**Microsoft SQL Server**

1. **Q:** How would you optimize a slow-running SQL query?  
   **A:** Analyze the execution plan, add indexes, and avoid SELECT \*.
2. **Q:** What is the difference between INNER JOIN and LEFT JOIN?  
   **A:** INNER JOIN returns matching rows, while LEFT JOIN returns all rows from the left table and matching rows from the right.
3. **Q:** How would you implement a recursive query in SQL Server?  
   **A:** Use a Common Table Expression (CTE) with a recursive anchor and recursive member.
4. **Q:** What is the difference between WHERE and HAVING?  
   **A:** WHERE filters rows before grouping, while HAVING filters after grouping.
5. **Q:** How would you implement a pivot table in SQL Server?  
   **A:** Use the PIVOT operator to transform rows into columns.
6. **Q:** What is the difference between DELETE and TRUNCATE?  
   **A:** DELETE removes rows one by one and can be rolled back, while TRUNCATE removes all rows at once and cannot be rolled back.
7. **Q:** How would you implement a full-text search in SQL Server?  
   **A:** Use CONTAINS or FREETEXT with a full-text index.
8. **Q:** What is the difference between ROW\_NUMBER(), RANK(), and DENSE\_RANK()?  
   **A:** ROW\_NUMBER() assigns unique numbers, RANK() leaves gaps for ties, and DENSE\_RANK() does not leave gaps.
9. **Q:** How would you implement a transaction in SQL Server?  
   **A:** Use BEGIN TRANSACTION, COMMIT, and ROLLBACK to ensure atomicity.
10. **Q:** What is the difference between a clustered and non-clustered index?  
    **A:** A clustered index determines the physical order of data, while a non-clustered index is a separate structure.
11. **Q:** How would you implement a stored procedure with parameters?  
    **A:** Define the procedure with CREATE PROCEDURE and use @parameter for input.
12. **Q:** What is the difference between UNION and UNION ALL?  
    **A:** UNION removes duplicates, while UNION ALL includes all rows.
13. **Q:** How would you implement a trigger in SQL Server?  
    **A:** Use CREATE TRIGGER to define logic that executes on specific events (e.g., INSERT, UPDATE).
14. **Q:** What is the difference between CHAR and VARCHAR?  
    **A:** CHAR is fixed-length, while VARCHAR is variable-length.
15. **Q:** How would you implement a backup and restore strategy in SQL Server?  
    **A:** Use BACKUP DATABASE and RESTORE DATABASE commands with a schedule.
16. **Q:** What is the difference between CROSS JOIN and INNER JOIN?  
    **A:** CROSS JOIN returns the Cartesian product, while INNER JOIN returns matching rows.
17. **Q:** How would you implement a view in SQL Server?  
    **A:** Use CREATE VIEW to define a virtual table based on a query.
18. **Q:** What is the difference between GROUP BY and DISTINCT?  
    **A:** GROUP BY groups rows for aggregation, while DISTINCT removes duplicates.
19. **Q:** How would you implement a foreign key constraint?  
    **A:** Use ALTER TABLE with ADD CONSTRAINT to enforce referential integrity.
20. **Q:** What is the difference between ISNULL and COALESCE?  
    **A:** ISNULL replaces NULL with a single value, while COALESCE returns the first non-null value in a list.

**SQL**

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