Fall Semester 13, Dr. Punch. Exam #1 (10/3), 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 (10:20-11:40)
c) This exam booklet contains 30 multiple choice questions, each weighted equally (5 points). **Seven 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.

**Form A**

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1) Given user input of 3, what output is produced by the if statement of Line 3?
   a) sum is larger
   b) product is larger
   c) sum and product are equal
   d) Error
   e) None of the above.

2) Given user input of 2, what output is produced by the if statement of Line 3?
   a) sum is larger
   b) product is larger
   c) sum and product are equal
   d) Error
   e) None of the above.

3) Given user input of 4 what output is produced by the if statement of Line 3?
   a) sum is larger
   b) product is larger
   c) sum and product are equal
   d) Error
   e) None of the above.

4) Under what conditions does the while statement at Line 1 end?
   a) entering a character
   b) entering end of file
   c) entering a period
   d) All of the above
   e) None of the above.
5) What does the fixed modifier do in Line 2 of the Figure 1 program?
   a) Fixes output to do only integers
   b) Repairs any errors (clears them) resulting from an incorrect output
   c) Prints all numbers as fixed decimals (not scientific notation)
   d) Makes the output constant (fixes it)
   e) None of the above.

6) As discussed in class, what drives the C++ system?
   a) types
   b) the compiler
   c) the linker
   d) the programmer
   e) None of the above

7) What is different about the setw statement as compared to other output formatting statements?
   a) nothing, except for its function/purpose it is the same
   b) it requires a different include/header file
   c) it only applies to the next output
   d) it only operates on specific types, namely numbers (ints, doubles)
   e) None of the above

8) What is the associativity (the order in which multiple operators are processed as binary pairs) for the two statements cin >> a >> b; and a = b = c;
   a) >> associates left to right, = associates right to left
   b) both associate left to right
   c) >> associates right to left, = associates left to right
   d) both associate right to left
   e) None of the above.

9) Which of the following are true concerning the auto modifier?
   a) it makes a variable with no type
   b) can make its decision at runtime about type
   c) can only be used for integer types
   d) All of the above
   e) None of the above

10) What is the purpose of the & symbol?
    a) It depends on the context.
    b) Get the address of a variable.
    c) Declare a reference variable
    d) logical and operator
    e) None of the above

11) Which of the following are true about the ternary operator in C++?
    a) An operator that adds 3 values
    b) A kind of conditional statement that returns a value
    c) An operator used to combine multiple return values into one structure
    d) An operator to convert one type to another
    e) None of the above

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

```cpp
#include <iostream>
#include <iomanip>
using std::cout; using std::endl; using std::cin;
using std::boolalpha;

int main (){
    long l = 123;
    long *p_l;
    long &r_l = l;
p_l = &r_l;

cout << boolalpha;
cout << p_l << endl; // Line 1
l = 789;
cout << *p_l << endl; // Line 2
r_l = 91011;
cout << p_l << endl; // Line 3
cout << l << endl; // Line 4
cout << (p_l == &r_l) << endl; // Line 5
}
```

13) For the program in Figure 2, give the output of Line 1.
   a) 123
   b) 789
   c) 91011
   d) 0
   e) None of the above

14) For the program in Figure 2, give the output of Line 2.
   a) 123
   b) 789
   c) 91011
   d) 0
   e) None of the above

15) For the program in Figure 2, give the output of Line 3.
   a) 123
   b) 789
   c) 91011
   d) 0
   e) None of the above

16) For the program in Figure 2, give the output of Line 4.
   a) 123
   b) 789
   c) 91011
   d) 0
   e) None of the above

17) For the program in Figure 2, give the output of Line 5.
   a) 0
b) 1
c) true
d) false
e) None of the above

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

long a_fun(long &x, long y=2){
    long rem;
    if ((x % y) || (y == 4)){
        x /= y;
        rem = x % y;
    } else {
        x = x * y;
        rem = y % x;
    }
    return rem;
}

int main () {
    long val=10;
    cout << a_fun(val) << endl; // Line 1
    cout << val << endl; // Line 2
    val = 20;
    cout << a_fun(val,4) << endl; // Line 3
    cout << val << endl; // Line 4
}
```

18) For the program shown in Figure 3, what output is produced by Line 1?
   a) 10
   b) 20
   c) 0
   d) 2
   e) None of the above

19) For the program shown in Figure 3, what output is produced by Line 2?
   a) 10
   b) 20
   c) 0
   d) 2
   e) None of the above

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

21) For the program shown in Figure 3, what output is produced by Line 4?
   a) 1
22) For the program in Figure 4, what value is printed by Line 1?
   a) 0 
   b) 5 
   c) 6 
   d) 10 
   e) None of the above

23) For the program in Figure 4, what value is printed by Line 2?
   a) 0 
   b) 40 
   c) 60 
   d) 80 
   e) None of the above

24) For the program in Figure 4, what value is printed by Line 3?
   a) 2.5 
   b) 40 
   c) 60 
   d) 80 
   e) None of the above

25) For the program in Figure 4, what value is printed by Line 4?
   a) 0 
   b) 4 
   c) 5 
   d) 6 
   e) None of the above

26) For the program in Figure 4, Line 5 won't compile. Why not?
   a) can't assign a floating point value to a double
b) v is const
c) it requires that the c++11 standard was set
d) only if the using statements were modified
e) None of the above

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

long fun1(long param){
    if (param < 10)
        return 100;
    else
        return 1;
}

long fun2(long param1, long *param2){
    param1 = fun1(param1);
    *param2 = fun1(*param2);
    return param1 * (*param2);
}

int main () {
    long x=5, y=25;
    cout << fun2(x, &y) << endl; // Line 1
    cout << x << endl; // Line 2
    x=5;
    y=25;
    cout << fun2(y, &x) << endl; // Line 3
    cout << x << endl; // Line 4
}
```

**Figure 5**

27) For the program in Figure 5, what output is produced by Line 1?
   a) 0
   b) 5
   c) 25
   d) 100
   e) None of the above

28) For the program in Figure 5, what output is produced by Line 2?
   a) 0
   b) 5
   c) 25
   d) 100
   e) None of the above

29) For the program in Figure 5, what output is produced by Line 3?
   a) 0
   b) 5
   c) 25
   d) 100
   e) None of the above

30) For the program in Figure 5, what output is produced by Line 4?
   a) 0
b) 5

c) 25

d) 100

e) None of the above