UNIT-5

Study of RDBMS through Oracle

1. Architecture
   A database server is the key to information management.
   - Database instances: a set of memory structures that manage database files.

2. Instance memory structures
   - System Global Area (SGA) - data & control information for one instance.
   - Program Global Area (PGA) - data & control information for server or background process.

3. Physical files
   - Data files
   - Control files
   - Online redo log files

4. Background processes
   - Asynchronously perform I/O & monitor other
   - Oracle database processes to provide increased parallelism for better performance and reliability.

5. Logical storage structures
   - Data blocks: At finest level of granularity, Oracle database data is stored in data blocks. An data block comprises a specific number of bytes on disk.
   -Extent: An extent is a specific number of logically contiguous data blocks.
   -Segment: It is a set of extents allocated for a user project.
   -Tablespace: It is the logical container for a segment. Each tablespace contains at least one datafile.

6. Network architecture
   - Dedicated server architecture: Each client process connects to a dedicated server process. The server process is not shared by any other client for the duration of the client's session.
Multithreaded server (shared server) architecture - The database uses a pool of shared processes for multiple sessions. A client process communicates with a dispatcher, which is a process that enables many clients to connect to the same database instance without the need for a dedicated server process for each client.

1. **Database links** - It is a connection between two physical database servers that allow a client to access them as one logical database.
   Types of database links → private, public & global.
   Snapshot - It is a replica of a target master table from a single point in time.

3. **Data dictionary** - Read-only set of tables that provides information about the database.
   Dynamic performance views - Views which are continuously updated while a database is open and in use, and their contents relate primarily to performance.

3. **Role management** - Add users, remove users, assign roles & notification profiles to users.
   Privilege Management - Granting & revoking individual privileges, creating a role and assigning privileges to it, creating a reusable application role.

10. **Hierarchical queries** - Table contains hierarchical data. Used as - START WITH, CONNECT BY.
    Online queries - act as a data source.
    Flashback queries - view past states of database objects or the return database objects to a previous state.
ANSI 501 - (American National Standards Institute 501) -
It is a standard

Anonymous block - It is a pl/sql block that appears within
your application and it is not named or stored in the database.

Cursor Management -

1. A cursor is a variable that runs through the tuples of
   some relation. Two types of cursors -
   - Nested cursor
   - Parameterized cursor
   
   Example - DECLARE cursor c1 is select ename, hiredate from emp;

2. Procedure - Accept arguments and no return any values.
   
   Example - create or replace procedure add1 (i varcher) is number (10);
   begin ... end;
   
   Use:
   
   execute add1 ('SMITH');

3. Function - Accept arguments and return values
   
   Example - create or replace function sum (i number, j number) return number is
   
   s_num number (10);
   begin ... end;
   
   Example:
   
   n := sum (2, 3);...

4. Triggers - Similar to procedure or function, never accept any argument,
   neither return any value, automatically called.
   
   Example - create or replace trigger empcheck before delete on emp;
   begin ... end;

5. Control structures in pl/sql - if else then, if then else,
   if then elsif, case, loop, exit, exit when, while, for,
   goto, null,