**1. What are logical operators? How many are they?**

Logical operators are used to combine conditional statements. There are 3 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 result (True becomes False)

**2. What is the difference between logical AND and logical OR?**

**AND(and)**:All conditions must be True

Example: 5 > 2 and 3 > 1 → True

**OR (or)**: At least one condition must be True

Example: 5 > 2 or 3 < 1 → True

**3. What are membership operators? How many are they?**

Membership operators check whether a value is present in a sequence (like list, string, etc.)
There are 2 membership operators:

- in – returns True if value exists
- not in – returns True if value does not exist

**4. What is the difference between in and not in operators?**

- in: Checks if a value is present
  Example: "a" in "apple" → True
- not in: Checks if a value is **not** present
  Example: "x" not in "apple" → True

**5. What is the difference between == and != operators?**

- ==: Checks if two values are **equal**

  Example: 5 == 5 → True

- !=: Checks if two values are **not equal**

  Example: 5 != 3 → True

**6. What are conditional statements in Python? Write a syntax and simple example.**

Conditional statements help in decision-making using if, else, and elif.

**Syntax:**

```
if condition:

    # code
elif condition:
    # code
else:
    # code
```

**Example:**

```
age = 18
if age >= 18:
    print("Eligible to vote")
else:
    print("Not eligible")
```

**7. Write a program to demonstrate the if-else condition.**

```
marks = 75
if marks >= 40:
    print("Pass")
else:
    print("Fail")
```

**8. Write if-elif-else ladder with a simple example.**

```
score = 85

if score >= 90:
    print("Grade A")
elif score >= 75:
    print("Grade B")
elif score >= 60:
    print("Grade C")
else:
    print("Fail")
```

**9. Write a program to demonstrate how nested conditions work in Python.**

```
age = 20
citizen = "yes"

if age >= 18:
    if citizen == "yes":
        print("Eligible to vote")
    else:
        print("Not a citizen")
else:
    print("Not eligible due to age")
```

**10. What is indentation in Python? What is the importance of it in Python? Explain with an example.**

Indentation in Python refers to spaces or tabs used at the beginning of a line to define blocks of code.

It is very important because Python uses indentation instead of curly braces {} to group statements.

**Example:**

```
if 5 > 3:
    print("5 is greater")  # indented block
```

If we don't use proper indentation, Python will show an Indentation Error.

**11. What is error and how many types of errors do you know?**
An error is a mistake in the code that causes the program to stop or behave unexpectedly.

**Types of errors:**

1. **Syntax Error** – Wrong code format.
2. **Name Error** – Using a variable that is not defined.
3. **Type Error** – Performing an operation on wrong data types.
4. **Key Error** – Accessing a dictionary with a key that doesn't exist.
5. **Index Error** – Using an invalid index in a list or tuple.
6. **Value Error** – Passing an incorrect value to a function.

**12. Write an example each to demonstrate Syntax Error, Name Error, and Key Error.**

**Syntax Error:**

```
# Missing colon
if 5 > 3
    print("Hello")
```

**Name Error:**

```
print(x)  # x is not defined
```

**Key Error:**

```
my_dict = {"name": "likhi"}
print(my_dict["age"])  # 'age' key does not exist
```

**13. What is loop and how many types of loops are there in Python?**
A loop is used to repeat a block of code multiple times.

**Types of loops in Python:**

1. **for loop** – Used to iterate over a sequence like list, tuple, etc.
2. **while loop** – Runs as long as a condition is True.

**14. Write an example for for loop using list.**

```
fruits = ["apple", "banana", "cherry"]

for fruit in fruits:
    print(fruit)
```

**15. Write an example for for loop using str and dict and tuple.**

**Using string:**

```
name = “likhi”
for letter in name:
    print(letter)
```

**Using dictionary:**

```
person = {"name": "likhi", "age": 22}
for key in person:
    print(key, ":", person[key])
```

**Using tuple:**

```
colors = ("red", "blue", "green")

for color in colors:
    print(color)
```