

CSCI 1300 – First Exam

You may not use any notes, books, electronic devices or other resources. I'm sorry, but because the class is so large, we won't be able to answer any questions during the exam.

Many of the questions will include part of a program, and you will need to determine the behavior of that program. Please assume that each program uses the standard namespace and has the include directives that it needs. There may also be questions on the homework, lecture material, and assigned reading.

1. What is the value of  $19 \% 10$  in C++?

- A. 0    B. 0.9    C. 1    D. 1.9    E. 9

2. What is the value of  $19 / 10$  in C++?

- A. 0    B. 0.9    C. 1    D. 1.9    E. 9

3. Suppose that  $i$  is an integer variable and  $x$  is a double variable. Which of the following statements will cause a warning in C++?

- A.  $i = x;$   
B.  $i = \text{int}(x);$   
C.  $x = i;$   
D.  $x = \text{double}(i);$   
E.  $x = x;$

4. Suppose that  $i$  is an integer variable with a value of 2. What is the new value of  $i$  after the statement  $i += 4$ ?

- A. 2    B. 4    C. 6    D. 8    E. 10

5. What are the final values of  $j$  and  $k$  after these statements?

```
int j = 1;
int k = 2;
j = j + k;
k = k + j;
```

- A.  $j$  is 3 and  $k$  is 3  
B.  $j$  is 3 and  $k$  is 5  
C.  $j$  is 5 and  $k$  is 3  
D.  $j$  is 5 and  $k$  is 5  
E. None of the above

6. The mouse is sitting in a graphics window that is 400 pixels wide. I want to convert the x-coordinate of the mouse to a number between -10.0 (on the left side of the window) and +10.0 (on the right side of the window). Which formula best defines the conversion?

- A.  $10.0 * \text{mousex}() / 400 - 20.0$   
B.  $10.0 * \text{mousex}() / 20.0 - 400$   
C.  $20.0 * \text{mousex}() / 400 - 10.0$   
D.  $400 * \text{mousex}() / 10.0 - 20.0$   
E.  $400 * \text{mousex}() / 20.0 - 10.0$

7. Which of these statements will correctly read two integers, i and j, from the keyboard?

- A. `cin >> i && j;`
- B. `cin >> i && j >> endl;`
- C. `cin >> i >> j;`
- D. `cin >> i >> j >> endl;`
- E. `cin >> i >> cin >> j;`

8. What is the maximum number of things that can be printed with a single use of `cout`? Please count the `endl` as one item that is printed.

- A. 1
- B. 2
- C. 3
- D. 80
- E. There is no limit.

9. Which of these statements (if either) in C++ might be calling a void function?

```
tom(42); // First statement
x = 1 + jerry(42.8); // Second statement
```

- A. Neither can be calling a void function
- B. Only the first might be calling a void function
- C. Only the second might be calling a void function
- D. Both could be calling a void function

10. Here is a function definition and a code fragment. What is the value of the result?

```
int exam(int a, int b)
{
    return a - b;
}

int main( )
{
    int a = 10;
    int b = 8;
    int result;
    result = exam(b, a); // Notice that b is first and a is second
}
```

- A. -2
- B. 2
- C. 8
- D. 10
- E. None of the other answers.

11. Here is a bit of code. What is the final value of i after the loop ends?

```
int i = 1;
while (i%3 != 0 || i%5 != 0)
{
    ++i;
}
```

- A. 2
- B. 3
- C. 5
- D. 8
- E. None of the other answers.

**12. What will this code print?**

```
if (3 < 10)
{
    cout << 3;
}
else
{
    cout << 10;
}
```

- A. **3**    B. 10    C. 310    D. 103    E. It will print no output.

**13. What will this code print?**

```
if (3 < 10)
{
    cout << 3;
}
else if (10 > 3)
{
    cout << 10;
}
```

- A. **3**    B. 10    C. 310    D. 103    E. It will print no output.

**14. How many lines will this code print? Notice that i is an int.**

```
int i = 7;
while (i > 0)
{
    cout << i << endl;
    i = i/2;
}
```

- A. **3**    B. 4    C. 6    D. 7    E. 8

**15. When is the Boolean expression ((x == 42) && (y == 42)) true?**

- A. Only when at least one of the variables is 42.  
B. Only when at least one of the variables is not 42.  
**C. Only when both of the variables are 42.**  
D. Only when neither variable is 42.  
E. Only when one variable is 42 and the other is not.

16. When is the Boolean expression  $((x == 42) \parallel (y == 42))$  true?

- A. Only when at least one of the variables is 42.
- B. Only when at least one of the variables is not 42.
- C. Only when both of the variables are 42.
- D. Only when neither variable is 42.
- E. Only when one variable is 42 and the other is not.

17. When is the Boolean expression  $!((x == 42) \&\& (y == 42))$  true?

- A. Only when at least one of the variables is 42.
- B. Only when at least one of the variables is not 42.
- C. Only when both of the variables are 42.
- D. Only when neither variable is 42.
- E. Only when one variable is 42 and the other is not.

18. Suppose I have a graphics window that is 200 pixels wide and 400 pixels tall. Which statement will draw a line from the top-left corner to the bottom-right corner?

- A. `line(0, 0, 200, 400);`
- B. `line(0, 200, 0, 400);`
- C. `line(0, 200, 400, 0);`
- D. `line(0, 400, 200, 0);`
- E. `line(0, 400, 0, 200);`

19. I've opened a square graphics window that is 25 pixels wide, and I drew the largest possible circle in the window. The circle is entirely filled with red pixels. Approximately what fraction of the pixels on the screen are red?

- A.  $\pi/4$
- B.  $\pi/5$
- C.  $\pi(12.5)^2/25^2$
- D.  $\pi/12.5$
- E.  $1/\pi$

20. Fill in the blank in this code so that it draws a small circle that is precisely on top of a larger circle.

```
circle(x, y, r);  
circle(x, _____, r/2);
```

- A.  $y - r/2$
- B.  $y - r$
- C.  $y - r*3/2$
- D.  $y + r/2$
- E.  $y + r$

**21. What is the purpose of the swapbuffers function in a graphics program?**

- A. To display a picture that the program has just finished drawing.
- B. To flip the graphics screen around an axis (either the x or y axis).
- B. To interchange the global memory with the local memory (of a function).
- D. To invert the colors on the graphics screen.
- E. To translate all the pixels on the screen by a specified distance.

**22. What is the primary purpose of “return EXIT\_SUCCESS;” in a main function?**

- A. To close the graphics window.
- B. To compile the program and list all errors in the second window of emacs.
- C. To print the program’s return value.
- D. To return the memory of all live variables to the operating system.
- E. To tell the operating system that the program finished successfully.

**23. Suppose you have this definition in a program: `const int S = 250;`  
What must be done if you change the value of S to 300?**

- A. You must add the extra three parameters to `initwindow`.
- B. You must insert the assignment statement `S = 300;` in the main function.
- C. You must insert the assignment statement `S == 300;` in the main function.
- D. You must recompile the program after changing 250 to 300.
- E. You must turn on the double-buffering.

**24. Under what conditions will this code fragment produce some output?**

```
if (x <= y)
{
    if (x >= y)
    {
        cout << "I studied hard!" << endl;
    }
}
```

- A. Always
- B. Only when  $x \leq y$ .
- C. Only when  $x$  is equal to  $y$ .
- D. Only when  $x \geq y$ .
- E. Never.

**25. Here is a bit of code. What number is closest to the final value of x after the loop ends?**

```
double x = 0;
double error = abs(x - (4 + x/2));
while (error > 0.001)
{
    x = 4 + x/2;
    error = abs(x - (4 + x/2));
}
```

- A. 2
- B. 4
- C. 6
- D. 8
- E. 10