**Database Set up and Schema Setup**

1.Domain: Library

* Create database

**CREATE DATABASE Library**

**USE Library;**

* Categories tables relating to library

**CREATE TABLE Category\_book (**

**category\_id INT PRIMARY KEY,**

**category\_name VARCHAR(100) NOT NULL**

**);**

* Book\_Author table

**CREATE TABLE Author (**

**author\_id INT PRIMARY KEY,**

**name VARCHAR(100) NOT NULL**

**);**

* Books table

**CREATE TABLE Books (**

**book\_id INT PRIMARY KEY,**

**title VARCHAR(200) NOT NULL,**

**category\_id INT,**

**published\_year INT,**

**FOREIGN KEY (category\_id) REFERENCES Categories(category\_id)**

**);**

* BookAuthor mapping table

**CREATE TABLE BookAuthor (**

**book\_id INT,**

**author\_id INT,**

**PRIMARY KEY (book\_id, author\_id),**

**FOREIGN KEY (book\_id) REFERENCES Books(book\_id),**

**FOREIGN KEY (author\_id) REFERENCES Authors(author\_id)**

**);**

* Student table

**CREATE TABLE students (**

**student\_id INT PRIMARY KEY,**

**name VARCHAR(100) NOT NULL,**

**email VARCHAR(100) UNIQUE NOT NULL,**

**join\_date DATE NOT NULL**

**);**

* Loans table

**CREATE TABLE Loans (**

**loan\_id INT PRIMARY KEY,**

**book\_id INT,**

**student\_id INT,**

**loan\_date DATE,**

**return\_date DATE,**

**FOREIGN KEY (book\_id) REFERENCES Books(book\_id),**

**FOREIGN KEY (student\_id) REFERENCES studtns(student\_id)**

**);**

**ER Diagram:**

**Categories\_book ───< Books >─── BookAuthor >─── Authors**

**│**

**Loans**

**│**

**Students**

**Step2: Interview Questions:**

1. .What is normalization?

Ans: **Normalization is the process of organizing data in a relational database to reduce data redundancy and improve data integrity.**

1. Explain primary vs foreign key:

Ans: Primary Key: **A Primary Key is a column in a table that uniquely identifies each row**

Foreign Key**: A Foreign Key is a column that creates a relationship between two tables by referring to the Primary Key of another table**.

Difference: 1.primary key: Must be **unique**,**Cannot be NULL**

2. Foreign Key: Can have **duplicates values,**

Can contain **NULLs** (if allowed)

1. .What are constraints?

Ans: **Constraints are rules applied to columns in a table to enforce data integrity, consistency, and accuracy in the database.**

1. What is a surrogate key?

Ans: **A Surrogate Key is an artificial unique identifier used in a table, not derived from the actual business data**.

1. How do you avoid data redundancy?

Ans: **Data redundancy** means storing the **same piece of data in multiple places**, which can lead to:Inconsistency,Waste of storage

1. .What is ER diagram?

Ans: **An ER Diagram (Entity-Relationship Diagram) is a visual representation of a database’s structure**

1. What are the types of relationships in DBMS?

Ans: **One-to-One**

**One-to-Many**

**Many-to-Many**

1. .Explain the purpose of AUTO\_INCREMENT

Ans: **AUTO\_INCREMENT is a column attribute used in SQL to automatically generate unique numeric values for new records — typically used for primary keys**.

1. What is the default storage engine in MySQL?

Ans: InnoDB was made the default for mysql

1. What is a composite key?

Ans: **A composite key is a combination of two or more columns in a table that together uniquely identify each row**