CSE 232 F'11 Last name (printed): _____

Exam #1 First name (printed): _____

Form 1 X

Directions:

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

b. This exam booklet contains 30 questions, each of which will be weighted equally.

c. 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.

d. Questions will not be interpreted during the examination.

e. You should choose the single best alternative for each question, even if you believe that a question is ambiguous or contains a typographic error.

f. Please fill in the requested information at the top of this exam booklet.

g. Use a #2 pencil to encode any information on the OMR form.

h. Please encode the following on the OMR form:

- -- Last name and first initial
- -- MSU PID
- -- Exam form (1 X)

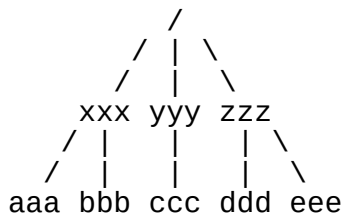
i. Please sign the OMR form.

j. Only answers recorded on your OMR form will be counted for credit. Completely erase any responses on the OMR form that you wish to delete.

k. 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.

```
**************************************************************************
*  Sample Exam #1 Key                                                    *
*                                                                        *
*  01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24  *
*   A  E  D  D  C  E  C  A  E  B  D  E  B  C  B  A  B  C  D  E  D  D  C  C  *
*                                                                        *
*  25 26 27 28 29 30                                                     *
*   D  A  D  A  B  C                                                     *
**************************************************************************
```

```
##############
#  Figure 1  #
##############
```



01. Consider the Linux file system shown in Figure 1. Assuming that the current directory is "zzz", which of the following commands will reset the current directory to "xxx"?

A) cd ../xxx
B) cd xxx
C) mv ../xxx
D) mv xxx
E) None of the above.

02. Consider the Linux file system shown in Figure 1. Assuming that the current directory is "zzz", which of the following commands will create a copy of the file "ddd" in the directory "yyy"?

A) mv ddd yyy/ddd
B) cp ddd yyy/ddd
C) mv ddd yyy
D) cp ddd yyy
E) None of the above.

03. Which of the following statements about "g++" and the computers used for this course is correct?

A) A data object of type "char" uses one byte of memory.
B) A data object of type "short int" uses two bytes of memory.
C) A data object of type "double" uses eight bytes of memory.
D) All of the above.
E) None of the above.

04. Which of the following statements about "g++" and the computers used for this course is correct?

A) Underflow occurs when a floating point value requires an exponent which is too small to be represented.
B) Overflow occurs when a floating point value requires an exponent which is too large to be represented.
C) Roundoff error may be compounded during a series of floating point calculations.
D) All of the above.
E) None of the above.

```
##############
#  Figure 2  #
##############

     using namespace std;
     #include <iostream>

     int main()
     {
       int A = 0, B = 0, C = 0, D = 0;

       for (A=17; A>=3; A-=4)
       {
         ++B;
         if (A/3*3 == A)
           ++C;
         else
           ++D;
       }
       cout << A << endl;    // Line 1
       cout << B << endl;    // Line 2
       cout << C << endl;    // Line 3
       cout << D << endl;    // Line 4
     }
```

05. What output is produced by the statement labeled "Line 1" when the source code in Figure 2 is compiled and executed?

A) 3
B) 2
C) 1
D) 0
E) None of the above.

06. What output is produced by the statement labeled "Line 2" when the source code in Figure 2 is compiled and executed?

A) 3
B) 2
C) 1
D) 0
E) None of the above.

07. What output is produced by the statement labeled "Line 3" when the source code in Figure 2 is compiled and executed?

A) 3
B) 2
C) 1
D) 0
E) None of the above.

08. What output is produced by the statement labeled "Line 4" when the source code in Figure 2 is compiled and executed?

A) 3
B) 2
C) 1
D) 0
E) None of the above.

```
##############
#  Figure 3  #
##############

     using namespace std;
     #include <iostream>

     int main()
     {
       int A = 0, B = 0, C = 0, D = 0;

       while (D <= 6)
       {
         A++;
         switch(A%3)
         {
           case 0: B++;
           case 1: C++;
         }
         D += 2;
       }
       cout << A << endl;    // Line 1
       cout << B << endl;    // Line 2
       cout << C << endl;    // Line 3
       cout << D << endl;    // Line 4
     }
```

09. What output is produced by the statement labeled "Line 1" when the source code in Figure 3 is compiled and executed?

A) 0
B) 1
C) 2
D) 3
E) None of the above.

10. What output is produced by the statement labeled "Line 2" when the source code in Figure 3 is compiled and executed?

A) 0
B) 1
C) 2
D) 3
E) None of the above.

11. What output is produced by the statement labeled "Line 3" when the source code in Figure 3 is compiled and executed?

A) 0
B) 1
C) 2
D) 3
E) None of the above.

12. What output is produced by the statement labeled "Line 4" when the source code in Figure 3 is compiled and executed?

A) 0
B) 2
C) 4
D) 6
E) None of the above.

```
##############
#  Figure 4  #
##############

     using namespace std;
     #include <iostream>

     int f( int, int& );             // Line 1

     int main()
     {
       int A = 7, B = 4;
       cout << f( A, B ) << endl;    // Line 2
       cout << (A * B) << endl;      // Line 3
     }

     int f( int X, int& Y )
     {
       Y -= 2;
       X /= Y + 1;
       return X + Y;
     }
```

13. Consider the source code in Figure 4. What term is used to describe the statement labeled "Line 1"?

A) Function description
B) Function declaration
C) Function definition
D) Function invocation
E) None of the above.

14. What value is displayed by the statement labeled "Line 2" when the source code in Figure 4 is compiled and executed?

A) 6
B) 5
C) 4
D) 3
E) None of the above.

15. What value is displayed by the statement labeled "Line 3" when the source code in Figure 4 is compiled and executed?

A) 28
B) 14
C) 8
D) 4
E) None of the above.

16. Which of the C++ features is NOT contained in the source code shown in Figure 4?

A) variable data object with programmer-defined lifetime
B) variable data object with file scope
C) variable data object with program lifetime
D) variable data object with block scope
E) variable data object with block lifetime

```
##############
#  Figure 5  #
##############

     using namespace std;
     #include <iostream>

     int main()
     {
       int X[] = {10, 12, 14, 16, 18, 20};

       cout << sizeof( X ) << endl;     // Line 1

       cout << X[4] << endl;            // Line 2

       for (int I=3; I<=6; I++)
       {
         X[I-1] = X[I-2] + X[I-3];
       }

       cout << X[2] << endl;            // Line 3

       cout << X[5] << endl;            // Line 4
     }
```

17. What output is produced by the statement labeled "Line 1" when the source code in Figure 5 is compiled and executed?

A) 6
B) 24
C) 40
D) 48
E) None of the above.

18. What output is produced by the statement labeled "Line 2" when the source code in Figure 5 is compiled and executed?

A) 10 12 14 16
B) 16
C) 18
D) 20
E) None of the above.

19. What output is produced by the statement labeled "Line 3" when the source code in Figure 5 is compiled and executed?

A) 10 12
B) 12
C) 14
D) 22
E) None of the above.

20. What output is produced by the statement labeled "Line 4" when the source code in Figure 5 is compiled and executed?

A) 10 12 14 16 18
B) 18
C) 20
D) 34
E) None of the above.

```
##############
#  Figure 6  #
##############

   #include <iostream>
   using namespace std;

   struct Thing
   {
     char Name[20];
     unsigned ID;
     float Value[10];
   };

   int main()
   {
     Thing A[100];

     cout << sizeof( Thing ) << endl;
   }
```

21. Consider the source code in Figure 6. What value will be displayed by the program when it is translated and executed?

A) 104
B) 84
C) 82
D) 64
E) None of the above.

22. Consider the source code in Figure 6. Assuming that the address of "A[0]" is 400200 (base 10), what is the address of "A[0].ID"?

A) 400228 (base 10)
B) 400224 (base 10)
C) 400222 (base 10)
D) 400220 (base 10)
E) None of the above.

23. Consider the source code in Figure 6. Assuming that the address of "A[0]" is 400200 (base 10), what is the address of "A[0].Value[2]"?

A) 400240 (base 10)
B) 400236 (base 10)
C) 400232 (base 10)
D) 400208 (base 10)
E) None of the above.

24. Consider the source code in Figure 6. Assuming that the address of "A[0]" is 400200 (base 10), what is the address of "A[5]"?

A) 400720 (base 10)
B) 400620 (base 10)
C) 400520 (base 10)
D) 400510 (base 10)
E) None of the above.

```
##############
#  Figure 7  #
##############

     using namespace std;
     #include <iostream>

     int A[] = { 100, 90, 80, 70, 60, 50, 40, 30, 20, 10 };

     int main()
     {
       int *B;

       // Assume that all addresses are displayed as base 10 numbers

       cout << &A[0] << endl;    // Value displayed:  6295000
       B = &A[5];
       cout << B << endl;        // Line 1

       cout << *B << endl;       // Line 2
       B += 4;
       cout << B << endl;        // Line 3

       // Some statement

     }
```

25. What output is produced by the statement labeled "Line 1" when the source code in Figure 7 is compiled and executed?

A) 50
B) 60
C) 6295016
D) 6295020
E) None of the above.

26. What output is produced by the statement labeled "Line 2" when the source code in Figure 7 is compiled and executed?

A) 50
B) 60
C) 6295016
D) 6295020
E) None of the above.

27. What output is produced by the statement labeled "Line 3" when the source code in Figure 7 is compiled and executed?

A) 10
B) 40
C) 6295024
D) 6295036
E) None of the above.

28. Which of the following is NOT a valid replacement for the comment labeled "Some statement" in Figure 7?

A) cout << (B == A[5]) << endl;
B) B = new int;
C) cout << B[2] << endl;
D) B = new int [100];
E) cout << &B << endl;

```
##############
#  Figure 8  #
##############
```

The following lists the date and time when each file was last modified:

```
Jul 21 18:32  driver.cpp
Jul 21 17:55  driver.h
Jul 20  8:17  driver.o
Jul 19 10:51  midterm
Jul 18  9:24  midterm.makefile
Jul 20 22:46  support.cpp
Jul 20 22:40  support.h
Jul 21 15:51  support.o
```

The following is the contents of "midterm.makefile" (which you may assume is correctly formatted):

```
midterm: driver.o support.o
        g++ -o midterm driver.o support.o

driver.o: driver.cpp driver.h
        g++ -c -Wall driver.cpp

support.o: support.cpp support.h
        g++ -c -Wall support.cpp
```

29. Consider the information shown in Figure 8. Assume that the user enters "make -f midterm.makefile" as the next command. Which of the following commands will be executed by the "make" command?

```
I.    g++ -c -Wall driver.cpp
II.   g++ -c -Wall support.cpp
III.  g++ -o midterm driver.o support.o
```

A) I and II, but not III.
B) I and III, but not II.
C) II and III, but not I.
D) I, II and III.
E) None of the above.

30. Consider the information shown in Figure 8. Assume that the user enters "make -f midterm.makefile", executes an editor to modify the contents of "support.h", and then enters "make -f midterm.makefile" as the next command. Which of the following commands will be executed by the last "make" command?

```
I.    g++ -c -Wall driver.cpp
II.   g++ -c -Wall support.cpp
III.  g++ -o midterm driver.o support.o
```

A) I and II, but not III.
B) I and III, but not II.
C) II and III, but not I.
D) I, II and III.
E) None of the above.