DBMS

1) Views:

- Views in sql are kind of virtual tables. A view also has rows and columns as they are in a real table in the database. We can create a view by selecting fields from one or more tables present in the database. A view can either have all the rows of a table or specific rows based on certain condition.

i] Creating views:

- We can create view using CREATE VIEW STATEMENT. A view can be created from a single table or multiple tables.

ii] Deleting views:

- Sql allows us to delete an existing view. We can delete or drop a view using the DROP statement.

iii] Updating views:

- We can update the view by using replace statement

2) Trigger:

- A trigger is a stored procedure in database which automatically invokes whenever a special event in the database occurs. For ex, a trigger can be invoked when a row is inserted into a specified table or when certain table columns are being updated.

        Syntax: create trigger [trigger_name]
                            [before | after]
                            { insert | update | delete }
                            on [table_name]
                            [for each row]
                            [trigger_body]

3] Stored Procedures :

- Stored procedures are created to perform one or more DML operations on Database. It is nothing but the group of SQL Statements that accepts some input in the form of parameters and performs some task and may or may not returns a value.

- The most important part is parameters. Parameters are used to pass values to the procedure. There are 3 different types of parameters.

   1] IN : Default parameter, receives values
   2] OUT : Sends value to the calling program
   3] IN OUT : It receives and sends values

4] Properties of the transaction [ACID] :

   i] Atomicity
   ii] Consistency
   iii] Isolation
   iv] Durability

5] Transaction States :

   i] Active
   ii] Partially Committed
   iii] Failed
   iv] Aborted
   v] Committed

6] Serializability:
 - Serializability is a concept that helps us to check which schedules are serializable. A serializable schedule is the one that always leaves the database in consistent state.

a) Conflict Serializability:
 - Since we are dealing with only read and write instructions, there are four cases that we need to consider.

i] $I = read(Q)$, $J = read(Q)$
ii] $I = read(Q)$, $J = write(Q)$
iii] $I = write(Q)$, $J = read(Q)$
iv] $I = write(Q)$, $J = write(Q)$

7] Cascadeless Schedules:
 - The phenomenon, in which a single transaction failure leads to a series of transaction rollback, is called cascading rollback.
 - Cascading rollback is undesirable, since it leads to the undoing of a significant amount of work. It is desirable to restrict the schedules to those where cascading rollbacks cannot occur. Such schedules are called cascadeless schedules.

8] Transaction Isolation levels:
 - The isolation levels specified by SQL standard are as follows

i] Serializable
ii] Repeatable read
iii] Read Committed
iv] Read uncommitted

9] Lock-Based Protocols.
  - There are various modes in which a data item may be locked. In this section, there are two modes:

  i] Shared : Ti can read but cannot write, Q
  ii] Exclusive : Ti can both read and write Q

10] Two-phase Locking protocol :
  - This protocol requires that each transaction issue lock and unlock requests in two phases :

  i] Growing phase : May obtain locks but cannot release it
  ii] Shrinking phase : May release locks, but cannot obtain it

11] Deadlock Handling :
  - A system is in a deadlock state if there exists a set of transaction such that every transaction in the set is waiting for another transaction the set.
  - The only remedy to this undesirable situation is for the system to invoke some drastic action, such as rolling back some of the transactions involved in deadlock.
  - There are two principal methods for dealing with the deadlock problem are.
    i] deadlock prevention
    ii] deadlock detection & recovery scheme

12) Recovery Concept :
- The Recovery from deadlock, the three actions need to be taken are :
   i] Selection of a victim
   ii] Rollback
   iii] Starvation

13) Categories of Storage :
- The three categories of Storage are :

   i] Volatile Storage
   ii] Non-volatile Storage
   iii] Stable Storage

14] Recovery Algorithm :
   - i] Transaction Rollback :
   - ii] Recovery After a System Crash :