

Module 8 - Basic Relational DBMS Concepts

What is a Relational DBMS?

A **Relational Database Management System (RDBMS)** is a type of software that stores data in the form of **tables**. Think of it like a collection of spreadsheets, where each spreadsheet represents one table with organized data.

1. Table (Relation)

**What it is:**

A **table** is a set of data arranged in **rows** and **columns**. Each table stores data about one kind of object or concept.

**Example:**

A table named "Students" might look like this:

StudentID	Name	Age	Class
101	Alice	15	10-A
102	Bob	14	9-B
103	Charlie	15	10-A

This entire table is called a **relation** in database terminology.

2. Tuple (Row)

**What it is:**

A **tuple** is a single **row** in a table. It represents **one record**.

**Example:**

The row:

101	Alice	15	10-A
-----	-------	----	------

is a tuple. It represents one student's data.

3. Attribute (Column)

**What it is:**

An **attribute** is a **column** in the table. It represents a specific **property** of the data.

Course  
&  
Test Series

Data and Database Management System

Example:

In the "Students" table, the attributes are:

- StudentID
- Name
- Age
- Class

Each column holds the same type of data for all rows.

4. Relation Schema

What it is:

A relation schema is the **structure or design** of the table. It defines the table name, its attributes, and the type of data each attribute can hold.

Example:

Schema for the "Students" table:

Students(StudentID: Integer, Name: String, Age: Integer, Class: String)

This tells us that:

- The table is named "Students"
- It has four attributes: StudentID, Name, Age, and Class
- Each attribute has a data type (like Integer or String)

5. Relation Key (Primary Key)

What it is:

A key is used to **uniquely identify** each row in the table.

The most important type of key is the **Primary Key**. It must be:

- Unique (no two rows can have the same key value)
- Not null (cannot be empty)

Example:

In the "Students" table, StudentID is a good **primary key** because:



CBSE



ICSE



NTSE



Banking &  
Insurance



Central Govt.  
Service



State Govt.  
Services



LAW  
Entrance



MBA  
Entrance



Railways & Metro  
Services

...many more

abhyasonline.in



Course  
&  
Test Series

Data and Database Management System

- Each student has a unique ID
- No ID is missing or duplicated

6. Relational Integrity Constraints

These are rules that help keep the data in the database correct, complete, and consistent.

There are three main types:

a) Domain Constraint

This rule ensures that the value of an attribute is valid.

Example:

If the Age attribute is defined as a number:

- Valid: Age = 15
- Invalid: Age = "fifteen" (text is not allowed)

b) Entity Integrity Constraint

This rule applies to the primary key:

- It cannot be null
- It must be unique

Example:

If StudentID is the primary key:

- You cannot have two students with the same StudentID
- Every student must have a StudentID

c) Referential Integrity Constraint

This rule ensures that relationships between tables remain consistent.

Example:

Suppose we have another table called "Marks":



CBSE



ICSE



NTSE



Banking &  
Insurance



Central Govt.  
Service



State Govt.  
Services



LAW  
Entrance



MBA  
Entrance



Railways & Metro  
Services



...many more

abhyasonline.in



Course  
&  
Test Series

Data and Database Management System

StudentID	Subject	Marks
101	Math	90
102	Science	85

Here, StudentID is a **foreign key** that refers to the "Students" table.

The rule says:

Every StudentID in the "Marks" table **must exist** in the "Students" table.

So, this would be invalid:

999	English	80
-----	---------	----

Because StudentID 999 does not exist in the "Students" table.

Assignment

Ques 1: Given the following table, answer the questions below:

StudentID	Name	Age	Class
201	Riya	14	9-A
202	Sameer	15	10-B
203	Tanvi	14	9-A

- How many tuples are in this table?
- List the attributes in the table.
- What would be a good primary key for this table?

Ques 2: Fill in the blanks with the correct terms:

- A \_\_\_\_\_ is a row in a table and represents one record.
- A \_\_\_\_\_ is a column in a table and shows a property of the data.
- The structure of a table is defined in the \_\_\_\_\_.
- A \_\_\_\_\_ must be unique and cannot be null.

 **CBSE**  
 **ICSE**  
 **NTSE**  
 **Banking & Insurance**  
 **Central Govt. Service**  
 **State Govt. Services**  
 **LAW Entrance**  
 **MBA Entrance**  
 **Railways & Metro Services**  
**...many more**  
**abhyasonline.in**