Module 1 – DDL (Data Definition Language)

Defines and modifies database structure.

Keyword	Meaning	Usage
CREATE TABLE	Create new table	Use when creating new tables
ALTER TABLE	Modify table	Add/Drop/Modify columns
DROP TABLE	Delete table	Remove obsolete table
TRUNCATE	Empty table	Remove all rows
PRIMARY KEY	Unique identifier	Identify rows uniquely

Example:

```
CREATE TABLE Department (dept_id INT PRIMARY KEY, dept_name VARCHAR(50) UNIQUE);
```

5 Practice Questions:

- Create Student table with constraints
- Alter table to add column
- Difference DROP vs TRUNCATE
- Foreign key example
- UNIQUE usage

Module 2 – DML (Data Manipulation Language)

Manipulates data within tables.

Keyword	Meaning	Usage
INSERT INTO	Insert new row	Add new data
VALUES	Data values	Provide values for insert
UPDATE	Modify row	Change existing data
DELETE FROM	Delete row	Remove unwanted data

Example:

```
INSERT INTO Employee (emp_name, age, dept_id) VALUES ('Awinash',24,1);
```

5 Practice Questions:

- Insert multiple rows
- Update rows with condition
- Delete rows with condition
- DELETE without WHERE?
- VALUES usage

Module 3 – DQL (Data Query Language)

Fetches and queries data.

Keyword	Meaning	Usage
SELECT	Retrieve data	Get columns from table
DISTINCT	Remove duplicates	Get unique values
WHERE	Filter rows	Select based on condition

ORDER BY	Sort data	ASC/DESC order
LIKE	Pattern matching	Search with % or _

Example:
```
SELECT DISTINCT emp_name FROM Employee WHERE age BETWEEN 20 AND 30 ORDER BY emp_name ASC;
```

5 Practice Questions:
- Names starting with A
- Distinct dept IDs
- Age=25 or 30
- Sort by age DESC
- BETWEEN vs IN difference

Module 4 – Aggregates & Grouping

Summarizes data into groups.

Keyword	Meaning	Usage
COUNT()	Row count	Count employees per dept
SUM()	Total sum	Calculate total salary
AVG()	Average	Average marks
GROUP BY	Group rows	Aggregate per group
HAVING	Filter groups	Condition after grouping

Example:
```
SELECT dept_id, COUNT(*) AS total_emps, AVG(age) AS avg_age FROM Employee GROUP BY dept_id HAVING COUNT(*)>2;
```

5 Practice Questions:
- Count employees per dept
- Average age per dept
- Depts with >3 employees
- WHERE vs HAVING
- Max & Min age

Module 5 – Joins

Combines rows from multiple tables.

Keyword	Meaning	Usage
INNER JOIN	Matching rows only	Combine related data
LEFT JOIN	All left rows	Show all employees
RIGHT JOIN	All right rows	Show all departments
FULL OUTER JOIN	All rows both sides	Show everything
ON	Join condition	Column to match

Example:
```
SELECT e.emp_name,d.dept_name FROM Employee e INNER JOIN Department d ON e.dept_id=d.dept_id;
```

5 Practice Questions:

- Employee + Dept names
- All depts even without employees
- INNER vs OUTER JOIN
- Self join example
- Join 3 tables

Module 6 – Subqueries

Query inside another query.

Keyword	Meaning	Usage
IN	Matches values in subquery	Select employees in certain dept
ANY/ALL	Compare multiple values	Conditional filtering
Correlated Subquery	References outer query	Row-by-row comparison

Example:
```
SELECT emp_name FROM Employee WHERE dept_id IN (SELECT dept_id FROM Department WHERE dept_name='IT');
```

5 Practice Questions:
- Employees in Sales
- Employees older than avg age
- Correlated vs non-correlated
- Subquery in FROM clause
- Subquery vs JOIN

Module 7 – Transactions & Security

Executes multiple statements as one unit and manages permissions.

Keyword	Meaning	Usage
START TRANSACTION	Begin transaction	Multiple statements as one unit
COMMIT	Save changes	Make changes permanent
ROLLBACK	Undo changes	Revert to previous state
GRANT	Give permission	User access
REVOKE	Remove permission	Remove user access

Example:
```
START TRANSACTION; UPDATE Employee SET age=age+1 WHERE dept_id=1; COMMIT;
```

5 Practice Questions:
- ACID properties
- Start, Commit, Rollback transaction
- Difference COMMIT vs ROLLBACK
- Grant SELECT privilege
- Revoke permissions