What is your name?: ___________________________(0 points)

There are two sections:
   I. Short Questions . . . . . . . . .40 points; (40 questions, 1 point each)
   II. Short Sections of Code . .24 points; (  6 questions, 4 points each)
   II. Longer Sections of Code . .36 points; (  3 questions, 12 points each)

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100 points total

This test is worth 10% of your final grade. For all problems you must put your answers on the bubble form using a #2 pencil. This test is open book and open notes. You have 50 minutes.

• For the True/False questions, if the answer is True, fill in a on your answer form. If the answer is False, fill in b on your answer form.
• For the multiple choice problems, select the best answer for each one and select the appropriate letter on your answer sheet.
• Be careful - more than one answer may seem to be correct. Some questions are tricky.
• Several problems ask you to determine whether something is valid. Something is valid if it would not generate a compiler error and would execute without the program crashing.

I. Short Questions: (1 pt. each)

   T   F   1. In UNIX, the command man ls could used to give more information on the ls command.
   T   F   2. Both C++ comments (/!) and C-style comments (/!* */!) can be used in the same program, but they can’t appear on the same line.
   T   F   3. An infinite loop is best represented using a while loop.
   T   F   4. C++ has three different looping structures for convenience. Anything written with one of the looping structures could be written with a different looping structure, with some modification of the code.
   T   F   5. An if - else statement can always be rewritten as two if statements.
   T   F   6. Once a program is longer than 1024 lines, the C++ compiler requires that it be broken up into functions.
   T   F   7. A function that determines whether or not a program is done will most likely have a return type of bool.
   T   F   8. Using the VC++ debugger it is possible to run your program a step at a time, displaying the values of all variables along the way.
   T   F   9. The following sequence will halt the execution of your program.
   int x = -1;
   assert ( 1 < x < 4);
T  F   10. To ensure a character stored in variable $c$ is upper case, we could use the following:
   if( (c>='a') && (c<='z')) $c = c - ('a' - 'A');$

T  F   11. To ensure a character stored in variable $c$ is upper case, we could use the following:
   #include <cctype>
   // ... rest of program
   $c = \text{toupper}(c);$;

T  F   12. The following cout statement outputs the letter 'A', followed by the newline character, followed by the letter 'B', followed by the tab character, followed by the letter 'C'.
   
   \text{cout} \ll \text{ 'A' } \ll \text{ "\nB" } \ll \text{ "\tC" };$

For questions 13 through 20 determine if each is a valid identifier.

T  F   13. first_and_second
T  F   14. expen$ive$
T  F   15. 2bOrNot
T  F   16. toBeOrNot2B
T  F   17. supercalifragilisticexpialidocious
T  F   18. a
T  F   19. Main
T  F   20. salt&pepper

For questions 21 through 29 assume that $\text{intNum}$ is an integer, $\text{realNum}$ is a real (floating point), and $\text{aChar}$ is a character, and there are no other variables declared. Determine if each is a valid assignment statement.

T  F   21. $\text{aChar} = \text{"A1"};$
T  F   22. $\text{aChar} = (\text{intNum} < 0) ? 'Y' : 'N';$
T  F   23. $\text{aChar} = \text{aChar} + ('a' - 'A');$
T  F   24. $\text{aChar} = 65;$
T  F   25. $\text{intNum} + 1 = \text{intNum};$
T  F   26. $\text{intNum} = \text{aChar};$
T  F   27. $\text{intNum} = ++\text{intNum};$
T  F   28. $\text{realNum} = \text{intNum} - - \text{aChar};$
T  F   29. $\text{realNum} = \text{ 'A' };$
For questions 30 through 37 determine if each is a valid statement or statements.

T  F  30. char c='A';
       if ( c) cout << "Yes";
T  F  31. cout<<' Hey ...\n';
T  F  32. int x( 6);
       if ( 0 < x < 5) cout << " Between 0 and 5";
T  F  33. char pi = '3.1415';
T  F  34. char Output = 'A';
       char text = 'B';
       cout << Output text << endl;
T  F  35. cout<<"W"<<"e"<<"i"<<"r"<<"d";
T  F  36. cout<< 'O' << 'K' << '?';
T  F  37. int z=0;
       for( z/=z; z=1; z=1)
               ;   // semicolon only on this line before this comment

38. Assume that program9 is a directory in your current working directory. What is the command to remove program9 and all files and directories inside program9?
   a) removeDir program9
   b) rmdir program9
   c) rm -r program9
   d) del program9
   e) None of the above

39. Which of the following is the correct UNIX command to compile the C++ program game.cpp into an executable file called game?
   a) g++ game.cpp
   b) g++ game
   c) g++ -o game game.cpp
   d) g++ -o game.game.cpp game
   e) None of the above

40. Consider the following segment of code:

        int number = (2/5)*5;
        cout <<"The answer is: " << number;

What is the output?
   a) 2
   b) The answer is 2
   c) The answer is: 2
   d) The answer is: 0
   e) None of the above
II. Short Sections of Code: (4 pts. each)

T    F  41. The output of the program segment below is the text:  
int num = 3;
switch (num) {
    case 1:
    case 2:
    case 3: cout << "Was 1 to 3\n";
    case 4: cout << "Was 4\n";
    default: printf("Unknown");
}
cout<<".";

T    F  42. The output of the program segment below is the text:  
float pi = 3.14159;
switch (pi) {
    case 3.14159: cout << "Is pi\n";
    break;
    default: cout << "Not pi\n";
    break;
}

T    F  43. The output of the program segment below is the text:  
int x = 0;
if (x = 1)
    cout<<"Was equal";
else
    cout<<"Not equal ";
    cout<<" *** ";

T    F  44. The output of the program segment below is the text:  
int x = 3;
if (x <= 3)
    if (x < 3)
        cout << "less than ";
    else
        cout<<"greater than ";
    cout<<"Done."

45. Consider the program segment given below. Its output can best be described as:

    char a='b';
    char b='c';
    char c=a;
    cout<<'a'&&b&&'c'&&a&&'b'&&c;

    a) abcabc
    b) acebcb
    c) accbb
    d) accabb
    e) None of the above
46. Consider the program given below.

```cpp
#include <iostream>
using namespace std;
int main()
{
    for ( int i=1; i<5; i++) {
        cout << i << " ";
    }
    for ( int i=4; i>=1; i--) {
        cout << i << " ";
    }
    return 0;
}
```

This program compiles and runs using:

- a) VC++ but not g++
- b) g++ but not VC++
- c) both VC++ and g++
- d) neither VC++ or g++
- e) None of the above

III. Longer Sections of Code: (12 points each)

47. Consider the program given below. Its output can best be described as:

```cpp
#include <iostream>
using namespace std;
int main()
{
    int x;
    cout<<"Please enter a 3-digit positive integer: ";
    cin>> x;
    while (x > 0) {
        cout<< x % 10;
        x /= 10;
    }
    cout<<"\n";
    return 0;
}
```

- a) The remainder of the digits after dividing by 10
- b) The input digits in reverse order
- c) A tenth of the original input
- d) All of the digits except the rightmost digit.
- e) None of the above
48. Consider the program given below. If its output is:

\[
\begin{array}{cccc}
2 & 4 & 6 & 8 \\
3 & 6 & 9 & 12 \\
\end{array}
\]

What was the input?

a) 2 4 3  

b) 3 2 4  

c) 3 4 2  

d) 2 3 3  

e) None of the above

49. What is the output of the program given in the two columns below?

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

int main()
{
    int i, j, k, n, r;
    cin >> k >> n >> r;
    for( j=k; j<=n; j++) {
        for( i=1; i<=r; i++) {
            cout << i*j << "\t";
        }
        cout << "\n";
    }
    return 0;
}
```

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

int a,b,c;
void confuse1(int b, int a)
{
    a += 1;
    b += 1;
    c += 1;
}

void confuse2(int b, int &a)
{
    a += 2;
    b += 2;
    c += 2;
}

void confuse3(int &b, int c)
{
    a += 3;
    b += 3;
    c += 3;
}

int main()
{
    int a,c;
    a=b=c=1;
    confuse1( a, b);
    confuse2( b, c);
    confuse3( a, c);
    cout << a << b << c << endl;
    return 0;
}
```

a) 879  

b) 414  

c) 745  

d) 251  

e) None of the above