Definition Matching – (12 Points)

1. (12 pts) Match the words with their definitions. Choose the best definition for each word.

   Identifier _____   Type Casting _____   Void Function _____
   Declaration _____   Algorithm _____   Syntax _____
   named constant _____   Assignment _____   Type Coercion _____
   Argument List _____   Data Type _____   Reading Marker _____

A) Definition is not listed below (This answer can be used more than once if necessary)
B) A specific set of values along with a set of operations on those values.
C) A statement that stores the value of an expression into a variable.
D) A mechanism by which functions communicate with each other.
E) A location in memory, referenced by an identifier, that contains a data value that can be changed.
F) The set of rules that determines the meaning of instructions written in a programming language.
G) Computes a new value by performing a specified set of operations on given values.
H) The formal rules governing how valid instructions are written in a programming language.
I) A Name associated with a function or data object and used to refer to that function or data object.
J) The explicit conversion of a value from one data type to another.
L) A function that does not return a function value to its caller.
M) A location in memory, referenced by an identifier, that contains a data value that cannot be changed.
N) A function that returns a single function value to its caller.
O) Indicates the next character waiting to read from the input stream.
P) The implicit conversion of a value from one data type to another.
Q) A statement that associates an identifier with a data object, a function or a data type.
True or False – (8 Points)

2. (8 pts) **Circle T for true and F for false:**

   T   F   a) The C++ compiler finds **syntax** errors in a program?
   T   F   b) The function **main()** is required for every C++ program.
   T   F   c) The statement `cout << num++;` gives the same output as `cout << ++num;`
   T   F   d) The **getline** function reads an entire line without skipping any leading white spaces.
   T   F   e) **string** variables can hold more than one character.
   T   F   f) Type casting is the implicit conversion of one data type to another.
   T   F   g) Algorithms are a step-by-step procedure for solving a problem in a finite amount of time.
   T   F   h) `sum + average = (float)(average + 25.0);` is a valid assignment statement.
   T   F   i) The statement `cin.ignore(100, ‘A’);` skips 100 characters or until an ‘A’ is encountered which ever occurs first.

Multiple choice (30 points) – Questions 3 – 17

For these problems circle all correct answers → For example if answers A, C and E are all valid then circle A, C and E.

3. Which of the following statements about the C++ **main()** function are **true**?

   A) **main()** is an optional function for all programs
   B) Program execution begins with the first executable statement in the **main()** function.
   C) The **main()** function must call (invoke) at least one other function.
   D) The word **int** in the function heading means that the **main()** function has one integer argument.
   E) A, B, C and D are all **true** statements
   F) A, B, C and D are all **false** statements

4. Which of the following are **valid** identifiers in C++?

   A) 4by4        B) two-by-2        C) four        D) Six_        E) All are invalid

5. Which of the following are **not valid** identifiers in C++?

   A) two_bits     B) $fourBits     C) _6bits      D) aByte?      E) All are valid
6. Determining and writing algorithms takes place during the ________________ phase of a computer program’s life cycle.

A) Implementation  B) Problem-Solving  C) Maintenance  D) Full Moon

E) None of the above

7. Converting algorithms to C++ code takes place during the ________________ phase of a computer program’s life cycle.

A) Implementation  B) Problem-Solving  C) Maintenance  D) Full Moon

E) None of the above

8. After the following code segment executes, what value is stored in the variable result?:

```cpp
float result;
int num = 7;
result = int(num / 4.0 + 2.0);
```

A) 3.0  B) 4.25  C) 4.0  D) 3.75  E) 3.25  F) a runtime error

9. What is the name of the header file required for using setw and setprecision?

A) iostream  B) string  C) cmath  D) iomanip  E) fstream

10. Which output manipulator is used to terminate output on the current line?

A) endl  B) showpoint  C) setprecision  D) setw

E) None of the above

11. Which output manipulator is used to control the number of digits printed?

A) endl  B) showpoint  C) setprecision  D) setw

E) None of the above

12. Which output manipulator is used to control the number of positions the next data item should occupy when printed?

A) endl  B) showpoint  C) setprecision  D) setw

E) None of the above
13. The following C++ statements are to be included in a program. What is the correct data type needed for the variable len? (only one possible answer for this question)

```cpp
string firstName="Reginald";
????? len;
len = firstName.find("Hello");
```

A) float   B) string::size_type   C) string   D) bool   E) None of these

For questions 13-16, consider the following C++ declarations. In the code, a indicates a space

```cpp
string str1 = "This Is the First Test";
string str2 = "Next One?";
string str3;
string::size_type Length, Position;
```

For the above declarations, answer the questions based on the program fragment shown.

14. What is the output of the following program fragment listed below? (a indicates a space)

```cpp
Length = str2.size(); cout << Length;
```

A) 11   B) 10   C) 9   D) 0   E) string::npos

15. What is the output of the following program fragment listed below? (a indicates a space)

```cpp
Position = str1.find("Is"); cout << Position;
```

A) 2   B) 3   C) 5   D) 6   E) string::npos

16. What is the output of the following program fragment listed below? (a indicates a space)

```cpp
Position = str2.find("o"); cout << Position;
```

A) 8   B) 7   C) 6   D) 5   E) string::npos

17. What is the output of the following program fragment listed below? (a indicates a space)

```cpp
str3 = str1.substr(str1.find("the"),4); cout << str3;
```

A) the   B) fir   C) The   D) e fir   E) None of the above
Unix Commands (18 points) – Questions 18 – 26

18. What is the Unix command that is used to view the contents of a directory?

19. Give the Unix command that is used to rename the file in.txt to out.txt

20. Give the Unix command to delete the file gone.txt

21. Give the Unix command to delete the empty directory mydir

22. What Unix command is used to obtain the current working directory path (shows you which directory you are in)?

23. What command is typed at a terminal prompt to edit the file editMe.txt with the editor nedit?

24. Give the Unix command that copies the file copyMe.txt to backup.txt?

25. Give the Unix command to create the directory MyDir.

26. Give the Unix command to compile the C++ program MyProgram.cpp and create an executable named MyProgram?
Short Answer (72 points) – Questions 27 – 40

27. (3pts) Identifiers can consist of what types of characters (three distinct answers)?

28. (3pts) An expression is an arrangement of __________________, ________________
and __________________ that can be evaluated to compute a value of a given type.

29. (2 pts) What are two methods used to indicate comments in a C++ program?

30. (6 pts) Assignment and declaration statements
   
   a) Provide a constant declaration for a string identifier of DAY with a value of “Monday”.

   b) Provide a constant declaration for a float identifier of PI with a value of 3.14159.

   c) Provide a bool variable declaration for the identifier finished.

   d) Provide a double variable declaration for the identifier cost.

   e) Write a statement that assigns a null string to the string variable str1.

   f) Write a statement that assigns the value 32.5 to the float variable avg.
31. (6 pts) Show the output of each statement below. Place a single character in each box. Skip a box to indicate a space.

a) `cout << setw(3) << left << "Hello" << setw(8) << right << "World";`


b) `cout << right << setw(3) << "Number" << setw(8) << "please";`

32. (12 pts) Write a valid C++ mathematical expression for the following algebraic expressions.

a) \(a(b) - b(c) + d\)

b) \((a/b)*(c/d)\)

c) \(\frac{(a + b) * c + d}{d - e/f} + a\)

d) \(\frac{(a + b) * (a - b)}{4a - 3b} + 5b\)

33. (4 pts) Write a segment of code that prompts the user to enter in an integer, and then reads the value entered into the integer variable `num`. Assume that all variables have been declared previously.
34. (8 pts) Show precisely the displayed output of the following cout statement.

- Write one character per box. A space indicates a space.
- 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.

Example:
```
S e e S p o t r u n.
```

```
cout << setw(8) << "What " << " Line \n"
   << "is the output " << endl << "\nFor\n" << endl
   << " This mess " << endl;
```

35. (4 pts) The input stream buffer contains the following characters (\n represents the new line character): 22 34.5\nHello A\nWorld 34 45. What is the output to the terminal when the code segment below is executed? Place one character in each box.

```cpp
int m; float x; string text; char ch;
cin >> m >> x;
getline(cin,text);
cin.get(ch);
cout << m << "-" << x << "-" << text << "-" << ch << endl;
```

```cpp
22 34.5 Hello A World 34 45
```
36. (6 pts) If the standard input stream contains the characters indicated, what is the output for the following segment of code? Remember \n indicates the new line character, and the character indicates a space.

Input stream cin contains characters: Line1
Line2
Line3
Line4
A

int num1;
string L1="L1", L2="L2", L3="L3", L4="L4"; // initial values
cin.ignore(4, '\n');
cin >> num1;
cin >> L1;
getline(cin, L2);
cin >> L3 >> L4;
cout << num1 << L1 << endl << L2 << endl << L3 << endl << L4;

Place a single character in each box, skip a box to indicate a space, skip a row to indicate a blank line.

37. (10 pts) Write a segment of code that prompts the user for the price of an item and the quantity of that item purchased. These values are read in and the total cost of the purchase is calculated and output using a precision of 2 decimal places. Assume that all header files have been declared, and use the following variable declarations.

int number;  // number of items purchased
float cost;  // cost for one item
float total;  // total cost of the order
40. (18 pts) Write a **complete program** (turn an empty file into a program that compiles, runs and performs the task mentioned.) that performs the following:

- Prompts the user to type in a sentence and reads the sentence entered – use getline
- The sentence has two parts separated by a colon
- Split the sentence into its two parts and
- Output the original sentence, the two parts and the location of the colon
- **Assume** that the sentence entered has a single colon in it.
- **Do not forget the necessary header files**

**Sample output**: if the sentence is “This sentence:is split at the colon”, then the output is:

```
This sentence is:split at the colon
This sentence is
split at the colon
colon position is: 16
```