Database Systems
SQL and Relational Model Quiz

Instructions:

- Answer all questions.
- For Questions 1–5, choose the best option.
- For Questions 6–8, mark True or False.
- For Questions 9–10, write detailed answers with SQL examples where appropriate.

1. Which normal form eliminates transitive dependencies?

(A) First Normal Form (1NF)

(B) Second Normal Form (2NF)

(C) Third Normal Form (3NF)

(D) Boyce-Codd Normal Form (BCNF)

2. Which SQL clause is used to filter groups created by GROUP BY?

(A) WHERE

(B) HAVING

(C) ORDER BY

(D) FILTER

3. A foreign key constraint ensures:

(A) All values in a column are unique

(B) Values reference existing values in another table

(C) No NULL values exist in the column

(D) The column is indexed automatically

4. Which type of JOIN returns all rows from both tables, matching where possible?

(A) INNER JOIN

(B) LEFT JOIN

(C) RIGHT JOIN

(D) FULL OUTER JOIN

5. The ACID property "Isolation" ensures:

(A) Transactions are permanent once committed

(B) Database remains consistent after transactions

(C) Concurrent transactions don't interfere with each other

(D) Transactions complete entirely or not at all

6. A primary key can contain NULL values. (True/False)

7. The DELETE statement can be rolled back if within a transaction. (True/False)

8. An index always improves query performance. (True/False)

9. Explain database normalization and its purpose. Describe First, Second, and Third Normal Forms with examples of tables that violate each form and how to correct them.

10. Discuss the ACID properties of database transactions. Explain each property and describe mechanisms databases use to ensure these properties are maintained.