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

1. A variable declared outside any function is said to be a local variable.

2. Consider two blocks, one within another. If an identifier is declared as a variable in the inmost of these two blocks, one can access this variable from the outer block.

3. Given the declaration
   
   ```
   int x = 0;
   ```

   The following expression causes a divide by zero error:
   
   
   ```
   (x == 0) || (2/x < 1);
   ```

4. In a while loop, the boolean expression is executed before each execution of the loop body.

5. A break statement is used in loops only.

6. When a loop is nested inside another loop, a break terminates the outermost loop of the nested loop structure.

7. Curly braces are required around a single statement contained in a control structure.

8. The range of values for an unsigned int variable is from about -4 billion to +4 billion.

9. C++ not only supports OOP but also supports other programming styles.

10. In C++ the variables Alpha, ALPHA and AlphA are the same identifier.
11. In C++ the compiler will infer the type intended for a variable from the context in which the variable occurs.

12. A C++ variable declaration includes a name and data type.

13. A C++ declaration is a definition that also allocates storage for an identifier's value (or function's body etc.).

14. C++ uses only /* */ for comments.

15. Code, within the same block, after a return or a call to the exit function, will not be executed.

16. It is legal to replace the prototype

   double totalCost(int numberParam, double priceParam);

   with the more terse, alternate form

   double totalCost(int, double);

17. Extensive use of global variables is a satisfactory replacement for the difficulties of parameter passing with functions.

**Multiple Choice (3 pts each):**

18. In C++, which of the following is a legal identifier?
   a) 9xyz
   b) @Xyz
   c) X+yz
   d) xy_z
   e) a and d
19. A call to a C++ function is
   a) The name of the function followed by empty parentheses.
   b) The name of the function followed by any number of arguments, regardless of the
      number of parameters in the definition.
   c) The name of the function followed by a number of arguments not greater than the number
      of parameters in the definition.
   d) The name of the function only.
   e) none of the above

20. A void function
   a) performs some action and returns a value
   b) performs some action but does not return a value
   c) is a statement
   d) call is written much like a call to a value returning function but is terminated with a
      semicolon.
   e) may return a value but is not required to have one.

21. A definition of a variable outside any function is called a
   a) local function definition
   b) global variable definition
   c) global function header
   d) global function definition
   e) local variable definition

22. Where can you not declare a variable in a C++ program?
   a) Within the parameter list of a function definition
   b) Within the block of a void function.
   c) Within the argument list of a function call
   d) Within a block nested within another block
   e) Within the block of a value returning function.
23. Pick the word that is not a C++ keyword out of the following list.
   a) while
   b) boolean
   c) double
   d) if
   e) none of the above

24. Which of the following types is not built into the C++ language:
   a) bool
   b) real
   c) short
   d) long
   e) double

25. An l-value is
   a) an expression that can be only be placed on the left of any operator such as +, *, /, etc.
   b) assigned a value
   c) can never have a value fetched from it
   d) is designed for use by a left-handed person

26. The value of the expression 20.0 * (9/5) + 32.0 is
   a) 68.0
   b) 52.0
   c) incorrect expression so there is no value
   d) 32.0
   e) incorrect expression, the / should be %
27. Given the following include directive (to get the declaration for the pow function from the math library):

```cpp
#include <cmath>
```

Now make these declarations:

```cpp
double base = 2, exponent = 3, power = 4;
```

Which of the following are syntactically correct invocations for the pow function?

a) `power = pow(base, exponent);`
b) `pow(power, base, exponent);`
c) `pow(base, exponent) = power;`
d) `base = pow(exponent, power);`
e) both a and d

28. Which control construct repeats a sequence of statements zero or more times?

   a) while statement
   b) do-while statement
   c) switch statement
   d) if-else statement
   e) none of the above

29. 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 operands is true.
   e) It uses short circuit evaluation.
30. Assume this code fragment is embedded in an otherwise correct and complete program. What should be the output from this code segment?

```cpp
{  
    for( int i = 0; i < 10; i++)  
    {  
        ...  
    }  
    cout << i << endl;  
}
```

a) 10  
b) 9  
c) 0  
d) The variable `i` is undefined in this scope, so this should not compile  
e) none of the above

31. What is the difference between executing the `return 0;` statement and its rough equivalent, a call to the `exit(0);` function, or the difference between `return 1;` and `exit(1);`?

a) These are very nearly equivalent anywhere they are encountered.  
b) These are very different if encountered in a function other than `main();`. The `exit` function terminates the program, returning control to the operating system, whereas `return` only terminates the function, returning control to the calling function.  
c) Both these return control to the free store manager by way of the exception controller, sending the argument as an error code.  
d) none of the above
32. 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.

33. 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) The statement has incorrect syntax so will not compile at all.  
c) x=12 is illegal in the Boolean expression of an if statement.  
d) The yes_statement will be executed.
34. In a switch statement, when a break statement is encountered, an immediate transfer of control is made to
   a) the default case of the switch statement
   b) a goto statement
   c) the else clause
   d) the statement beyond the end of the switch statement.
   e) none of these

35. 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

36. 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

37. Which of the following loop statements is guaranteed to iterate the body of the loop at least once?
   a) while(control) body;
   b) do body while(control);
   c) for (initialize; test; update) body;
   d) none of the above
38. Given the function, and the main function calling it: What is the output of the following code if you omit the ampersand (&) from the first parameter, but not from the second parameter? (You are to assume this code is embedded in a correct function that calls it.):

```c++
#include <iostream>
using namespace std;

void func(int & x, int & y)
{
    int t = x;
    x = y;
    y = t;
}

int main()
{
    int u = 3; v = 4;
    // ...
    cout << u << " " << v << endl;
    func ( u, v );
    cout << u << " " << v << endl;
    // ...
}

a) 3 4
   3 3
b) 3 4
   4 3
c) 3 4
   3 4
d) 3 4
   4 4
e) none of the above.
```
39. The statements \( \text{int } x = 1; \text{ int } y; \text{ y } = (++x)++; \)
   a) Assign \( y \) the value 2;
   b) Change the value of \( x \) to 2.
   c) Assign \( y \) the value 0;
   d) Assign \( y \) the value 1;
   e) none of the above.

Extra Credit (5 pts each):
Write a function definition called `even` that takes one argument of type `int` and returns a `bool` value. The function returns `true` if one argument is an even number; otherwise it returns `false`.

Write a function definition for a `isdigit` function that takes one argument of type `char` and returns a `bool` value. The function returns `true` if the argument is a decimal digit; otherwise it returns `false`.