True or False – (15 Points)

1. (15 pts) Circle T for true and F for false:

   T   F   a) In C++, a function definition should not be nested within another function definition.

   T   F   b) Local variables retain their value from function call to function call.

   T   F   c) When a continue statement is executed, the innermost loop in which it appears is exited.

   T   F   d) Arguments corresponding to value parameters can be literal values.

   T   F   e) Value parameters receive a copy of an arguments value

   T   F   f) Void functions must use return expression; to transfer control back to the caller of the function.

   T   F   g) Members of a structure must have unique names

   T   F   h) Members of a structure must all be of the same DataTypes.

   T   F   i) The expression name.first could be used to access the name member of the structure variable first.

   T   F   j) A break statement is required in a switch statement

   T   F   k) The default switch label is required in a switch statement.

   T   F   l) All possible values for the switch expression must be included among the case labels for a given switch statement.

   T   F   m) The lifetime of a local variable is from the point of declaration to the end of the block in which it is declared.

   T   F   n) Local identifiers have name precedence over global identifiers.
Multiple choice (16 points) – Questions 2 – 9
For these problems circle all correct answers.
For example if answers A, C and E are all valid then circle A, C and E.

2. How many function values does a value-returning function have?
   A) 4     B) 2     C) As many as necessary
   D) 1     E) 3     F) None of these

3. Which operations below ARE ALLOWABLE aggregate operations on structures?
   A) Return as a functions return value     B) Arithmetic     C) Input/Output
   D) Pass by value in a function call       E) Assignment     F) Comparison

4. Which of the following can be used as a switch expression? (Select all correct answers):
   A) bool variable     B) char variable     C) integer variable
   D) string constant   E) floating point variable     F) None of Them

5. Reference parameters (passing by reference) are used if a parameters data flow is
   A) One-way, into the function
   B) One-way, out of the function
   C) Two-way, into and out of the function
   D) A and C
   E) B and C
   F) None of these

6. What are the reference parameters in the following function heading?
   void DoSomething(string date, int& num, float average, float& sum, string& name)
   A) date     B) num     C) average     D) sum     E) name     F) None of them

7. What are the value parameters in the following function heading?
   void DoSomething(string& year, int value, float& avg, float per, string& city)
   A) year     B) value     C) avg     D) per     E) city     F) None of them
8. The void function named GetNums has two parameters

A pass-by-reference parameter named x of type float
A pass-by-reference parameter named num of type int.

Which of the following choices is a valid function prototype for the description of the parameters for the function GetNums?

A) void GetNums( float&, int )
B) void GetNums( float x, int& num )
C) void GetNums( float x, int num )
D) void GetNums( float , int&  )
E) none of the above

9. What is the output of the following code segment if num has a value of 3? Assume all variables are integers.

switch(num)
{
    case 1: cout << “a”;
    case 2: cout << “b”;
    case 3: cout << “c”;
        break;
    default: cout << “end”;  
}

A) abcend   B) abc   C) ab   D) a

E) b   F) c   G) cend   H) None of these

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Short Answer (69 points) – Questions 10 – 20

10. (5 pts) When the following segment of code is executed, the standard input stream contains the numbers 1 2 4 5 6 7 8 9. What is the output when the code executes

```cpp
int sum = 0;
int number;
do{
    cin >> number;
    cout << sum << “-”;  // note no line termination
    sum = sum + number;
}while (number < 6);
```
11. (6 pts) Given the following constant and variable definitions/declarations:

```c
const string NAME = "Ron";
int value;
float sum;
string city;
float cube(int); // function prototype
```

Consider the following list of expressions:

- a) `NAME`
- b) `cube(value)`
- c) `city`
- d) "Ron"
- e) 13
- f) `value`
- g) `sum`
- h) 'X'

A) List all expressions above that are valid for use as arguments with value parameters?

B) List all expressions above that are valid for use as arguments with reference parameters?

12. (6 pts) There are two functions shown in the code segment below. Assume all variables and function prototypes have been correctly declared before this segment of code.

```c
status = Average(sum);
WriteInfo(outFile, num, sum, average);
```

A) Which function(s) is(are) most likely value-returning function(s)?

B) Which function(s) is(are) most likely void function(s)?

C) What are the arguments that are used in the function calls?
13. (6 pts) Consider the following segment of code

```cpp
int number;
cout << "Enter an integer between 0 and 10: ";
cin >> number;
switch(number*2)
{
    case 2: cout << 'A';
    case 5: cout << 'B';
    case 6: cout << 'C';
    case 12: cout << 'X';
    case 15: cout << 'Y';
    case 16: cout << 'Z';
        break;
    default: cout << "Default" << endl;
}
```

a) What is the output if 3 is entered?

b) What is the output if 5 is entered?

14. (4 pts) Given the for loop below, write an equivalent do-while loop. Be sure to include all necessary variable declarations

```cpp
for (int value=0; value <= 5; value++)
    cout << "value is: " << value << endl;
```
15. (8 pts) Write a segment of code using a switch statement to solve the following problem. The int variable coin is used as the switch expression, and it can contain a value of 1, 5, 10, 25 or some other integer value. Only 1, 5, 10 and 25 are expected. If coin contains 1, print out the word “Penny”. If coin contains 5 print out the word “Nickel”. If coin contains 10, print out the word “Dime”. If coin contains 25, print out the word “Quarter”. For any other value of coin, print out the word “Unrecognized Coin”.

16. (4 pts) Write a structure declaration for a structure named Building containing the following members:

- an integer variable representing the number of floors
- a string variable representing the city of the buildings location
- a string variable representing the name of the business contained in the building
17. (10 pts) Write a **void function definition** that counts the **number of non-empty lines** in an input file. The **number of non-empty lines** contained in the input file is returned to the caller using a reference parameter. **This function requires two parameters – the input file stream and a line count.**

- When an empty line is read with the getline function, the string variable holding the line read contains a null string (represented by """).
- The function assumes that the input file stream passed into the function is already open and associated with a file on the hard drive.
18. (12 pts) Finish the program below by adding a void function as specified below. **Add only a function prototype, function call statement and function definition** to the following program.

The name of the **void** function is **InitStruct**.
The function has **one parameter** of the struct **DataType MyTime**.
The function is to initialize the structure parameter with a time of 1:00:00 AM.
The information stored in the parameter **must be available in main()** after the function call.

```cpp
#include <iostream>
using namespace std;

struct MyTime
{
    int hour;
    int minute;
    int second;
    string daytime; // holds AM or PM
};

// Place the function prototype below this line

int main()
{
    MyTime time;

    // Place the function call statement below this line

    return 0;
}
// Place the function definition below this line
```
19. (8 pts) For the following code segment, write out what is printed to the screen. Show the displayed output precisely by using the following rules:
  o Write one character per box.
  o Skip a box to indicate the presence of a blank space in the output.
  o Skip a row to indicate the presence of a blank line in the output.

```cpp
#include <iostream>
using namespace std;
void Test(int);
int main()
{
    Test(1);
    Test(2);

    Test(3);
    Test(4);

    Test(5);
    Test(6);
    return 0;
}
void Test(int value)
{
    static int j = 0;

    cout << j << "-" << value << endl;
    j = j + 2;
}
```
Extra Credit (6 pts)
For this problem show precisely the displayed output
  ◦ Write one character per box.
  ◦ Skip a box to indicate the presence of a blank space in the output.
  ◦ Skip a row to indicate the presence of a blank line in the output.

What is the output for the following segment of code? All variables are integers

```cpp
for (i = 0; i < 10; i++)
{
    if (i > 4)
        continue;
    for (j = 0; j < 10; j++)
    {
        if (j < 5)
            cout << "A";
        else
            break;
        cout << j;
    }
    cout << "-" << i << endl;
}
```