Definition Matching – (8 Points)

1. (8 pts) Match the words with their definitions. Choose the best definition for each word.

   **Iteration Counter** _____
   **Concrete Step** _____
   **Event Counter** _____
   **Flow of Control** _____
   **Loop** _____
   **Event-controlled loop** _____
   **Abstract Step** _____
   **Count Controlled Loop** _____

   **A)** Definition is not listed below (can be used more than once if necessary)
   **B)** A loop that executes a specified number of times
   **C)** A variable that is incremented with each iteration of the loop
   **D)** A control structure that causes a statement or block to be executed repeatedly
   **E)** A step for which some implementation details remain unspecified
   **F)** The order in which the computer executes statements in a program
   **G)** A variable that is incremented each time a particular event occurs
   **H)** A statement used to alter the normally sequential flow of control
   **I)** A step for which the implementation details are fully specified

Multiple choice (14 points) – Questions 2 – 15

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 times does the body of the following **while** loop execute?

   ```java
   int sum = 0;
   int count = 1;
   while (count <= 9)
   {
       sum = sum + count;
       count = count + 2;
   }
   ```

   A) 3   B) 4   C) 5   D) 6   E) 7   F) None of these
3. What happens when a C++ input stream enters the fail state?
   a) The system displays an error message, and program execution is terminated.
   b) The system does not display an error message, and program execution is terminated.
   c) The system does not display an error message; the program continues running, and further input operations with that stream are ignored.
   d) None of the above

4. What is the output for the following segment of code? Note: the comment is correct

   ```cpp
   int sum = 0;
   int j = 1;
   do
   {  // true if j is not divisible by 2
       if ( j%2 == 1 )
           sum = sum +j;
       j++;
   }while(j < 10);
   cout << sum;
   ```

   a) 0  b) 1  c) 4  d) 9  e) 16  f) 21  g) 25  h) None of These

5. What is the output for the following code if the user enters: 55B6A

   ```cpp
   int number;
   char letter;
   cin >> number >> letter >> letter;
   cout << letter;
   ```

   a) 5  b) 6  c) A  d) A space  e) Answer is not shown

6. What is the output for the following code if the user enters: 55B6A

   ```cpp
   int number;
   char letter;
   cin >> number;
   cin.get(letter);
   cin >> letter;
   cout << letter;
   ```

   a) 5  b) B  c) A  d) A space  e) Answer is not shown

7. Assume that the Boolean variable X has a logical value false and that the Boolean variable Y has the logical value true. What is the logical value of the following logical expression?

   ```cpp
   (!Y && Y) || (X && !X)
   ```

   a) true  b) false  c) maybe  d) not sure  e) None of these
8. What is the output for the following code if the user enters: 55 B6A 33.
   (in this problem a □ indicates a single space)

   string line;
   char letter;
   getline(cin, line,'A');
   cin.get(letter);
   cout << "Start" << letter << "End";

A) StartEnd  B) Start End  C) Start  D) Start□End  E) Answer is not shown

9. What is the output of the following if-then-else-if code segment?

   int score = 70;
   if (score < 70)
       score = score + 5;
   else if (score < 80)
       score = score + 10;
   else if (score < 90)
       score = score + 15;

   cout << score << endl;

A) 85  B) 80  C) 75  D) 70  E) None of These

10. In the following code segment, what is the data type of the variable named mystery?

    ?? mystery;                          A) int
    char ch = 'A';                       B) float
    cin.ignore(20, mystery);             C) char
                                           D) string
                                           E) Can’t determine from given info

11. In the following code segment, what is the data type of the variable named mystery?

    ??? mystery;                            // variable declaration of mystery
    string start;
    mystery.open(“somefile.txt”);
    mystery >> start;

A) ofstream  B) string  C) ifstream  D) bool  E) Can’t determine from given info
12. What is the output for the following segment of code? (Hint: be careful on this problem—look at all parts of the for statement)

```cpp
int sum = 0;
for (int j = 5; j < 0; j--)
    sum += j;
cout << sum;
```

A) 0  B) 5  C) 10  D) 15  E) Nothing, it is an infinite loop

13. What are the two main types of loops mentioned in class and in the text?

A) Event-Controlled  B) End-Of-File Controlled  C) Count-Controlled
D) Sentinel-Controlled  E) Flag-Controlled  F) None of These

14. After the following code is executed, what value is output by the cout statement?

```cpp
int number = 2;
int count = 0;
bool done = false;
while (!done)
{
    number = number+2;
    count++;
    done = (number == 12); // assigns true or false to done
}
cout << count << endl;
```

A) 0  B) 1  C) 2  D) 3  E) 4  F) Nothing, it is an infinite loop  G) None of These

15. What is the output for the following segment of code?

```cpp
for (int i = 1; i < 5; i++)
{
    switch(i)
    {
    case 1:  cout << "1";
    case 2:  cout << "2";
             break;
    case 3:  cout << "3";
    case 4:  cout << "4";
             break;
    default: cout << "5";
    }
}
```

A) 1234  B) 12234545  C) 122344  D) 123452345
16. **Circle T for true and F for false:**

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

T   F  b) The body of a **for loop** executes zero or more times.

T   F  c) In **count-controlled loops**, the loop terminates when a specific event occurs.

T   F  d) The statement `cin.get(ch)`; reads the first non-white space character from cin?

T   F  e) The getline function reads in an entire line up to a line termination character without skipping any white spaces.

T   F  f) The statement `cin.ignore(10,'A')`; always skips 10 characters on the input stream cin?

T   F  g) A **logical expression** can consist of a single Boolean variable?

T   F  h) **Logical operators** can take relational expressions as operands?

T   F  i) Placing an if statement inside the block associated with another if statement is an example of **nested if** statements?

T   F  j) The state of an input stream can be tested as if it were a Boolean value?

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

T   F  l) When a **break** statement is executed, the loop in which it appears is exited.

T   F  m) In a switch statement, a variable can be used as a **case label**

T   F  n) Switch statements are **required** to have a default label

T   F  o) In a switch statement the switch expression can be a floating point variable
Short Answer (63 points) – Questions 17 – 27

17. (3 pts) What are the three logical operators (show the symbols) for C++?

____________________  _____________________  _____________________

18. (6 pts) For the “operators” shown below, CLEARLY indicate if the operator is relational (use an R) or other (use an O). NOTE: there are no spaces between characters

a) => _____   b) > _____   c) == _____   d) = _____
d) ! _____   e) >= _____   f) != _____   g) >> _____

19. (4 pts) Given the following values for the Boolean variables w, x, y and z:

w = false, x = true, y = true, z = false

Clearly indicate whether each logical expression is true or false.

a) !w && !y || z && x _______   b) !w || x && y _______

c) (!w || y) && (z && x) _______   d) y || w || z || x _______

20. (4 pts) Place the following statements in the proper order for correctly using file stream variables in a program. Place the numbers 1 through 4 on the line provided with 1 being the first step.

_____ Include the header file fstream

_____ Declare an identifier to be an input file stream or output file stream variable

_____ Use the file stream variable in a statement to write to a file or read from a file.

_____ Associate a file on the hard drive with a file stream variable using the open function.

21. (2 pts) For the code segment shown, add a single line of code to open the output file output.txt using the literal value of the file name.

ofstream out;
// place open statement using a literal value below this line
22. (8 pts) For the following code segment, write out what is printed to the screen. Place a single character in each box, skip a box to indicate a space, and skip a row to indicate a blank line.

```cpp
int m;
int n;

for (n = 0; n < 4; n++)
{
    for (m = n; m >= 0; m--) // m starts at value of n
        cout << m;
    cout << "-" << n << endl;
}
```
23. (10 pts) Finish the code segment below so that the following actions are performed:

a)  Prompt the user for the name of an input file and read it.

b)  Open the file entered by the user.

c)  While the file does not open successfully,
    ➢  print out a message stating an error in opening the file,
    ➢  reset the input stream variable (code to do this is `inFile.clear();`)
    ➢  Prompt the user for the name of an input file and read it.
    ➢  Open the file entered by the user.

// variables to use for the code segment
ifstream inFile;
string filename;
24. (8 pts) Write a segment of code that uses an if-then-else-if statement to

a) Print out Penny if the value of coinValue is 1
b) Print out Nickel if the value of coinValue is 5
c) Print out Dime if the value of coinValue is 10.
d) Print out Unknown Coin Value for all other values

```cpp
int coinValue;
// other statements that result in an integer value being assigned to coinValue
```

25. (6 pts) Consider the following segment of code

```cpp
for(int count=0; count < 10; count++)
    cout<< "count is: " " << count << endl;
```

Rewrite the above code segment using a do-while loop such that the same output is obtained.
26. (8 pts) Using a **while loop**, write segment of code that

   a) Prompts the user for an integer, and reads the integer entered
   b) While the integer entered is not 0,
      i) Increment the counter variable **count** by one
      ii) Add the integer read to the variable **sum**
      iii) Prompt for and read another integer
   c) Repeat step b until 0 is entered.

```c
// Variable declarations
int count = 0;  // counter of how many words were read
int value;      // integer value entered by the user
int sum = 0;    // sum of all numbers entered
```
27. (4 pts) What is the output of the following code segment, all variables are integers.
```cpp
int maxHeight = 40;
int maxWeight = 40;
int height = 30, weight = 50;  // declare and initialize variables
if (height >= maxHeight)
{
    cout << "Message #A\n";
    if (weight >= maxWeight)
        cout << "Message #1\n";
    else
        cout << "Message #2\n";
}
else
{
    cout << "Message #B\n";
    if (weight >= maxWeight)
        cout << "Message #3\n";
    else
        cout << "Message #4\n";
}
```

Extra Credit #1) (2 pts) What is the code from class on Wednesday 10/8 or Tuesday 10/14? Had to be present in class to receive credit

A) FallBreak  B) SpringBreak  C) 123  D) 456  E) 789

Extra Credit #2) (3 pts) What is the output of the following code segment?
```cpp
int count = 6;
int sum = 0;
while (count > 0)
{
    sum = (++sum) + (--count);  // be careful on this line
    count--;  
    cout << sum << "-" << count << endl;
}
```