CSci 1113
Sample Quiz

Name: ________________________________

Student ID: ____________________________

Lab Section (circle one):

Instructions: Please pick and answer any 3 of the 4 problems for a total of 30 points. If you answer all 4 problems, only the first 3 will be graded. You should be able to complete the mini-quiz in 15 minutes but the real quiz will take the full 50 minutes. Please write your answers in the space provided. The quiz 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] Write the formula

\[ d = \frac{1}{7} + \sqrt{a^4 + b^4} \]

as a C++ statement. Assume all the variables involved have already been declared to be of type double, any needed libraries have been included, etc.: all you need to do is write the C++ statement that does the calculation in the formula.

\[ d = 1.0/7 + \text{sqrt}(a*a*a*a + \text{pow}(b,4)); \]

Problem (2) [10 points] Assume \( r \), \( g \), and \( b \) are ints that have already been declared.

(a) The following C++ code fragment, which is complete except for the if-condition, should print out "Off by 1" if \( r \) is exactly one less than \( g \), or \( r \) is exactly 1 less than \( b \).

\[
\text{if ( // condition missing )}
\text{cout} \ll \"Off by 1\" \ll \text{endl;}
\]

Write the C++ for the missing condition here:

\[ \text{if}(r == g-1 \text{ || } r == b-1) \]
(b) Suppose $r=10$, $g=10$, and $b=20$. Does the following logical expression evaluate to true or false? Circle the correct answer below, and show enough work to indicate how you obtained your answer.

$$(! (r == b)) \ || \ ((r < g) \ &\& \ (g < b))$$

Answer:

true

$r=10$, $g=10$, $b=20$
$(! (r == b)) \ || \ ((r < g) \&\& \ (g < b))$
$(! (10 == 20)) \ || \ ((10 < 10) \&\& \ (10 < 20))$
$(! (false)) \ || \ ((false) \&\& \ (true))$
$(true) \ || \ (false)$
true

Problem (3) [10 points] Suppose $d$ and $e$ are ints, and consider the following code:

```cpp
if (d/10 == e/10 || d%10 == e%10)
    cout << "Meets condition" << endl;
else
    cout << "Does not meet condition" << endl;
```

For each of the three cases below, circle whether the code would output "Meets condition" or "Does not meet condition".

(a) $d = 12$, $e = 82$

Meets condition

$\left(\frac{d}{10} = \frac{e}{10} \ || \ d \% 10 = e \% 10\right)$
$\left(\frac{12}{10} = \frac{82}{10} \ || \ 12 \% 10 = 82 \% 10\right)$
$(false \ || \ true)$
true

(b) $d = 22$, $e = 253$

Does not meet condition
(d/10 == e/10 || d%10 == e%10)
(22/10 == 253/10 || 22%10 == 253%10)
(2 == 25 || 2 == 3)
(false || false)
false

(c) d = 177, e = 178
    Meets condition
(d/10 == e/10 || d%10 == e%10)
(177/10 == 178/10 || 177%10 == 178%10)
(17 == 17 || 7 == 8)
(true || false)
true

**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()
{
    cin << x;
    if (x < '10');
    {
        cout << "x is less than 10\n";
    }
    return 0;
}
```

Any 3 of these 4:
1. `cin << x;`
x has not been declared. Syntax error

2. `cin << x;`
   Inequality symbols going the wrong way, should be `cin >> x`. Syntax error.

3. `if (x < '10');`
   '10' is two characters and not one.
   If x is an int/double should be: if (x < 10). Syntax error.

4. `if (x < '10');`
   Semi colon after if statement,
   so even if x is 22 (assumed x is type int) the cout statement will run.
   Logic error.