Definition Matching – (10 Points)

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

Syntax _____ Algorithm _____
Semantics _____ Data Type _____
Named Constant _____ Software Piracy _____
Type Casting _____ Identifier _____
Declaration _____ Assignment Statement_____  

A) Definition is not listed below (This answer can be used more than once if necessary)
B) The formal rules governing how valid instructions are written in a programming language.
C) A specific set of values along with a set of operations on those values.
D) The unauthorized copying of software for either personal use or use by others
E) A statement that associates an identifier with a data object, a function or a data type.
F) A Name associated with a function or data object and used to refer to that function or data object.
G) Arrangement of identifiers, literals and operators that can be evaluated to compute a value.
H) A location in memory, referenced by an identifier, that contains a data value that can be changed.
I) A location in memory, referenced by an identifier, that contains a data value that cannot be changed.
J) The set of rules that determines the meaning of instructions written in a programming language.
K) The implicit conversion of a value from one data type to another.
L) A step-by-step procedure for solving a problem in a finite amount of time
M) A statement that stores the value of an expression into a variable
N) Computes a new value by performing a specified set of operations on given values.
O) The mechanism that transfers control to a function.
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 **main()** is required for every C++ program.

T   F  c) A **void function** can be called within an expression.

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

T   F  e). The statement **inFile >> charVar;** reads the first **non-white space** character from the input stream inFile (charVar has been declared as a char).

T   F  f) The statement **cin.ignore(100,’:’);** skips characters on the input stream until the character is encountered or 100 characters have been skipped whichever occurs first.

Multiple choice (18 points) – Questions 3 – 11

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) \_4    B) 2\_3    C) ABC@123    D) one+two    E) One

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

A) \_Name    B) 321ABC    C) A\_B    D) \_2two    E) A=B

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

```cpp
int result;
int num = 12;
result = num/5.0 + 7.8;
```

A) 10.2    B) 9.8    C) 9    D) 10    E) a runtime error    F) None of These

6. Given a variable **n** of type **int** with an initial value of 4, which of the following C++ statements results in the value 3 being stored into **n**?

A) n = 3;    B) --n;    C) n++;    D) n = n - 1;    E) n--;

Page 2 of 10
For questions 7-9, consider the following C++ declarations. In the code, a □ indicates a space

```cpp
string str1 = "CPE112 is great";  
string str2 = "No it's not";  
string str3;  
string::size_type num, Position;
```

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

7. What is the output of the following program fragment listed below?

```cpp
num = str1.size(); cout << num;
```

A) 12  
B) 13  
C) 14  
D) 15  
E) string::npos

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

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

A) 9  
B) 10  
C) 4  
D) 5  
E) string::npos

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

```cpp
str3 = str2.substr(6,5); cout << str3;
```

A) □not  
B) s□not  
C) not  
D) 's□not  
E) None of the above

10. How many characters can be stored in a variable of DataType `char`?

A) 0  
B) 1  
C) 2  
D) 3  
E) As many as necessary

11. The following C++ statements are to be included in a program. What is the most correct data type needed for the variable `mystery`? (only one possible answer for this question)

```cpp
string firstName;  
?????? mystery;  
getline(cin, firstName, mystery);
```

A) char  
B) string::size_type  
C) string  
D) int  
E) None of these  
F) Not enough information provided
**UNIX Commands (8 points) – Questions 12 – 19**

12. What is the UNIX command that is used to **view the contents of a directory**?

13. Give the UNIX command to **delete** the file `prog1.cpp`

14. What command is typed at a terminal prompt to **edit** the file `prog2.cpp` with the editor `gedit`?

15. Give the UNIX command to **create the directory** `Home`.

16. Give a UNIX command to **compile** the C++ program `Project3.cpp` and **create an executable** named `Project3`?

17. Give the UNIX command that is used to **copy** the file `in.txt` to `in.txt.bk`

18. What UNIX command is used to obtain the **current working directory path** (shows you which directory the terminal window is in)?

19. Give the UNIX command to **delete** the **empty directory** `Homer`

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**Short Answer (58 points) – Questions 20 – 30**

20. *(3pts)* Identifiers can consist of what types of characters (three distinct answers)?

21. *(3pts)* An *expression* is an arrangement of ____________________, ____________________ and ____________________ that can be evaluated to compute a value of a given type.
22. (2 pts) What are two methods used to indicate comments in a C++ program?

23. (4 pts) Assignment and declaration statements
   a) Provide a **constant declaration** for the **float** identifier **E** with a value of 2.71828

   b) Provide a **char variable declaration** for the identifier **note**.

   c) Write a **statement that assigns** ‘D’ to the **char** variable **initial**.

   d) Write a **statement that assigns** the value 21 to the **int** variable **age**.

24. (6 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 << right << setw(6) << "My" << left << setw(8) << "name" << "is";`

   b) `cout << left << setw(6) << "Class" << setw(4) << "one" << "over";`
25. (4 pts) Write a valid C++ mathematical expression to implement the following algebraic expressions.

a) \[ \frac{A + B \times (D + E)}{\frac{X}{Y}} \]

b) \[ \frac{x + y}{b \times c + d} \]

26. (6 pts) Show precisely the displayed output of the following `cout` statement.

- Write one character per box. A \( \square \) 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:

\[
\begin{array}{cccccc}
S & e & e & S & p & o & t & \quad r & u & n & .
\end{array}
\]

\[
\text{cout} \ll \text{"Hey} \backslash n \square \text{"} \ll \text{"there"} \ll \text{endl;}
\]
\[
\text{cout} \ll \text{"What"} \ll \text{setw(6)} \ll \text{left} \ll \text{"Is"} \ll \text{endl;}
\]
\[
\text{cout} \ll \text{setw(6)} \ll \text{"this"} \ll \text{"line} \backslash n\text{";}
\]
\[
\text{cout} \ll \text{endl} \ll \text{"The} \backslash n \square \text{End";}
\]
27. (6 pts) The input stream buffer for `cin` contains the following characters (`\n` represents the new line character): 

```
Hello
34
A
World
50 60 70.
```

What is the output to the terminal when the code segment below is executed? Place one character in each box. **Hint:** Text and `ch` repeatedly have their value changed as the input is read. Reading marker is on the `H` of Hello

```cpp
int m; int x; string text; char ch;
cin.get(ch);
getline(cin, text,'3');
cin >> m >> text;
cin.get(ch);
getline(cin, text);
cin >> ch;
cin >>  x >> m;
cout << m << "-" << x << "-" << text << "-" << ch;
```

28. (6 pts) For the code segments shown, **add ONE LINE OF code** to open an input file, named `input.txt`, in the manner specified.

a) For this code segment use the literal value, `input.txt`, for opening the file
   ```cpp
   ifstream inData;
   // place open statement using a literal value below this line
   ```

b) For this code segment the file name is stored in a string variable, and the string variable is used for opening the input file.
   ```cpp
   ifstream inData;
   string filename = "input.txt";
   // place open statement using a string variable below this line
   ```
29. (8 pts) Finish the segment of code below so that it:
- Prompts for and reads two entire lines into two string variables
- Determines and outputs from the first line an 8 character substring starting at character position 5
- Determines and outputs the number of characters in the second line.
- Assume that all header files have been declared, and use the following variable declarations.

```
string line1, line2;  // lines read from input
string::size_type numChars;  // num. of chars in a line
string sub;  // substring pulled from line 1
```
30. (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:

- Prompt the user for the name of an input file,
- Read in the filename into the variable filename,
- Associate the file entered with the input file stream inFile (use open function)
- Read the first line from the input file into the string variable line – the line termination character is a ?
- Output the line read to the standard output stream (cout)
- **Do not forget the necessary header files. Program is to be written to handle ANY name that is typed in not just the sample one provided**
Extra Credit (5 pts) What is the output for the following segment of code when it is executed?

```cpp
int n = 6, k = 4;

cout << --n << endl;
cout << n++ << endl;
cout << -n << endl;
cout << ++n << endl;
cout << n-- << endl;

cout << n + k << endl;
cout << n << endl;
cout << k << endl;

cout << "n*n=" << n*n << endl;
```

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