

Advanced SQL & Optimization Quiz (25 Marks)

1. Which isolation level provides the highest level of data consistency but results in the lowest concurrency?

- A. Read Committed
- B. Serializable
- C. Read Uncommitted
- D. Repeatable Read

Answer: B

2. What is a "View" in SQL?

- A. A permanent physical table stored on the disk.
- B. A temporary variable used in calculations.
- C. A virtual table based on the result-set of an SQL statement.
- D. A backup copy of the database schema.

Answer: C

3. Which ACID property ensures that all operations within a transaction are completed; otherwise, the entire transaction is aborted?

- A. Atomicity
- B. Consistency
- C. Isolation
- D. Durability

Answer: A

4. A "Deadlock" occurs when:

- A. The database server runs out of storage space.
- B. A query takes more than 10 seconds to run.
- C. Two transactions are waiting for each other to release locks, preventing both from proceeding.
- D. A user forgets their password.

Answer: C

5. What is the primary purpose of a "Trigger" in SQL?

- A. To speed up SELECT queries.
- B. To automatically execute code in response to events like INSERT, UPDATE, or DELETE.
- C. To allow users to log in to the database.
- D. To define the relationship between two tables.

Answer: B

6. In a transaction lifecycle, which command is used to permanently save changes to the database?

- A. SAVEPOINT
- B. COMMIT
- C. ROLLBACK
- D. SET TRANSACTION

Answer: B

7. Which type of partitioning splits data based on a defined range of values, such as dates or ages?

- A. List Partitioning
- B. Hash Partitioning
- C. Key Partitioning
- D. Range Partitioning

Answer: D

8. What does an "Execution Plan" help a Database Administrator do?

- A. Design the ER diagram.
- B. Set up user passwords.
- C. Understand how the database engine executes a query and identify performance bottlenecks.
- D. Calculate the total number of rows in a table.

Answer: C

9. Which TCL command allows you to roll back a transaction to a specific point rather than the very beginning?

- A. RELEASE
- B. SAVEPOINT
- C. COMMIT
- D. TRUNCATE

Answer: B

10. "Dirty Reads" are a common anomaly where a transaction reads data that hasn't been committed yet. Which isolation level allows this?

- A. Read Committed
- B. Repeatable Read
- C. Serializable
- D. Read Uncommitted

Answer: D

11. What is the difference between a Stored Procedure and a Function?

- A. Functions can return values, while Procedures are generally used to perform actions.
- B. Procedures are faster than Functions.
- C. Functions cannot be used in SELECT statements.
- D. There is no difference.

Answer: A

12. Which concurrency control technique assumes that conflicts are rare and only checks for them before committing?

- A. Pessimistic Concurrency Control
- B. Lock-Based Control
- C. Optimistic Concurrency Control
- D. Deadlock Prevention

Answer: C

13. What happens when you execute a ROLLBACK command?

- A. The database is deleted.
- B. All changes made in the current transaction are undone.
- C. The database is backed up.
- D. The user is logged out.

Answer: B

14. In the context of ACID, "Durability" means:

- A. The data is hard to delete.
- B. The database can handle many users.
- C. Changes persist even in the event of a system failure once the transaction is committed.
- D. The data is encrypted.

Answer: C

15. What is the main goal of "Query Optimization"?

- A. To make the SQL code look cleaner.
- B. To reduce the execution time and resource usage of a query.
- C. To add more columns to a table.
- D. To prevent users from seeing data.

Answer: B

16. A "Stored Procedure" is executed using which keyword?

- A. RUN
- B. CALL (or EXEC)
- C. START
- D. OPEN

Answer: B

17. Which technique is used to automatically detect and resolve deadlocks by terminating one of the transactions?

- A. Deadlock Recovery
- B. Deadlock Prevention
- C. Deadlock Avoidance
- D. Index Rebuilding

Answer: A

18. Which isolation level prevents "Non-Repeatable Reads" but may still allow "Phantom Reads"?

- A. Read Uncommitted
- B. Read Committed
- C. Serializable
- D. Repeatable Read

Answer: D

19. "MVCC" stands for:

- A. Multi-Value Connection Control
- B. Main Variable Consistency Check
- C. Multi-Version Concurrency Control
- D. Manual Version Command Center

Answer: C

20. If you want to log changes before they are applied to a table, you should use:

- A. AFTER UPDATE Trigger
- B. BEFORE UPDATE Trigger
- C. INSTEAD OF DELETE Trigger
- D. AFTER INSERT Trigger

Answer: B

21. The "Transaction State" where a transaction has finished its final statement but is not yet committed is:

- A. Partially Committed
- B. Active
- C. Failed
- D. Aborted

Answer: A

22. Which partitioning type allows you to group data based on a specific set of discrete values (e.g., Region: North, South, East, West)?

- A. Range Partitioning
- B. List Partitioning
- C. Key Partitioning
- D. Hash Partitioning

Answer: B

23. What is the purpose of "Control Flow" (like IF...ELSE) in Stored Procedures?

- A. To change the color of the output.
- B. To add logic and decision-making to SQL scripts.
- C. To encrypt the database password.
- D. To connect to the internet.

Answer: B

24. A "Phantom Read" occurs when:

- A. A row disappears while you are reading it.
- B. The data turns into a secret code.
- C. New rows are added by another transaction that match your query criteria during your transaction.
- D. The query returns 0 results.

Answer: C

25. Which SQL statement is used to define the characteristics of a transaction, such as its isolation level?

- A. COMMIT
- B. SET TRANSACTION
- C. UPDATE TRANSACTION
- D. LOCK TRANSACTION

Answer: B