**1.what is python and why it is popular?**

* Python is a high-level, interpreted programming language known for its simplicity and readability. It was created by Guido van Rossum and first released in 1991. Python supports multiple programming paradigms, including:
* Object-Oriented Programming (OOP)
* Procedural Programming
* Functional Programming

**2.what is an interpreter in python?**

* An interpreter in python is programming that reads and execute the python code line by line and helping us test and debug our program efficiently

**3.what is predefined key words in python?**

* Pre-defined keywords are reserved words that are part of language syntax and rules.
* we cannot use them as identifier because they have specific function in how python code works.

**4.Can keywords be used as variable names**

* No, keywords cannot be used as variable in python because they reserved for specific language functions.

**5.what is mutability in python?**

* mutability in python refers to whether an object's values can be changed after it is created.
* 1.mutable (can be change)
* 2.immutable (cannot be change)

**6.Why are list mutable, but tuples are immutable in python?**

* The difference lies in their design purpose and internal structure.
* List are mutable to allow flexible, changeable data handling.
* Tuples are immutable to provide safety, reliability and performance benefits when data should not change.

**7.what is the differnce between "==" and "is" operator in python?**

In python both "==" and "is" comparison operator, but they for different purpose.

* 1.== use when comparing values.
* 2.is use when checking for object identity.

**8.What are logical operator in python?**

* logical operator in python are used to combine the conditional statement, that returns true or false.
* AND, OR, NOT are the operators.

**9.what is type casting in python?**

* Type casting in python means converting the data type to variable or value from one type to another.
* 1.implicit= Python handle it for us.
* 2.explicit= we do it function like str (), int (), float ().

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

| **Feature** | **Implicit Type Casting** | **Explicit Type Casting** |
| --- | --- | --- |
| Definition | Automatic conversion of data types by Python | Manual conversion of data types by the programmer |
| Who Performs It? | Python (interpreter) | Programmer (using casting functions) |
| Syntax | No function call needed | Uses functions like int(), float(), str() |
| Control | You have no control — Python decides | Full control over what to convert and how |
| Risk of Error | Very low (safe conversions only) | Can cause errors if types are incompatible |

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

* Conditional statements are used to make decisions in a program. They allow your code to execute different actions based on whether a condition is True or False.

**12. How does the elif statement work?**

* The elif (short for "else if") statement allows you to check multiple conditions, one after another**.**

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

| **Feature** | **for Loop** | **while Loop** |
| --- | --- | --- |
| Use Case | Used when the number of iterations is known | Used when the condition is based on logic, not count |
| Condition Check | Automatically handled by the loop over a sequence | Manually specified condition |
| Structure | Iterates over a sequence (list, range, etc.) | Repeats as long as the condition is True |
| Termination | Ends after going through the sequence | Ends when the condition becomes False |

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

* A \*\*while\*\* loop is more suitable when the number of iterations is not known in advance and depends on a condition that changes during execution**.**