Definition Matching – (8 Points)

1. (10 pts) Match the words with their definitions. Choose the best definition for each word.

Semantics _____ Identifier _____
Syntax _____ Data Type _____
Literal Value _____ Type Casting _____
Expression _____ Named Constant _____
Variable _____ Assignment Statement____

A) Definition is not listed below (This answer can be used more than once if necessary)

B) The set of rules that determines the meaning of instructions written in a programming language.
C) The formal rules governing how valid instructions are written in a programming language.
D) Any constant value written in a program
E) The implicit conversion of a value from one data type to another

F) A specific set of values along with a set of operations on those values
G) The explicit conversion of a value from one data type to another.
H) A statement that associates an identifier with a data object, a function or a data type.

J) A statement that stores the value of an expression into a variable
K) A location in memory, referenced by an identifier, that contains a data value that cannot be changed.
L) A location in memory, referenced by an identifier, that contains a data value that can be changed
M) A Name associated with a function or data object and used to refer to that function or data object.
True or False – (6 Points)

2. (6 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 **start()** is required for every C++ program.

T   F  c) A **char** variable can hold more than one character at a time.

T   F  d) **Type casting** is the implicit conversion of one data type to another.

T   F  e) The statement **cin >> charVar;** reads the first non-white space character from the
input stream.

T   F  f) The statement **cin.ignore(100,\' \n\');** skips characters on the input stream until the
newline character is encountered.

Multiple choice (22 points) – Questions 3 – 13

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 are **valid** identifiers in C++?

A) “Name”  B) 2bits  C) -Name  D) 123@456  E) All are invalid

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

A) _Line  B) fileName  C) Money  D) Time  E) All are valid

5. 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

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

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

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

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

E) None of the above

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8. Which output manipulator is used to terminate and output line?

A) setw   B) setprecision   C) showpoint   D) endl
E) None of the above

For questions 9-11, consider the following C++ declarations. In the code, a □ indicates a space

string str1 = "This□Class□is□programming";
string str2 = "Line□2";
string str3;
string::size_type num, Position;

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

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

num = str2.size(); cout << num;

A) 4   B) 5   C) 6   D) 7   E) string::npos

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

Position = str1.find("□is"); cout << Position;

A) 4   B) 5   C) 10   D) 11   E) string::npos

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

str3 = str1.substr(4,10); cout << str3;

A) s□is   B)□is□   C)□Class□is□   D) s□Class□is

E) None of the above

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

float result;
int num = 12;
result = num/5 + 3;

A) 5.4   B) 5.0   C) 6.0   D) 6.4   E) a runtime error   F) None of These
13. The following C++ statements are to be included in a program. What is the correct data type needed for the variable mystery? (only one possible answer for this question)

```cpp
    string firstName="Reginald";
    ???? mystery;
    mystery = firstName.find("REG");
```

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

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Unix Commands (8 points) – Questions 14 – 21

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

15. Give the Unix command to delete the file removed.txt

16. What command is typed at a terminal prompt to edit the file file1.txt with the editor nedit?

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

18. Give the Unix command to compile the C++ program MyProgram.cpp and create an executable named MyProgram?

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

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

21. Give the Unix command to delete the empty directory mydir
22. (3pts) Identifiers can consist of what types of characters (three distinct answers)?

23. (3pts) An expression is an arrangement of ________________, _______________ and _______________ that can be evaluated to compute a value of a given type.

24. (2 pts) What are two methods used to indicate comments in a C++ program?

25. (4 pts) Assignment and declaration statements

   a) Provide a **constant declaration** for a **string** identifier of **DAY** with a value of “Mon”.

   b) Provide a **bool variable declaration** for the identifier **finished**.

   c) Write a **statement that assigns** “Ron” to the **string** variable **name**.

   d) Write a **statement that assigns** the value 21 to the **int** variable **age**.
26. (4 pts) Show the output of each statement below. (output starts at the left side)
Place a single character in each box. Skip a box to indicate a space.

   a) cout << setw(3) << “Hello” << setw(8) << left << “World” << “A”;

   b) cout << right << setw(6) << “Name” << setw(8) << left << “please”;

27. (4 pts) Write a valid C++ mathematical expression for the following algebraic expressions.

   a) $\sqrt{a^2 + b^2 + c^2}$

   b) $(\text{Rad})(\cos(B(\frac{\pi}{180})))$

28. (6 pts) Write a segment of code that prompts the user to enter in any ten characters. Use the Ignore function to skip the first seven characters in the input stream (cin). Read in (from cin) the last three characters entered (regardless of what they are) into char variables ch1, ch2 and ch3. Assume that all variables have been declared previously.
29. (4 pts) Show precisely the displayed output of the following `cout` statement.

- Write one character per box. A □ 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:

```
See Spot run.
```

```
cout << "Hello" << "*\*" << "there" << endl;
cout << setw(10) << right << "What?\n";
cout << "Goes here?\n" << endl;
cout << endl << "I don't know";
```
31. (4 pts) What is the output for the following segment of code?

```cpp
int num = 19;
cout << num/2 << endl;
num--;
cout << num%7 << endl;
--num;
cout << num << endl;
```

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

```
<p>| | | | | |</p>
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</table>
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32. (6 pts) Write a segment of code that prompts the user for the radius of a circle and the units (i.e. meters, feet, etc), reads in the values entered and determines the circumference \( \text{circum} = 2 \times \pi \times \text{radius} \) of the circle. Output the circumference using 3 decimal places (requires 2 output manipulators) followed by the units designation entered. Assume that all header files have been declared, and use the following variable declarations.

```cpp
float radius;  // radius of a circle
string units;  // single word for units on the radius
float circum;  // circumference of the circle
float pi 3.14159;  // float variable holding pi
```
33. (10 pts) Write a complete program (turn an empty file into a program that compiles, runs and performs the task mentioned.) that performs the following:

- Reads two entire lines into two string variables
- Determines and outputs the number of characters in the first line
- Determine and output the starting character position of the word “Hello” in the second line.
- Do not forget the necessary header files. Program is to be written to handle ANY two lines that are typed in not just the sample ones provided

Sample lines inputs:  
Line 1 is here  
Hello, Line 2 has a lot of characters in it

Program output for the above inputs:  
Chars in line 1: 14  
Hello starts at: 0
Extra Credit (5 pts) Given the following variable declarations and assignments, evaluate the C++ expressions shown. If the answer is a floating-point value, be sure to indicate as such by using a decimal point in the answer. Remember that evaluation proceeds from left to right following an order of precedence for the operations.

```cpp
int a = 4, b = 2, c = 6, d = 8;
float x = 4.0, z = 26.0;
```

A) \((4*8)%3 + d/3*b\) ________________________________

B) \(d - (d+1)/b*b\) ________________________________

C) \(z/c + b/x\) ________________________________