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Q.8 Logical | Physical

Physical data independence refers to the ability to change physical storage of data without affecting the logical schema or application programs.

Logical data independence refers to the ability to change the logical schema without altering the physical schema

Ex:- Suppose the DBMS stores on disk and later upgrades to SSD. This doesn't require any logical changes

Q.9 Data Independence is important feature in modern DBMS as;-

1. It simplifies DBMS
2. Flexible & scalable
3. Reduces System downtime
4. Enhance Security and data Privacy

during or after a transaction doesn't affect the permanent database.

0.6 A DBMS differs from (FPS) in several ways.

(i) Data Handling: A DBMS can handle large amounts of data, while a file system is limited in scalability.

(ii) consistency

(iii) Redundancy: File system can result in duplication of data whereas ~~file~~ DBMS removes redundancy.

(iv) Storage space: File system can be inefficient on larger data unlike DBMS.

0.7 Three levels of abstraction

1. Physical level: Lowest level of abstraction in a DBMS and describes how data is stored in DB.

2. Logical level: Middle level of data abstraction, focusing on what data is stored in the database and the relationship among those data elements.

3. View level: The view level is the highest level of data abstraction, presenting only a part of the DB to the user.

1. Query Processor: The query processor is responsible for interpreting and executing database queries, It translates high level SQL queries into low level instructions that the database engine can execute.

Storage Manager: It is responsible for efficient storage, retrieval and updating of the data on disc and ensures that the data can be accessed quickly and reliably.

Transaction Manager: The transaction manager ensures that all database transactions are executed adhering to ACID properties.

Q5 The ACID properties ~~are~~ contribute to the consistency and integrity in the following manner:

(i) Atomicity: This property makes sure that all the transactions in a database are treated as a single unit. i.e. a transaction can either be complete or incompelete.

(ii) Consistency: This property ensures that the data is consistent before and after a transaction for example
Before tranction Sender = 500, Reciever = 200
After transaction Sender = 400, Reciever = 300.
Sum of before and after remains consistent.

(iii) Isolation: This property ensures that the transactions are treated independently without interference with other transactions.

(iv) Durability: It ensures that any system failure

Q.1 In healthcare industry, a DBMS plays a crucial role in storing the patient information, medicine availability, treatment plans, bills etc.

It faces challenges related to data security, interoperability, and the complexity of managing so much data.

Q.2 Metadata is the information about the data in the database like the data-types, structures, the constrai Metadata is important because it defines how data organised.

It helps the retrieval of data to be consisten and also optimizes queries for performance.

Q.3 Database design is the process of structuring a database to meet the needs of the user/client. It comprise determining the database's schema, including tables, relationships and constraints.

Steps in database design are:-

1. Requirements Analysis
2. Design : ER Digram
3. Converting the conceptual design into logical design.
4. Normalization

Q.4 Architecture of a typical DBMS is designed to manage data efficiently, ensuring the security and consistency.

The primary components include.