**Part 1**

1.1. SQL plays a crucial role in managing data for dynamic websites like online stores by providing a structured way to store, retrieve, and manipulate data. Product information, user accounts, and order details are typically stored in SQL databases, allowing efficient querying and management.

1.2. Role of sql in web application is that it facilitates the management of data in web applications by providing a standardized language for creating, querying, updating, and deleting data in databases.

1.3. 3 benefits of using SQL for web applications:

* Data Integrity: Ensures data consistency and accuracy.
* Data Organization: Provides a structured way to organize and relate data.
* Data Retrieval Capabilities: Enables efficient retrieval of specific data based on various criteria.

1.4.

* Efficiency: SQL allows optimized queries that execute quickly, enhancing application performance.
* Data Organization: Tables and relationships in SQL databases help organize complex data structures.
* Data Retrieval: SQL queries can fetch specific data subsets, supporting various application functionalities.

1.5. 3 Database Management Systems:

* PostgreSQL
* MySQL
* Microsoft SQL Server

**Part 2**

2.1. A database table is a structured collection of data organized into rows and columns. It’ s similarity to a spreadsheet, is that it holds data in a tabular format but offers more robust data management capabilities like indexing and relational operations.

2.2. Columns in a database table define the types of data each field can contain. For example, in a table storing expenses, a "sales" column might store numerical values representing sold price.

2.3. Importance of data types:

* Data types enforce rules about what kind of data can be stored in each column, preventing incorrect data entry.
* Properly chosen data types optimize storage space by using only necessary bytes for each data item.
* Data types influence how efficiently queries are processed, especially when performing operations like sorting or filtering.

3 Common data types:

* Text: Stores alphanumeric characters.
* Number: Stores numerical values.
* Date: Stores dates and times.

**Part 3**

3.1. 5 data points for expense tracker application:

* expense\_id (unique identifier for each expense)
* amount (numerical, representing the expense amount)
* date (date type, recording when the expense occurred)
* category (text, indicating the type of expense)
* description (text, optional field for additional notes)

3.2. Basic database schema (example):

|  |
| --- |
| Table name: Expenses |
| Column Name - Data Type |
| expense\_id- INT |
| amount -DECIMAL |
| date - DATE |
| category - TEXT |
| description - TEXT |