# DBMSI VIVA

## 🎓 Viva Questions & Answers – DMSL Practicals (1–5)

### 🧩 Practical 1 – Basic SQL Table Creation and Constraints

**Q1.** What is a primary key?

**A.** A column that uniquely identifies each record in a table.

**Q2.** What is a foreign key?

**A.** A key used to link two tables; it references the primary key of another table.

**Q3.** Can a table have multiple primary keys?

**A.** No, only one primary key per table, but it can be composite.

**Q4.** What is a default constraint?

**A.** It assigns a predefined value to a column when no value is given.

**Q5.** What is the purpose of a check constraint?

**A.** It ensures that all values in a column meet a specific condition.

### 🧩 Practical 2 – PL/SQL Block (Control Structure & Exception Handling)

**Q1.** What are the sections in a PL/SQL block?

**A.** DECLARE, BEGIN, EXCEPTION, and END.

**Q2.** What is an exception in PL/SQL?

**A.** An error or abnormal condition that disrupts normal program flow.

**Q3.** What are the two types of exceptions?

**A.** Predefined and user-defined exceptions.

**Q4.** What is the use of the DECLARE section?

**A.** It is used to declare variables and constants.

**Q5.** How does PL/SQL handle exceptions?

**A.** Using the EXCEPTION section with handlers like `WHEN NO_DATA_FOUND THEN`.

## 🧩 Practical 3 – Customer & Account (SQL Joins & Aggregation)

**Q1.** What is a join in SQL?

**A.** It combines data from two or more tables based on a related column.

**Q2.** Difference between INNER JOIN and LEFT JOIN?

**A.** INNER JOIN shows only matching rows; LEFT JOIN shows all rows from the left table.

**Q3.** What is a natural join?

**A.** A join that automatically matches columns with the same name in both tables.

**Q4.** What does GROUP BY do?

**A.** Groups rows sharing the same values so aggregate functions can be applied.

**Q5.** What is the HAVING clause used for?

**A.** To filter groups created by GROUP BY after aggregation.

## 🧩 Practical 4 – Library Fine Calculation (PL/SQL Block)

**Q1.** What is the purpose of SYSDATE?

**A.** It returns the current system date and time.

**Q2.** What is a cursor in PL/SQL?

**A.** A pointer that allows row-by-row processing of query results.

**Q3.** How do you calculate fine in PL/SQL?

**A.** By comparing the due date and return date, applying a rate per late day.

**Q4.** What is an IF–ELSE statement used for?

**A.** For conditional execution of statements based on logical tests.

**Q5.** Why is status updated from 'I' to 'R'?

**A.** To indicate that the book is returned instead of issued.

### 🧩 Practical 5 – Student–Instructor–Course Database

**Q1.** What does the HAVING clause do?

**A.** It filters aggregated results in a GROUP BY query.

**Q2.** How can we increase salary by 10% in SQL?

**A.** Using `UPDATE table SET salary = salary * 1.10`.

**Q3.** What is the use of NOT IN operator?

**A.** To exclude specific values from a result set.

**Q4.** How do you find substrings in names?

**A.** By using `LIKE '%am%'` in the WHERE clause.

**Q5.** What is the purpose of a JOIN in this practical?

**A.** To combine student and course data to show which student takes which subject.

# 🎓 Viva Questions & Answers – DMSL Practicals (6–10)

### 🧩 Practical 6 – Cursors in PL/SQL

**Q1.** What is a cursor in PL/SQL?

**A.** A cursor is a pointer to the result set of a query that allows row-by-row processing.

**Q2.** What are the types of cursors?

**A.** Implicit (handled automatically) and explicit (defined by the programmer).

**Q3.** What are cursor attributes?

**A.** `%FOUND`, `%NOTFOUND`, `%ROWCOUNT`, and `%ISOPEN` give cursor status information.

**Q4.** What is a parameterized cursor?

**A.** A cursor that accepts parameters to filter data dynamically.

**Q5.** Why use cursors in PL/SQL?

**A.** To handle multiple rows returned by a query one at a time.

## 🧩 Practical 7 – Stored Procedure (Grade Calculation)

**Q1.** What is a stored procedure?

**A.** A precompiled block of SQL statements stored in the database.

**Q2.** What are IN, OUT, and INOUT parameters?

**A.** IN passes data to the procedure, OUT returns data, and INOUT does both.

**Q3.** How is a procedure different from a function?

**A.** A procedure doesn't return a value directly; a function always returns one.

**Q4.** What are the advantages of stored procedures?

**A.** Better performance, reusability, and centralized logic.

**Q5.** How do you execute a procedure?

**A.** Using the `CALL procedure_name();` statement in MySQL.

## 🧩 Practical 8 – PL/SQL Loop for Circle Area

**Q1.** What are the types of loops in PL/SQL?

**A.** Simple loop, FOR loop, and WHILE loop.

**Q2.** What is the difference between FOR and WHILE loops?

**A.** FOR has a fixed range; WHILE runs until a condition becomes false.

**Q3.** How can you exit a loop early?

**A.** Using the `EXIT` or `EXIT WHEN` statement.

**Q4.** What is the purpose of using loops here?

**A.** To repeatedly calculate and insert multiple records like circle areas.

**Q5.** What is the syntax of a FOR loop?

**A.** `FOR i IN start..end LOOP ... END LOOP;`

## 🧩 Practical 9 – Triggers

**Q1.** What is a trigger?

**A.** A stored block that executes automatically when a specific event occurs on a table.

**Q2.** What are types of triggers?

**A.** BEFORE, AFTER, and INSTEAD OF triggers.

**Q3.** When does a BEFORE trigger execute?

**A.** Before an insert, update, or delete operation occurs.

**Q4.** What is the practical use of triggers?

**A.** For enforcing business rules or automatic logging.

**Q5.** Can a trigger call another trigger?

**A.** Yes, if an operation inside it causes another triggering event.

## 🧩 Practical 10 – MongoDB OrderInfo Collection

**Q1.** What is a collection in MongoDB?

**A.** A collection is similar to a table in SQL that stores multiple JSON-like documents.

**Q2.** What is a document?

**A.** A single record in MongoDB represented in BSON (Binary JSON) format.

**Q3.** What is the use of `$match` in aggregation?

**A.** It filters documents based on given conditions.

**Q4.** How do you create an index in MongoDB?

**A.** Using `db.collection.createIndex({ field: 1 })` .

**Q5.** What is the difference between `insertOne()` and `insertMany()` ?

**A.** `insertOne()` adds a single document, while `insertMany()` adds multiple at once.

## 🎓 Viva Questions & Answers – DMSL Practicals (11–15)

## 🧩 Practical 11 – MongoDB Movies Collection

**Q1.** What does `insertOne()` do?

**A.** It inserts a single document into a MongoDB collection.

**Q2.** How do you find documents with a condition?

**A.** Using `find()` with a filter, e.g. `db.movies.find({budget:{$gt:100000}})` .

**Q3.** What does `$gt` mean in MongoDB?

**A.** It means "greater than" and filters values above a given number.

**Q4.** How do you update multiple documents?

**A.** Using `updateMany()` instead of `updateOne()` .

**Q5.** What is dot notation used for?

**A.** To access nested fields inside embedded documents, like `"producer.name"` .

## 🧩 Practical 12 – MongoDB Teachers–Department–Students

**Q1.** What is a nested document in MongoDB?

**A.** A document that contains another document as a field value.

**Q2.** How do you use `$or` in MongoDB?

**A.** It filters documents matching at least one of multiple conditions.

**Q3.** What is the use of `updateOne()` ?

**A.** It updates the first document that matches a filter.

**Q4.** How do you delete multiple documents?

**A.** Using `deleteMany()` with a condition.

**Q5.** Why create indexes in MongoDB?

**A.** To improve query performance and speed of searching.

## 🧩 Practical 13 – MongoDB Aggregation and Indexing

**Q1.** What is aggregation in MongoDB?

**A.** A process of performing calculations on grouped data like SQL GROUP BY.

**Q2.** What does `$group` do?

**A.** Groups documents by a field and applies accumulators like `$sum` , `$avg` .

**Q3.** What does `$avg` calculate?

**A.** It returns the average value of a numeric field.

**Q4.** How do you drop an index?

**A.** Using `db.collection.dropIndex("index_name")` .

**Q5.** Why use aggregation instead of simple queries?

**A.** To perform complex computations like totals and averages in one query.

## 🧩 Practical 14 – MongoDB MapReduce

**Q1.** What is MapReduce?

**A.** It's a data processing model that maps data to key-value pairs and reduces results.

**Q2.** What is the role of the map function?

**A.** It emits key-value pairs for processing.

**Q3.** What is the role of the reduce function?

**A.** It combines and summarizes values with the same key.

**Q4.** What does `emit()` do in MapReduce?

**A.** Emits a key and its value during the map phase.

**Q5.** Difference between aggregation and MapReduce?

**A.** Aggregation is simpler and faster; MapReduce is more flexible for large data sets.

## 🧩 Practical 15 – MongoDB Student Marks Aggregation

**Q1.** What does `$max` operator do?

**A.** It returns the highest value from grouped documents.

**Q2.** What does `$min` operator do?

**A.** It returns the lowest value from grouped documents.

**Q3.** What does `$sum` calculate?

**A.** The total of numeric fields in a group.

**Q4.** What does `$avg` represent?

**A.** The average value of numeric data.

**Q5.** What is the purpose of `$group` in aggregation?

**A.** To group documents based on a specific field for summarization.

# 🎓 Viva Questions & Answers – DMSL Practicals (16–20)

## 🧩 Practical 16 – MongoDB MapReduce (Salary Calculation)

**Q1.** What is the purpose of the map function?

**A.** It processes each document and emits key-value pairs for reduction.

**Q2.** What is the reduce function used for?

**A.** It aggregates and combines all values that share the same key.

**Q3.** What is MapReduce mainly used for?

**A.** For complex calculations like total salary or count across large data sets.

**Q4.** What is the use of the `out` option in MapReduce?

**A.** It defines where the output of MapReduce will be stored.

**Q5.** Difference between MapReduce and aggregation?

**A.** Aggregation is faster; MapReduce is more flexible and customizable.

## 🧩 Practical 17 – MongoDB OrderInfo Updates

**Q1.** How do you remove a field from a document?

**A.** Using `$unset`, e.g., `db.collection.update({},{$unset:{field:1}})`.

**Q2.** What does `$or` do?

**A.** Combines multiple conditions, returning documents that match any.

**Q3.** How do you increment a value?

**A.** Using `$inc`, e.g., `db.collection.update({},{$inc:{amount:100}})`.

**Q4.** Difference between `$inc` and `$mul` ?

**A.** `$inc` adds a value, `$mul` multiplies a value.

**Q5.** What is `$set` used for?

**A.** To update or add a specific field in a document.

## 🧩 Practical 18 – SQL Employee–Company Database

**Q1.** What is a `CASE` statement used for?

**A.** To apply conditional logic within a SQL statement.

**Q2.** What is the difference between `UPDATE` and `ALTER` ?

**A.** `UPDATE` changes data; `ALTER` modifies table structure.

**Q3.** What is a foreign key?

**A.** It enforces a relationship between two tables.

**Q4.** What is the use of `DELETE` ?

**A.** To remove records from a table while keeping the structure.

**Q5.** What is a composite key?

**A.** A key formed by combining two or more columns to uniquely identify a record.

## 🧩 Practical 19 – MongoDB Employee Collection

**Q1.** What is the difference between `insertOne()` and `insertMany()` ?

**A.** `insertOne()` adds a single document; `insertMany()` adds multiple at once.

**Q2.** How do you drop a collection?

**A.** Using `db.collection.drop()` .

**Q3.** How do you rename a collection?

**A.** Using `db.collection.renameCollection("newName")` .

**Q4.** What is `$regex` used for?

**A.** For pattern matching in string searches.

**Q5.** What does `sort()` do in MongoDB?

**A.** It orders the output by specified fields, ascending or descending.

### 🧩 Practical 20 – SQL Duty Allocation

**Q1.** What is a view in SQL?

**A.** A virtual table created using the result of a SELECT query.

**Q2.** What is an aggregate function?

**A.** A function that performs a calculation on multiple values, e.g., `SUM()`, `AVG()`.

**Q3.** What does `GROUP BY` do?

**A.** Groups rows with the same values for aggregation.

**Q4.** What is a foreign key used for?

**A.** To maintain referential integrity between two tables.

**Q5.** What is the purpose of `COUNT()`?

**A.** To return the total number of rows that meet a condition.

## 🎓 Viva Questions & Answers – DMSL Practicals (21–23)

### 🧩 Practical 21 – Employee–Company–Manager (SQL Joins & Updates)

**Q1.** What is a self-join?

**A.** It's a join where a table is joined with itself to compare related data in the same table.

**Q2.** What does `NOT IN` do?

**A.** It excludes rows that match a list or subquery of specified values.

**Q3.** What is the purpose of aliasing (`AS`)?

**A.** To assign a temporary name to a table or column for readability.

**Q4.** How do you update salaries in SQL?

**A.** Using the `UPDATE` statement with arithmetic operations like `salary = salary * 1.10`.

**Q5.** What is the difference between `DELETE` and `DROP` ?

**A.** `DELETE` removes records, while `DROP` removes the entire table structure.

## 🧩 Practical 22 – Advanced Employee–Company Queries

**Q1.** What is a correlated subquery?

**A.** A subquery that depends on values from the outer query to execute.

**Q2.** What does `> ALL` mean in SQL?

**A.** It compares a value to all values in a subquery and returns true if greater than every one.

**Q3.** What is the use of `NOT EXISTS` ?

**A.** It returns rows when the subquery finds no matching rows.

**Q4.** What is the role of `HAVING` in aggregation?

**A.** It filters aggregated data after a `GROUP BY` operation.

**Q5.** How can you find the company with the maximum employees?

**A.** Use `COUNT()` with `GROUP BY` and `ORDER BY DESC LIMIT 1` .

## 🧩 Practical 23 – Employee Table (Constraints, Index & View)

**Q1.** What is an index in SQL?

**A.** A data structure that improves query performance by speeding up searches.

**Q2.** What is `AUTO_INCREMENT` used for?

**A.** To automatically generate sequential numeric values for a column.

**Q3.** What is the difference between a table and a view?

**A.** A table stores physical data, while a view is a virtual table derived from a query.

**Q4.** What does the `DEFAULT` constraint do?

**A.** It automatically assigns a predefined value if no value is given during insert.

**Q5.** How do you add a new column after table creation?

**A.** Using `ALTER TABLE table_name ADD column_name datatype;` .

Create following tables with primary and foreign key and solve the queries given below

Person (driver_id, name, address)

Car (license, model, year)

Accident (report_no, date_acc, location)

Owns (driver_id, license)

Participated (driver_id,  model,  report_no, damage_amount)

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# 🔍 3. Views

**Q9.** What is a view?

**A:** A view is a virtual table based on the result of an SQL query.

**Q10.** Can we update data through a view?

**A:** Yes, if the view is based on a single table and doesn't use aggregation or joins that prevent updates.

**Q11.** How did you create `Driver_Car_View` ?

**A:** By joining `Person` , `Owns` , and `Car` tables to show each driver's name and car model.

**Q12.** What is the difference between `CREATE VIEW` and `CREATE OR REPLACE VIEW` ?

**A:** `CREATE` is used initially, while `CREATE OR REPLACE` modifies an existing view without dropping it first.

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# 🔢 4. Sequences

**Q13.** What is a sequence in SQL?

**A:** A sequence automatically generates numeric values, often used for primary keys.

**Q14.** What is the starting value and increment in `seq_report_no` ?

**A:** It starts at **6001** and increments by **5**.

**Q15.** How do you use a sequence in an `INSERT` statement?

**A:** `INSERT INTO Person VALUES (seq_driver_id.NEXTVAL, 'Name', 'City');`

# 🧭 5. Indexes

**Q16.** What is an index?

**A:** An index improves the speed of data retrieval operations.

**Q17.** What is the difference between a normal index and a unique index?

**A:** A **unique index** ensures all values in the indexed column are distinct.

**Q18.** What is a composite index?

**A:** An index created on multiple columns, e.g., `CREATE INDEX idx_car_model_year ON Car(model, year);`

**Q19.** Why did we create an index on `damage_amount`?

**A:** To speed up queries that frequently filter or sort by `damage_amount`.

# 🪞 6. Synonyms

**Q20.** What is a synonym in SQL?

**A:** A synonym is an alias for a database object like a table or view.

**Q21.** Why do we create a synonym for the `Accident` table?

**A:** To simplify queries — instead of typing `Accident`, we can use `acc_info`.

**Q22.** Can synonyms be public or private?

**A:** Yes — **private synonyms** are accessible to one user, **public synonyms** to all users.