Spring Semester 19 Dr. Punch. Exam #1 (2/14), form 1 C

Last name (printed): ________________________________________________

First name (printed): _______________________________________________

Directions:

a) DO NOT OPEN YOUR EXAM BOOKLET UNTIL YOU HAVE BEEN TOLD TO BEGIN.
b) You have 90 minutes to complete the exam (7:00pm – 8:30pm)
c) This exam booklet contains 30 multiple choice questions, each weighted equally (5 points). **10 pages total**
d) You may use one 8.5” x 11” note sheet during the exam. No other reference materials or calculating devices may be used during the examination.
e) Questions will not be interpreted during the examination.
f) You should choose the single best alternative for each question, even if you believe that a question is ambiguous or contains a typographic error.
g) Please fill in the requested information at the top of this exam booklet.
h) Use a #2 pencil to encode any information on the OMR form.
i) Please encode the following on the OMR form:
   ■ Last name and first initial
   ■ MSU PID
   ■ Exam form (see the title of this page)
j) Please sign the OMR form.
k) Only answers recorded on your OMR form will be counted for credit.
l) Completely erase any responses on the OMR form that you wish to delete.
m) You must turn in this exam booklet and the OMR form when you have completed the exam. When leaving, please be courteous to those still taking the exam.

Good luck.

**Timing tip.** A rate of 2.5 minutes per multiple choice problem leaves 5 minutes to go over any parts of the exam you might have skipped.
```cpp
#include <iostream>
using namespace std;

long fn1(long arg1, int switch_val) {
    long result;
    switch (switch_val) {
    case 1 :{
        result = arg1 * arg1;
        break;
    }
    case 2 :{
        result = arg1 % switch_val;
        break;
    }
    default : {
        result = arg1;
    } // of switch
    return result;
} // of fn1

long fn2(long arg1) {
    long result = 0;
    for (int i = 2; i <= arg1 - 1; ++i) {
        if (arg1 % i == 0)
            ++result;
    }
    return result;
}

long fn3(long arg1) {
    long div = arg1 / 10;
    long mod = arg1 % 10;
    return mod * 10 + div;
}

int main (){
    cout << fn1(11, 2) << endl; // Line 1
    cout << fn1(3, 3) << endl; // Line 2
    cout << fn2(20) << endl; // Line 3
    cout << fn2(17) << endl; // Line 4
    cout << fn3(13) << endl; // Line 5
    cout << fn3(4) << endl; // Line 6
}
```

Figure 2

1) For the program in Figure 2, what value is output on Line 1.
   a) 0
   b) 1
   c) 2
   d) 3
   e) None of the above
2) For the program in Figure 2, what value is output on Line 2.
   a) 0
   b) 1
   c) 2
   d) 3
   e) None of the above
3) For the program in Figure 2, give the output of Line 3.
   a) 0
   b) 1
   c) 2
   d) 3
   e) None of the above
4) For the program in Figure 2, give the output of Line 4.
   a) 0
   b) 1
   c) 2
   d) 3
   e) None of the above
5) For the program in Figure 2, give the output of Line 5.
   a) 1
   b) 3
   c) 13
   d) 31
   e) None of the above
6) For the program in Figure 2, give the output of Line 6.
   a) 0
   b) 1
   c) 4
   d) 14
   e) None of the above
For the program shown in Figure 3, what type is `var` on Line 1?

a) `string`

b) `int`

c) `long`

d) `double`

e) None of the above
8) For the program shown in Figure 3, what output is produced by Line 2?
   a) 0
   b) 1
   c) 2
   d) 3
   e) None of the above
9) For the program shown in Figure 3, what output is produced by Line 3?
   a) 0
   b) 1
   c) 2
   d) 3
   e) None of the above
10) For the program shown in Figure 3, what output is produced by Line 4?
    a) o
    b) hello world
    c) o world
    d) world
    e) None of the above
11) For the program shown in Figure 3, what output is produced by Line 5?
    a) 0
    b) 123
    c) 123abc
    d) abc123
    e) None of the above
12) For the program shown in Figure 3, what output is produced by Line 6?
    a) 0
    b) 123
    c) 123abc
    d) abc123
    e) None of the above
13) For the program shown in Figure 4, what output is produced by Line 1?
   a) abc
   b) abcabc
   c) 1
   d) some address
   e) None of the above

14) For the program shown in Figure 4, what output is produced by Line 2?
   a) abc
   b) abcabc
   c) 1
   d) some address
   e) None of the above

```cpp
#include<iostream>
using std::cout; using std::endl;
#include<string>
using std::string;

string fn1(string arg1){
    return arg1 + arg1;
}

long fn1(long *arg1){
    return *arg1 *= 2;
}

int main(){
    string str = "abc";
    string &amp_s = str;
    string *star_s;
    long lng = 2;
    long &amp_l = lng;
    long *star_l;

    star_s = &str;
    star_l = &lng;
    cout << amp_s << endl; // Line 1
    cout << fn1(amp_s) << endl; // Line 2
    cout << fn1(star_l) << endl; // Line 3

    (*star_s).push_back('z');
    cout << str << endl; // Line 4
    amp_l = 1;
    cout << lng << endl; // Line 5
}
```

Figure 4
15) For the program shown in Figure 4, what output is produced by Line 3?
   a) abc
   b) abcabc
   c) 1
   d) some address
   e) None of the above

16) For the program shown in Figure 4, what output is produced by Line 4?
   a) abc
   b) abcabc
   c) 1
   d) some address
   e) None of the above

17) For the program shown in Figure 4, what output is produced by Line 5?
   a) abc
   b) abcabc
   c) 1
   d) some address
   e) None of the above
```cpp
#include <iostream>
using std::cout; using std::endl; using std::cin;

int main (){
    long lng1=1, lng2=2;
    double dbl1=3.14;
    int i=0;

    cout << (dbl1 * lng2) << endl; // Line 1
    cout << (lng1 / lng2) << endl; // Line 2

    while(i <= lng2){
        lng1 = lng2 + lng1;
        ++i;
    }

    cout << lng1 << endl; // Line 3
    cout << i << endl; // Line 4

    long result = 0;
    for(int j = 1; j < 10; j *= 2){
        if (j < lng2)
            result = result + 2;
        else if (j > lng2)
            result = result - 2;
    }

    cout << result << endl; // Line 5
    // cout << j << endl; // Line 6
}
```

Figure 1

Watch the Line Numbers for this one

18) For the program in Figure 1, what value is output on Line 1?
   a) 2
   b) 3.14
   c) 6
   d) 6.28
   e) None of the above.

19) For the program in Figure 1, what value is output on Line 2?
   a) 0
   b) 0.5
   c) 1
   d) 2
   e) None of the above.
20) For the program in Figure 1, what value is output on Line 3?
   a) 0
   b) 3
   c) 6
   d) 7
   e) None of the above.

21) For the program in Figure 1, what value is output on Line 4?
   a) 0
   b) 3
   c) 6
   d) 7
   e) None of the above.

22) For the program in Figure 1, what value is output on Line 5?
   a) -4
   b) -2
   c) 0
   d) 2
   e) None of the above.

23) In Figure 1, Line 6 is commented out. What would be the result of uncommenting that Line, compiling and running the program?
   a) The program would compile and run, outputting the value 10.
   b) The program would compile and run, outputting the value 8.
   c) The program would not compile (j not declared)
   d) The program would compile but would segmentation fault when run.
   e) None of the above.
24) For the following code snippet:
   ```cpp
   int i = 5;
   cout << i-- << endl;
   ```
   What would be printed?
   a) 4
   b) 5
   c) 6
   d) The cout statement is malformed and that code would not compile
   e) None of the above

25) Which of the following expressions will return a double given int i=5;?
   a) i/10.0;
   b) static_cast<double>(i);
   c) i + 0.0;
   d) All of the above
   e) None of the above

26) What is the return value of an assignment statement?
   a) the value assigned
   b) the value of the variable before assignment
   c) no return
   d) the null value of the type being assigned
   e) None of the above.

27) Which of the following is true about a logical expression such as (a && b)?
   a) returns the value that made the result "obvious"
   b) always returns true or false
   c) can only be used for integer types
   d) All of the above
   e) None of the above

28) Which of the following is a declaration of a pointer variable?
   a) long ptr;
   b) long ptr = *p;
   c) long *ptr;
   d) long ptr++;
   e) None of the above

29) `unsigned` is a modifier for what kinds of types
    a) floating point types
    b) integer types
    c) Boolean types
    d) all types
    e) None of the above

30) An appropriate synonym for a reference type is:
    a) pointer
    b) integer
    c) long
    d) unsigned
    e) None of the above