Q96 Explain the process of query optimization in a DBMS, including steps like query parsing, query rewriting, query transformation, and cost-based optimization, and how it improves query performance.

Q97 How does a DBMS handle data concurrency and manage resource contention in a multi-user environment, utilizing techniques like locking, latching, and timestamp-based concurrency control?

Q98 Discuss the advantages and disadvantages of different database storage models, such as file-based storage, page-based storage, and tablespace-based storage, in terms of data access efficiency, scalability, and fault tolerance.

Q99 Explain the concept of database normalization and its different normal forms (1NF, 2NF, 3NF, BCNF), highlighting the benefits of achieving a well-normalized database schema in terms of data redundancy reduction and data consistency.

Q100 What are the various backup and recovery strategies implemented by a DBMS, including full backups, incremental backups, differential backups, and point-in-time recovery, and how do they ensure data availability and data loss prevention?

Q40 What is database normalization, and why is it important in database design?

Q41 Discuss the concept of database denormalization and when it may be appropriate.

Q42 Explain database backup and recovery strategies, including full and incremental backups.

Q43 How does a distributed database system differ from a centralized database system?

Q44 Discuss the concept of database normalization and its role in reducing data redundancy.

Q45 What is the purpose of a database management system (DBMS) in an organization's data infrastructure?

Q46 Explain the concept of database indexing and its impact on query performance in a DBMS.

Q47 How does a transaction log ensure data durability and recoverability in a database system?

Q48 Discuss the advantages and disadvantages of using denormalized databases in certain scenarios.

Q49 What is the role of a database administrator (DBA) in maintaining data security and integrity?

Q50 Explain the concept of database sharding and its use in horizontal database scaling.

Q51 How does database replication contribute to high availability and fault tolerance in distributed systems?

Q52 Discuss the differences between online transaction processing (OLTP) and online analytical processing (OLAP) databases.

Q53 What is the difference between logical and physical database design?

Q54 Explain the purpose of stored procedures and their benefits.

Q55 Discuss the concept of database mirroring for achieving redundancy.

Q56 How does database partitioning enhance performance and manageability in large datasets?

Q57 Define referential integrity and its role in maintaining data consistency.

Q58 What are the benefits of using materialized views in a database?

Q59 Explain the role of triggers in enforcing data integrity constraints.

Q60 Discuss the significance of database locking for concurrency control.

Q61 What are the ACID properties and how do they ensure transactional consistency?

Q62 Explain normalization in database design with a brief example.

Q63 What are primary and foreign keys in a database?

Q64 Define SQL and its purpose in managing databases.

Q1. Explain the different types of joins in SQL.

Q2. What is the PRIMARY KEY in SQL?

Q3. What are constraints?

Q4. What’s the difference between DELETE and TRUNCATE statements in SQL?

Q5. What is query optimization?

Q6. Given the tables below, select the top three departments with at least ten employees and rank them according to the percentage of their employees making over $100,000 in salary.

Q7. Given a users table, write a query to get the cumulative number of new users added by day, with the total reset every month.

Q8. Given a table of product subscriptions with a subscription start date and end date for each user, write a query that returns true or false whether or not each user has a subscription date range that overlaps with any other user.

Q9. Given a table of students and their SAT test scores, write a query to return the two students with the closest test scores with the score difference.

Q10 Discuss the differences between optimistic and pessimistic concurrency control in a DBMS.

Q11 Explain the purpose of SQL (Structured Query Language) in a DBMS and provide an example query.

Q12 What is a data dictionary and how does it provide metadata about the database structure?

Q13 Explain the concept of data integrity constraints in a relational database. Provide examples.

Q14 Discuss the differences between a logical and a physical data model in database design.

Q15 What is the role of a database administrator (DBA) in a DBMS environment?

Q16 Explain the concept of query optimization in a DBMS and techniques used for performance improvement.

Q17 Can you explain the concept of database replication and its benefits and challenges?

Q18 Discuss the differences between horizontal and vertical partitioning in database design.

Q19 What is the purpose of a transaction log in a DBMS, and how does it ensure durability?

Q51 How does database replication contribute to high availability and fault tolerance in distributed systems?

Q52 Discuss the differences between online transaction processing (OLTP) and online analytical processing (OLAP) databases.

Q53 What is the difference between logical and physical database design?

Q54 Explain the purpose of stored procedures and their benefits.

Q55 Discuss the concept of database mirroring for achieving redundancy.

Q56 How does database partitioning enhance performance and manageability in large datasets?

Q57 Define referential integrity and its role in maintaining data consistency.