Fall Semester 17 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 90 minutes to complete the exam (7:00pm – 8:30pm)

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.
Figure 1

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

2) For the program in Figure 1, give the output of Line 3?
   a) 0
   b) 1
   c) 2
   d) 5
   e) None of the above.
3) For the program in Figure 1, give the output of Line 4?
   a) 0  
   b) 1  
   c) 2  
   d) 5  
   e) None of the above.

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

5) For the program in Figure 1, which of the following would be an equivalent performing substitution for the if expression on Line 1?
   a) if (i % 2) {
   b) if ((i / 2) == 0) {
   c) if (i == 2) {
   d) if (i) {
   e) None of the above.
6) Which of the following are true about the terms *lvalue* and an *rvalue*?
   a) an rvalue represents a value
   b) an lvalue represents a memory location
   c) rvalue is on the right, lvalue on the left, of an assignment statement
   d) All of the above
   e) None of the above

7) For the following code snippet:
   ```
   unsigned int my_long = 0;
   my_long = my_long - 1;
   ```
   Which of the following statements are true?
   a) These two statements will not compile as this is an illegal operation for an unsigned value.
   b) At the end, the value of my_long will be the maximum value an unsigned int can hold, for example: 4,294,967,295
   c) At the end, the value of my_long will remain 0.
   d) At the end, the value of my_long will be -1.
   e) None of the above

8) For the following code snippet:
   ```
   long my_long = 123;
   long* val = &my_long;
   ```
   What does the & signify?
   a) treat my_long as a reference type
   b) take the Boolean-and of my_long
   c) extract the memory address of my_long
   d) This expression is illegal, will not compile
   e) None of the above

9) Which of the following Unix command line commands will act as a pager for viewing a text file?
   a) ls
   b) cp
   c) mv
   d) rm
   e) None of the above

10) Which of the following are true about a *const* variable?
    a) You can still assign a value to a *const* variable by using a reference variable associated with the *const* variable
    b) It must be initialized at the time of declaration.
    c) You cannot add *const* to a reference variable associated with non-*const* variable.
    d) All of the above
    e) None of the above
11) Given the following code snippet:
   long my_var = 123;
   auto some_var = my_var;
   Which of the following statements are true?
   a) some_var has the type double.
   b) some_var does not have a type, the compiler will allow its type to automatically change over time.
   c) some_var has a type but we cannot know that type is.
   d) some_var has the type long
   e) None of the above

12) Which of the following initializes a string s to the value "Hi Mom"?
   a) string s = "Hi Mom";
   b) string s("Hi Mom");
   c) string s = {'H', 'i', ' ', 'M', 'o', 'm'};
   d) All of the above
   e) None of the above
Figure 2

13) For the program in Figure 2, what value is output on Line 1.
   a) 4
   b) 40
   c) 60
   d) 0
   e) None of the above

14) For the program in Figure 2, what value is output on Line 2.
   a) 4
   b) 40
   c) 60
   d) 0
   e) None of the above
15) For the program in Figure 2, give the output of Line 3.
   a) 4
   b) 40
   c) 60
   d) 0
   e) None of the above
16) For the program in Figure 2, give the output of Line 4.
   a) 0
   b) 10
   c) 20
   d) 1
   e) None of the above
17) For the program in Figure 2, give the output of Line 5.
   a) 0
   b) 10
   c) 20
   d) 1
   e) None of the above
18) For the program in Figure 2, give the output of Line 6.
   a) 0
   b) 10
   c) 20
   d) 1
   e) None of the above
#include<iostream>
using std::cout; using std::endl; using std::boolalpha;

int main () {
    cout << boolalpha;

    long lng = 123;
    double dbl = 4.5;

    auto var_auto = &lng;    // Line 1
    double *dbl_star = &dbl;

    cout << var_auto << endl;    // Line 2
    cout << *dbl_star << endl;   // Line 3
    dbl = dbl * 2;
    cout << *dbl_star << endl;   // Line 4

    cout << &var_auto << endl;   // Line 5
    cout << (*var_auto == lng) << endl; // Line 6
}

19) For the program in Figure 3, what type is var_auto on Line 1?
   a) long
   b) long reference
   c) bool
   d) long pointer
   e) None of the above

20) For the program shown in Figure 3, what output is produced by Line 2?
   a) some address
   b) 123
   c) 4.5
   d) 9
   e) None of the above

21) For the program shown in Figure 3, what output is produced by Line 3?
   a) some address
   b) 123
   c) 4.5
   d) 9
   e) None of the above
22) For the program shown in Figure 3, what output is produced by Line 4?
   a) some address
   b) 123
   c) 4.5
   d) 9
   e) None of the above

23) For the program shown in Figure 3, what output is produced by Line 5?
   a) some address
   b) 123
   c) 4.5
   d) 9
   e) None of the above

24) For the program shown in Figure 3, what output is produced by Line 6?
   a) false
   b) true
   c) 0
   d) 1
   e) None of the above
```cpp
#include<iostream>
using std::cout; using std::endl;
#include<string>
using std::string;
#include<algorithm>
using std::sort;

string fn1(string s1, char c){
    string result = "";
    unsigned int i=0;
    sort(s1.begin(), s1.end());

    while ( (i < s1.size()) && (s1[i] != c ) ){
        result += s1[i];
        ++i;
    }
    return result;
}

string fn2(string s1, char c){
    string result = "";
    for (unsigned int i=0; i<s1.size(); ++i){
        if (s1[i] <= c)
            result += s1[i];
    }
    return result;
}

string fn3 (string s1, char c){
    string result = "";
    for (auto var : s1){ // Line 1
        if (var > c)
            result = result + var;
        else
            result = var + result;
    }
    return result;
}

int main (){
    string s = "father";
    char c = 'h';
    cout << fn1 (s,c) << endl;       // Line 2
    cout << fn2 (s,c) << endl;       // Line 3
    cout << fn3 (s,c) << endl;       // Line 4
    cout << s << endl;              // Line 5
    cout << s.substr(1,3) << endl;   // Line 6
}
```

Figure 4
25) For the program in Figure 4, what type is var on Line 1?
   a) double
   b) string
   c) Type
   d) unsigned int
   e) None of the above

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

27) For the program in Figure 4, what value is printed by Line 3?
   a) fahe
   b) fath
   c) father
   d) aefhrt
   e) None of the above

28) For the program in Figure 4, what value is printed by Line 4?
   a) father
   b) ehaftr
   c) rehtaf
   d) fraeth
   e) None of the above

29) For the program in Figure 4, what value is printed by Line 5?
   a) fahe
   b) fath
   c) father
   d) aefhrt
   e) None of the above

30) For the program in Figure 4, what value is printed by Line 6?
   a) fat
   b) ath
   c) at
   d) fa
   e) None of the above