))
Question 20

Assume that `myclass.h` and `myclass.cpp` are files containing a class `MyClass` and that `someprog.cpp` is a client program of class `MyClass`. Which file(s) must `#include` the file `myclass.h`?

A) `someprog.cpp`
B) `myclass.cpp`
C) `myclass.h`
D) a and b above

Ans: D – both `someprog.cpp` and `myclass.cpp` need `myclass.h`
Question 21

The following code fragment invokes a function named `initToZero`:

```c
int alpha[10][20];
initToZero(alpha);
```

Which of the following is **not** a valid function heading for `initToZero`?

A) `void initToZero( int beta[][ ]  )`
B) `void initToZero( int beta[][20]  )`
C) `void initToZero( int beta[10][]  )`
D) a and c above
E) a and b above

**Ans:** D – it needs to know the row width (# of cols)
Question 22

In the expression \( \&\alpha \), the ampersand (\&) is known as the ________________ operator.

A) address-of
B) dereference
C) scope resolution
D) b and c
E) None of the above

Ans: A – address-of
Question 23

Given a 3000-element, one-dimensional int array beta, write a code fragment that could be used to print out the values of beta[1], beta[3], beta[5], and so forth. (values at all odd indexes)

```cpp
for (int i = 1; i < 3000; i = i + 2)
    cout << beta[i] << endl;
```
Question 24: given Student.h

class Student{
  private:
    int id;
    string uniquename;
    void print(ostream& outs);

  public:
    Student();
    Student(int sid,
      string name);
};

void Student::print(ostream& outs)
{
    outs << id << " "
    << uniquename
    << endl;
}
class Student {
    private:
        int id;
        string uniquename;
        void print(ostream& outs);
    public:
        Student();
        Student(int sid, string name);
    };

ostream& operator << (ostream& outs, Student stud);

    ostream& operator << (ostream& outs, Student stud)
    {
        stud.print(outs);
        return outs;
    }
Question 26: given Student.h

class Student{
    private:
        int id;
        string uniquename;
        void print(ostream& outs);

    public:
        Student();
        Student(int sid, string name);
    
    ostream& operator << (ostream& outs, Student stud);
};

Write the **main** function that will declare a student, load with data, and print.

```cpp
#include "Student.h"
#include <iostream>
using namespace std;

int main() {
    Student p (1234, "Peter");
    cout << p << endl;
    return 0;
}
```