Spring Semester 17 Dr. Punch. Exam #1 (2/15), form 1 A

Last name (printed): __________________________________________

First name (printed): __________________________________________

Directions:

a) DO NOT OPEN YOUR EXAM BOOKLET UNTIL YOU HAVE BEEN TOLD TO BEGIN.

b) You have 80 minutes to complete the exam (6:00-7:20)

c) This exam booklet contains 30 multiple choice questions, each weighted equally (5 points). 11 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 std::cout; using std::endl; using std::cin;

int main (){
    long l1 = 0;
    long l2 = 0;
    int i;
    cin >> l1;

    for (i = 1; i < l1; i += 3){
        if (i % 2)
            l2 = l2 * 2;
        else
            l2 = l2 + i;
    }

    cout << l1 << endl; // Line 1
    cout << l2 << endl; // Line 2
    cout << i << endl; // Line 3
}
```

Figure 1

1) For the program in Figure 1 with the input 9 give the output of Line 1?
   a) 7  
   b) 8  
   c) 9  
   d) 10 
   e) None of the above.

2) For the program in Figure 1 with the input 9 give the output of Line 2?
   a) 7  
   b) 8  
   c) 9  
   d) 10 
   e) None of the above.

3) For the program in Figure 1 with the input 9 give the output of Line 3?
   a) 7  
   b) 8  
   c) 9  
   d) 10 
   e) None of the above.
4) For the program in Figure 1 with the input 1 how many iterations of the for loop occur?
   a) 1
   b) 2
   c) 3
   d) 4
   e) None of the above.

5) For the program in Figure 1 with the input 1 give the output of Line 2?
   a) 1
   b) 2
   c) 3
   d) 4
   e) None of the above.
6) What is the return type for the expression `cout << 14;`?
   a) No return, a `void` type
   b) `long`
   c) `int`
   d) `char`
   e) None of the above

7) Which of the following are part of a function signature?
   a) function name
   b) function parameter names
   c) the number of lines in the function
   d) All of the above
   e) None of the above

8) Given an `unsigned int i=pow(2,32)-1;` with a range of 0 to $2^{32} - 1$, which of the following is output given `cout << ++i;`?
   a) 0
   b) $2^{32}$
   c) -1
   d) This expression is illegal, will not compile
   e) None of the above

9) Given a variable `int i = 5;` what is the value returned from the expression `(i < 10) ? 100 : 200;`
   a) no return value
   b) 0
   c) 1
   d) 100
   e) None of the above

10) Given the two variables `long i = 10; long j = 20;` which of the following are true concerning the statement `i = j;`?
    a) i is an rvalue, j is an lvalue
    b) i is an lvalue, j is an rvalue
    c) both are rvalues
    d) both are lvalues
    e) None of the above
11) Which of the following are true about a template function in C++?
   a) it is a function that can be called directly without further processing
   b) `template` is a keyword used to make a template function
   c) template substitution occurs at runtime.
   d) All of the above
   e) None of the above

12) Which of the following are true regarding function parameter default values?
   a) default and required parameters can occur in any order
   b) you must have at least one required parameter
   c) if all parameters have a default value, then this means the function can be called without arguments.
   d) All of the above
   e) None of the above
Figure 2

13) For the program in Figure 2, what type is result on Line 1.

a) 123
b) 321
c) 0
d) 111
e) None of the above

```
#include<iostream>
using std::cout; using std::endl; using std::cin;
#include<cmath>

long fn1 (long lng){
    long t = 0;
    while (lng > 0){
        t = (t * 10) + (lng % 10);
        lng = lng / 10;
    }
    return t;
}

long fn2(long l1, long l2, long l3){
    long result = 0;
    if ( (l3 > l2) && (l3 > l1) )
        result = l3;
    else if ( (l1 > l2) || (l1 > l3) )
        result = l2;
    else if (l1 != l2)
        result = l1;
    else
        result = 0;
    return result;
}

int main (){  
    cout << fn1(123) << endl;    // Line 1
    cout << fn1(9) << endl;       // Line 2
    cout << fn1(-123) << endl;    // Line 3

    cout << fn2(1,2,3) << endl;   // Line 4
    cout << fn2 (3,2,1) << endl;  // Line 5
    cout << fn2 (1,3,2) << endl;  // Line 6
}
```
14) For the program in Figure 2, what value is output on Line 2.
   a) 9
   b) -9
   c) 0
   d) 90
   e) None of the above
15) For the program in Figure 2, give the output of Line 3.
   a) 0
   b) -321
   c) -123
   d) 111
   e) None of the above
16) 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
17) For the program in Figure 2, give the output of Line 5.
   a) 0
   b) 1
   c) 2
   d) 3
   e) None of the above
18) For the program in Figure 2, give the output of Line 6.
   a) 0
   b) 1
   c) 2
   d) 3
   e) None of the above
#include<iostream>
using std::cout; using std::endl; using std::cin;

int fn1(long &p1, long *p2, long p3){
    int i = 0;
    for (int i=0; i<p3; ++i){
        if (*p2 > p1){
            p1 = *p2;
            *p2 += 1;
        }
    }
    else{
        *p2 = p1;
        p1 += 1;
    }
} // of for
    return i;
} // of fn

int main (){
    long a1 = 5, a2 = 10, a3 = 3;
    long *a4 = &a2;

    cout << fn1(a1,a4,a3) << endl; // Line 1
    cout << a1 << endl; // Line 2
    cout << a2 << endl; // Line 3
    cout << a3 << endl; // Line 4
    cout << a4 << endl; // Line 5
    cout << *a4 << endl; // Line 6
}

19) For the program shown in Figure 3, what output is produced by Line 1?
   a) 0
   b) 1
   c) 2
   d) 3
   e) None of the above

20) For the program shown in Figure 3, what output is produced by Line 2?
   a) 10
   b) 11
   c) 12
   d) 13
   e) None of the above
21) For the program shown in Figure 3, what output is produced by Line 3?
   a) 10
   b) 11
   c) 12
   d) 13
   e) None of the above

22) For the program shown in Figure 3, what output is produced by Line 4?
   a) 0
   b) 1
   c) 2
   d) 3
   e) None of the above

23) For the program shown in Figure 3, what output is produced by Line 5?
   a) 10
   b) 11
   c) 12
   d) 13
   e) None of the above

24) For the program shown in Figure 3, what output is produced by Line 6?
   a) 10
   b) 11
   c) 12
   d) 13
   e) None of the above
```cpp
#include<iostream>
using std::cout; using std::endl; using std::cin;
#include<iomanip>
using std::setprecision;
#include<string>
using std::string;
#include<ctype>

int fn1(string s1, string &s2, char c){
    int i, lim, cnt=0;
    char temp;

    if (s1.size() > s2.size())
        lim = s2.size();
    else
        lim = s1.size();

    for (i=0; i<lim; ++i){
        temp = s1[i];
        if (isalnum(temp))
            s2[i] = temp;
        else
            s2[i] = c;
        ++cnt;
    }
    return cnt;
}

string fn2(string s, string::size_type i){
    string result;
    auto temp = s.size() - i; // Line 1
    result = s.substr(temp) + s.substr(0, temp);
    return result;
}

int main (){  
    string s1 = "1!2!3", s2="*ab12*";
    char c = 'z';
    cout << fn1(s1, s2, c) << endl; // Line 2
    cout << s1 << endl; // Line 3
    cout << s2 << endl; // Line 4

    string s3 = "abc123";
    cout << fn2(s3, 2) << endl; // Line 5;
    cout << s3 << endl; // Line 6
} 
```
25) For the program in Figure 4, what type is `temp` on Line 1?
   a) double
   b) string
   c) Type
   d) char
   e) None of the above

26) For the program in Figure 4, what value is printed by Line 2?
   a) 1
   b) 2
   c) 3
   d) 4
   e) None of the above

27) For the program in Figure 4, what value is printed by Line 3?
   a) 1!2!3
   b) 123
   c) !!!
   d) 1!2!3!*
   e) None of the above

28) For the program in Figure 4, what value is printed by Line 4?
   a) 1z2z3z
   b) 1z2z3*
   c) *1z2z3
   d) !1!2!3
   e) None of the above

29) For the program in Figure 4, what value is printed by Line 5?
   a) abc123
   b) c123ab
   c) 23abc1
   d) abc123abc123
   e) None of the above

30) For the program in Figure 4, what value is printed by Line 6?
   a) abc123
   b) c123ab
   c) 23abc1
   d) abc123abc123
   e) None of the above