**What is meant by a database?**

database is collection of related data includes SQL and NOSQL where we can retrieve, insert ,deletes and manipulate the data efficiently.

**Explain a few advantages of a DBMS**

reduce redundancy-

The whole data is stored only once in a single place so there is no chance of duplicate data.For example, A student record in a library or examination can contain duplicate values, but when they are converted into a single database, all the duplicate values are removed.

inconsistency-

Data consistency means if you want to update data in any files then all the files should not be updated again. As in DBMS, data is stored in a single database so data becomes more consistent in comparison to file processing system. Also, updated values are available to all the users immediately.

better security-

Data security means protecting your precious data from unauthorized access. Data in database should be kept secure and safe from unauthorized modifications. Only authorized users should have the grant to access the database

easier backup,-

DBMS allows automatic backup and recovery of database. For examples, if a system fails in the middle of any process then DBMS stores the values of that state in which database were before query execution.

have concurrent access-

If two users are accessing data simultaneously and they both want to update values of same record then it may create concurrency. DBMS has the power to control concurrency so that no transactions are lost.

Data Migration-

Data migration means adjusting storage of data according to its popularity. In a database, there is some kind of data that is accessed frequently and at the same time some data is accessed occasionally. So it is required to store frequently accessed data in a manner that it can be accessed quickly.

Powerful User Language-

A DBMS permits end users to use database without having special training or expertise. Any untrained user can easily query, search and updates data in database. He can easily generate report or documents with less knowledge.

**What is meant by Data Warehousing?**

A data warehouse can be defined as a collection of organizational data and information extracted from operational sources and external data sources. The data is periodically pulled from various internal applications like sales, marketing, and finance; customer-interface applications; as well as external partner systems. This data is then made available for decision-makers to access and analyze.

For a start, it is a comprehensive repository of current and historical information that is designed to enhance an organization’s performance.

What are the disadvantages of file processing systems?

Data redundancy and inconsistency-

File processing system leads to the usage of many copies of same data. This is data redundancy. If we need to change any of the data, then we need to change the data at all copies. If not, this will lead to inconsistency.

Difficulty in accessing data-

In a file processing system, to access data differently we need to have different programs.

For example, if you want to access student names from a file, we need a program that does the job. If you want to view only address of all students from a specific city, then we need different program that does the required job. This list goes endless. Hence, it is difficult to access data.

Data isolation-

Files are stored in different locations, different formats. Thus they are isolated.

For example, one location the student data may be stored in .txt format. In other location, the same file may be stored in .doc format.

Integrity problems-

Integrity problem arises when the database fails to satisfy certain integrity conditions.

For example, the phone number cannot be longer than 10 digits, bank balance should not go below 1000 etc. The actual problem arises when we would like to include new such conditions with the existing database. It is hard to make those changes.

Concurrent access anomalies-

Simultaneous access of a data item should be handled carefully.

For example, if only one ticket is there and two customers are trying to book the ticket simultaneously, the ticket should be allotted to any one customer.

It is difficult to handle in file processing system due to the fact of data isolation, redundancy etc.

**Enlist the advantages of DBMS.**

reduce redundancy

inconsistency

better security

easier backup

have concurrent access

Data Migration

Powerful User Language

**Explain the terms ‘Record’, ‘Field’ and ‘Table’ in terms of database.**

Record-

In database management systems, a complete set of

information. Records are composed of fields, each of which

contains one item of information. A set of records

constitutes a file. For example, a personnel file might

contain records that have three fields: a name field, an

address field, and a phone number field

Field-

A space allocated for a particular item of information. A

tax form, for example, contains a number of fields: one for

your name, one for your Social Security number, one for

your income, and so on. In database systems, fields are the

smallest units of information you can access. In

spreadsheets, fields are called cells

Table-

Refers to data arranged in rows and columns. A spreadsheet,

for example, is a table. In relational database management

systems, all information is stored in the form of tables.

**What is Data Integrity?**

Data integrity means unification of so many files into a single file. In DBMS data is stored in different tables. A database contains different tables that are linked to each other. Many users feed entries in these tables so it is important to maintain data items and association between data items. DBMS allows data integrity that makes it easy to decrease data duplicity Data integration reduces redundancy as well as data inconsistency.

Integrity Constraints are used to store accurate data because there are many users who feed data in database. Data stored in database should always be correct and accurate. DBMS provides the capability to enforce these constraints on database.

For example, the maximum marks obtained by the students can never be more than 100. Also account balance of Banks like Axis should not be less than 2500 otherwise you will be penalized.

**Explain 2-Tier Architecture**.

The 2-Tier architecture is same as basic client-server. In the two-tier architecture, applications on the client end can directly communicate with the database at the server side. For this interaction, API's like: ODBC, JDBC are used.

The user interfaces and application programs are run on the client-side.

The server side is responsible to provide the functionalities like: query processing and transaction management.

To communicate with the DBMS, client-side application establishes a connection with the server side.

**What is the difference between two- and three-tier architectures?**

2 - tier Architecture consist of two layers: Client and Database(Data tier)

Easy to build and maintain.

Runs slower.

Less secured as client can communicate with database directly.

3 - tier Architecture consist of three layers: Client layer, Business layer and Data layer.

Complex to build and maintain.

Runs faster.

It is secured as client is not allowed to communicate with database directly.