**Query Optimization and Performance Tuning**

1. **Explain the purpose of indexing in a database. What types of indexes are available, and how do you decide which one to use?**
2. **What are some common techniques to optimize SQL queries for better performance?**
3. **How do you analyze and optimize the execution plan of a query?**
4. **What is a clustered index, and how does it differ from a non-clustered index?**
5. **Discuss the implications of using too many indexes on a table.**
6. **How do you handle query performance issues in large datasets?**

**Complex Queries and Subqueries**

1. **What are Common Table Expressions (CTEs) and how do you use them?**
2. **How would you write a recursive CTE? Provide an example.**
3. **What is the difference between correlated and uncorrelated subqueries? Provide examples.**
4. **Explain window functions and their uses. Can you give examples of ROW\_NUMBER, RANK, and DENSE\_RANK functions?**
5. **How do you perform a pivot operation in SQL? Provide an example.**

**Transactions and Concurrency**

1. **What is a database transaction, and what are the ACID properties?**
2. **How do you implement and manage transactions in SQL?**
3. **What are isolation levels in SQL, and how do they affect transaction behavior?**
4. **How would you handle deadlocks in a database?**

**Advanced Joins and Set Operations**

1. **Explain the different types of joins in SQL.**
2. **What is a self-join, and when would you use it?**
3. **How do you use UNION, INTERSECT, and EXCEPT set operations? Provide examples.**
4. **What is a cross join, and how does it differ from other join types?**

**Data Modeling and Design**

1. **Discuss normalization and denormalization. When would you choose one over the other?**
2. **Explain the different types of database relationships (one-to-one, one-to-many, many-to-many) and how they are implemented.**
3. **What are database constraints, and what types are there? How do you apply them?**

**Stored Procedures and Functions**

1. **What are stored procedures, and how do they differ from functions?**
2. **How do you handle error handling and transaction management within a stored procedure?**
3. **Can you provide an example of creating and using a user-defined function?**
4. **What are triggers, and how do you use them? Provide examples of before and after triggers.**

**Advanced Data Manipulation**

1. **How do you perform bulk insert operations efficiently?**
2. **What are temporary tables, and when would you use them?**
3. **Explain the MERGE statement and provide a scenario where it is useful.**
4. **How do you handle NULL values in SQL?**

**Security and Permissions**

1. **How do you manage user permissions and roles in SQL?**
2. **What are SQL injection attacks, and how do you prevent them?**
3. **Explain the concept of row-level security and how it can be implemented.**

**Miscellaneous**

1. **What are the differences between SQL and NoSQL databases? When would you use each?**
2. **Explain the concept of a materialized view. How does it differ from a regular view?**
3. **How do you perform full-text search in SQL?**
4. **What are JSON and XML data types in SQL, and how do you work with them?**