FORM 1 (Please put your name and form # on the scantron!!!!)

CS 161 Exam I:

True (A)/False(B) (2 pts each):

1. All nested if-else statements can be converted into switch statements.
2. Variable names may begin with a number.
3. A break statement in a switch stops your program.
4. A semicolon by itself is a valid C++ statement.
5. Every include directive must be followed by `using namespace std;`
6. Executable code is computer code that contains no errors.
7. Functions that do not have a return type are called null functions.
8. If a new value is stored in a variable, it replaces whatever value was previously there.
9. Once a value has been stored in a variable it cannot be changed.
10. C++ is a case-sensitive language.
11. A variable of the char data type can hold a set of characters like "January".
12. The following two C++ statements perform the same operation.

```
regWages = regPay + overTime;
regPay + overTime = regWages;
```

13. 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";
```

14. If the operand on the left side of an || operator is true, the expression on the right side will not be checked.
15. The function main is always compiled first, regardless of where in the program the function main is placed.
16. Assuming goodData is a Boolean variable, the following two tests are logically equivalent.

```
if (goodData == false)
if (!goodData)
```

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

Multiple Choice (3 pts each):

18. 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.

19. _____ 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

20. 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.

21. `#include <iostream>` is an example of a(n)

a) I/O statement.
b) stream directive.
c) comment.
d) preprocessor directive.
e) compiler option.

22. Suppose `str = " Hello There. ";`. The output of the statement

```
cout << str.size() << endl;
```

is ____.

a) 11
b) 12
c) 13
d) 14

23. Before a variable in C++ is used, it *must* be

a) created
b) initialized
c) used in some expression
d) begin with a capital letter
e) contain only letters, digits and underscores.

24. 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

25. What is the output of the following C++ code?

```
count = 1;
num = 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

26. Assume this code fragment is embedded in an otherwise correct and complete program. What should be the output from this code segment?

```
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

27. 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

28. 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.

29. 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

30. 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

31. If this code fragment were executed in an otherwise correct and complete program, what would the output be?

```
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.

32. What is the value of the following expression?

```
(true && (4/3 || !(6)))
```

    a) true
    b) false
    c) 0
    d) illegal syntax

33. If the following code fragment is executed in an otherwise complete and correct program, which expression will be executed?

```
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.

34. 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.

35. Given the following code fragment, which of the following expressions is always true?

```
int x;
cin >> x;
```

a) if(x < 3)
b) if(x==1)
c) if((x / 3) >1)
d) if(x = 1)

36. What is the output of the following code fragment?

```
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

37. The expression `(int)(6.9) + (int)(7.9)` evaluates to ____.

a) `13`
b) `14`
c) `14.8`
d) `15`
e) None of the above

38. Given the following function:

```
int strange(int x, int y) {
   if (x > y)
        return x + y;
   else
        return x - y;
}
```

what is the output of the following statement?

```
cout << strange(4, 5) << endl;
```

a) `-1`
b) `1`
c) `9`
d) `20`
e) None of the above

39. Given the following function:

```
int next(int x) {
     return (x + 1);
}
```

what is the output of the following statement?

```
cout << next(next(5)) << endl;
```

a) `5`
b) `6`
c) `7`
d) `8`
e) None of the above

Extra Credit: (2 pts each)

40. The _____ operator takes an operand and reverses its truth or falsehood.

a) !=
b) ||
c) relational
d) !
e) &&

41. What is the final value of x after the following fragment of code executes?

```
unsigned int x=0;
do
{
      x++;
} while(x > 0);
```

a) 0
b) 9
c) 10
d) 11
e) infinite loop.

42. What will the following expression evaluate to?

```
!( 6 > 7 || 3 == 4)
```

a) 6
b) 0
c) -1
d) true
e) false

43. **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.

44. 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.