THEORY QUESTION

1. What is Python, and why is it popular?
Ans Python is a high-level, interpreted programming language known for its simple syntax and readability. It is popular because it's easy to learn, supports multiple programming paradigms, has a vast standard library, and is widely used in fields like web development, data science, AI, automation, and more.

2. What is an interpreter in Python?
An interpreter is a program that reads and executes Python code line by line. Python's interpreter translates source code into machine code at runtime.

3. What are pre-defined keywords in Python?
Pre-defined keywords are reserved words that have special meaning in Python, like if, else, for, while, True, False, etc.

4. Can keywords be used as variable names?
No, keywords cannot be used as variable names. Doing so will result in a syntax error.

5. What is mutability in Python?
Mutability refers to whether an object can be changed after creation. Mutable objects (like lists) can be modified, while immutable objects (like tuples, strings) cannot.

6. Why are lists mutable, but tuples are immutable?
Lists are designed for collections that may change, so Python allows modifications. Tuples are meant to be fixed collections, often used as dictionary keys or constants, so they are immutable for safety and performance.

7. What is the difference between == and is operators?

== checks if the values of two variables are equal.

is checks if the two variables refer to the same object in memory.

8. What are logical operators in Python?

and: Returns True if both conditions are True.

or: Returns True if at least one condition is True.

not: Reverses the boolean value.

9. What is type casting in Python?
Type casting is converting a variable from one data type to another, like from string to integer using int().

10. What is the difference between implicit and explicit type casting?

Implicit: Done automatically by Python.
Example: x = 10 + 5.5 → x becomes float.

Explicit: Done manually by the programmer using functions like int(), float(), str().

11. What is the purpose of conditional statements?
They allow the program to make decisions and execute certain blocks of code based on conditions (like if, else, elif).

12. How does the elif statement work?
elif (else if) checks another condition if the previous if condition is false. It prevents multiple if statements.

13. What is the difference between for and while loops

for is used when you know the number of iterations.

while is used when the number of iterations is unknown and depends on a condition.

14. Describe a scenario where a while loop is more suitable than a for loop.
Scenario where a while loop is better than a for loop:
Example: Taking input until the user types "exit". You don’t know how many times the loop will run, so a while loop is better.