Definition Matching – (10 Points)

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

   - Syntax _____  Semantic _____
   - Algorithm _____  Declaration _____
   - Named Constant _____  Identifier _____
   - Variable _____  Literal Value _____
   - Data Type _____  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 step-by-step procedure for solving a problem in a finite amount of time.**
   D) **The mechanism that transfers control to a function**
   E) **A Name associated with a function or data object and used to refer to that function or data object.**

   F) **A location in memory, referenced by an identifier, that contains a data value that **can be changed**
   G) **A specific set of values along with a set of operations on those values**
   H) **To compute a new value by performing a specified set of operations on given values**
   I) **The set of rules that determines the meaning of instructions written in a programming language.**

   J) **A statement that stores the value of an expression into a variable**
   K) **Any constant value written in a program**
   L) **A statement that associates an identifier with a data object, a function or a data type.**
   M) **A location in memory, referenced by an identifier, that contains a data value that **cannot be changed**
True or False – (8 Points)

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

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<tbody>
<tr>
<td>T</td>
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<tr>
<td>a) The C++ compiler finds <strong>syntax</strong> errors in a program?</td>
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<td>T</td>
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<td>b) The function <strong>main()</strong> is required for every C++ program.</td>
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<td>c) A <strong>string</strong> variable can hold a single character.</td>
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<td>d) <strong>Type coercion</strong> is the implicit conversion of one data type to another.</td>
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<td>e) The statement <code>cin &gt;&gt; charVar;</code> reads the first character, regardless of what it is, from the input stream <code>cin</code> (charVar has been declared as a char).</td>
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<td>f) The statement <code>cin.ignore(10, ’:’);</code> always skips 10 characters on the standard input stream.</td>
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<td>g) The getline function skips all whitespace characters when reading from the input stream?</td>
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<td>h) Value returning functions return exactly one function value.</td>
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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 **invalid** identifiers in C++?

A) `_Hello`  B) `Goodbye`  C) `3Bells`  D) `NineLives`  E) `One$`

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

A) `time`  B) `#hashtag`  C) `hashtag#`  D) `–name`  E) `_B`

5. Translating algorithms into a programming language 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) `iomanip`  B) `iostream`  C) `manip`  D) `string`  E) `output`
7. What is the name of the header file required for use with strings?

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

8. Which output manipulator(s) is(are) used to set justification in a field specified by setw?

A) center  B) right  C) showpoint  D) left  E) None of the above

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

```cpp
string str1 = "This□class□is□CPE112";
string str2 = "Hello□World";
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?

```cpp
num = str2.length(); cout << num;
```

A) 10  B) 11  C) 12  D) 5  E) string::npos

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

```cpp
Position = str2.find('W'); cout << Position;
```

A) 3  B) 4  C) 5  D) 6  E) string::npos

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

```cpp
str3 = str1.substr(10,5); cout << str3;
```

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

E) None of the above
12. After the following code segment executes, what value is stored in the variable result?

```c
float result;
float num = 14.0;
result = int(num/5 + 3.4);
```

A) 6.2   B) 5   C) 6   D) 5.4   E) a runtime error   F) None of These

13. 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)

```c
????? mystery = 'A';
```

A) char   B) string::size_type   C) string   D) int

E) None of these

**UNIX/LINUX Commands (6 points) – Questions 14 – 19**

14. What is the UNIX/LINUX command that is used to view the contents of a directory?

15. Give the complete UNIX/LINUX command to delete the file myfile.txt

16. Give the complete UNIX/LINUX command to create the directory MyDir.

17. Give the complete UNIX/LINUX command to compile the C++ program Prog2.cpp and create an executable named Prog2?

18. Give the complete UNIX/LINUX command that is used to copy the file in.txt to in.txt.cp

19. What UNIX/LINUX command is used to obtain the current working directory path (shows you which directory the terminal window is in)?
Short Answer (54 points) – Questions 20 – 29

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 integer declaration for the identifier LEGAL with a value of 21.

   b) Provide a float variable declaration for the identifier value.

   c) Write a statement that assigns the letter A to the char variable grade.

   d) Write a statement that assigns the word Hello to the string variable greeting.

24. (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 << left << setw(8) << “Hello” << setw(8) << “World” << “A”;

   b) cout << right << setw(6) << “Here” << left << setw(8) << “There” << “B”;
25. (6 pts) The input stream buffer contains the following characters (\n represents the new line character) and the reading marker is currently on the □ before the A:
□123\nA\n2\nC\n4\nE\n6\nWhat is the output to the terminal when the code segment below is executed? Place one character in each box. Hint: Some variables have their value changed as the input is read. □ indicates a space.

```cpp
int num1;
char ch1, ch2;
cin >> ch1 >> ch2;
cin.ignore(200, '\n');
cin >> ch1;
cin >> num1;
cin >> ch1;
cin.ignore(5, '4');
cin >> ch2 >> ch2;

cout << ch1 << "-" << num1 << "-" << ch2;
```

□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □
26. (8 pts) Write a segment of code that prompts for and reads in two integer values. Output how many times the first number divides the second and output the remainder from that division. Output for this segment of code is shown below.

Declare all variables needed in your segment.

If 10 and 3 are entered, then the output is: 10 divided by 3 is 3 remainder 1
If 16 and 9 are entered, then the output is: 16 divided by 9 is 1 remainder 7

27. (4 pts) What is the output for the following segment of code?

```cpp
    int num = 5;
    num += 4;       // increment num by 4
    cout << num/6 << endl;  // int arithmetic
    --num;    // decrement num by 1
    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.
28. (10 pts) Write a segment of code that:
   - Prompts for and reads two entire lines into two string variables
   - The line termination character for each line is a colon (":"
   - Determines and outputs the number of characters in the first line
   - Determines and outputs the substring starting at character position 5 and pulling out 10 characters from the second line.
   - Assume that all header files have been declared, and use the following variable declarations only.

```cpp
string line1, line2;  // lines read from input
string sub;          // substring pulled from line2
string::size_type len;  // length of a line
```
29. (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 (program requires 4 variables):

- Prompt the user for three words,
- Read the words entered (from cin) into the variables str1, str2 and str3
- Concatenate the three words together and store the result in the string variable phrase.
- Output the phrase obtained.

Do not forget the necessary header files and all variable declarations.
Extra Credit #1 (3 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 = 15.0;
```

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

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

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

Extra Credit #2 (2 pts) An astronaut standing on the moon is holding a pencil. When the astronaut lets go of the pencil, the pencil will

A) Slowly float away  
B) Stay where it is  
C) Fall to the surface of the moon  
D) Nothing  
E) How did the pencil get there?  
F) None of these