DML – INSERT Command (Detailed Notes)

1. What is INSERT?

The **INSERT** command is used to **add new records (rows)** into an existing table.

- It works on **table data**, not structure
- It adds data **row by row**
- INSERT is a **DML command**
- Changes made by INSERT can be controlled using **COMMIT** and **ROLLBACK**

2. Basic INSERT Syntax

2.1 Insert values into all columns

INSERT INTO table_name

VALUES (value1, value2, value3);

⚠️ Order of values must match the table's column order.

2.2 Insert values into specific columns

INSERT INTO table_name (column1, column2)

VALUES (value1, value2);

✔️ Safer and more commonly used
✔️ Column order can be changed

3. Example Table

Assume we have this table:

STUDENTS

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id | name | age | city

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4. INSERT Examples

4.1 Insert into all columns

INSERT INTO students

VALUES (1, 'Riya', 20, 'Mumbai');

✔️ Inserts one complete record

4.2 Insert into specific columns

INSERT INTO students (id, name, city)

VALUES (2, 'Aman', 'Delhi');

✔️ Age will be **NULL** if allowed

4.3 Insert multiple rows

INSERT INTO students (id, name, age, city)

VALUES

(3, 'Neha', 21, 'Pune'),

(4, 'Rahul', 22, 'Ahmedabad');

✔️ Inserts more than one record at once

4.4 Insert using SELECT

INSERT INTO backup_students

SELECT * FROM students;

✔️ Copies data from one table to another

5. Important Rules of INSERT

- Data type must match column type

- NOT NULL columns must have values

- Primary key values must be unique

- INSERT does not create a table

- INSERT can be rolled back before COMMIT

6. INSERT with Transaction Control

INSERT INTO students VALUES (5, 'Kiran', 23, 'Surat');

ROLLBACK;

❌ Data is not saved

INSERT INTO students VALUES (6, 'Mehul', 24, 'Rajkot');

COMMIT;

✔️ Data is permanently saved

7. Common Mistakes

❌ Forgetting column order
❌ Mismatch of data types
❌ Missing required columns
❌ Duplicate primary key values
❌ Forgetting WHERE is **not applicable** in INSERT

8. Real-World Use Cases

- Registering a new user

- Adding new customer details

- Creating student or employee records

- Logging transactions

Practice Questions – INSERT Command

Practice Set 1: Basic

1. Insert a student with ID 10, name "Anjali", age 19, city "Jaipur".

2. Insert a record by specifying only id and name.

3. Insert two student records in a single query.

Practice Set 2: Conceptual

4. What happens if a NOT NULL column is skipped?

5. Can INSERT be rolled back? Explain.

6. Difference between inserting with column names vs without column names.

Practice Set 3: Scenario Based

7. A table has a primary key. What error occurs if you insert a duplicate value?

8. How do you copy data from one table to another using INSERT?

Mini Challenge 🧠

Write an INSERT query for a table:

EMPLOYEES (emp_id, emp_name, salary, department)

Insert:

- emp_id = 101

- emp_name = "Rohit"

- salary = 45000

- department = "IT"