True or False – (15 Points)

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

   T   F   a) A **do-while loop** is executed one or more times.

   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 **reference parameters** can be literal values.

   T   F   e) A **function call** cannot contain more arguments than the number of parameters in the corresponding function heading.

   T   F   f) **void functions** must use **return expression**;

   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 **date.day** could be used to access the **date** member of the structure variable **day**.

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

   T   F   k) The **lifetime** of a local variable is for the duration of the program

   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) A **switch** statement **MUST** have a **default switch label**

   T   F   n) **value parameters** receive a copy of an arguments value

   T   F   o) Global identifiers have name precedence over local 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 void 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) Input/Output       B) Assignment       C) Arithmetic
   D) Return as a functions return value       E) Comparison

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

6. Which parameters in the following function heading are value parameters?
   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. Which parameters in the following function heading are reference parameters?
   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
8. The `void` function named `GetNums` has two parameters

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

Which of the following choices is a valid function heading for the function `GetNums`?

A) `void GetNums( float& , int )`
B) `void GetNums( float& x , int num )`
C) `void GetNums( float x , int num )`
D) both A and C
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.

```cpp
switch(num)
{
    case 3: cout << "a";
    case 2: cout << "b";
        break;
    case 1: cout << "c";
    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. (4 pts) Given the following constant and variable definitions/declarations.

```cpp
const int SIZE = 10;
int sum;
float average;
string name;
int square(float); // function prototype
```

consider the following list of expressions to be used as arguments in a function call:

a) `name`  b) ‘A’  c) `sum`  d) `SIZE*10`

e) `square(average)`  f) `average`  g) “name”  h) `average*float(sum)`

A) Which expressions listed above are valid for use as arguments with value parameters?

B) Which expressions listed above are valid for use as arguments with reference parameters?
11. (4 pts) If the numbers entered are 1 1 2 2 5 6 7 8 9, what is the output for the following segment of code? Assume all variables are declared as integers.

```cpp
sum = 0;
do {
    cin >> number;
    sum = sum + number;
    cout << sum << "-";
}while (sum < 9);
```

12. (6 pts) Consider the following segment of code

```cpp
int value; int start;
cin >> start;
for (value = start; value < 10; value += 2) {
    switch (value) {
    case 2:  cout << "2*1";
    case 8:  cout << "2*3";
          break;
    case 3:  cout << "3*1";
    case 7:  cout << "7*1";
          break;
    case 10: cout << "2*5";
    default: cout << "No Match";
          break;
    }
    cout << endl;
}
```

a) What is the output if the user enters 2 for start?

b) What is the output if the user enters 3 for start?
13. (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++
avg = Average(float(sum), num);
ReadInfo(inFile, array);
```

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 four different arguments that are used in the function calls.

For Problem 14 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.

14. (6 pts) What is the output for the following segment of code? All variables are integers

```c++
for (i = 0 ; i < 5; i++)
{
    for (j = 0; j < 5; j++)
    {
        if ( j >= 3)
            continue;
        cout << i << j;
    }
    cout << "-" << j << endl;
    if ( i >= 3)
        break;
}
```
15. (8 pts) Write an integer value returning function definition that counts the number of non-blank lines in an input file. The value returned by the function is the number of non-blank lines contained in the input file. This function requires a single parameter – the input file stream.

16. (6 pts) Write a segment of code using a switch statement to solve the following problem. The integer variable coin is used as the switch expression, and it can contain values of 1, 5, 10, 25 or some other value. Only 1, 5, 10 and 25 are expected. If coin contains 1 print out “Penny”, if coin contains 5 print out “Nickel”, if coin contains 10 print out “Dime” and if coin contains 25 print out “Quarter”. For any other value of coin, print out the word “No Change”.
17. (5 pts) Consider the following structure declarations when answering the questions below.

```c
struct Date
{
    int day;
    int month;
    int year;
};
struct Person
{
    string name;
    Date birthday;
};
```

a) Write a statement that declares the identifier `day` as a variable of DataType `Date`.

b) Write a `cout` statement that will output the value of `month` of the variable `day`.

c) Write a statement that declares the identifier `student` as a variable of DataType `Person`.

d) Write a statement that assigns a value of “John” to the `name` member of `student`.

e) Write a `cout` statement that will output the value of `year` of the `birthday` member of `student`.

18. (4 pts) Write the type declaration for a struct DataType named `LogType` containing the following members:
- an integer variable representing the log entry number
- a string variable representing the name of the person making the log entry
- a floating-point variable indicating the cost of the entry
- A `Date` variable indicating the day of the entry where `Date` is a structure already defined
19. (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. No other information is to be added (i.e. variables)

The name of the void function is InitStruct.
The function has one parameter of the struct DataType Date.
The function is to initialize each member of the parameter with a value of 0.
The information stored in the parameter must be available in main() after the function call.

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

struct Date
{
    int month;
    int day;
    int year;
};

// Place the function prototype below this line

int main()
{
    Date date;

    // Place the function call statement below this line

    return 0;
}

// Place the function definition below this line
```
20. (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:

- 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.

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

void Test();

int main()
{
    Test();
    Test();
    Test();
    Test();
    return 0;
}

void Test()
{
    static int i = 0;
    static int j = 5;

    cout << i << "—" << j << endl;
    i++;
    j++;
}
```
For Bonus questions #1 and #2 – circle the correct answer

Bonus #1 (+2 pts) The first code given out in class (for those who attended) is

A) FALL08  B) CPE112-01  C) CPE112-02  D) SPR06
E) 123DEF  F) FALLABC  G) XYZ789  H) ABC123

Bonus #2 (+2 pts) The second code given out in class (for those who attended) is

A) FALL08  B) CPE112-01  C) CPE112-02  D) SPR06
E) 123DEF  F) FALLABC  G) XYZ789  H) ABC123

Extra Credit (4 pts)

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

int main()
{
    int sum = 0, num = 0;
    do
    {
        cout << "Enter a positive number: ";
        cin >> num;
        if (!cin)
            break;
        sum += num;
        cout << sum << endl;
    } while (num > 0)
    cout << sum << endl;

    return 0;
}
```

a) What is the output if the values entered are 2 4 6 a 8

b) What is the output if the values entered are 1 3 5 –2 a