CS115: Introduction to Computer Science in C++
Sample & Study Guide for First Exam

Part I. True or False. Circle one.
1. T or F: \((x<z<y)\) returns the same result as \((x<y)\&(z<y)\).
2. T or F: Return value for the \texttt{main} program is not required.
3. T or F: If variable \(x\) is defined with the \texttt{const} modifier, then \(x++\) cannot be used.
4. T or F: If \(a\) is an integer, then single instruction \(a++\) and \(++a\) produce the same results.

Part II. Multiple Choices. Circle one answer.
5. Which one is correct \texttt{#include} directives if \texttt{cin} or \texttt{cout} is used:
   a. \texttt{#include <stdio.h>}
   b. \texttt{#include <iostream>}
   c. \texttt{#include “iostream”}
   d. None of the above.
6. If a function returns \texttt{void}, then which one of the followings is correct:
   a. \texttt{return –1;}
   b. \texttt{return 0;}
   c. \texttt{return;}
   d. None of the above.

Part III. Short Answers. Let \(x=5, y=7, z=-2\).
7. \((x>y \&\& z)\) returns ________________.
8. \((2*x \neq y-z)\) returns ________________.
9. \((y-x+z || x*z)\) returns ________________.

Part IV. Short Answers. (6 Points – 3 Each)
10. In order to insert a back-slash (\) into a string, which escape sequence should be used?
    ________________.  
11. If \(x=3, y=5\) and \(z=2\), then \(x<z<y\) returns ________________.
12. If \(x=3, y=5\) and \(z=2\), then \((x<z)\&(z<y)\) returns ________________.
13. If \(x=1, y=0\) and \(z=2\), then \((x--)\&(y++)\) returns ________________.
14. If \(x=1, y=0\) and \(z=2\), then \((--x)\|(++y)\) returns ________________.
15. If \texttt{str1}='xyz' and \texttt{str2}='123', then \texttt{str1+str2} returns ________________.
Part VI. Short Answers.

16. What output would be produced by the following lines (when embedded in a complete and correct program)?

   ```
   // cout<< “Hello World!”;
   cout<< “Am I the first line?”;
   ```

17. Rewrite the following codes to a more formal form (indenting and with line breaks) which matches the style we used in the textbook.

   ```
   if (x<0) {y=pow(x,2); cout<< “x is negative”;}
   else {y=x; cout<< “x is positive”;}
   ```

18. Rewrite the following codes to a more formal form (indenting and with line breaks) which matches the style we used in the textbook. Given that pow(x,2) returns $x^2$. What output would be produced by the following lines (when embedded in a complete and correct program)?

   ```
   int res=0,i;
   for(i=0; i<5; i++) {res+=pow(i,2); cout<<“i”<<v<<” res=”<<res<<endl;}
   ```

19. Complete the following truth table:

   | E1 | E2 | E1 && E2 | E1 || E2 |
   |----|----|---------|--------|
   | true | true | _______ | _______ |
   | true | false | _______ | _______ |
   | false | true | _______ | _______ |
   | false | false | _______ | _______ |

20. What output would be produced by the following lines (when embedded in a complete and correct program)?

   ```
   int res=0,k=10;
   while(k>0){res+=k; cout<<“k”<<v<<” res=”<<res<<endl; k=3}
   ```

21. What output would be produced by the following lines (when embedded in a complete and correct program)?

   ```
   string str = R"(C:\\User\\you\\cs115)";
   cout<< str <<endl;
   ```

22. What output would be produced by the following lines (when embedded in a complete and correct program)?

   ```
   int a=3,b,c;
   b += a++;
   cout<< a <<“, ” <<b <<endl;
   c += ++a;
   cout<< a <<“, ” <<c <<endl;
   ```

23. What output would be produced by the following lines (when embedded in a complete and correct program)?

   ```
   int a=4,b=5; double c=5;
   cout<< a/b <<“, ” <<a/c <<“, ” <<c/a <<endl;
   ```
24. What output would be produced by the following lines (when embedded in a complete and correct program)?
   ```cpp
   int a=4, b=5;
   cout<< (a==7)?a:b <<endl;
   if (a==7) cout<< a <<endl;
   else cout<< b <<endl;
   ```

25. Write a for-loop statement block to compute n-factorial. Your program needs to read an integer n and output to an integer variable res. Just ignore the #include directives part.

26. Write a while-loop statement block to compute n-factorial. Your program needs to read an integer n and output to an integer variable res. Just ignore the #include directives part.