1. In the below elements which of them are values or an expression? eg:- values can be integer or string and expressions will be mathematical operators.

\*

'hello'

-87.8

-

/

6

**Solution**:

**Values**: ‘hello’, -87.8, 6

**Expression**: \*, -, /, +,

2. What is the difference between string and variable?

**Solution:**

**String**: A string is a sequence of characters.

**Variable**: A variable is a reserved memory location to store values**.**

3. Describe three different data types.

**Solution**:

There are different types of data types in python, were string, integer, float, complex, list, tuples, sets, dictionary etc.

**List**: A list can have any number of items and they may be of different types (integer, float, string, etc.). A list can also have another list as an item. This is called a nested list.  A list is created by placing elements inside square brackets [], separated by commas. And list is MUTABLE.

**Tuples**: Tuples are used to store multiple items in a single variable, used to store collections of data.  A tuple is a collection which is ordered and unchangeable. Tuples use parentheses instead of square brackets, and the items in tuples cannot be modified, were tuples are IMMUTABLE.

**Dictionary**: Dictionary is an unordered collection of data values, used to store data values like a map. A dictionary consists of a collection of key-value pairs. Each key-value pair maps the key to its associated value. Values can be any type of object, but KEYS must be IMMUTABLE. This means keys could be integers, strings, or tuples, but not lists, because lists are mutable.

4. What is an expression made up of? What do all expressions do?

**Solution**:

An expression is a combination of operators and operands that is interpreted to produce some other value. For example any string is also an expressions since it represents the value of the string as well. Ex: 2+5 = 7.

5. This assignment statements, like spam = 10. What is the difference between an expression and a statement?

**Solution**:

Expression is a combination of variables, operations and values that yields a result value.

The assignment statement is the value that assign to variable. By above example the value is 10 which is assigned to spam.

6. After running the following code, what does the variable bacon contain?

bacon = 22

bacon + 1

**Solution**:

Bacon contains 23.

7. What should the values of the following two terms be?

'spam' + 'spamspam'

'spam' \* 3

**Solution**:

'spam' + 'spamspam' => ’spamspamspam’

'spam' \* 3 => ‘’spamspamspam’

8. Why is eggs a valid variable name while 100 is invalid?

**Solution**: The eggs is a valid variable name because it is an string , were 100 is an integer.

9. What three functions can be used to get the integer, floating-point number, or string version of a value?

**Solution**:

The three function can be used to get the integer, floating-point number, or string version of a value are : int, float, str.

10. Why does this expression cause an error? How can you fix it?

'I have eaten ' + 99 + ' burritos.'

**Solution**: can only concatenate strings (not "integer") to strings.

We can fix it by changing or types casting integer to string.

'I have eaten ' + ‘99’ + ' burritos.'