Sec-A Assignment - 2

1. List some Integrity Constraints:
   - Primary key Constraints
   - Foreign key constraints
   - Unique constraints
   - Not Null Constraints
   - Check constraints

Q. What is selection operation in relational algebra?

Ans It selects rows that satisfy a given predicate.
Syntax: σ Condition (Relation)

3. Short notes on SELECT command in SQL:

Ans SELECT is used to retrieve data from a database.

Example: SELECT * FROM student;

4. Short notes on COUNT (*) command in SQL:

Ans COUNT (*) returns the total number of rows in a table, including NULL values.

Example: SELECT COUNT (*) FROM Students;

Section-B

1. What is relational calculus, explain?

ans Relational calculus is a non-Procedeural query language. It tells what to retrieve rather than how.

Types:

- Tuple Relational Calculus (TRC)
- Domain Relational Calculus (DRC)

Example (TRC): $\{t \mid t \in \text{Student} \wedge t.\text{marks} > 50\}$

2. List and explain aggregate functions in SQL:

- COUNT(): Returns the number of rows.
- SUM(): Calculates total of a numeric column.
- AVG(): Returns average value.
- MIN(): finds minimum value.
- MAX(): finds maximum value.

Example: SELECT AVG (Smarks) FROM Student;

Sec-C

1. Explain Codd's 12 rules in relational database:

Codd's rules define what is required from a DBMS for it to be considered relational:

- Rule 1: Information Rule
- Rule 2: Guaranteed Access Rule
- Rule 3: Systematic Treatment of NULLs.
- Rule 4: Dynamic Online Catalog.
- Rule 5: Comprehensive Data sub-language.
- Rule 6: View Updating Rule
- Rule 7: High-level Insert, Update, Delete
- Rule 8: Physical Data Independence
- Rule 9: Logical Data Independence.
- Rule 10: Integrity Independence.
- Rule 11: Distribution Independence.
- Rule 12: Non-Subversion Rule.

2. Create STUDENT table and Perform SQL Operation:

```
-- Create Table
CREATE TABLE STUDENT (
    Sroll INT PRIMARY KEY,
    Sname VARCHAR(50),
    Saddr VARCHAR(100),
    Smark INT
);
-- INSERT Operation
INSERT INTO STUDENT VALUES (1, 'John', 'Delhi', 85);
-- UPDATE Operation
UPDATE STUDENT SET Smark = 90 WHERE Sroll = 1;
-- DELETE Operation
DELETE FROM STUDENT WHERE Sroll = 1;
```