1. Key Terms Related to Databases: \*\*

1.1. Database: A database is a structured collection of data organized and stored electronically. It allows for efficient retrieval, manipulation, and management of data.

1.1.2. Table: A table is a collection of related data organized into rows and columns. Each column represents a different attribute or field, while each row represents a record.

1.1.3. Record: A record, also known as a row, is a complete set of fields that represent a single entity or instance within a table.

1.1.4. Field: A field, also known as a column, is a specific piece of information within a record. It represents a single attribute of the entity being stored in the table.

1.1.5. Primary Key: A primary key is a unique identifier for each record in a table. It ensures that each record can be uniquely identified and retrieved. Primary keys are typically used to enforce entity integrity and establish relationships between tables.

1.1.6. SQL: SQL (Structured Query Language) is a domain-specific language used for managing and manipulating data in relational database management systems (RDBMS). It allows users to perform tasks such as querying data, inserting, updating, and deleting records, and defining and modifying database schemas.

1.1.7. Query: A query is a request for data retrieval or manipulation from a database. It allows users to specify criteria for selecting, filtering, and sorting data according to their needs.

1.1.8. Index: An index is a data structure that improves the speed of data retrieval operations on a database table. It is created on one or more columns of a table to facilitate quick access to rows based on the values stored in those columns.

1.1.9. Normalization: Normalization is the process of organizing data in a database to reduce redundancy and dependency. It involves breaking down large tables into smaller, related tables and defining relationships between them to improve data integrity and minimize data anomalies.

1.1.10. Database Management System (DBMS): \*\* A database management system (DBMS) is software that enables users to create, manage, and interact with databases. It provides tools for storing, retrieving, updating, and securing data, as well as managing database schemas, transactions, and user access permissions.

2. Discussions:

2.1.1. Purpose of a Primary Key:

The primary key serves as a unique identifier for each record in a database table. Its main purpose is to ensure data integrity by uniquely identifying each record and preventing duplicate or inconsistent data. For example, in a table of employee records, the employee ID could be used as the primary key. This ensures that each employee has a unique identifier, which is essential for accurately retrieving and managing employee data.

2.1.2. Difference between a DBMS and a Database:

A database is an organized collection of data, while a database management system (DBMS) is software that facilitates the creation, management, and manipulation of databases. In other words, a database is the actual repository where data is stored, while a DBMS provides the interface and tools for users to interact with the database, including functions such as data entry, retrieval, manipulation, and security management.

2.1.3. Importance of Normalization:

Normalization is crucial in database design as it helps eliminate data redundancy and dependency, which can lead to anomalies such as update, insert, and delete anomalies. By breaking down large tables into smaller, related tables and establishing relationships between them, normalization improves data integrity and reduces the likelihood of data inconsistencies. For example, in a database of customer orders, normalization would involve separating customer information from order details and creating a separate table for products. This ensures that each piece of data is stored in only one place, making it easier to maintain and update.