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.

\* **(Multiplication Operator)**

'hello' **(A String Value)**

-87.8 **(A Floating Value)**

- **(Subtraction Operator)**

/ **(Division Operator)**

* **(Addition Operator)**

6 **(An Integer Value)**

2. What is the difference between string and variable?

String - In programming language, we are using string value for the sequence of characters and its basically used like (‘’) or (“”). String can any value like “Hello,” “Hello 123”.

Variable – Variable means we have assigned a particular name for the any value. In programming language, we call the value based on their name like as below.

Name = “Vinayak”

Number = 123

3. Describe three different data types.

There are 8 data types in the python as integer, string, float, Boolean, list, tuple, dictionary and set.

Integer – Means a numerical value **1, 2, 3**

String – Means a characters **“Hello”**

Float – Means is decimal value **12.2, 22.2**

Boolean – Means conditional and logical **True, False**

List – Means collection of items and its mutable. We used [] for the list value. **[1, 12, 3, 5], [“Apple”, “Banana”,” Orange”]**

Tuple – Means collection of items which are immutable. We used () for the tuple value **(1,2,3), (“Apple”,”Banana”,”Orange”)**

Dictionary - Means the collection of key-value. where we have assigned the key for the value and we used {} for the Dictionary. **{‘Name’:’Vinayak’, ‘Age’:30}**

Set – Means the collection of the value. In the set duplicate value not allowed. We used {} for the set value. **{1,2,3}, {“Apple”,”Banana”,”Orange”}**

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

Expression are fundamental in programming as the allow calculation (+,-,\*,/) comparisons, logical operations and transformations of data. They are used extensively in control flow statements. Mathematical computations, defining conditions, creating data structure and much more.

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

**An expression is a combination of values, variables, operators, and function calls that can be evaluated to produce a value.**

**A Statement on the other hand, is a complete unit of code that performs an action or carries out a specific task. It is a command that instruction the program to perform a particular action.**

**The key difference between an expression and a statement is that expression produce a value when evaluated, while statements perform actions or task in the program. Expression is used to compute values, whereas statements are used to control the flow of the program or perform specific actions like assignment or functions calls.**

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

**bacon = 22 (bocon contain the 22)**

bacon + 1

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

'spam' + 'spamspam'

**Two strings are the concatenate with operator (+) like as 'spamspamspam'**

'spam' \* 3

**String value multiple by the integer with operator (\*) like as**

**'spamspamspam'**

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

**‘eggs’ is a valid variable name because it consists of letters only, does not start with a digit, and is not a reserved keyword.**

**100 is invalid as it starts with a digit and does not meet the requirements for a valid variable name.**

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

**Int – the ‘int()’ function can be used to convert a value to an integer. If the value is a string representing a valid integer, it will be converted to an integer.**

**Num = int(“12”) string “12” converted in to integer 12**

**Float – the ‘float ()’ function is used to convert a value of a floating-point number. If the value is a float number, it will be converted to a float.**

**Num = float(“12.5”) string “12.5” converted in to float value 12.5**

**String – the ‘str()’ function is used to convert a value to a string. This function can be used to convert numbers or other data types to string**

**Text = str(12) integer 12 converted in to string value “12”**

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

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

**The issue arises because the + operator is used for both string concatenation and addition, but in this expression the first operand is the string ‘I have eaten’ second operand is the integer value 99, and the third operand is the string ‘burritos’.**