Lecture Notes – What are Databases

Section 1: Lecture Summary

Database is a collection of large size interrelated data, efficiently organized and stored on computer storage for easy retrieval and management. Unlike personal data files, databases handle business data such as e-commerce entities including customers, products, orders, payments, and related statuses, stored in **tables** with relationships between them. **DBMS** software like MySQL, PostgreSQL, SQL Server, and Oracle manages this data, using **SQL** as the interaction language.

Section 2: Key Concepts and Explanations

Database stores large volumes of interrelated business data permanently on storage devices like HDD or SSD, organized into **tables** with rows and columns for entities like customers and products. Tables are interrelated, such as linking customers to orders, orders to products, and orders to payments. **DBMS** provides the environment to organize, store, retrieve, and maintain these relationships automatically. **SQL** is the language used to interact with DBMS software. Examples of DBMS include open-source options like **MySQL** and **PostgreSQL**, and vendor products like **SQL Server** and **Oracle**.

Section 3: Example Code and Use Cases

Using eCommerceDB schema:

```
-- View customers table structure (customer data as table)
DESCRIBE Customers;
```

```
-- View products table (product data as table)
DESCRIBE Products;
```

```
-- Join related tables: customers to orders
SELECT c.CustomerID, c.FirstName, o.OrderID, o.OrderDate
FROM Customers c
JOIN Orders o ON c.CustomerID = o.CustomerID;
```

```
-- Related tables: orders to order items and products
SELECT o.OrderID, oi.ProductID, p.ProductName, oi.Quantity
FROM Orders o
JOIN OrderItems oi ON o.OrderID = oi.OrderID
JOIN Products p ON oi.ProductID = p.ProductID;
```

Section 4: Key Takeaways

Database manages large, interrelated business data in **tables** with relationships, not simple files. **DBMS** software like **MySQL** handles storage, organization, and retrieval using **SQL**. E-commerce example shows entities like customers, products, orders, and payments stored efficiently for business use.