

## Some Questions and Answers on SQL

### Basic SQL Questions:

#### **1. What is SQL?**

Answer: SQL stands for Structured Query Language, used for managing and manipulating relational databases.

#### **2. What are the different types of SQL commands?**

Answer: The types are DDL (Data Definition Language), DML (Data Manipulation Language), DCL (Data Control Language), and TCL (Transaction Control Language).

#### **3. What is the primary key?**

Answer: A primary key is a unique identifier for each record in a database table.

#### **4. What is a foreign key?**

Answer: A foreign key is a field in one table that uniquely identifies a row in another table, thereby establishing a relationship between the two tables.

#### **5. Explain the difference between DELETE and TRUNCATE commands.**

Answer: DELETE removes specific rows from a table and can use a WHERE clause, while TRUNCATE removes all rows from a table and resets its identity value.

#### **6. What is a JOIN in SQL?**

Answer: A JOIN clause is used to combine rows from two or more tables, based on a related column between them.

#### **7. What are the different types of JOINS?**

Answer: The types are INNER JOIN, LEFT JOIN, RIGHT JOIN, FULL OUTER JOIN, and CROSS JOIN.

### **8. What is normalization?**

Answer: Normalization is the process of organizing data in a database to reduce redundancy and improve data integrity.

### **9. What are the different normal forms?**

Answer: The normal forms are 1NF (First Normal Form), 2NF (Second Normal Form), 3NF (Third Normal Form), BCNF (Boyce-Codd Normal Form), and 4NF (Fourth Normal Form).

### **10. What is a view in SQL?**

Answer: A view is a virtual table based on the result set of an SQL statement.

## **Intermediate SQL Questions:**

### **11. What is an index in SQL?**

Answer: An index in SQL is used to speed up the retrieval of data from a database table.

### **12. Explain the GROUP BY statement.**

Answer: GROUP BY is used in collaboration with the aggregate functions to group the result set by one or more columns.

### **13. What is a subquery?**

Answer: A subquery is an SQL query nested inside a larger query.

### **14. What is a stored procedure?**

Answer: A stored procedure is a set of SQL statements that can be stored in the database.

### **15. Explain ACID properties in a database.**

Answer: ACID stands for Atomicity, Consistency, Isolation, and Durability - essential for ensuring database transactions are processed reliably.

### **16. What is a transaction in SQL?**

Answer: A transaction is a sequence of operations performed as a single logical unit of work.

**17. What is the difference between UNION and UNION ALL?**

Answer: UNION combines the results of two or more SELECT statements and removes duplicate rows, while UNION ALL combines the results and does not remove duplicates.

**18. What are the constraints in SQL?**

Answer: Constraints are rules enforced on data columns in a table. They are used to prevent invalid data from entering the table.

**19. What is SQL injection?**

Answer: SQL injection is a code injection technique used to attack data-driven applications by inserting malicious SQL statements into the execution field.

**20. What is a cursor in SQL?**

Answer: A cursor is a database object used to retrieve data from a result set one row at a time.

**Intermediate to Advanced SQL Questions:**

**21. Explain the concept of self-join.**

Answer: A self-join is a regular join, but the table joins with itself.

**22. What is a composite key?**

Answer: A composite key is a primary key composed of two or more columns used together to identify a unique record.

**23. What is a clustered index?**

Answer: A clustered index sorts and stores the data rows of the table or view based on their key values.

**24. What is a non-clustered index?**

Answer: A non-clustered index stores the data somewhere else in the table and maintains a logical order of the key values.

**25. What are aggregate functions in SQL?**

Answer: Aggregate functions perform a calculation on a set of values and return a single value, e.g., COUNT, SUM, AVG, MAX, MIN.

**26. What is a "HAVING" clause in SQL?**

Answer: HAVING is used to filter records that work on summarized GROUP BY results.

**27. What is a "UNIQUE" constraint?**

Answer: A UNIQUE constraint ensures that all values in a column are different.

**28. Can the primary key be NULL?**

Answer: No, a primary key cannot be NULL. It must contain a unique value for each row of data.

**29. What is data integrity?**

Answer: Data integrity refers to the accuracy and consistency of data in a database.

**30. Explain the difference between CHAR and VARCHAR data types.**

Answer: CHAR is a fixed-length character type, whereas VARCHAR is a variable-length character type.

**31. What is a "WITH" clause or Common Table Expression (CTE)?**

Answer: A CTE provides a way to write auxiliary statements for use in a larger query.

**32. What is a pivot table in SQL?**

Answer: A pivot table is used to transform or reshape data, which turns unique values from one column into multiple columns in the output.

**33. What is SQL Profiler?**

Answer: SQL Profiler is a tool that allows system administrators to monitor events in the SQL Server.

**34. What is a deadlock in SQL?**

Answer: A deadlock is a situation where two or more transactions are waiting for each other to give up locks.

**35. What are triggers in SQL?**

Answer: Triggers are stored procedures in a database that automatically execute when certain conditions are met.

**36. What is a correlated subquery?**

Answer: A correlated subquery is a subquery that uses values from the outer query.

**37. Explain the use of the SET NOCOUNT ON statement.**

Answer: SET NOCOUNT ON prevents the message that shows the count of affected rows from being returned as part of the results.

**38. What is table partitioning?**

Answer: Table partitioning is the process of dividing a large table into smaller, more manageable pieces while maintaining the overall structure.

**39. What are SQL Server Reporting Services (SSRS)?**

Answer: SSRS is a reporting generation tool that allows creating reports from SQL Server and other data sources.

**40. What is an alias in SQL?**

Answer: An alias is a temporary name given to a table or column for a particular SQL query.

### **Advanced SQL Questions:**

**41. Explain the difference between INNER JOIN and OUTER JOIN.**

Answer: INNER JOIN returns rows when there is at least one match in both tables. OUTER JOIN returns all rows from one table and matched rows from the other.

**42. What is a full-text search in SQL?**

Answer: Full-text search in SQL is a feature for performing complex queries against character-based data.

**43. Explain the use of the EXCEPT clause.**

Answer: EXCEPT returns all rows from the first dataset that do not exist in the second dataset.

**44. What is a window function in SQL?**

Answer: Window functions perform a calculation across a set of table rows that are somehow related to the current row.

**45. What does a cross-apply in SQL?**

Answer: CROSS APPLY is used to join a table to a table-valued function.

**46. What is SQL injection and how can it be prevented?**

Answer: SQL injection is a code injection technique where attackers can execute malicious SQL. It can be prevented by using parameterized queries.

**47. What is the difference between a function and a stored procedure?**

Answer: A function must return a value and cannot modify the data received as parameters, while a stored procedure doesn't have to return a value and can modify data.

**48. What is a temporary table in SQL?**

Answer: Temporary tables are used to store temporary data. They are created in the database for the duration of a session.

**49. What is the use of the COALESCE function?**

Answer: COALESCE returns the first non-null value in a list.

**50. What is a recursive query in SQL?**

Answer: A recursive query refers to itself in its definition.

**51. What are indexed views?**

Answer: Indexed views are views that have been materialized. This means they have been computed and stored in the database.

**52. What is a covering index?**

Answer: A covering index is an index that contains all, and possibly more, columns needed for a query to be processed.

**53. What is the difference between a lock, a block, and a deadlock in SQL?**

Answer: A lock is a mechanism to control concurrent access, a block is a situation where one process is waiting for another to release a lock, and a deadlock is a situation where two or more processes are unable to proceed because each is waiting for the other to release a lock.

**54. What is database replication?**

Answer: Database replication is the process of copying data from one database to another to ensure consistency.

**55. What is the difference between RANK(), DENSE\_RANK(), and ROW\_NUMBER()?**

Answer: RANK() assigns a unique rank to each distinct row, with gaps in the ranking for tied values. DENSE\_RANK() also assigns a unique rank, but without gaps. ROW\_NUMBER() assigns a unique number to each row starting from 1.

**56. What are the uses of the CASE statement in SQL?**

Answer: CASE statements are used to provide if-then-else logic to SQL queries.

**57. What is a materialized view?**

Answer: A materialized view is a database object that contains the results of a query and can be updated as needed.

**58. What is a lateral join?**

Answer: A lateral join allows a subquery in the FROM clause to refer to columns of preceding tables.

**59. What are the best practices for SQL query optimization?**

Answer: Best practices include using proper indexing, avoiding unnecessary columns in SELECT statements, and avoiding complex joins when possible.

**60. What is a sequence in SQL?**

Answer: A sequence is a database object that generates a sequence of numbers according to a specified specification.

**Thank You All**