Python theoretical Question :-

1. What is Python, and why is it popular?
   >> In a computer we need a programing language for creating instruction to follow the computer. Python is one of the programing language. It was developed by Guido Van Rossem in 19991.It is popular because of the simple and easy to learn the other who does'nt know any programing.It also have a lots of libraries which they help the learners and the others for knowing the codes information.

2. What is an interpreter in Python?
   >>An interpreter in Python is a program that reads and executes Python code line by line. which first convert code into machine language before running, Python is an interpreted language, meaning that its code is executed directly by the interpreter at runtime.In Phyton if a little error in its code the code will not be executed.

3. What are pre-defined keywords in Python ?
   >> In python pre-defined words are special that have a predefined meaning and cannot be used as identifiers such as variables. By knowing the variables in python we will use the code
   help("keywords") and execute it.

   By this you can run and see all the keywords.There are many keywords for e.g.- false,none,true,as,for, etc.

4. Can keywords be used as variable names ?
   >>No, keywords in Python cannot be used as variable names or identifiers. Because keywords can be used for some specific function and for set of rules which we implemented.
   For Example:- a=5 (we can execute it)
   But we cannot execute if=5 (because if is a pre defined keywords)
   But instead we can use if a =5 in a loop statement.

5. What is mutability in Python ?
   >>Objects/Containers whose value can be changed after they are created is called mutable object or container
   For ex:- # list_count ("ajay,1,suman")
   list_count #we execute we can change it after
   list_count [0]= "vijay"
   By which we execute the list_count #ajay will be replaced by vijay in list count.

6. Why are lists mutable, but tuples are immutable ?
   >>List :- Lists are designed to hold a collection of items that can change over time. They are intended for situations where the data might need to be modified, such as adding, removing, or changing elements.That why lists are mutable in condition.

   Tuples :- Tuples are designed to hold a fixed, unchangeable collection of items. They are typically used when you need a collection of items that should remain constant and not change throughout the program.It ensures that the data will not be accidentally changed or modified that why it is immutable.

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7. What is the difference between “==” and “is” operators in Python ?
>> “==” Equality operator :-
The == operator is used to check if **the values** of two objects are **equal**. It compares the **contents** or **values** of the objects, regardless of whether they are stored in the same location in memory.
For ex ;- a = (1,2,3)
b = (1,2,3)
a==b # after execute it it will be true i.e a and b have the same value however they are different object /variable.

“is” Operator :-
The `is` operator checks whether two objects are the same object in memory. It compares the identity of the objects, meaning it checks whether the two variables refer to the same memory location.
For ex ;- a = (1,2,3)
b = (1,2,3)
# a is b is not execute because a and b are two different object in memory. The output is false when we execute it.

7. What are logical operators in Python ?
>>, logical operators are combine conditional statements and evaluate expressions. They return a boolean value (true/false) based on the truth values of the conditions.
There are three types of logical operator :-
i) And : Returns true if both statements are true otherwise false.
ii) Or :- Returns true if one statements are true otherwise false
iii) Not :- Reverse the result ,return false if the result is true.

8. What is type casting in Python ?
>>Type casting in Python is the process of converting one data type to another. Python provides several built-in functions convert between different types, known as type casting.
For ex :- “2”+3 # if we execute in code the output give the error by which we convert “2” (string) to integer.

9. What is the difference between implicit and explicit type casting ?
>> Implicit :- Implicit type casting happens automatically by Python when it is safe to do. Example a = 5
Type (a) = integer # if we execute in code the output will be integer. Because python understand the data.

Explicit :- Explicit type casting occurs when the programmer explicitly specifies how the conversion between data types should happen using built-in functions like str(), float(), etc. Example a = 2
b = “ajay”
a+b = Error if we execute the code it will give the error both a and b are not same variable/component by this we need to do type casting first.

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11. What is the purpose of conditional statements in Python?

>> The purpose of Conditional statements in Python are used to make decisions in the code, allowing the program to execute specific blocks of code based on whether a condition is True or False. They enable the program to choose different actions based on different situations.

For example :- if ,if-else, if-elif-else , nested if-else.

12. How does the elif statement work ?

>>The elif statement in Python allows you to check multiple conditions sequentially after an initial if statement. If the condition in the if statement is False, the program moves on to the elif statements (if any), and checks each condition in order. If an elif condition is True the associated block of code is executed, and the remaining elif or else blocks are skipped.

```
For ex :- x = 15
          If x >10 :
        print  (“Jatin”)
   elif  x==5 :
    Print (“hello”)
else :
print  (“hii”)
# now the output will be come “Jatin”
```

13. What is the difference between for and while loops ?

>> For Loop :- is used for iterate over a sequence of elements string, list

```
Example :- for i in “Jatin”:
                print  (i)
#Output will be J
                       a
                       t
                       i
                       n
```

While Loop:- it is repeatedly executed a block of code until a condition is met

```
Example :- n=3
                i=1
       While i<n:
       print (i)
       i=i+1
#output will be 1
                      2
```

14. Describe a scenario where a while loop is more suitable than a for loop.

>>A Whileloop is more suitable than a for loop in situations where the number of iterations is not known in advance and you need the loop to continue until a certain condition is met. A While loop is ideal when you don't have a fixed range or sequence to iterate over, but instead, the loop should continue running until a specific condition becomes False

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For example:- n = 7

```
i = 1
while i < n:
    i = i+1
    if i == 3:
        continue
    print(i)
else:
    print("This will be executed when the while is run successfuly without any break")

#output will be
2
4
5
6
7
This will be executed when the while is run successfuly without any break
```