🧠 MOCK TECHNICAL INTERVIEW (Python • SQL • Projects)

🐍 PYTHON QUESTIONS

✅ Q1. What are list, tuple, set, and dictionary in Python?

Answer:

- **List**: Ordered, mutable collection.
  Used when data can change.

- nums = [1, 2, 3]

- **Tuple**: Ordered, immutable collection.
  Used when data should not change (e.g., coordinates).

- point = (10, 20)

- **Set**: Unordered, mutable, no duplicates.
  Used to store unique values.

- s = {1, 2, 3}

- **Dictionary**: Key–value pair collection.
  Used for fast lookups.

- student = {"name": "Chaitali", "cgpi": 9.02}

✅ Q2. What is mutable vs immutable in Python?

Answer:
Mutable objects can be modified after creation (list, dict, set).
Immutable objects cannot be changed (int, float, tuple, string).

Example:

a = [1, 2]

a.append(3)   # allowed

b = "Hi"

b[0] = "h" # not allowed

✅ Q3. Explain exceptions and how you handle them.

Answer:

Exceptions are runtime errors that stop program execution.
We handle them using try-except.

try:

  x = int(input())

  print(10 / x)

except ZeroDivisionError:

  print("Cannot divide by zero")

except ValueError:

  print("Invalid input")

This improves program reliability.

✅ Q4. What is a Python decorator?

Answer (fresher-friendly):

A decorator is a function that modifies another function's behavior without changing its code.

def my_decorator(func):

  def wrapper():

    print("Before")

    func()

    print("After")

  return wrapper

Used in logging, authentication, validation.

✅ Q5. How did you use Python in your projects?

Answer (IMPORTANT for interview):

I used Python for backend processing, API integration, and data analysis. In the Privacy Guardian project, I used Python with Streamlit to build UI, integrated external APIs like Pwned Passwords, and applied text processing to detect sensitive information in documents.

🗄 SQL QUESTIONS

✅ Q6. What is primary key vs foreign key?

Answer:

- **Primary key** uniquely identifies a record and cannot be null.
- **Foreign key** creates a relationship between two tables.

Example:

User(id PK)

Orders(user_id FK)

✅ Q7. Difference between WHERE and HAVING?

Answer:

- WHERE filters **rows**
- HAVING filters **groups**

SELECT dept, COUNT(*)

FROM employee

GROUP BY dept

HAVING COUNT(*) > 5;

✅ Q8. Types of joins in SQL

Answer:

- **INNER JOIN** → matching records
- **LEFT JOIN** → all left + matching right
- **RIGHT JOIN** → all right + matching left
- **FULL JOIN** → all records

✅ Q9. What are indexes?

Answer:
Indexes are database objects that improve query performance.

CREATE INDEX idx_name ON student(name);

They speed up SELECT queries but slow down INSERT/UPDATE.

✅ Q10. How did you use SQL in your projects?

Answer (resume-based):

I used SQL for designing schemas, writing joins, handling authentication data, and storing transactional records. In the Alumni Gyan Setu project, I used Microsoft SQL Server to manage users, events, role-based access, and payment records securely.

🧩 PROJECT-BASED QUESTIONS

✅ Q11. Explain your Alumni Gyan Setu project

Answer:

Alumni Gyan Setu is a full-stack ASP.NET web application that connects alumni and students. It includes role-based authentication, event creation, academic resource sharing, and secure payment integration for events using SQL Server. The project focused on security, usability, and scalability.

✅ Q12. What security measures did you implement?

Answer:

- Authentication & role-based authorization

- Secure password storage

- Validation of user inputs

- JWT authentication (LawLens project)

✅ Q13. What challenges did you face?

Answer:

Handling authentication, database relationships, and API integration. I overcame this by modular coding, debugging step-by-step, and testing each component individually.

🌐 FULL-STACK / GENERAL QUESTIONS

✅ Q14. What is REST API?

Answer:
REST is an architectural style using HTTP methods like GET, POST, PUT, DELETE for communication between client and server.

✅ Q15. Git vs GitHub?

Answer:

- **Git**: Local version control system
- **GitHub**: Cloud-based hosting for Git repositories

⭐ **BONUS: CONSULTING-READY QUESTIONS**

✅ **Q16. Why are you suitable for a consulting role?**

Answer:

I combine technical skills with problem-solving and communication. My projects required understanding user needs, data, and security, which aligns well with consulting environments.

✅ **Q17. How do you learn new technology quickly?**

Answer:

I prefer hands-on learning. I start with basics, practice on small examples, apply it in a mini-project, and then improve by reading documentation and debugging real issues.