1) Benefits of database system over traditional file-based system.

➢ Consider Savings Bank enterprise

➢ Keeps information about all customers & saving accounts.

➢ One way, Store all information in OS files

➢ TO allow user to manipulate data, system has no. of application programs, such as :

- a program to debit or credit an account
- a program to add new account
- a program to find balance of an account
- a program to generate monthly statements
- a program to generate list of all customers

➢ System programmer wrote above programs

2) Different types of data base with examples.

Database

- It is a collection of related data
- Represents some aspects of real world
- Db is designed, built & populated for a specific purpose

- E.g. Related data of TEXT, IMAGES, VIDEOS etc..

Types of Databases

- Traditional DB: Only TEXT & Numbers
- Multimedia DB: Videos & Images
- GIS DB: Satellite Images etc.
- Real Time DB: Inventory management etc..

- Data Warehouse: Large collection of business data used to help an organization make decisions.

3) Define the following term.

Schema:

➢ Schema – the **Logical Structure** of the **Database**

or Description of Database

❑ *E.g., the database consists of information about a set of customers and accounts and the relationship between them*

ID	Name	Age

- **Physical schema**: database design at the physical level
- **Logical schema**: database design at the logical level
- **Sub schema**: database design at the view level

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Information: Processed data that provides value

Instance:

- Instance – the actual content of the database at a particular point in time
  -- also known as "Database state" or "Snapshot "

ID	Name	Age
e1	a	15
e2	b	6

Entity:

- **Entity** is anything about which data are to be collected and stored

Attribute:

- **Attribute** is a characteristic of an entity

DBMS:

It is a collection of interrelated data & a SET OF PROGRAMS to access those data.

- The collection of data, usually referred to as the database, contains information relevant to an enterprise.
- Primary Goal of DBMS: provide a way to store & retrieve database information that is both convenient & efficient.

1. Define Database structure.
2. Construct Database
3. Manipulate Data

Conclusion: DBMS is the SOFTWARE acting on database!

Therefore: Database + DBMS = Database System

Data abstraction:

Data independence:

- Is the capacity to change the schema at one level of a database system without having to change the schema at the next higher level.
- Logical data independence: capacity to change the conceptual schema without having to change external schemas or application programs.
- Physical data independence: capacity to change the internal schema without having to change the conceptual (or external) schemas

4) Types of information with exampls.

Types of Information

STRATEGIC :
- Top level of management within an organization
- Needed for long range planning and directions

TACTICAL :
- Middle management (employees) when managing or planning projects
- To improve profitability and performance
- Tactical plans have a medium level of detail and will be very specific

OPERATIONAL :
- Day to day operations of the organization
- Is usually very short, anything from immediately, daily or at most a week or month
- Example handling customer's queries on daily basis

STATUTORY :
- Needed by law to sent to government authorities.

5) Advantages and Disadvantages of DBMS.

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 query languages
- Improved data security
- Reduced data entry, storage, and retrieval costs
- Facilitated development of new applications program

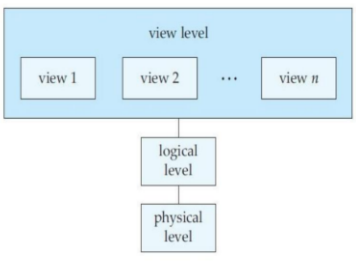
Disadvantages:

- Database systems are complex, difficult and time consuming to design.
- Start-up cost of Hardware & Software
- Cost of Data Conversion
- Cost of Staff Training
- Appointing Technical Staff
- Database Failures

6) Explain the following term.

a) Data Abstraction in dbms

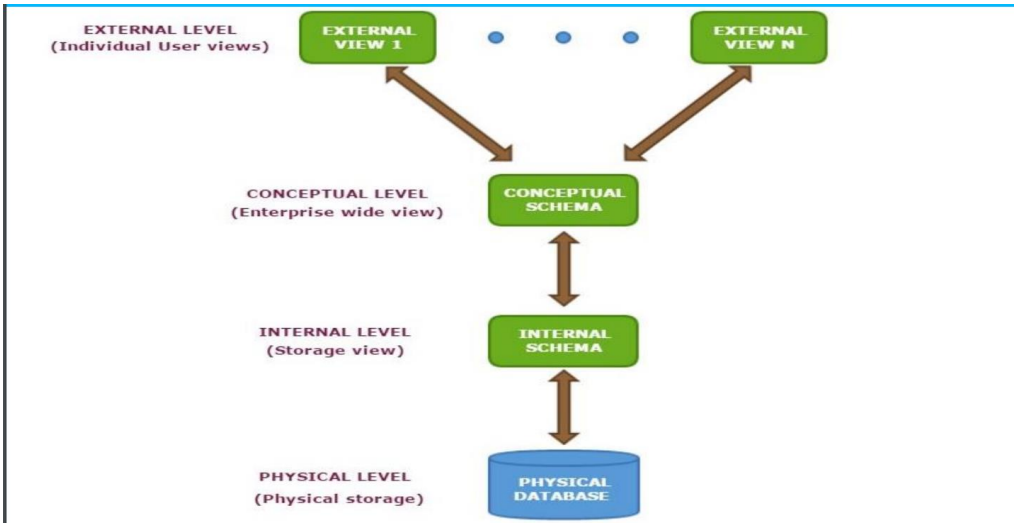
- View level
  - Describes which data is to be displayed
  - E.g. hide specific data for security purposes
- Logical/Conceptual Level
  - Describes what data is stored in database & relationship among the data
- Physical Level
  - Describes how a data is stored



Levels of Data Abstraction in a DBMS

b) Three schema data base architecture:

- Schema can be defined into three levels:
  - The INTERNAL LEVEL has an internal schema
    - Describes the physical storage structure of the database.
    - Uses a Physical Data Model
  - The LOGICAL/CONCEPTUAL LEVEL has a conceptual schema describing the structure of the whole database for a community of users.
    - It hides the details of physical storage structures and concentrates on describing entities, data types, relationships, user operations, and constraints.
    - A High-level Data Model Or An Implementation Data Model can be used at this level.
  - The EXTERNAL OR VIEW LEVEL includes a number of external schemas or user views describing the part of the db that a particular user group is interested in and hides the rest of the db from that user group.
    - A High-level Data Model Or An Implementation Data Model Can be used at this level.



c) Data Independence:

- Is the capacity to change the schema at one level of a database system without having to change the schema at the next higher level.
- Logical data independence: capacity to change the conceptual schema without having to change external schemas or application programs.
- Physical data independence: capacity to change the internal schema without having to change the conceptual (or external) schemas