Name: Exam Key Exam 1 CS151

This exam consists of 15 problems. You have until 12:15pm. The code used in this exam should be error free except for the problems in section B.

A. What do the following code snippets print? (5 points each)

1.
```
int x = 3, y = 11;
cout << x << x;
```

Ans: 33

2.
```
int x = 3, y = 11;
cout << x + y << " != " << y + x;
```

Ans: 14 != 14

3.
```
int n = 10, a = 2, b = 8, c = 4;
if (b > 6 && c < 4 || c <= 9)
{
        n = n + 5;
}
if (a > 3 && b > 5 || a >= 9)
{
        n = n + 20;
}
if (c > 2 || a < 8 && b == 8)
{
        n = n - 7;
}

cout << n;
```

Ans: 8

4. `cout << 7 + 2 / 3 * 5 * 3 / (2 - 1) / 2;`

Ans: 7

5.
```
for ( int i = 3; i < 7; i++ )
{
    for ( int j = 0; j < i; j++ )
    {
        cout << j << " ";
    }
    cout << endl;
}
```

Ans:
0 1 2
0 1 2 3
0 1 2 3 4
0 1 2 3 4 5

6.
```
int sheep( int );

int main()
{
    int n = 1;
    for ( int i = 1; i < 2; i++ )
    {
        cout << "quack " << endl;
        sheep( i + 1);
    }
}

int sheep( int x )
{
    for ( int i = 0; i < x; i++ )
    {
        cout << "baa ";
    }


    return 0;
}
```

Ans:
quack
baa baa

B. Find the logic or syntax errors in each of the following programs (there may be more than one). Circle the syntax errors you find. Describe the logic errors you find. (5 points each)

7. Find the syntax errors.

```
include <iostream>
using namespace std;
char main( )
{
 cout << "hello world!" << endl;
 return 0;
}
```

8. Find the syntax and logic errors.

```
#include <iostream>

int main()
{
  double c,f ;
  char Ans;

  do
  {
    cin >> c;
    f = (9/5) * c + 32.0;
    cout << f << \n;
    cout << "Do you want to perform another conversion (Y/N)? ";
    cin >> Ans;
  }
  while (Ans = 'y') || (Ans = 'Y');

  return 0;
}
```

9. Find the syntax errors.

definition header does not match prototype

```
#include <iostream>
int test( float n );

int main()
{
  float n = 5.0;
  cout >> test( n );
return 0;
}

float test( int )
{
        return (n+1);
}
```

might need 'using namespace std;' but this is system specific

int float n

Ans:

10. Find the logic error in this nested loop:

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

int main()
{

    for ( int i = 0; i < 6; i++ )
    {
      for ( int j = 0; j < 5; i++ )
      {
        cout << i*j;
      }
    }

return 0;
}
```

Ans: j never changes so the inner loop's guard condition is never false, (infinite loop).

C. Write short but complete programs to do each of the following:
(10 points each)

11. Get three floating point numbers from the user. Print the largest of those numbers.

```
#include <iostream>
using namespace std;
int main()
{
  float x=0.0, y=0.0, z=0.0, max=0.0;
  cout << "Enter three numbers:";
  cin >> x >> y >> z;
  max = x;
  if (y > max)
  {
    max = y;
  }
  if (z > max)
  {
    max = z;
  }

  cout << "The largest number you entered was " << max
       << endl;
  return 0;
}
```

12. Rewrite the following while loop as a for loop.

```
#include <iostream>

using namespace std;

int main()
{
 int max = 1900;
 int sum = 0;

 while ( max < 1950 )
 {
  sum = sum + (max - 1900);
  cout << "Sum: " << sum << endl;
  max = max + 5;
 }

return 0;
}
```

```
#include <iostream>
using namespace std;
int main()
{ int sum =0;
for ( int max =1900; max <1950; max=max+5)
{
   sum = sum + (max-1900);
   cout <<"Sum:" << sum << endl;
}
return 0;
}
```

13. Get two integers *a* and *b* from the user. Print *a/b* using integer division and *a/b* using floating point division.

```
#include <iostream>
using namespace std;
int main()
{
  int a, b;
  cout << "enter two integers" << endl;
  cin >> a >> b;
  cout << "integer division: " << a/b << endl;
  cout << "floating point division: " << (1.0 * a) / b << endl;
  return 0;
}
```

14. A metric ton is 35,273.92 ounces. Write a program that will read the weight of a package of breakfast cereal in ounces and output the weight in metric tons as well as the number of boxes needed to yield one metric ton of cereal. Your program should allow the user to repeat this calculation as often as the user wishes without having to restart the program each time.

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

int main()
{
const float ton_in_ounces = 35273.92;
long int number_of_boxes = 0;
char cont = '\0';
float weight_in_ounces = 0.0;
do {
    cout << "Enter weight (ounces) of a package of cereal: ";
    cin >> weight_in_ounces;

    cout << "Weight in tons is: " << weight_in_ounces / ton_in_ounces
        << endl;

    cout << ton_in_ounces / weight_in_ounces << " boxes per ton"
        << endl;

    cout << "Enter another package weight? (Y/N)" << endl;
        cin >> cont;

    } while (cont == 'Y');

return 0;
}
```

15. Write a program that gets two floating point numbers *a* and *b* from the user. The program will then swap the values in *a* and *b* and print the result.

Example Run:
User enters 0.4 and 1.5.
Set a to be 0.4 and b to be 1.5.
Swap the values in a and b so that a = 1.5 and b = 0.4.
Program prints 1.5 and 0.4.

```
# include <iostream>
Using namespace std;
int main()
{
   float a=0.0, b=0.0; temp=0.0;
   cin >> a >> b;
   temp = a;
   a=b;
   b = temp;
   cout << a << " " << b;
   return 0;
}
```