Short Answer Questions

TOPIC : OVERVIEW OF DBMS

Q: What is database?

ANS: A database is a structured collection of records or data that is stored in a computer system. The structure is achieved by organizing the data according to a database model. The model that is most commonly used today is the relational model. Other models such as the hierarchical model and the network model use a more explicit representation of relationships.

A Relational Database Management System (RDBMS) implements the features of the relational model outlined above. In this context, Date's "Information Principle" states: "the entire information content of the database is represented in one and only one way. Namely as explicit values in column positions (attributes) and rows in relations (tuples). Therefore, there are no explicit pointers between related tables."

Q: Describe few disadvantages of databases.

ANS:THESE ARE SEVEN ADVANTAGES:

· Reduced data redundancy
· Reduced updating errors and increased consistency
· Greater data integrity and independence from applications programs
· Improved data access to users through use of host and query languages
· Improved data security
· Reduced data entry, storage, and retrieval costs
· Facilitated development of new applications program

Q:What are 3-label in database architecture.

ANS:The three labels in database architecture are:

· Internal label
· Conceptual Label
· External Label

Q: List some limitations of file processing approach.

ANS:Limitations of file processing approach :

· Data redundancy and inconsistencies
· Difficulties of accessing data
· Data isolations
· Integrity problem
· Atomicity problem
· Concurrent-access anomalies
· Securities problems

Q: What is difference between data and information?
ANS: Both information and data are types of knowledge, a concept for which English has numerous words. The various words are used in different ways, according to context, but here's an effort to differentiate some of them.
information - "knowledge obtained from investigation or communication."
data - "reliable information based on observation and record-keeping."

Q: What do you mean by data redundancy?
ANS:Data redundancy sometime refers to in computer data storage, is a property of some disk arrays which provides fault tolerance, so that all or part of the data stored in the array can be recovered in the case of disk failure. The cost typically associated with providing this feature is a reduction of disk capacity available to the user, since the implementations require either a duplication of the entire data set, or an error-correcting code to be stored on the array.
Redundancy is attained when the same data values are stored more than once in a table, or when the same values are stored in more than one table.
To prevent redundancy in Database Tables, database normalization should be done to prevent redundancy and any other problems that might affect the performance of the database.

Q: What do you mean by database schema?
ANS: The schema of a database system is its structure described in a formal language supported by the database management system (DBMS). In a relational database, the schema defines the tables, the fields in each table, and the relationships between fields and tables. Schema s are generally stored in a data dictionary. Although a schema is defined in text database language, the term is often used to refer to a graphical depiction of the database structure.

Q: What is meta data?
ANS: Meta data (meta data, or sometimes meta information) is "data about other data", of any sort in any media. An item of meta data may describe an individual datum, or content item, or a collection of data including multiple content items and hierarchical levels, for example a database schema. In data processing, meta data provides information about, or documentation of, other data managed within an application or environment. This commonly defines the structure or schema of the primary data. The term should be used with caution as all data is about something, and is therefore "meta data" in a sense, and vice versa.

Q: What do you mean by data inconsistency?
ANS: Data inconsistency exists when different and conflicting versions of the same data appear in different places. Data inconsistency creates unreliable information, because it will be difficult to determine which version of the information is correct. (It's difficult to make correct – and timely – decisions if those decisions are based on conflicting information.)
Data inconsistency is likely to occur when there is data redundancy. Data

redundancy occurs when the data file/database file contains redundant – unnecessarily duplicated – data. That's why one major goal of good database design is to eliminate data redundancy.

Database— is shared, integrated computer structure that houses:
•End user data (raw facts)
•Meta data (data about data)

Q: What do you understand by a distributed database?

ANS: A distributed database is a database that is under the control of a central database management system (DBMS) in which storage devices are not all attached to a common CPU. It may be stored in multiple computers located in the same physical location, or may be dispersed over a network of interconnected computers.

Collections of data (eg. in a database) can be distributed across multiple physical locations. A distributed database can reside on network servers on the Internet, on corporate intranets or extranets, or on other company networks. Replication and distribution of databases improve database performance at end-user worksites.

Q: Explain the basic components of data base systems?

ANS: The basic components of database are
· Data
· users/people
· SQL – A language for database manipulation
· hardware
· software

Q: What is data dictionary? What type of information is stored in it?

ANS: A data dictionary, as defined in the IBM Dictionary of Computing, is a "centralized repository of information about data such as meaning, relationships to other data, origin, usage, and format." The term may have one of several closely related meanings pertaining to databases and database management systems (DBMS):
· a document describing a database or collection of databases
· an integral component of a DBMS that is required to determine its structure
· a piece of middle ware that extends or supplants the native data dictionary of a DBMS.

Q: What is three views of data in DBMS?

Three Views of Data

ANS: We know that the same thing, if viewed from different angles produces difference sights. Likewise, the database that we have created already can have different aspects to reveal if seen from different levels of abstraction. The term **Abstraction** is very important here. Generally it means the amount of detail you want to hide. Any entity can be seen from different perspectives and

levels of complexity to make it a reveal its current amount of abstraction. Let us illustrate by a simple example.

A computer reveals the minimum of its internal details, when seen from outside. We do not know what parts it is built with. This is the highest level of abstraction, meaning very few details are visible. If we open the computer case and look inside at the hard disc, motherboard, CD drive, CPU and RAM, we are in middle level of abstraction. If we move on to open the hard disc and examine its tracks, sectors and read-write heads, we are at the lowest level of abstraction, where no details are invisible.

In the same manner, the database can also be viewed from different levels of abstraction to reveal different levels of details. From a bottom-up manner, we may find that there are three levels of abstraction or views in the database. We discuss them here.
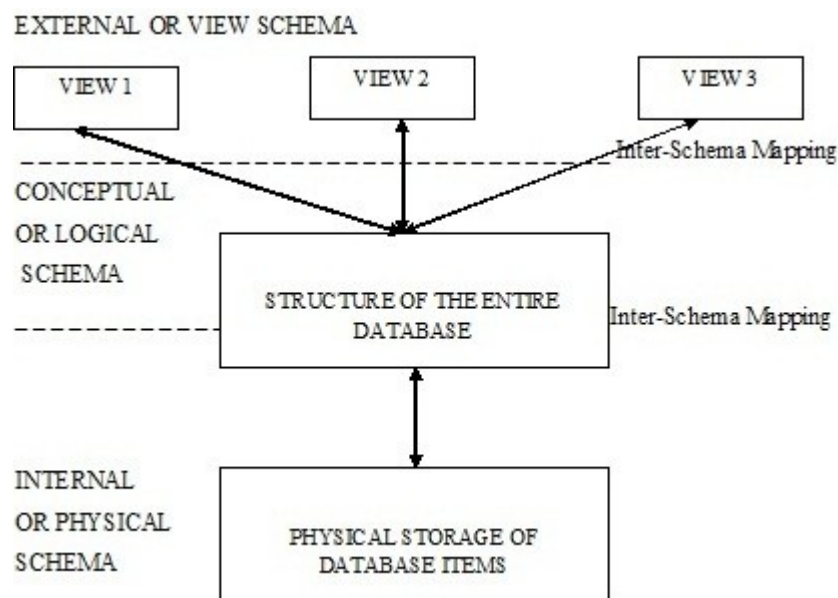
The word schema means arrangement – how we want to arrange things that we have to store. The diagram above shows the three different schemas used in DBMS, seen from different levels of abstraction.

The lowest level, called the **Internal or Physical schema**, deals with the description of how raw data items (like 1, ABC, KOL, H2 etc.) are stored in the physical storage (Hard Disc, CD, Tape Drive etc.). It also describes the data type of these data items, the size of the items in the storage media, the location (physical address) of the items in the storage device and so on. This schema is useful for database application developers and database administrator.

The middle level is known as the **Conceptual or Logical Schema**, and deals with the structure of the entire database. Please note that at this level we are not interested with the raw data items anymore, we are interested with the structure of the database. This means we want to know the information about the attributes of each table, the common attributes in different tables that help them to be combined, what kind of data can be input into these attributes, and

so on. Conceptual or Logical schema is very useful for database administrators whose responsibility is to maintain the entire database.

The highest level of abstraction is the **External or View Schema**. This is targeted for the end users. Now, an end user does not need to know everything about the structure of the entire database, rather than the amount of details he/she needs to work with. We may not want the end user to become confused with astounding amount of details by allowing him/her to have a look at the entire database, or we may also not allow this for the purpose of security, where sensitive information must remain hidden from unwanted persons. The database administrator may want to create custom made tables, keeping in mind the specific kind of need for each user. These tables are also known as **virtual tables**, because they have no separate physical existence. They are crated dynamically for the users at runtime. Say for example, in our sample database we have created earlier, we have a special officer whose responsibility is to keep in touch with the parents of any under aged student living in the hostels. That officer does not need to know every detail except the *Roll, Name, Addresss* and *Age*. The database administrator may create a virtual table with only these four attributes, only for the use of this officer.

Q: Define Database Administrator.

ANS:Database Administrator

The Database Administrator, better known as DBA, is the person (or a group of persons) responsible for the well being of the database management system. S/he has the flowing functions and responsibilities regarding database management:

1. Definition of the schema, the architecture of the three levels of the data abstraction, data independence.
2. Modification of the defined schema as and when required.
3. Definition of the storage structure i.e. and access method of the data stored i.e. sequential, indexed or direct.
4. Creating new used-id, password etc, and also creating the access permissions that each user can or cannot enjoy. DBA is responsible to create user roles, which are collection of the permissions (like read, write etc.) granted and restricted for a class of users. S/he can also grant additional permissions to and/or revoke existing permissions from a user if need be.
5. Defining the integrity constraints for the database to ensure that the data entered conform to some rules, thereby increasing the reliability of data.
6. Creating a security mechanism to prevent unauthorized access, accidental or intentional handling of data that can cause security threat.
7. Creating backup and recovery policy. This is essential because in case of a failure the database must be able to revive itself to its complete functionality with no loss of data, as if the failure has never occurred. It is essential to keep regular backup of the data so that if the system fails

then all data up to the point of failure will be available from a stable storage. Only those amount of data gathered during the failure would have to be fed to the database to recover it to a healthy status.