



**Course Title : Database System**

**Course Code : CCE - 223**

### **Assignment : 03**

#### **Submitted To**

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**(1.1) Define the following terms:**

**Data, Database, DBMS, Database System, Database Catalog, Program-data Independence, User view, DBA, End User, Canned Transaction, Deductive Database System, Persistent object, Meta-data, and Transaction-processing Application.**

**Answer:**

**Data:** Data is a relative entity or object. Ex-name, age, class.

**Database:** A Database is a collection of related data with an implicit meaning.

**DBMS:** A database management system is a software system that helps users to create and maintains a database. This system contains the processes of defining, constructing, manipulating and sharing databases from various users and applications.

**Database System:** Data base system is nothing but database and DBMS software together we call as data base system.

**Database catalog:** Database catalog contains information such as the structure of each file, the type and storage format of each data item and various constraints on the data.

**Program-data independence:** The structure of data files is stored in the DBMS catalog separately from the access programs is known as program – data independence.

**User view:** It is the view that may be a subset of the database or it contains virtual data is derived from the database files but is not explicitly stored.

**DBA:** Database Administrator is an administrator who is responsible for authorizing access to the database. DBA manages and coordinates the resources and acquires software and hardware resources.

**End-user:** An end user is a person whose job requires access to the database for querying, updating and generating the reports.

**Canned transaction:** The main aim of canned transaction is using standard types of queries and updates for querying and updating database.

**Deductive database systems:** This type of database systems provides capability for defining deduction rules for new information from the stored database.

**Persistent object:** Persistent means object is stored permanently in an object – oriented DBMS and it survives to terminate the program execution and then retrieved directly by another program.

**Meta-data:** It is information about structure of each file, type and storage format of each data and various constraints on the data is called meta-data.

**Transaction-processing application:** This application is designed to maintain database integrity in a known, consistent state.

### **(1.2) What four main types of actions involve databases? Briefly discuss each.**

#### **Answer:**

The database is a database system which allows users to maintain their database. There are basically four actions which involved in the database-

- **Define Database**
- **Construct Database**
- **Manipulate Database**
- **Share Database**

There are the basic actions which are necessary for the database users.

#### **Define Database:**

The database definition is to define the database like database structure, database type to store data into database. It is called metadata of the data.

#### **Construct Database:**

Construct database is the process in which the data get stored into the database and can be maintained by the DBMS.

#### **Manipulate Database:**

Manipulate database is to retrieve database by using query and to insert, update and delete the database also.

#### **Share Database:**

Share database is to share database among many users so that more than one user can access database at one time.

### **(1.3) Discuss the main characteristics of the database approach and how it differs from traditional file systems.**

#### **Answer:**

The main characteristics of the database approach are:  
Self-describing nature of a database system.

Insulation between programs and data, and data abstraction.

Support of multiple views of the data.

Sharing of data and multiuser transaction processing.

- There are number of characteristics that differs from traditional file management system. In file system approach, each user defines and implements the needed files for a specific application to run. For example in sales department of an enterprise, One user will be maintaining the details of how many sales personnel are there in the sales department and their grades, these details will be stored and maintained in a separate file.

- Another user will be maintaining the salesperson salary details working in the concern, the detailed salary report will be stored and maintained in a separate file. Although both of the users are interested in the data's of the salespersons they will be having their details in a separate files and they need different programs to manipulate their files. This will lead to wastage of space and redundancy or replication of data's, which may lead to confusion, sharing of data among various users is not possible, data inconsistency may occur. These files will not be having any inter-relationship among the data's stored in these files. Therefore in traditional file processing every user will be defining their own constraints and implement the files needed for the applications.
- In database approach, a single repository of data is maintained that is defined once and then accessed by many users. The fundamental characteristic of database approach is that the database system not only contains data's but it contains complete definition or description of the database structure and constraints. These definitions are stored in a system catalog, which contains the information about the structure and definitions of the database. The information stored in the catalog is called the metadata, it describes the primary database. Hence this approach will work on any type of database for example, insurance database, Airlines, banking database, Finance details, and Enterprise information database. But in traditional file processing system the application is developed for a specific purpose and they will access specific database only.

#### **(1.4) What are the responsibilities of the DBA and the database designers?**

**Answer:**

DBA and the database designer both are responsible for data maintenance and data construction in an organization. Following are some responsibilities of DBA and the database designer-

- Database Security
- Design Database
- Implement Data Models
- Resolve Capacity Issues
- Resolve Performance Issues
- Maintain Database

#### **(1.5) What are the different types of database end users? Discuss the main activities of each.**

**Answer:**

**There are several categories of end users these are as follows:**

Casual End Users

- Naive or parametric end users
- Sophisticated end users

Standalone users:

- ☐ Naive end users need to learn very little about the facilities provided by the DBMS.
- ☐ Casual users learn only a few facilities that they may use repeatedly
- ☐ Sophisticated users try to learn most of the DBMS facilities in order to achieve their complex requirement.
- ☐ Standalone users typically become very proficient in using a specific software package.

**(1.6) Discuss the capabilities that should be provided by a DBMS.**

**Answer:**

**Controlling Redundancy:**

normalization   restricting   unauthorized  
Access

**Multiple User interfaces:**

query language, programming language  
interfaces (forms and command codes)  
Representing Complex Relationships among Data  
Enforcing Integrity Constraints  
Providing Persistent storage for program objects

Providing storage structures for efficient query processing  
Backup and recovery

**(1.7) Discuss the differences between database systems and information retrieval systems.**

**Answer:**

Database management system can be regarded as a store house of information. It is a centralized repository where raw data would be organized as tables with each column representing an attribute of the data.

Information retrieval system on the other hand refers to an overall system which is capable of searching and providing useful information from a data repository based one or more combinations of search conditions (queries).

## 1.8 Difference between DBMS and RDMS, File system DBMS

### Answer:

**A DBMS** (database management system) is a software system that allows users to define, create, maintain, and control access to a database. It provides a way to store and manage data in an organized manner, with tools for adding, modifying, and querying the data.

**An RDBMS** (relational database management system) is a type of DBMS that stores data in tabular form, with each row representing a unique record and each column representing a different attribute of the record. An RDBMS uses a relational model to organize the data, which means that it establishes relationships between tables based on common fields. This makes it easier to manage large data sets and perform complex queries.

**A file system DBMS** is a type of DBMS that stores data as files on a disk. It is a simple form of database management that does not use a relational model. Instead, it relies on a hierarchical structure of directories and files to organize and access data. While file system DBMS can be useful for small-scale applications, they are generally less effective than RDBMS for larger data sets or complex queries.

In summary, both DBMS and RDBMS are used for managing data, but RDBMS is a specific type of DBMS that uses a relational model to organize data in tables, while a file system DBMS stores data as files on a disk and does not use a relational model.