Section A: Definitions

1.1.1. Database:

Definition: A database is a structured collection of data organized for efficient retrieval, storage, and management. It can be electronic or manual and is designed to support data manipulation, querying, and reporting.

1.1.2. Table:

Definition: In the context of a relational database, a table is a collection of data organized into rows and columns. Each row represents a record, and each column represents a field or attribute.

1.1.3. Record:

Definition: A record is a single, complete set of data that represents a single instance or entity within a table. It consists of values corresponding to the attributes or fields defined for that table.

1.1.4. Field:

Definition: A field is a single data element, or attribute, within a record or row in a database table. It represents a specific characteristic or property of the entity being modeled.

1.1.5. Primary Key:

Definition: A primary key is a unique identifier for a record in a table. It ensures each record can be uniquely identified and is used to establish relationships between tables.

1.1.6. SQL (Structured Query Language):

Definition: SQL is a domain-specific language used for managing and manipulating relational databases. It provides commands for querying, updating, and managing data in a database.

1.1.7. Query:

Definition: A query is a request for information from a database. It is formulated using SQL or a similar query language and is used to retrieve specific data that meets certain criteria.

1.1.8. Index:

Definition: 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 provide quicker access to rows.

1.1.9. Normalization:

Definition: Normalization is the process of organizing data in a database to reduce redundancy and dependency. It involves dividing large tables into smaller, related tables and defining relationships between them.

1.1.10. Database Management System (DBMS):

Definition: A DBMS is software that facilitates the creation, organization, and manipulation of databases. It provides an interface for users and applications to interact with the database and ensures data integrity, security, and efficiency.

Section B: Discussions

2.1.1. Purpose of a Primary Key:

Purpose: A primary key uniquely identifies each record in a database table. It ensures data integrity, enables efficient data retrieval, and establishes relationships between tables. Example: In a "Students" table, a "StudentID" column could serve as the primary key.

2.1.2. Difference between DBMS and Database:

Explanation: A database is the actual organized collection of data, while a DBMS is the software that manages and controls access to the database. The DBMS provides an interface for users to interact with the database, ensuring data integrity, security, and efficient data manipulation.

2.1.3. Importance of Normalization:

Discussion: Normalization is important for reducing data redundancy and dependency, improving data integrity, and simplifying data maintenance. Example: In a denormalized database, customer information may be duplicated across multiple tables. Through normalization, this redundancy is minimized, and updates to customer details are more efficient and consistent.