Fall Semester 14, Dr. Punch. Exam #1 (10/2), 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). **Eight 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.
1) Given user input of 1, what output is produced by Line 2 of Figure 1?
   a) -1
   b) 0
   c) 1
   d) 2
   e) None of the above.

2) Given user input of 3, what output is produced by Line 2 of Figure 1?
   a) -1
   b) 0
   c) 1
   d) 2
   e) None of the above.

3) Given user input of 1, what output is produced by Line 3 of Figure 1?
   a) 9
   b) 10
   c) 11
   d) 0
   e) None of the above.

4) If Line 1 in Figure 1 is commented out, what effect does it have on the program?
   a) No effect
   b) Error on the compile
   c) Unexpected result
   d) Compiles but error when run
   e) None of the above.
5) Which of the following is true about a pointer variable?
   a) It is created with a * in the declaration
   b) cannot be changed once it is created
   c) Is a different size for every type it points to
   d) All of the above
   e) None of the above

6) What is the return value for the statement `cout << 5`?
   a) 5
   b) no return value
   c) a pointer to 5
   d) cout
   e) None of the above

7) Which of the following are true about a `const int` declaration?
   a) variable is an integer
   b) it must be initialized when declared
   c) cannot be changed after it is declared
   d) All of the above
   e) None of the above

8) Which of the following are true concerning the `auto` declaration 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

9) 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

10) Which of the following are true about the `string` type in C++?
    a) Is immutable
    b) Can store multiple types
    c) Is a sequence
    d) All of the above
    e) None of the above

11) Which of the following is true about a template function:
    a) is a pattern that generates a function
    b) uses the template keyword
    c) has a "type variable"
    d) All of the above
    e) None of the above
12) For the program in Figure 2, give the output of Line 1.
   a) 23
   b) 45
   c) some_address
   d) 1
   e) None of the above

13) For the program in Figure 2, give the output of Line 2.
   a) 23
   b) 45
   c) some_address
   d) 1
   e) None of the above

14) For the program in Figure 2, give the output of Line 3.
   a) 23
   b) 45
   c) some_address
   d) 1
   e) None of the above

15) For the program in Figure 2, give the output of Line 4.
   a) 23
   b) 45
   c) some_address
   d) 1
   e) None of the above

16) For the program in Figure 2, give the output of Line 5.
   a) 23
   b) 45
   c) some_address
   d) 1
   e) None of the above
17) For the program shown in Figure 3, what output is produced by Line 1?  
   a) 1  
   b) 12  
   c) 10  
   d) -1  
   e) None of the above  

18) For the program shown in Figure 3, what output is produced by Line 2?  
   a) 1  
   b) 12  
   c) 10  
   d) -1  
   e) None of the above  

19) For the program shown in Figure 3, what output is produced by Line 3?  
   a) 1  
   b) 12  
   c) 10  
   d) -1  
   e) None of the above  

20) For the program shown in Figure 3, what output is produced by Line 4?  
   a) 1  
   b) 12  
   c) 10  
   d) -1  
   e) None of the above
21) For the program shown in Figure 3, what output is produced by Line 5?
   a) 1
   b) 12
   c) 10
   d) -1
   e) None of the above

```cpp
#include<iostream>
#include<string>

using namespace std;

int main() {
    string my_str = "abcde", your_string = "xyzzy";
    cout << my_str + your_string << endl; // Line 1
    cout << my_fun(my_str, 2) << endl;    // Line 2
    cout << my_str << endl;               // Line 3
    cout << new_fun(your_string, 'z') << endl; // Line 4
    cout << new_fun(my_str, 'z') << endl;  // Line 5
}
```

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22) For the program in Figure 4, what value is printed by Line 1?
   a) abc123
   b) abc124
   c) xyzzy
   d) xyzzz
   e) None of the above

23) For the program in Figure 4, what value is printed by Line 2?
   a) abcde
   b) cdeab
   c) edabc
   d) abcede
   e) None of the above
24) For the program in Figure 4, what value is printed by Line 3?
   a) abcde
   b) cdeab
   c) edabc
   d) abcde5
   e) None of the above

25) For the program in Figure 4, what value is printed by Line 4?
   a) 0
   b) 1
   c) 2
   d) 3
   e) None of the above

26) For the program in Figure 4, what value is printed by Line 5?
   a) 0
   b) 1
   c) 2
   d) 3
   e) None of the above
```cpp
#include<iostream>
using std::cout; using std::endl;
#include<string>
using std::string;
#include<cctype>
using std::isalpha;

string my_fun(string s){
    string result = "";
    for (auto c : s){  // Line 1
        if (isalpha(c))
            result += c;
    }
    return result;
}

int main (){
    string my_str = ("abc123");
cout << my_fun(my_str) << endl;  // Line 2
    cout << my_str << endl;        // Line 3
    cout << my_fun("12345") << endl;  // Line 4
}
```

**Figure 5**

27) For the program in Figure 5, what type is `c` on Line 1?
   a) string  
   b) int  
   c) char  
   d) bool  
   e) None of the above

28) For the program in Figure 5, what output is produced by Line 2?
   a) abc123  
   b) abc  
   c) 123  
   d) empty string  
   e) None of the above

29) For the program in Figure 5, what output is produced by Line 3?
   a) abc123  
   b) abc  
   c) 123  
   d) empty string  
   e) None of the above

30) For the program in Figure 5, what output is produced by Line 4?
   a) abc123  
   b) abc  
   c) 123  
   d) empty string  
   e) None of the above