

Name _____ Section _____

CS120 Computer Science I

Sample First Exam

This is a closed note, closed book exam.

1. Create an if-else statement that checks whether a variable x is between 10 and 20, inclusive. If x is any value from 10 to 20 (including 10 and 20) the if-else statement prints the word "yes". Otherwise it prints the word "no".

You don't have to write the whole program (e.g. no includes or main required).

2. Below is the prototype for a function called absolute. The function should return the absolute value of its input argument. (I.e. if the argument is positive the function returns the same value, if the argument is negative the function returns -1 times the argument.) Write the definition of the function.

```
int absolute(int); // Prototype
```

Function:

3. Circle each of the following statements which are true.

A function can have zero or more arguments.

A function cannot create any variables.

A function must return a value.

A function may contain a loop.

Any type of loop can be rewritten as any other type of loop.

A for loop is useful when you want to do something a pre-determined number of times.

A while loop is always executed/performed at least once.

A compiler translates a program from a machine language into a high level language.

A constant variable is a variable that can be used anywhere within a program.

All variables must have a type.

One of the difficulties of programming is that there is always only one specific way to solve a programming problem.

4. Consider the following program:

```
#include<iostream>
using namespace std;

int function1(int a){
    int x;
    a = a + 1;
    x = 2*a;
    return x;
}

int main(){
    int x, y;
    cin >> x;
    y = x+5;
    cout << "1) " << x << " " << y << endl;
    x = function1(y);
    cout << "2) " <<x << " " << y << endl;
}
```

What is printed if the user enters a 4?

5. For each of the following logical expressions circle *all* of the variable combinations that would make the expression *true*. The first one is done for you.

$x < 10$
 a) $x = 5$
 b) $x = 15$

$(x < 1 \parallel x > 5)$
 a) $x = 15$
 b) $x = 5$
 c) $x = -1$

$((x < 1 \parallel x > 5) \&\& \text{flag} == 0)$
 a) $x = 2, \text{flag} = 0$
 b) $x = 12, \text{flag} = 1$
 c) $x = 12, \text{flag} = 0$

$((x \geq 1 \&\& x \leq 5) \&\& (y == 0 \parallel (y \% 2 == 1)))$
 a) $x = 2, y = 0$
 b) $x = 4, y = 4$
 c) $x = 1, y = 5$
 d) $x = 6, y = 5$

$((x \&\& y) \parallel \text{flag})$
 a) $x = 1, y = 1, \text{flag} = 0$
 b) $x = 1, y = 0, \text{flag} = 0$
 c) $x = 0, y = 0, \text{flag} = 0$
 d) $x = 0, y = 0, \text{flag} = 1$
 e) $x = 7, y = 5, \text{flag} = 3$

6. (10 points) Rewrite the following code with a while loop or a do-while loop that has the same output:

```
for(int i = 0; i < 10; i++){
    cout << i << endl;
}
```

7. Write a *complete program* that gets exactly 10 integers from the user and prints the *largest* of the ten integers.

8. Evaluate each of the following expressions using the following variable definitions:

`int x = 7;`

`double y = 5.5;`

The first one is done for you.

a) $10 + x$

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b) $(2 * x) \% 3$

c) $x / 10$

d) $y / 10$

e) $3 * y - x / 10.0$

f) $2 * y + 20 / 3 + 2$