

Technical Questions

1. Programming

- Reverse a string without using built-in functions
- Find the second largest element in an array
- Write SQL query to find duplicate records in a table
- Implement binary search in Java/Python
- Explain the difference between `==` and `.equals()` in Java

2. Database

- What are ACID properties in DBMS?
- Write a query to find the 3rd highest salary
- Difference between clustered and non-clustered index
- Normalization vs Denormalization
- How to prevent SQL injection?

3. Data Structures

- Implement stack using queues
- Detect loop in linked list
- Time complexity of bubble sort
- When to use hashmap vs arraylist?
- Reverse words in a string ("Hello World" → "World Hello")

Aptitude Questions

1. Quantitative

- A train 150m long passes a pole in 15s. Find speed in km/hr
- If 20% of $x = 30\%$ of y , what is $x:y$?
- 2, 5, 10, 17, 26, ? (Next number in series)
- A works twice as fast as B. Together they finish in 12 days. How long would B alone take?
- Probability of drawing 2 red balls from bag with 3 red/5 blue

2. Logical Reasoning

- All cats are dogs. Some dogs are tigers. Conclusion?
- Coding-Decoding: If APPLE=25563, then PEAL=?
- Venn diagram: Doctors, Engineers, Married
- Clock angle at 3:15
- Cube painting problems

3. Verbal

- Identify error: "Neither of the candidates were suitable"
- Antonym of "Ephemeral"
- Active to passive: "The committee approved the new policy"

- Fill blank: "She was ____ to accept the offer" (advice/advised)
- Idiom meaning: "Bite the bullet"

System Design/Scenario-Based

1. How would you design a library management system?
2. Explain CAP theorem with real examples
3. What happens when you type a URL in browser?
4. Design parking lot system with OOP principles
5. Optimize a slow SQL query on 10M+ records

HR/Behavioral

1. Describe a time you faced conflict in team
2. How do you prioritize tasks under tight deadlines?
3. Where do you see yourself in 5 years?
4. Explain a complex technical concept to non-tech client
5. What motivates you to join TCS?

Advanced Coding Problems

python

Copy

1. Fibonacci series with memoization

```
def fib(n, memo={}):
```

```
    # Your code
```

2. Find missing number in array of 1-n

```
def missing_num(arr):
```

```
    # Your code
```

3. Validate balanced parentheses

```
def is_valid(s):
```

```
    # Your code
```

4. LRU Cache implementation

```
class LRUCache:
```

```
    # Your code
```

5. Merge overlapping intervals

```
def merge(intervals):
```

```
    # Your code
```

How to Use with Your RAG

1. **Input Format:**

2. **python**

3. **Copy**

questions = [

"Explain ACID properties with examples",

"Write SQL query to find nth highest salary",

"Solve: 2,5,10,17,26,?",

"How to prevent SQL injection attacks?"

]

for q in questions:

4. **print(f"Q: {q}\nA: {get_response(q)}\n")**

5. **Evaluation Metrics:**

- **Accuracy of technical concepts**
- **Step-by-step problem solving**
- **Handling ambiguous questions**
- **Code correctness/optimization**