5. DATABASE SECURITY :-

SECURITY REQUIREMENTS :-

1] PHYSICAL DATABASE INTEGRITY :-

- After a physical failure like power failure, machine crash, whole data can be recovered back.

2] LOGICAL DATABASE INTEGRITY :-

- structure of database is preserved.
- modification of one value should not affect other values of database.

3] ELEMENT INTEGRITY :-

- deals with accuracy
- data in each element is accurate or not

4] AUDITABILITY :-

- keeps track who or what has accessed the elements in the database.

5] ACCESS CONTROL :-

- only an authorized user accesses/authoriz data.
- Different users can be restricted to read or write.

6] USER AUTHENTICATION :-

- every user is positively identified for audit trial & to access certain data.

7] AVAILABILITY :-

- user can access database in general
- ie. authorized data for which they are authorized.

RELIABILITY AND INTEGRITY :-

- Reliability means s/w runs for long time without failure.
- Reliability & Integrity can be viewed from three dimensions :-

a) Database Integrity :-
- The whole database is protected from damage.

b) Element Integrity :-
- The value of any element is written or changed by authorized user only.
- Proper access protects database from ~~co~~ corruption.

c) Element accuracy :-
- only correct values are written for elem
- checks are there to prevent insertio of & improper values.
- constraint condition can detect incorrect values.

SENSETIVE DATA:-

- It is private & so should not be publicly accessed.
- some databases are totally insensetive
  ∴ access is granted to all.
- some databases are totally sensitive
  ∴ access is rejected for unathorized user.
- problem is when a part of data is sensitive & part is unsensitive

factors that can make data sensitive:-

1] Inherently sensitive:-

- the value itself is revealing is sensitiv
  eg:- median income of a barber in town with only one barber.

2] From a sensitive source:-

- source of data is sensitive.

3] Declared sensitive:-

- The DBA has declared the data to be sensitive.

4] Part of a sensitive attribute or a sensitive record:-

- an entire attribute is declared as sens
  - eg:- salary attribute.

g) Sensitive in relation to previously disclosed information:-

- some data becomes sensitive in presence of other data.

Various facilities that a ~~datab~~ DBMS provide to protect the sensitive data are:-

1] Access Decisions:-

- DBA decides who should access what data.
- Decisions of DBA depends upon access policy.
- DBMS consider following factors while giving access:-

a) Acceptability of access:-

- one or more values of the record may be sensitive & not accessiblye by general user.
- DBMS should not release sensitive data to unauthorized user.

b) Availability of Data:-

- DBMS block or deny the access to data temporarily while it is being updated or changed.
- This avoides concurrency issues.