**Definition Matching – (10 Points)**

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

Syntax _____
Algorithm _____
Named Constant _____
Variable _____
Data Type _____

Semantics _____
Declaration _____
Identifier _____
Literal Value _____
Assignment Statement____

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

B) A statement that stores the value of an expression into a variable
C) A location in memory, referenced by an identifier, that contains a data value that **can** be changed
D) A specific set of values along with a set of operations on those values
E) The set of rules that determines the meaning of instructions written in a programming language.

G) The mechanism that transfers control to a function
H) To compute a new value by performing a specified set of operations on given values
I) A location in memory, referenced by an identifier, that contains a data value that **cannot** be changed

J) The formal rules governing how valid instructions are written in a programming language.
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 Name associated with a function or data object and used to refer to that function or data object.
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) A string variable can hold a character value.
   T   F  d) Type casting is the implicit conversion of one data type to another.
   T   F  e) The statement cin.get(charVar); reads the first character, regardless what it is,
          from the input stream cin (charVar has been declared as a char).
   T   F  f) The statement cin.ignore(10, ':'); skips characters on the input stream until the
          : character is encountered.
   T   F  g) The extraction operator skips all whitespace characters when reading from the input
          stream?
   T   F  h) Value returning functions return exactly one function value.

Multiple choice (12 points) – Questions 3 – 14

   For these problems circle all correct answers ✐

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

   A) Hello    B) _Goodbye    C) A%3    D) 9Lives    E) One

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

   A) _time    B) time    C) 4bells    D) -name    E) two_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) iostream    B) iomanip    C) manip    D) string    E) cmath
7. What is the name of the header file required for use with strings?
   A) iostream       B) iomanip       C) manip       D) string       E) cmath

8. 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

9. Which output manipulator is 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 10-12, consider the following C++ declarations. In the code, a □ indicates a space

```cpp
string str1 = "This□class□is□CPE112";
string str2 = "Good□Day";
string str3;
string::size_type num, Position;
```

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

10. What is the output of the following program fragment listed below?
    ```cpp
    num = str2.length(); cout << num;
    ```
    A) 7     B) 8     C) 9     D) 10     E) string::npos

11. What is the output of the following program fragment listed below? (a □ indicates a space)
    ```cpp
    Position = str2.find("d"); cout << Position;
    ```
    A) 3     B) 4     C) 5     D) 6     E) string::npos

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

```c
int result;
float num = 12.0;
result = num/5 + 3.2;
```

A) 5.2  B) 5  C) 6  D) 5.6  E) a runtime error  F) None of These

14. 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
string firstName="Reginald";
????? mystery;
mystery = firstName.find('D');
```

A) char  B) string::size_type  C) string  D) int  E) None of these

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 Unix Commands ( 6 points) – Questions 15 – 20

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

16. Give the Unix command to delete the file `myfile.txt`

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

18. Give the Unix command to compile the C++ program `Prog2.cpp` and create an executable named `Prog2`?

19. Give the Unix command that is used to copy the file `in.txt` to `in.txt.cp`

20. What Unix command is used to obtain the current working directory path (shows you which directory the terminal window is in)?
21. (3 pts) Identifiers can consist of what types of characters (three distinct answers)?

22. (3 pts) An expression is an arrangement of ________________, ________________ and ________________ that can be evaluated to compute a value of a given type.

23. (2 pts) What are two methods used to indicate comments in a C++ program?

24. (4 pts) Assignment and declaration statements
   a) Provide a constant declaration for a string identifier STREET with a value of “first”.
   b) Provide a float variable declaration for the identifier street.
   c) Write a statement that assigns 21 to the int variable blackjack.
   d) Write a statement that assigns the word Hello to the string variable greeting.

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

   b) cout << right << setw(6) << “Here” << left << setw(8) << “There” << “B”;
26. (8 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:

```
S | e | e | S | p | o | t | r | u | n |
```

```
cout << left << setw(8) << "Hello" << "world" << endl;
cout << setw(6) << right << "What" << "is";
cout << endl << setw(6) << left << "next" << endl;
cout << setw(3) << right << "Done";
```
27. (8 pts) Write a segment of code that prompts for and reads in an integer value indicating the number of centimeters. Take that value and calculate how many meters are in that many centimeters and the number of centimeters remaining. Output this information as shown below. Declare all variables needed in your segment. (Note: 100 centimeters in a meter)

If 10 is entered, then the output is: **10 centimeters is 0 meters and 10 centimeters.**
If 407 is entered, then the output is: **407 centimeters is 4 meters and 7 centimeters.**

28. (6 pts) What is the output for the following segment of code?

```cpp
int num = 8;
num -= 3;       // decrement num by 3
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.
29. (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 question mark (?)
- Determines and outputs the number of characters in the first line
- Determines and outputs the starting character position of the word “Stop” in the second line.
- Assume that all header files have been declared, and use the following variable declarations.

```cpp
string line1, line2;  // lines read from input
string::size_type len, pos;  // length of a line, position in a line
```
30. (14 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 three words,
- Read the words entered (from cin) into the variables str1, str2 and str3
- Output the three words in the reverse order in which they were read (str3 first). Each word should be output right justified in a field width of 10.
- Do not forget the necessary header files.