CS 161 Exam I Fall 2018 **FORM 1**

Useful Formulas (assuming N binary bits):
maximum signed int: $\frac{2^N}{2} - 1$
minimum signed int: $-\frac{2^N}{2}$
maximum unsigned int: $2^N - 1$

Please put your name and form number on the scantron.
For this exam you are allowed to use only a calculator and pencil.
Read each question carefully and choose the best answer.

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

1. A `string` is considered to be a C++ primitive data type. F
2. Errors in a program can be classified into three types: logic, syntax, and runtime. T
3. Any C++ program can be designed without the use of `for` loops (using `while` loops instead). T
4. In hexadecimal, the characters A-F are used to represent numeric values. T
5. Conditionals are used when we need our program to make a choice between two or more things. T
6. Variable names cannot begin with a number. T
7. if-else statements that are inside other if-else statements are said to be nested. T
8. A `break` statement inside a loop immediately exits the program. F
9. The compiler will catch all syntax errors. T
10. ~~The types of parameters are optional in the function declaration~~. F (Will drop this question due to possible confusion)
11. The minimum value of an `unsigned int` depends on the number of bits used to represent the number. F
12. It is possible to have a function with no parameters. T
13. It is possible to have a function that does not return any value. T
14. Functions may return multiple variable types simultaneously. F

Multiple Choice (3 pts each)

15. What punctuation indicates the end of a C++ statement?
    a. A semicolon (;)
    b. A period (.)
    c. A colon (:)
    d. A question mark (?)

16. The ability to write multiple functions, all having the same name, but with different parameter types is known as:
    a. default argumentation
    b. overloading
    c. pre-incrementing
    d. post-incrementing

17. Given the following code fragment and the input value of 3.0, what output is generated?

```
float discount;
float total;
cout << "enter the cost of the item\n";
cin >> total;

if (total >= 5.0) {
     discount = 2.0;
} else {
     discount = 0.5;
}
cout << total - discount << endl;
```

a. 1.0
b. 1.5
c. 2.5
d. 5.0

18. What is the output of the following program fragment?

```
cout << pow(4,2) << endl;
```

$= 4^2$

a. 2
b. 4
c. 8
d. 16

19. What is the correct conditional statement to determine if x is outside the range of 21 and 25?

a. (x < 21 && x > 25)
b. (x < 21 || x > 25)
c. (x > 21 && x < 25)
d. (x > 21 || x < 25)

OR

$x < 21$
$x > 25$

20. Which of the following is not a valid name for a variable?

a. myReturnVal
b. my_return_val
c. return
d. return_val

21. The unsigned decimal value 963 requires how many binary bits in order to be accurately represented?

a. 10
b. 11
c. 12
d. Decimal values greater than 512 cannot be represented in binary

$2^0 = 1$ $2^1 = 2$ $2^2 = 4$ $2^3 = 8$ $2^4 = 16$ . . . .

$2^9 = 512$

$2^{10} = 1024$

22. Which of the following statements is NOT legal?
    a. char ch = 'e';
    b. char ch = '0';
    c. char ch = 65;
    d. char ch = "cs";

23. What is the value of x after the following statements?

```
double x;
x = 3/2;
```

(double)3/2 OR 3.0/2

    a. 1.5
    b. 3.0
    c. 1.0
    d. 6.0

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

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

    a. if (x < 3)
    b. if (x == 2)
    c. if ((x / 3) > 2)
    d. if (x = 2)

25. Which of the following is not a good reason for choosing a certain loop control?
    a. What the loop does
    b. The minimum number of iterations of the loop
    c. The condition for ending the loop
    d. If the loop is in a function

26. The _____ contains the code that provides the compiler with the algorithm that a function should implement.
    a. function declaration
    b. function prototype
    c. function definition
    d. function call

27. Given the following code, what is the final value of i?

```
int i;
for (i=0; i<=4; i++) {
     cout << i << endl;
}
i++;
```

0, 1, 2, 3, 4, 5

→ 6

    a. 3
    b. 4
    c. 5
    d. 6

28. If you need to write a do-while loop that will ask the user to enter a number between 3 and 7 inclusive, and will keep asking until the user enters a correct number, what is the loop condition?
    a. (3 < 7 < number)
    b. (3 <= number && number <= 7)
    c. (3 > number || number > 7)
    d. (3 <= number <= 7)

29. What will the following `for` loop display?
```
for (int i=0; i > 5; i++) {
      cout << "Hello\n";
}
```
    a. It will print "Hello" 1 time
    b. It will print "Hello" 5 times
    c. The loop will never end and will keep printing "Hello"
    d. This code will print nothing at all

30. What will the following `for` loop display?
```
for (int i=0; i >= 5; i++) {
      cout << "Hello\n";
}
```
    a. It will print "Hello" 1 time
    b. It will print "Hello" 5 times
    c. The loop will never end and will keep printing "Hello"
    d. This code will print nothing at all

31. What will the following `for` loop display?
```
for (int i=1; i == 1; i++) {
      cout << "Hello\n";
}
```
    a. It will print "Hello" 1 time
    b. It will print "Hello" 5 times
    c. The loop will never end and will keep printing "Hello"
    d. This code will print nothing at all

32. What is the value returned by the following function?
```
int function() {
   int value = 17;
   return value + 5;
   value += 10;
}
```
    a. 10
    b. 17
    c. 22
    d. 32

33. Multiple arguments to a function are separated by
    a. comments
    b. semicolons
    c. colons
    d. commas

34. If you need to write a function that will compute the total cost of some candy, where each piece costs 50 cents, which of the following would be an appropriate function declaration?
    a. double calculateCost(char name);
    b. char calculateCost(int count);
    c. char calculateCost(string count);
    d. int calculateCost(int count);

35. If you have the following variable declaration in your program,

```
const int SIZE=54;
```

then which of the following statements is legal?

    a. SIZE++;
    b. x = SIZE--;
    c. cout << SIZE;
    d. cin >> SIZE;

36. When a variable is assigned a number that is too large for its data type, it
    a. Underflows
    b. Overflows
    c. Reverses
    d. Converts

37. Which statement is equivalent to the following?

```
number -= 1;
```

    a. number = number – 1;
    b. number = number + 1;
    c. number = 1;
    d. number = ++1;

38. Which of the following statements is true?
    a. Integer division only works with numbers less than 512
    b. Integer division truncates the result and ignores anything past the decimal point
    c. Floating point division uses the // operator, rather than the / operator
    d. Floating point division doesn't work with any of the C++ primitive data types

39. Extra Credit: What will the following code print?

```
int n = 7;
if ( n > 4 ) {
    int n = 5;
    cout << n++;
}
for (int n = 0; n == 1; n++)
    cout << n;
    cout << n;
```

    a. 5
    b. 6
    c. 57
    d. 507