DATABASE ASSINGMENT:

INTRODUCTION AND FUNDAMENTAL SKILLS.

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PART 1: UNDERSTANDING SQL

Questions and answers:

1.1 Imagine a dynamic website like an online store. How do you think SQL plays a role in managing data behind the scenes? Consider how product information, user accounts, and order details might be stored and accessed.

SQL manages data of product through storing their information, querying, data retrieval and updating the databases of selected products. Also, in terms of user accounts, SQL ensure authentication by validating user credentials during logins. Lastly, concerning order details, SQL keeps records of transaction history in its database and also tracks the status of orders from purchase to delivery.

1.2 Role of SQL in web applications.

SQL play the following roles in web application; data storage and management as it is used to create, read and update databases. SQL also facilitate user authentication and authorization by managing user accounts and permissions, and lastly data querying by enabling web applications to quickly retrieve and display relevant information.

1.3 Three benefits of using SQL for web applications.

a. Fast query processing as large data is retrievable quickly and efficiently.
b. Scalability in that large volume of data can be scaled up and down as per application requirement.
c. Security as SQL has built in features that protect user data from unauthorized access, through authentication, encryption, and access control.

1.4 Think about efficiency, data organization, and data retrieval capabilities. Briefly explain each benefit in your document.

a. Efficiency - SQL allow fast querying of large databases, thus program and application can quickly retrieve data, this enhances their performance in term of efficiency.
b. Data organization – databases are well organized into i.e., tables, this makes it much easier to create, change and relate data.
c. Data retrieval capabilities – through sorting and filtering data, applications can retrieve the exact information required, thus enhancing usability.

1.5 List any 3 Database Management Systems.

a. PostgreSQL
b. Windows server SQL
c. MYSQL

Part 2: Database Fundamentals.

Questions and answers.

2.1 A database table and explain its similarity to a spreadsheet.

A Database table is a data set depicted by rows and columns where rows represent records and columns represent attributes to the records. It is similar to a spreadsheet in that, both their data are organized into rows and columns. Both spreadsheet and database allow data filtering and sorting.

2.2 Define "columns" and provide an example with an explanation. Data types important in a database. Briefly explain 3 common data types

Columns are data cells in database tables that depict the attributes of the data being stored in the database.

Example: for a customer database, the column may have the following attributes,

a. Customer_id
b. Customer_name,
c. Email
d. Phone_number

2.3 Importance of data types and common data types:

As data types define the kind of data stored in each column, they ensure integrity and easy retrieval of data.

Some of the data types are:

a. Text - store a given length of characters. Example, name and email address.
b. Numbers - this store numerical values. Examples of data types are int(integers), float and decimals.
c. Date – store dates, used for date specific queries and functions.

Part 3: Expense Tracker Database Design.

Questions and answers:

3.1 Planning.

To build the expense tracker application, we will need the following data points.

a. Expense name
b. Expense amount.
c. Expense category.
d. Date.
e. Payment method.

A basic database schema with one main table.

EXPENSES					
	expense name	expense amount	expense category	date	payment method
data type	text	decimal	text	Date	text

The entity relation diagram is as below: