**CSci 1113**  
**Quiz**

Name: ____________________________________________

Student ID: _________________________________

*Instructions*: Please pick and answer any 3 of the 4 problems for a total of 30 points. If you answer more than 3 problems, only the first 3 will be graded. The time limit is 20 minutes. Please write your answers in the space provided. The exam is open book and notes. You may use electronic devices to ONLY look at either an e-book version or electronic notes. You may not use the internet, compiler or any other outside resources. (If you are typing on your keyboard/input device for anything other than ctrl-F to find words in the e-book or notes, this is probably not acceptable.)

**Problem (1)** [10 points] Indicate the values of x, y and z after the following statements. Show your work to recieve full credit.

```c
int x = 2;
int y = 3;
int z;
z = +x+++y; // ... :( 
```

*Grading breakdown:*
- 2 points: Evaluating unary first
- 2 points: End value of x (1 point if unchanged)
- 2 points: End value of y (1 point if unchanged)
- 2 points: End value of z
- 2 points: steps shown

*Solutions:*

x=2, y=3, z = +(x++) + -(++y)  
x=2, y=4, z = +(x++) + -(4)  
x=2, y=4, z = +(x++) + -4  
x=3, y=4, z = +(2) + -4  
x=3, y=4, z = -2

**Problem (2)** [10 points] With the given if-statement, what is the least number of evaluations that needs to be done? Give: (1) The values of a, b and c that cause this. (2) Then evaluate the if-statement showing your work at every step. (3) The total number of evaluations done.
if( (a>0 && b>0 && c>0) || (a==b && b==c) )
{
    // something
}

Grading breakdown:
3 points: values for a,b,c
4 points: using short circuit evaluation
2 points: steps of evaluation shown
1 point: reasonable number of evaluations

Solution 1: make first part true, do not need to compute "___" in "T || ___"
(1) a=1, b=1, c=1
(2) (T && b>0 && c>0) || (a==b && b==c)
(T && T && c>0) || (a==b && b==c)
(T && T && T) || (a==b && b==c)
T || (a==b && b==c)
(3) 3 evaluations (or up to 5, depending on T&&T&&T)

Solution 2: make statement false by failing ANDs
(1) a = -1, b = -2, c = w/e
(2) (F && b>0 && c>0) || (a==b && b==c)
F || (a==b && b==c)
F || (F && b==c)
F || F
F
(3) 2 evaluations (or up to 3 for F || F)

Problem (3) [10 points] Rewrite this multi-way if/else statements as a single if/else statement (i.e. only using one if and one else).

if(a>0)
{
    if(b>0)
    {
        x=2;
    }
    else
    {
        x=100;
    }
}
else
{
    x=2;
}

Grade breakdown:
3 points: using an && and || (anywhere)
5 points: correct answer (partial credit for closeness)
2 points: only one if/else

Sol 1: if(a>0 && !(b>0)) x=100; else x=2;
Sol 2: if((a>0 && b>0) || a<=0) x=2; else x=100;

Problem (4) [10 points] Find 3 possible places for errors in the following code. Explain specifically what causes the error and whether it is a syntax, runtime or logic error:

```cpp
int main()
{
    cout << "Enter your first and last name: " << endl;
    cin >> names >> endl;
    cout << "Hello, " << names << endl;
    if(names.length() > 25)
    {
        cout << "You have a long name!" << endl;
    }
    return 0;
}
```

Grade breakdown:
3 points per error (take first 3): 1 point for error type, 2 points for description
1 free point

Errors to find:
(1) cin >> names >> endl;  Syntax, names not declared
(2) cin >> names >> endl;  Syntax, cannot change value of endl (a constant)
(3) cin >> names >> endl;  Logic, need getline(cin,names) to hold both first and last name
(4) if(names.length() > 25); Logic, semi-colon makes cout always happen