FORM 2 (Please put your name and form # on the scantron!!!!)

CS 161 Exam I:
True (A)/False(B) (2 pts each):

1. Assuming goodData is a Boolean variable, the following two tests are logically equivalent.
   if (goodData == false)
   if (!goodData)

2. When a loop is nested inside another loop, the outer loop goes through all its iterations for each iteration of the inner loop.

3. To check if a variable has a particular value, use the = relational operator, as in the statement
   if (s = 3)
       cout << "S has the value 3";

4. If the operand on the left side of an || operator is true, the expression on the right side will not be checked.

5. The function main is always compiled first, regardless of where in the program the function main is placed.

6. Every include directive must be followed by using namespace std;

7. All nested if-else statements can be converted into switch statements.

8. Variable names may begin with a number.

9. Executable code is computer code that contains no errors.

10. Functions that do not have a return type are called null functions.

11. If a new value is stored in a variable, it replaces whatever value was previously there.

12. Once a value has been stored in a variable it cannot be changed.


14. A semicolon by itself is a valid C++ statement.

15. C++ is a case-sensitive language.

16. A variable of the char data type can hold a set of characters like "January".

17. The following two C++ statements perform the same operation.
   regWages = regPay + overTime;
   regPay + overTime = regWages;
Multiple Choice (3 pts each):

18. Assume this code fragment is embedded in an otherwise correct and complete program. What should be the output from this code segment?
```cpp
int main() {
    for (int i = 0; i < 10; i++)
    {
        cout << "hello" << endl;
    }
    cout << i << endl;
    return 0;
}
```
   a) 10  
   b) 9  
   c) 0  
   d) The variable i is undefined in this scope, so this should not compile

19. Which control construct repeats a sequence of statements one or more times?
   a) while statement  
   b) do-while statement  
   c) switch statement  
   d) if-else statement  
   e) none of the above

20. A function prototype is ____.
   a) a definition, but not a declaration  
   b) a declaration and a definition  
   c) a declaration, but not a definition  
   d) a comment line  
   e) None of the above

21. What is the output of the following C++ code?
```cpp
count = 1;
n = 25;
while (count < 25)
{
    num = num - 1;
    count++;
}
cout << count << " " << num << endl;
```
   a) 24 0  
   b) 24 1  
   c) 25 0  
   d) 25 1  
   e) None of the above
22. Mistakes that allow a program to run, but cause it to produce erroneous results are called
   a) logic errors.
   b) syntax errors.
   c) linker errors.
   d) compiler errors.
   e) none of the above.

23. #include <iostream> is an example of a(n)
   a) I/O statement.
   b) stream directive.
   c) comment.
   d) preprocessor directive.
   e) compiler option.

24. In the C++ statement
    ```
    pay = rate * hours;
    ```
    the rate variable is an example of
   a) a variable separator.
   b) an operator.
   c) an operand.
   d) syntax.

25. Before a variable in C++ is used, it must
   a) created
   b) initialized
   c) used in some expression
   d) begin with a capital letter
   e) contain only letters, digits and underscores.

26. Suppose `str = "Hello There."`. The output of the statement
    ```
    cout << str.size() << endl;
    ```
    is ____.
   a) 11
   b) 12
   c) 13
   d) 14

27. _______ is an example of volatile memory, used for temporary storage while a program is running.
   a) RAM
   b) A flash drive
   c) The CPU
   d) A hard disk
   e) The ALU
28. What is the output of the following code fragment?
   ```cpp
   int i=3;
   switch(i)
   {
   case 0: i=15;break;
   case 1: i=25;break;
   case 2: i=35;break;
   case 3: i=40;
   default: i=0;
   }
   cout << i <<endl;
   ```
   a) 15
   b) 25
   c) 35
   d) 40
   e) 0

29. What is the value of the following expression?
   ```cpp
   (true && (4/3 || !(6)))
   ```
   a) true
   b) false
   c) 0
   d) illegal syntax

30. The expression `(int)(6.9) + (int)(7.9)` evaluates to ____.
   a) 13
   b) 14
   c) 14.8
   d) 15
   e) None of the above

31. The statements `int x = 1; int y; y = (++x)++;`
   a) Assign y the value 2;
   b) Change the value of x to 2.
   c) Assign y the value 3;
   d) Assign y the value 1;
   e) This doesn’t work.

32. Given the following code fragment, which of the following expressions is always true?
   ```cpp
   int x;
   cin >> x;
   ```
   a) if( x < 3)
   b) if( x==1)
   c) if( (x / 3)>1 )
   d) if( x = 1)
33. Given the following function:
   ```c
   int strange(int x, int y) {
       if (x > y)
           return x + y;
       else
           return x - y;
   }
   ```
   what is the output of the following statement?
   ```c
   cout << strange(4, 5) << endl;
   ```
   a) -1
   b) 1
   c) 9
   d) 20
   e) None of the above

34. Which of the following is not true of the || operator?
   a) It has two operands.
   b) It can have one operand.
   c) It is the logical OR operator.
   d) It returns true if either operand is true.
   e) It uses short circuit evaluation.

35. Which of the following determines the operator that is processed prior to another operator?
   a) Operator precedence
   b) Whether the operator is an arithmetic operator
   c) None of these determine the order in which operators are processed.
   d) none of the above
   e) all of the above

36. Given the following function:
   ```c
   int next(int x) {
       return (x + 1);
   }
   ```
   what is the output of the following statement?
   ```c
   cout << next(next(5)) << endl;
   ```
   a) 5
   b) 6
   c) 7
   d) 8
   e) None of the above
37. If the following code fragment is executed in an otherwise complete and correct program, which expression will be executed?
   ```cpp
   x = 0;
   if (x = 12)
       yes_statement;
   else
       no_statement;
   ```
   a) The no_statement will be executed because x is not 12.
   b) x=12 is illegal in the Boolean expression of an if statement.
   c) The yes_statement will be executed.

38. In distinguishing an expression as true or false, C++ sees which of the following as true?
   a) true
   b) The character ' F'
   c) 1
   d) Any non-zero value
   e) all of the above

39. If this code fragment were executed in an otherwise correct and complete program, what would the output be?
   ```cpp
   int a = 3, b = 2, c = 5;
   if (a > b)
       a = 4;
       if (b > c)
           a = 5;
   else
       a = 6;
   cout << a << endl;
   ```
   a) 3
   b) 4
   c) 5
   d) 6
   e) None of the above, the cout statement belongs to the else and so is skipped.

Extra Credit: (2 pts each)
40. What will the following expression evaluate to?
   ```cpp
   !( 6 > 7 || 3 == 4)
   ```
   a) 6
   b) 0
   c) -1
   d) true
   e) false
41. **True (A) /False (B)**: If the operand on the left side of an `&&` operator is true, the expression on the right side will not be checked.

42. Two different variables in the same program may have the same name  
   a) if the second one is never declared.  
   b) if they always hold different values.  
   c) if they have different scope.  
   d) if the second one is initialized with a different value than the first one.  
   e) never. A program cannot have two variables with the same name.

43. The ________ operator takes an operand and reverses its truth or falsehood.  
   a) `!=`  
   b) `||`  
   c) relational  
   d) `!`  
   e) `&&`

44. What is the final value of `x` after the following fragment of code executes?  
   
   ```c
   unsigned int x=0;
   do
       { 
           x++;
       } while(x > 0);
   ```  
   a) 0  
   b) 9  
   c) 10  
   d) 11  
   e) infinite loop.