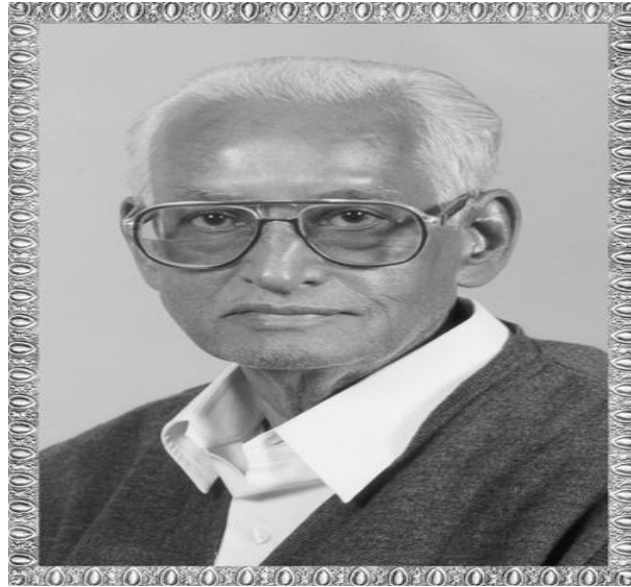


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**Lt. Shree Chimanbhai Shukla**

**B.C.A./B.SC.I.T.-SEMESTER-3**

**RDBMS USING ORACLE**

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**UNIT-1 INTRODUCTION OF DBMS & RDBMS**

**INDEX**

<b>TOPICS</b>
<b>INTRODUCTION OF ORACLE</b>
<b>WHAT IS INFORMATION?</b>
<b>WHAT IS DATA?</b>
<b>WHAT IS DATABASE?</b>
<b>DIFFERENCE BETWEEN DBMS &amp; RDBMS</b>
<b>SQL</b>
<b>EXPLAIN RELATIONSHIP</b>
<b>EXPLAIN E-R DIAGRAM</b>
<b>EXPLAIN DR.E.F. CODD RULES</b>
<b>SQL*PLUS</b>
<b>SQL COMMAND</b>
<b>DATA TYPES</b>
<b>SQL VS SQL * PLUS</b>
<b>SQL*PLUS FORMATTING TAG</b>
<b>OPERATOR</b>

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**Q-1. Introduction Of Oracle.**

- ✚ Oracle corporation is an american multinational company
- ✚ Headquartered of oracle corporation is in redwood city, california (usa).
- ✚ The company sells database software and technology.
- ✚ Oracle was found in june/16/1977 by larry ellison, bob miner.
- ✚ Oracle is the second-largest software company by revenue and market capitalization after microsoft.
- ✚ Total number of employees are 136,000 (2019).

**✚ ONE WORD QUESTION AND ANSWER**

SR.NO	QUESTION	ANSWER
1	who was found oracle	Larry elision bob miner
2	When was oracle found	16 <sup>th</sup> june1977
3	Head quarter of oracle is in ____	Redwood city

**Q-2 what is information ?**

- ✚ Meaning full data is called information.

**Q-3. What is data?.**

- Data is raw material

**Q-4what is database?**

- ✚ Collection of tables is called data base.

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Q-5 what is table?

- ✚ Table means collection of raw and column
- ✚ Raw and column means table
- ✚ In table all the users data are store.

Q-6 difference between Dbms & Rdbms.

<u>Dbms</u>	<u>Rdbms</u>
■ Database management system	■ Relational data base management system.
■ In dbms relationship between two table or file are maintain by program	■ In rdbms relationship between two tables or file can create at the time of table creation.
■ Dmbs does not support client and server model.	■ Rdbms support client and servermodel
■ Dbms there is no security of data.	■ In rdbms there are multi level of security of data.
■ Each table given extension	■ Many tables are in one data base.
■ Dbms satisfied less then 7 rules of dr.e.f codd rules	■ It satisfied more then 7 reules of dr.ef codd.

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**ONE WORD QUESTION AND ANSWER**

SR.NO	QUESTION	ANSWER
1	Full form of dbms	Database management system
2	Full form of rdbms	Relational database management system
3	Dbms support client server ?	No
4	Which one is best?	Rdbms.

**Q-7. Explain Relationship.**

✚ It is way to **define relation** between **Number of tables**.

✚ There are **three** types of relationship available like

- 1) **One to one** relationship
- 2) **One to many** relation ship
- 3) **Many to many** relationship

■ **One to one relationship:-**

✚ One to one relationship is **one field of first table is connected only one field of second table.**

■ **One to many relationship:-**

✚ **One field of first table** is connected with **many field of second table** is called one to many relationship.

■ **Many to many Relationship:-**

✚ Many to many relation ship is **one or more field of first table** is **connect** to the **one or more field of second table.**

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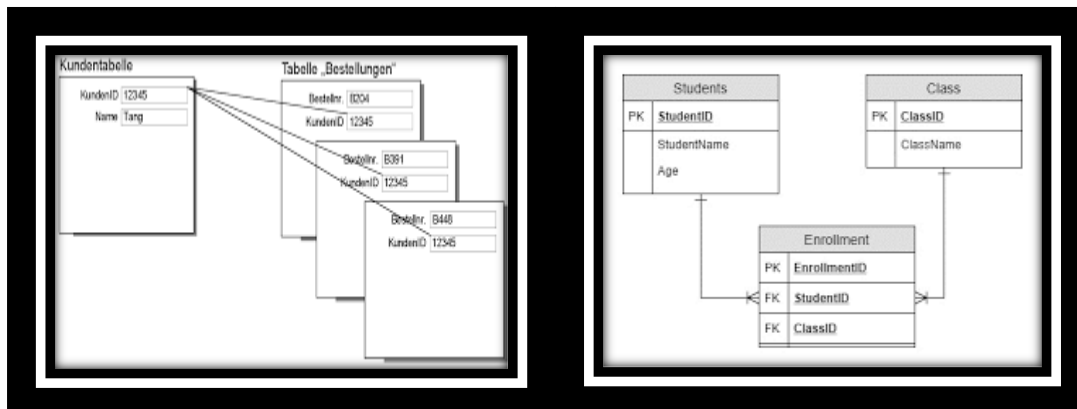
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**One to one relation ship.**



**One to many relationship.**

**Many to many relationship**

✚ In this topic relationship like one column with many other column.

### ✚ ONE WORD QUESTION AND ANSWER

No	QUESTION	ANSWER
1	How many types of relationship are available?	3
2	One to one means?	One field of first table and one field of second table.

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**Q-8. Explain Dr.E-F Codd Rules.**

- + **Dr.edgar.f. codd is ibm reseacher.**
- + Who first developed the relation **database model in 1970.**
- + In **1985 dr.e.f.codd** published the **list of 12 rules** that define anysoftware is dbms or rdbs.
- + Here we can explain some important rules of dr.e.f. codd.
  
- **The information rule:-**
  - + All the data should be **presented in table form.**
  
- **Guarantee access rule:-**
  - + All the data should be **access easily.**
  
- **Systematic treatment of null value:**
  - + A field should be allowed **null** which is **diferent from zero.**
  - + This **can not** apply **primary key.**
  
- **View update rule:-**
  - + each view **support** the **same range of data** manipulation that hasdirect access to a table available
  
- **High level insert,update,delete:-**
  - + It **support high level** insert,update and delete. Records of tables.
  
- **Physical data indepandence:-**
  - + User should **remain isolated** from the **physical method** of **store**and **retrive** data from the **data base.**

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■ **Logical data independence**

- + **How data is view** should **not be change when** the logical structure of the **data base is changed.**

+ **ONE WORD QUESTION AND ANSWER**

No	QUESTION	ANSWER
1	Who was developed rules	Dr.E.F. Codd
2	How many types of rules are available?	12
3	In data is present in tabular format?	Yes.

**Q-9. What is Sql?**

- + Sql is known as **language of database.**
- + Sql is **stand** for **structured query language.**
- + Sql is used to **communicate with data base.**
- + Sql **developed** by **ibm in 1970.**
- + It is standard language **used to interact** with **modern data base.**
- + Sql is an **english** like **language** and it has simple command set which is easy to remember.
- + Sql **statement are used** to perform task such as **insert, update and delete the data.**
- + Sql can **used by numbers** of **user**, including those with little or no programming experience.

+ **ONE WORD QUESTION AND ANSWER**

No	QUESTION	ANSWER
1	Sql Stands For	Structure Query Language.
2	Sql is Developed by _____	Ibm
3	When was Sql is Developed	1970.
4	Sql is Language of _____	Data base.



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**Q-10 . What is Sql \* plus ?**

- + **Sql \* plus is oracle product.**
- + **It provide command window, where sql command can be written by the user.**
- + **Sql\* plus is oracle product.**
- + **Sql\*plus is follow oracle rules.**
- + **It is command window.**

**+ ONE WORD QUESTION AND ANSWER**

No	<u>QUESTION</u>	<u>ANSWER</u>
1	Sql*plus is tool of _____	Oracle
2	When we can write command of oracle?	Sql*plus window.

**Q-11 .Explain Sql command.**

- There are **four** types of **SQL command**.

- + **DDL (Data Definition Language)**
- + **DML (Data Manipulation Language)**
- + **DCL (Data Control Language)**
- + **DQL (Data Query Language)**

- **DDL (Data Definition Language)**

- + DDL contains following commands or statements.
- + **CREATE**: It is used to **create objects** (table, view,

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function, procedure, trigger etc) in the database.

- + **ALTER**: It is used to **change the structure of database.**
- + **DROP**: It is used **to delete** objects from the database.
- + **TRUNCATE**: It is used to **remove all records** from the table, including all spaces allocated for the records are removed.
- + **GRANT**: It is used to give different **command grant (access rights) to the user.**
- + **REVOKE**: It is used to take the given grant **back from the user.**

## ■ **DML (Data Manipulation Language)**

- + **INSERT**: it used to **insert the data into a table**
- + **UPDATE**: it used to **update the existing data** within a table.
- + **DELETE**: it used to **delete all the records** from the table, the space will be remaining.
- + **CALL**: it is used to **call a PL/SQL program.**

## ■ **DCL (Data Control Language)**

- + DCL contains following commands or statements.
- + **COMMIT**: it is used to **save the work.**
- + **SAVEPOINT**: it is used to identify a **point in transaction.**
- + **ROLLBACK**: Restore database to original **since the last commit (like undo).**

## ■ **DQL (Data Query Language)**

- + DQL contain only one statement.
- + **SELECT**: It is used to **retrieve data from the database.**

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 **ONE WORD QUESTION AND ANSWER**


No	QUESTION	ANSWER
1	Ddl means _____	Data definition language
2	Dml means _____	Data manipulation language.
3	Dql means _____	Data query languages
4	Dcl means _____	Data control language
5	grant means _____	Give grant to user
6	Revoke means _____	Take back to given grant


**Q-11 .Explain data types.**

 SQL has following data types.

■ **CHAR:**


 **Syntax:** <column name> datatype (<size>)

 User can **enter only character** if you specify column with this data type.

 It is **fixed length character string**.


 **Example:** name CHAR (10).

 Now user can enter 10 alphabetic characters into name column.

 **Maximum size** of this **data type is 255**.


■ **VARCHAR:**

 **Syntax:** <column name> VARCHAR (<size>)

 User can **enter both character and numeric value** if you specify column with this data type.

 It is **variable length** character string.

 **Example:** name VARCHAR (10)

 Now user can enter 10 alphanumeric digits into name column.

 **Maximum size** of this data type are **2000 characters**.

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## ■ Varchar2

- + Syntax: **<column name> VARCHAR2 (<size>)**
- + User can enter both character and numeric value if you specify column with this data type.
- + It is variable length character string.
- + **Example: name VARCHAR 2(10).**
- + Maximum size of this data type are 4000 characters

## ■ Date:-

- + Syntax: **<column name> DATE.**
- + This data type is used to represent date.
- + The standard format is DD-MON-YY.
- + **Example: DOB date**
- + Now user can enter date into DOB column.

## ■ NUMBER(P,S):

- + Syntax: **<column name> NUMBER (P, S)**
- + The number data type is used to store numbers (fixed or floating point).
- + The **P (precision)** determines the maximum length of the data, whereas the scale determines the number of placesto the right of the decimal.
- + If the scale is omitted then the default is zero.
- + The maximum length of this data type is 38 digits with Precision and scale.
- + Example: mob NUMBER (10)

## ■ Long:

- + Syntax **<column name> LONG**
- + This data type is used to store variable length character strings containing up to 2GB.
- + Only one long value can be defined per table.

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✚ Long values cannot be used in sub queries, functions, and expressions.

✚ Example: image LONG

■ **RAW/RAW LONG:**

✚ Syntax: <column name> RAW

✚ <Column name> RAW LONG

✚ This data type is used to store binary data,such as picture or images.

✚ The size of RAW data type is 255 bytes.

✚ The size of RAW LONG data type is 2 GB.

✚ **ONE WORD QUESTION AND ANSWER**

No	<u>QUESTION</u>	<u>ANSWER</u>
1	How many types of data types ?	7
2	Char stands _____	Character
3	Varchar 2 maximum size	4000
4	Number data types maximum size	38 digit
5	Which data types is define only one in per table?	Long.

**Q-12 .Difference between Sql V/s Sql \* plus.**

<b>Sql</b>	<b>Sql*plus</b>
SQL is a language	SQL *Plus is an environment
SQL is created as per the ANSI standards	SQL *Plus is ORACLE proprietary
SQL keywords can not be abbreviated	SQL *Plus keywords can be abbreviated.

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SQL Statements manipulate data and table definitions in the database.	SQL *Plus commands do not allow manipulation of values in the database
SQL statements are passes to SQL Buffer	SQL *Plus commands are not passes toSQL Buffer

✚ ONE WORD QUESTION AND ANSWER

No	QUESTION	ANSWER
1	Sql*plus is tool of _____	Oracle
2	When we can write command of oracle?	Sql*plus window.
3	Sql is create as per _____ standard	Ansi
4	Sql* plus is _____ tool	Oracle
5	Sql command is abbrivated?	No

**Q-13 Explain Sql\*plus command.**

✚ **SQL \*PLUS HAS 10 SIMPLE COMMANDS.**

■ **SPOOL <filename>:**

✚ This allows **saving SQL statements** togetherwith **their outputs to a file**

■ **SAVE <filename>:**

✚ This allows you to **save buffer contents into a file.**

■ **DESCRIBE <table name>:**

✚ **Lists the attributes of tables and other objects.**

✚ The command **also** canbe **written** as **DESC <table name>.**

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## ■ EDIT [filename]:

- ✚ Places you in an **editor** so you can **edit a SQL command**.
- ✚ The command also **can be written as ED [filename]**

## ■ EXIT or QUIT :

- ✚ **Disconnect** from the database and **terminate SQL\*Plus**

## ■ SET SERVEROUTPUT {OFF|ON}:

- ✚ Whether to display the **output of stored procedures** (or PL/SQL blocks).

## ■ SET AUTOCOMMIT {OFF|ON}:

- ✚ **Commits after each SQL** command or **PL/SQL block automatically**.

## ■ SET COLSEP { |text} :

- ✚ The text to be **printed between columns** retrieved by SELECT statement.
- ✚ Columns normally separated **by a space**.

## ■ SET SQLPROMPT {SQL|Text}:

- ✚ Sets the **SQL\*Plus command prompt**
- ✚ **SQL> SET SQLPROMPT 'HNS';**
- ✚ Above command **will change** the prompt  
To **HNS>**

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 **ONE WORD QUESTION AND ANSWER**

<u>SR.NO</u>	<u>QUESTION</u>	<u>ANSWER</u>
1.	<b>SPOOL MEANS</b>	<b>SPOOLING</b>
2	<b>DESC MEANS</b>	<b>DISPLAY STURCUTRE</b>
3	<b>COMMIT MEANS</b>	<b>SAVE WORK</b>

**Q-14 Explain sql Operator.**

-  Operator is used with SQL statement in where clause.
-  SQL has following operator:
  -  1. **Arithmetic Operator.**
  -  2. **Comparison Operator.**
  -  3. **Logical Operator.**
  -  4. **Negate Operator.**

■ **Arithmetic operator:-**

-  +
-  -
-  \*



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+ %  
+ /

## ■ Comparison operator

+ =  
+ <>, !=  
+ <  
+ >  
+ >=  
+ <=  
+ !>  
+ !<

## ■ Logical operator:-

### And operator:-

- + This operator is used to provide multiple conditions in SQL statements.
- + Both conditions must be true.

### Or operator:-

- + This operator is used to provide multiple Conditions in SQL statements.
- + Either one or all condition may be true.

### Between operator:-

- + This operator is used to search values between max and minimum values

### Exists operator:-

- + This operator is used to search for the presence of a row in a specified table.

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**Like Operator:-**

✚ This operator is used to compare a string value.

**In operator:-**

✚ This operator is used to compare value from a given list.

**Is null operator:-**

✚ This operator is used to check the null value.

■ **Negate operator:-**

**Not operator:-**

✚ This operator reverses the meanings of the logical operator with which it is used.

✚ For ex. NOT EXISTS, NOT BETWEEN, NOT IN etc

\*

✚ **ONE WORD QUESTION AND ANSWER**

No	QUESTION	ANSWER
1	Both condition must be true in which operator?	And
2	Any one operator is true?	Or
3	Which operator is used for compare value from given list	In
4	Like is used for _____	Compare the string value.

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Nr. Amrapali Under Bridge  
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**UNIT-2 Other Oracle Database object.**

**INDEX**

<b><u>TOPICS</u></b>
<b>Create table</b>
<b>Alter table</b>
<b>Insert statement</b>
<b>Update statement</b>
<b>Delete statement</b>
<b>Primary key</b>
<b>Foreign key</b>
<b>Unique</b>
<b>Not null</b>
<b>Check constraint</b>
<b>Group by &amp; Having</b>
<b>Join</b>
<b>Select</b>
<b>String function</b>
<b>Date function</b>
<b>Aggregate function</b>
<b>Numeric function</b>

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## Q-1. How to create table ?explain in detail.

- ✚ The **CREATE TABLE** statement **allows you to create** and define a **table.**

### ■ Syntax:

```
CREATE TABLE table_name  
(  
Column 1 data type(size),  
column 2 data type(size),  
... Column data type (size)  
);
```

- ✚ Each **column** must **have a data type.**
- ✚ **Column name** must **not contain space** or any **special character.**
- ✚ It can **contain underscore ( \_ ).**
- ✚ The column should either be **defined as "null"** or **"not null"** and if this value is **left blank**, the database **assumes "null"** as the default.

### ■ Example:

```
Create table student  
(
```

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```
studno number(2),  
studnm varchar2(20),  
sem number(1),  
course varchar2(6),  
join_dt date  
);
```

**ONE WORD QUESTION AND ANSWER**

SR.NO	QUESTION	ANSWER
1	Which command is used to create table?	Create table
2	Data type is must require for table?	Yes
3	Space is allowd? In column name	No
4	Can blank values is allowed in table?	Yes

**Q-2 how to insert data in table? Explain with example.**

✚ The **INSERT INTO** statement allows you to insert asingle record or multiple records into a table.

■ **Syntax-1: Inserting value in all the fields of table**

✚ INSERT INTO *table-name* VALUES (*value-1, value-2, ... value-n*);

■ Example:

✚ Insert into student values (11,'Palak',1,'PGDCA','01-Jun-2008');

■ **Syntax-2:-insert values in all the fields using variable.**

✚ INSERT INTO *table-name* VALUES (&*variable1, &variable2,...*);

■ Example:-

✚ INSERT INTO student VALUES  
(&student\_no,&student\_nm,&semester,&course,' &Joining\_date');

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■ **Rules:**

- ✚ **Variable name** can be **same as column name** of the table or it can be different.
- ✚ **Space** is **not allowed** in variable name.
- ✚ Variable that represents **Varchar2, Char and Date type of columns, must be written in single bracket (' ')**.

■ **Syntax 3: Inserting values in selected fields.**

- ✚ INSERT INTO *table-name (column name1, column name2, column name3)* VALUES (*value1, value2, value3*);

■ **Example:-3**

- ✚ INSERT INTO student(studno,studnm,course) VALUES (10,'Ravi','PGDCA');

■ **Syntax-4: insert values in selected field using variable.**

- ✚ INSERT INTO *table-name (column name1, column name2, column name3)*  
VALUES (*&variable1, &variable2, &variable3*);

■ **Example:-**

- ✚ INSERT INTO student (studno,studnm,course)VALUES (&student\_no,;&student\_name', '&course');

✚ **ONE WORD QUESTION AND ANSWER**

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<u>SR.NO</u>	<u>QUESTION</u>	<u>ANSWER</u>
1.	USE OF INSERT COMMAND	INSERT RECORD IN TABLE
2	CAN MULTIPLE RECORD ARE INSERT INTO TABLE?	YES
3	HOW MANY TYPES OF METHODS ARE AVAILBLE TO INSERT INTO TABLE	BOTH

**Q-3. How to alter table? Explain with example.**

- + Alter table means to changes the structure of table.
- + We can add of modify table structure.

■ **Syntax 1: Adding new column in the table.**

```
ALTER TABLE table-name
ADD (newcolumnname
datatype(size),
newcolumnname
datatype(size), ...);
```

■ **Example:-**

```
ALTER TABLE student
ADD (result varchar2 (20));
```

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■ **Syntax 2: modify existing column in the table.**

```
ALTER TABLE table-name
MODIFY
(columnname
newdatatype(new
size));
```

■ **Example:-**

```
ALTER TABLE student
MODIFY (course varchar2 (7));
```

✚ **Restriction on ALTER TABLE:**

- ✚ One cannot change the name of the table.
- ✚ Once cannot change the name of the column.
- ✚ One cannot drop (remove) the column.

✚ **Note:** *Dropping a column is possible in Oracle 8ionwards versions of oracle.*

✚ **Syntax is** *ALTER TABLE table-name DROP COLUMNcolumn name.*

- ✚ One cannot decrease the size of a column if table data exists.
- ✚ One cannot change the data type of a column if table data exists.



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 **ONE WORD QUESTION AND ANSWER**

<u>SR. NO</u>	<u>QUESTION</u>	<u>ANSWER</u>
1.	ALTER MEANS _____	ADD OR MODIFY STRUCTRE
2	ADD MEANS _____	ADD NEW COLUMN
3	MODIFY MEANS ___	CHAGE THE COLUMN
4	CAN WE CHANGE TABLE NAME?	NO

**Q-4what are constraints? explain in detail.**

 Rules which are enforced on **data being entered** and **prevent** the user from entering **invalid data** into tables **are called Constraints.**

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- + The data passes this check, can stored in the table otherwise the data is rejected.
- + If a single column of the record being entered into the table fails a constraint, the entire record is rejected and not stored in the table.
- + Constraints can be connected to a column or a table by CREATE TABLE or ALTER TABLE command.
- + Thus, oracle allows defining constraint at
  - 1) Column Level
  - 2) Table Level
- + Column Level constraint
- + When data constraints are defined along with the column definition while creating or altering table, they are known as column level constraints.
- + Table Level constraint:-
- + When data constraints are defined after defining all the columns of table while creating or altering table, they are known as table level constraints.

+ TYPES OF DATA CONSTRAINTS

There are two types of data constraints

- + I/O Constraints
- + *Business Rule Constraints*

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■ **I/O Constraints:**

✚ *The Input/output (I/O) constraints are further divided into **four different** constraints.*

- Primary Key constraint
- Foreign Key Constraint
- NOT NULL
- UNIQUE constraints.

■ **Business Rule Constraints:**

✚ *Business rule can be implemented in Oracle using **CHECK constraint**. Business Managers determine business rules.*

✚ **ONE WORD QUESTION AND ANSWER**

<b>1</b>	<b>CONSTRAINT CAN DEFINE INTABLE SO WE CAN USE WHICH COMMAND</b>	<b>CREATE TABLE AND ALTER TABLE COMMAND</b>
<b>2</b>	<b>HOW MANY TYPES OF CONSTRAINT ARE AVAILABLE</b>	<b>2</b>
<b>3</b>	<b>LIST THE NAME OF CONSTRAINTS</b>	<b>I/O AND BUSINESS</b>
<b>4</b>	<b>IS CONSTRAINTS SPECIFY WHOLE COLUMN?</b>	<b>YES</b>
<b>5</b>	<b>IF CONSTRAINTS IS FAIL THEN RECORD IS INSERT OR NOT?</b>	<b>NO NOT INSERT</b>

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**Q-5 Explain Primary Key?**

- ✚ A primary key is **one or more column** in a table used to identify each **row uniquely in table.**
- ✚ Once the column has **defined Primary Key** constraint, it gets **NOT NULL and UNIQUE** constraints.
- ✚ A **single column primary key** is called a **Simple Key** and **Multicolumn primary key** is called **Composite Primary Key**
- ✚ **PRIMARY KEY** constraint at column level:

**Syntax:**

*Column name data type (size) PRIMARY KEY,*

**Example:**

Create table stud  
(  
No number(3) primary key,  
Name varchar2(20)  
);

- ✚ **PRIMARY KEY** constraint at table level:

**Syntax:**

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Primary key (column name1,column name2)

**Example:**

Create table stud

(

No number(3),

Name varchar2(20)

Primary key(no));

 **ONE WORD QUESTION AND ANSWER**

<b><u>SR. NO</u></b>	<b><u>QUESTION</u></b>	<b><u>ANSWER</u></b>
<b>1.</b>	<b>PRIMARY MEANS ___</b>	<b>UNIQUE</b>
<b>2</b>	<b>HOW MANY WAY TO DEFINEPRAMAY</b>	<b>2</b>

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	KEY	
3	PRIMARY KEY USE FOR RELATION?	YES
4	HOW MANY WAY TO DEFINE PRAMAY KEY	2 LIKE COLUMN LEVEL AND TABLE LEVEL.

**Q-6 Explain Foreign key.**

- ✚ Foreign key **represent relationships** between tables.
- ✚ A foreign key is a **column** or **group of columns whose** values are **derived from** the primary key of **some other table**.
- ✚ The table in which foreign key is **defined is called a foreign key table or detail table**.
- ✚ The table that **defines** the **primary key** and is referenced by the foreign key is called **primary table or master table**.

**FOREIGN KEY at column level:**

**Syntax:**

Column name data type (size) REFERENCES table name [(column name)]

**Syntax:**

FOREIGN KEY (column name [, column name , ...])  
REFERENCES tablename [(column name) [, column name , ... ] ]

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 **ONE WORD QUESTION AND ANSWER**

<u>SR.NO</u>	<u>QUESTION</u>	<u>ANSWER</u>
1.	FOREIGN KEY DEFINE _____	RELATIONSHIP
2	FOREIGN KEY CALL _____	DETAIL TABLE
3	FOREIGN KEY CAN RELATION WITH WHICH KEY?	PRIMARY KEY.
4	HOW MANY WAY TO DEFINE FOREIGN KEY	2LIKE COLUMN LEVEL AND TABLE LEVEL.

**Q-7. Explain Unique key with Example.**

-  The purpose of UNIQUE constraint is to **ensure** that the data in the column is **unique** and it **mustnot be repeated** across the column.
-  A table can have **more than** one **UNIQUE keycolumn.**

■ **Syntax (column level)**

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✚ Column name data type (size) unique,

## ■ Example:-

Create table stud  
No number(3) unique,  
Name varchar2(20),  
City varchar2(20)  
);

## ■ Syntax (table level)

✚ Unique(column name),

## ■ Example:-

Create table stud  
No number(3),  
Name varchar2(20),  
City varchar2(20),  
Unique(no)  
);

## ✚ ONE WORD QUESTION AND ANSWER

<u>SR. NO</u>	<u>QUESTION</u>	<u>ANSWER</u>
1.	UNIQUE MEANS_____	NOT REPEAT
2	HOW MANY WAY TO DEFINE UNIQUE KEY	2



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**Q-8. Explain Not null Constraints .**

- ✚ A NULL value **is different from space or zero.**
- ✚ A NULL value **can be inserted into** the column of any **data type.**
- ✚ NOT NULL constraint at **Column Level:**
- ✚ When a column is defined **as not null, it becomes mandatory column.**
- ✚ It means that a value **must be entered into the column.**

■ **Syntax:-**

Column name datatype(size) not null,

■ **Example:-**

Create table student

(

No number(3) not null,

Name varchar2(20)

);

■ **Note:-**

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✚ Not null constraint can not define at table level.

**✚ ONE WORD QUESTION AND ANSWER**

No	QUESTION	ANSWER
1	Null values is differ form zero?	yes
2	Not null means?	We can enter value in mandatory way.
3	Not null can define table level?	no

**Q-9. Explain Unique constraint?**

- ✚ The purpose of UNIQUE constraint is to ensure that the data in the column is unique and it mustnot be repeated across the column.
- ✚ A table can have more than one UNIQUE keycolumn.
- ✚ Example:- ( column level)


Create table student  
(

No number(3) unique,  
Name varchar2(20)  
);

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 **Example:- ( table level)**

Create table student



(

No number(3),  
Name varchar2(20),  
Unique(no)  
);

 **ONE WORD QUESTION AND ANSWER**

No	QUESTION	ANSWER
1	Unique means	We can not insert duplicate value
2	Unique and primary are same?	No

**Q-10 . Explian check constraint.**

-  Business Rule validations can be applied to a column using CHECK constraint.
-  CHECK constraint must be specified as logical expression that evaluates either to TRUE or FALSE.

**Syntax:-**

Column name datatype (size) check constraints

**Example:-**

Create table emp

(

empno varchar2(4) CHECK(empno like 'E%'),

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```
empnm varchar2(15)
CHECK(empnm=upper(empnm)), address1
varchar2 (20) NOT NULL,
address2 varchar2 (20),
city varchar2(15) CHECK(city IN
('bombay','delhi','rajkot','pune'))
);
```

**Syntax table level:-**



Column name datatype (size)  
check constraints( validation)

**Example:-**

```
CREATE TABLE emp
(
empno varchar2(4),
empnm varchar2(15),
city varchar2(15), CHECK(empno
like 'E%'),
CHECK(empnm=upper(empnm)),
CHECK(city IN ('bombay','delhi','rajkot','pune'))
);
```

---

**Q-11 .Explain Update command.**

-  The UPDATE command is used to change or modify data values in a table.
-  UPDATE statement can update all the rows from a table or selected rows from the table

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**+ Syntax-1:- Update all rows from table.**

- UPDATE table-name SET column name=expression, column name=expression,..;

**+ . Example-1**

- Update stud set name ='vishal';

**+ Syntax-2:- Update selected rows from table.**

- UPDATE table-name SET column name=expression where column name=expression;

**+ Example-2**

- Update stud set name ='vishal' where name='amar';

**+ ONE WORD QUESTION AND ANSWER**

No	QUESTION	ANSWER
1	UPDATE MEANS _____ MODIFY RECORDED	UPDATE MEANS _____ MODIFY RECORDED
2	Which key word use in update statement	Set and where
3	Update can only single records?	No we can update multiple also records.

**Q-11 .Explain Delete Statement.**

- + Delete Statement is used to remove all rows from a table or selected rows from a table.

**+ Syntax-1:-remove all the rows from table.**

- Delete from table name;

**+ Example:- 1**

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■ Delete from student;

✚ **Syntax-1:-remove selected rows from table.**

■ Delete from table name where column name= value;

✚ **Example:- 2**

✚ Delete from stud where name='vishal';

✚ **Truncate table statement:-**

✚ TRUNCATE TABLE removes all rows from a table.

✚ TRUNCATE TABLE is functionally identical to DELETE statement with no WHERE clause but TRUNCATE TABLE is faster and uses fewer system and transaction log resources than DELETE

**Syntax:-**

✚ Truncate table table name;

**Example:-**

✚ Truncate table student;

**✚ ONE WORD QUESTION AND ANSWER**

No	QUESTION	ANSWER
1	Delete means?	Remove record
2	Can we delete multiple record at a time?	Yes
3	Delete and truncate is same?	No
4	Truncate means _____	Remove all the row from table.

**Q-12 .explain select stamen.**

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✚ The SELECT statement allows you to retrieve records from one or more tables.

✚ **Syntax 1: Selected column and all rows.**

✚ SELECT columnname1, columnname2 ... column name n FROM table name;

✚ **Example- 1: Selected column and all rows.**

✚ Select no,name form stud;

✚ **Syntax 2: all rows and all column.**

✚ SELECT \* from FROM table name;

✚ **Example- 2:**

✚ Select \* form stud;

✚ **Selected rows and all columns:**

✚ To retrieve selected rows from the table, Oracle provides 'where' clause in an SQL statement.

✚ When 'where' clause is added to the SQL statement, the Oracle Server compares each record from the table with the condition specified in the 'where' clause and display only those records that satisfy the specified condition.

✚ **Syntax:-**

✚ Select \* from table name where columnname = value;

✚ **Example:-**

✚ Select \* from stud where name='vishal';

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## ■ Logical Operator “AND”:

✚ The Oracle engine will display only those rows of a table which satisfies all the condition specified in ‘where’ clause using AND operator.

✚ Example:-

✚ Select \* from stud where name='vishal and city='rajkot';

## ■ Logical Operator “OR”:

✚ The Oracle engine will display only those rows of a table which satisfies at least one condition specified in ‘where’ clause using OR operator.

✚ Example:-

✚ Select \* from stud where name='vishal or city='rajkot';

## ■ Not Operator:

✚ Operation will be TRUE when condition becomes FALSE.

✚ Example:-

✚ Select \* from stud where not (city='rajkot or city='surat');

## ■ Between operator:-

✚ To select the data within range, BETWEEN operators is used.

✚ Example:-

✚ SELECT \* FROM empdet WHERE salary BETWEEN 2000 AND 7000;

## ■ In and not in operator:-

✚ Operator = compares a single value to another single value.

✚ If a value needs to compare with list of values IN is used.

✚ By using IN, comparison becomes easy compare to doing with OR operator.

✚ Example (in):-

✚ SELECT \* FROM EMP WHERE city IN ('rajkot', 'bombay', 'pune');



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**Example (not in):-**

SELECT \* FROM EMP WHERE city not IN ('rajkot', 'bombay', 'pune');

**ONE WORD QUESTION AND ANSWER**

No	QUESTION	ANSWER
1	Select means _____	Retrive data from table.
2	Can we use operator in select statement?	Yes
3	Can we use select statement for multi purpose?	Yes

**Q-13 Explain Group by and having clause.**

- Group By clause is used to group rows based on distinct (unique) values that exist for specified columns.
- GROUP BY is used in conjunction with aggregating functions to group the results by the un-aggregated columns.

**Syntax:-**

SELECT column1, column2, column, aggregate function (expression)  
FROM table name;

**Example:-**

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+ Select deptno, sum (sal) from EMP group by deptno;

+ **Having clause:-**

+ HAVING clause restricts the results of a GROUP BY clause.

+ It can be used in conjunction with Group By clause.

+ HAVING is used to give condition on group by clause column(s).

+ The HAVING clause is applied to each group of the grouped data.

+ **Syntax:-**

+ SELECT column1, column2 ... column, aggregate function  
(expression) FROM table GROUP BY column1, column2, ... column  
HAVING groupbycolumn=expression;

+ **Example:-**

+ Select deptno, sum (sal) from EMP group by deptno having  
deptno=10;

+ **ONE WORD QUESTION AND ANSWER**

<u>SR.NO</u>	<u>QUESTION</u>	<u>ANSWER</u>
1.	In group by clause which function we can use?	Aggregate function.

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2	When we can use group by?	WE CAN SELECT GROUP WISE DATA AT THAT TIME WE CAN USE THIS
3	Having menas??	It is part of group by

---

**Q-14 Explain like Operator.**

- + This operator is used for pattern matching.
- + Pattern matching can be done using % and \_ along with like operator.
- + % is used to match any number of characters.
- + It can be used in any position.
- + When % is used, all characters after % are ignored by Oracle.
- + For example 'A%' represents any name start with A followed by any no of characters.

+ **Example:-** Select \* from EMP where name like 'C%';

+ \_ is used to match any one character.

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✚ When it is used Oracle will ignore the character only in the position where underscore is put.

✚ For ex. ‘\_ONY’ will display the word with 4 characters having first character as any character and remaining 3 characters would be ‘ONY’.

✚ **EXAMPLE:-** Select \* from EMP where name like ‘\_ca’;

\*

## ✚ ONE WORD QUESTION AND ANSWER

No	QUESTION	ANSWER
1	Like operator used for _____	Pattern matching
2	How many way we can use like operator?	2

### Q-14 Explain string operator.

#### ■ **Concat:**

✚ Purpose: it is used to combine the two strings and return combination of both string.

✚ Syntax: concat(string1, string2)

✚ Example: select concat(‘hi ‘,’ hw are you’) from dual;

✚ Output: hi hw are you

#### ■ **Initcap:**

✚ it returns the string with the first letter of each word in upper case and all other letters in lower case.

✚ Syntax: initcap(string).

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Example: Select `initcap('this is example')` from dual;  
Output :- This Is Example.

## ■ Lower:

It returns the string with all letters in lower case.  
Syntax: `lower (string)`  
Example:- select `lower('HOW ARE U')` from dual;  
Output:-  
how are u.

## ■ Upper:

It returns the string with all letters in upper case.  
Syntax: `upper (string)`  
Example:- select `upper('how are u')` from dual;  
Output:-  
HOW ARE U.

## ■ Lpad:

it returns the `Expr1` left padded to the length or `n` character with the sequence of characters in `Expr2`  
Syntax:`Lpad (expr1, n, expr2)`  
Example: select `lpad('hns',10,'*')` from dual;  
Output: \* \* \* \* \* hns

## ■ rpad:

it returns the `Expr1` right padded to the length or `n` character with the sequence of characters in `Expr2`  
Syntax:`rpad (expr1, n, expr2)`  
Example: select `rpad('hns',10,'*')` from dual;  
Output: hns\*\*\*\*\*

## ■ Ltrim:

It removes from the left end of string all of the character contains in set.

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- ✚ If set is not defined it will default as a blank.
- ✚ Syntax: ltrim(string,set)
- ✚ Example: Select ltrim('xyXxyHNS','y') from dual;
- ✚ Output: XxyHNS.

## ■ **Rtrim:**

- ✚ It removes from the right end string all of the character contains in set.
- ✚ If set is not defined it will default as blank.
- ✚ Syntax: rtrim(string,set)
- ✚ Example: Select rtrim('HNS\*\*\*\*\*','\*') from dual;

## ■ **Replace:-**

- ✚ It returns characters with every occurrence of search string replace with replacement string.
- ✚ If replacement string is omitted then all occurrence of search string are removed.
- ✚ Syntax:- replace (string,search\_string, replacement\_string);
- ✚ Example:- Select replace ('BCA College', 'BCA','PGDCA') from dual;

## ■ **Substr:-**

- ✚ This function returns a part of string beginning at character position define by m to n character long.
- ✚ If m is positive then start from beginning. If m is negative then start from ending.
- ✚ Syntax: Substr (str,m,n)
- ✚ Example: Select substr ('hello', 2, 5) from dual;
- ✚ Output: ello

## ■ **length:**

- ✚ It returns the total length or size of the specified string.
- ✚ Syntax: length (string)
- ✚ Example: Select length ('hello') from dual
- ✚ Output: 5.

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## Q-15 Explain date function.

### ■ ADD MONTHS:

- ✚ Syntax: ADD\_MONTHS (date, integer)
- ✚ This function returns the date plus integer months.
- ✚ The date argument can be a date value or any values that can be implicitly converted to DATE.
- ✚ The integer argument can be integer value or any values that can be implicitly converted to integer.
- ✚ The return type of this function is date.
- ✚ select add\_months('07-JAN-2011',1) from dual;

### ■ LAST DAY:

- ✚ Syntax: LAST\_DAY (d1)
- ✚ It returns the last date of specified month.
- ✚ The d1 argument can be any date value.
- ✚ Example: select last\_day('07-JAN-2011') from dual;
- ✚ Output: 31-JAN-11.

### ■ MONTHS BETWEEN:-

- ✚ Syntax: MONTHS\_BETWEEN (d1, d2);
- ✚ It returns the how many months fall between two dates.
- ✚ The return type of this function is number value.
- ✚ Here user has to give two dates as argument.
- ✚ Example: select months\_between('07-FEB-2011','07-JAN-2011') from dual;
- ✚ Output:-1

### ■ Sysdate:-

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- + Syntax: SYSDATE
- + This function returns the current system date
- + The return type of this function is date.
- + Example: Select sysdate from dual;
- + Output: 06-MAR-11.

## Q- 16:- Explain aggregate function.

### Answer:-

#### ■ AVG:

- + Syntax: AVG ( column name)
- + This function returns the average value of specified column.
- + Example: Select avg (sal) from EMP;
- + This statement returns the average value of sal from EMP table.

#### ■ Min:-

- + Syntax: MIN (column name)
- + This function returns the minimum value of specified column.
- + Example: Select min (sal) from EMP;
- + Output: 1

#### ■ Max:-

- + Syntax: MAX (column name) from table name
- + Purpose: This function returns the maximum value of specified column.
- + Example: Select max (sal) from emp;
- + Output: 4.

#### ■ Count:-

- + Syntax: COUNT (column name) from table name
- + Purpose: This function returns the number of rows where expr is not null.
- + Example: Select count (sal) from EMP;



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✚ OUTPUT: 14.

## ■ Sum:-

✚ Syntax: SUM (column name) from table name

✚ This function returns the sum of the specified column or n.

✚ Example: Select sum (sal) from emp;

✚ Output:-10;

## Q-17:- Explain numeric function.

### ■ Abs:-

✚ Syntax: abs (n)

✚ Purpose: This function returns the absolute value of n.

✚ Example: Select abs (-3) from dual;

✚ OUTPUT: 3.

### ■ POWER:

✚ Syntax: Power (m, n)

✚ This function returns the m raised to the nth power.

✚ N must be an integer, else an error is returned.

✚ Example: Select power (2, 3) from dual;

✚ OUTPUT: 8.

### ■ ROUND:

✚ Syntax: round (n, [m])

✚ Returns n, rounded to m places to the right of a decimal point.

✚ If m is omitted, n is rounded to 0 places.

✚ Example: Select round (15.19, 1) from dual;

✚ OUTPUT: 15.2

### ■ SQRT:

✚ Syntax: SQRT (n)

✚ Returns square root of n. if n

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✚ Select sqrt (9) from dual;

✚ OUTPUT: 3

## ■ GREATEST:

✚ Syntax: GREATEST (expr1, expr2 ... expr)

✚ Returns the greatest value in a list of expression.

✚ Example: Select greatest (1, 2, 3, 6) from dual;

✚ OUTPUT: 6

## ■ Least:-

✚ Syntax: LEAST (expr1, expr2 ... expr)

✚ Returns the smallest value in a list of expression.

✚ Example: Select least (1, 2, 3, 6) from dual;

✚ OUTPUT: 1

## ■ MOD:-

✚ Syntax: MOD (m, n)

✚ Returns the remainder of first number divided by second number passed into the argument.

✚ If the second number is zero, the result is the same as the first number.

✚ Select mod (6, 3) from dual;

✚ OUTPUT: 0

## ■ Ceil:-

✚ Syntax: ceil (n)

✚ Returns the largest integer value that is equal to or less than a number.

✚ Example: Select ceil (24.8) from dual;

✚ OUTPUT: 25.

## ■ Floor:-

✚ Syntax: floor(n)

✚ Returns the smallest integer value that is equal to or greater than a number.

✚ Example: Select floor (24.8) from dual;

✚ Output:-24.

\*

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 **ONE WORD QUESTION AND ANSWER**

No	QUESTION	ANSWER
1	Floor function return _____	Lowest integer
2	Ceil function return _____ value	Highest integer
3	Abs function return _____	Absolute value
4	Upper() return _____	Upper case letter
5	Lower () return _____	Lower case letter
6	Sum ()return _____	Sum of proper column
7	Greatest () return _____	Maximum value
8	Avg() return _____	Average of column
9	Last _ day() return _____	Last date of month
10	Months between () return _____	Gap between two months.
11	Mod() return _____	Modulus values.
12	Sqrt() return _____	Square root of given number.
13	Count() return _____	Total number of record in particular column
14	Sysdate () return _____	Current system date.

 **CH-3 :- OTHER ORACLE DATA BASE OBJECT**

**Q-1. EXPLAIN VIEW:**

**VIEWS:**

- ✓ After a table is created and populated with data, it may become necessary to prevent all users from accessing all columns of a table, for data security reasons.
- ✓ View use for hide particular column of table.
- ✓ View is dependent object.

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- 
- ✓ With out table we can not create view.
  - ✓ View connect with other object.
  - ✓ In view we can also insert ,update and delete data.
  - ✓ If we can create view for any table so if we insert record into table so it already insert to view and if we update record in view it will automatic update in table.
  - ✓ When data security is required At a time view is create.

**Syntax:**

Create view viewname as  
Select column1, column2 from table name

**Example:**

Create view v1 as select no,name from emp;

**Selecting a data set from a view:**

- ✓ Once a view has been created, it can be queried exactly like a base table.

**Syntax:**

Select ColumnName1, Column Name2 from ViewName;

**Example:**

Select \* from v1;

**Updateable Views:**

- ✓ Views can also be used for data manipulation (The user can perform the Insert, Update and Delete operations).
- ✓ Views on which data manipulation can be done are called updatable views.

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- ✓ When updatable view names is given in an insert update or delete sql statement, modification to data in the view will be immediately passed to the underlying table and also modification in table will affect the view.

## Inserting data in views:

### Example:

Insert into v1 values (500,'Harit');

## Updating data in views

### Example

Update v1 set name='vishal' where name='amar';

## Destroying a view

The drop view command is used to remove a view from the database.

### Syntax:

Drop view <View Name>>

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**Example**

Drop view v1;

**2. EXPLAIN SEQUENCE**

**SEQUENCES**

Oracle provides an object called a Sequence that can generate numeric values.

- ✓ The value generated can have a maximum of 38 digits.
- ✓ A sequence can be defined to:
  1. Generate numbers in ascending or descending order
  2. Provide intervals between numbers
  3. Caching of sequence numbers in memory to speed up their availability
- ✓ A sequence is an independent object and can be used with any table that requires its output.

**Syntax:**

**Create sequence Sequence Name**  
**[Increment By <Integer Value> Start**  
**With <Integer Value>**  
**Maxvalue <Integer Value> / NonMaxvalue**  
**Minvalue <Integer Value> / Nonminvalue**  
**Cycle/NoCycle**  
**Cache <Integer Value> / No Cache**  
**Order / Noorder]**

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## Keywords and Parameters:

### **Increment By:**

- Specifies the interval between sequence numbers.
- It can be any positive or negative value but not zero.
- If this clause is omitted, the default value is 1.

### **MinValue:**

- Specifies the sequence minimum value.

### **Nominvalue:**

- Specifies a minimum value of 1 for an ascending sequence and  $(10)^{26}$  for a descending sequence.

### **Maxvalue:**

- Specifies the maximum value that a sequence can generate

### **Nomaxvalue:**

- Specifies a maximum of  $10^{27}$  for an ascending sequence or -1 for a descending sequence. This is the default clause.

### **Startwith:**

- Specifies the first sequence number to be generated.
- The default for an ascending sequence is the sequence minimum value (1) and for a descending sequence, it is the maximum value (-1).

### **Cycle:**

- Specifies that the sequence continues to generate repeat values after reaching either its maximum value.

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## **Nocycle:**

- Specifies that a sequence cannot generate more values after reaching the maximum value.

## **Cache:**

- Specifies how many values of a sequence Oracle pre-allocates and keeps in memory for faster access.
- The minimum value for this parameter is tow.

## **No Cache:**

- Specifies that values of a sequence are not pre- allocated.

## **Example:**

**Create sequence s1 start with 5 increment by 1 maxvalue 50;**

## **To reference next value of sequence**

### **Syntax:**

**Select Sequence Name.Nextval from dual;**

- This will display the next value held in the cache.
- Every time nextval references a sequence its output is automatically incremented from the old value to the new value ready for user.

### **Example:**

**Select s1.nextval from dual;**

## ***To reference current value of sequence***

### **Syntax:**

**Select <Sequence Name>.Currval From Dual;**



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**Example**

Select stest1.currval from dual;

\* Alter sequence:-

Alter sequence s1 increment by 1;

**Dropping a Sequence:**

**Syntax:**

Drop Sequence <<Sequence Name>>;

**Example:**

Drop Sequence stest1;

**Explain synonyms with example.**

- A synonym is an alternative name for objects such as tables, views, sequences, stored procedures, and other database objects.

Synonyms is dependent object.

**Syntax:**

Create Synonym **Synonym.Name** for Table Name

**Example:**

Create synonym employees for emp;

- Now, users of other schemas can reference the table emp, which is now called as employees without having to prefix the table name with the schema named Scoot.

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**Example:**

Select \* from Employee;

**Dropping Synonyms**

**Syntax:**

Drop Synonym **Synonym.Name**;

**Example**

Drop Synonym employees;

**Explain Database Link with example.**

- If our data base is very big in size and at that time we can share to other user.
- In Oracle, remote data accesses such as queries and updates are enabled through the use of database links.
- You will also find information about direct connections to remote database, such as those used in client-server applications.
- Data base link is used to connect database with other user.
- It is network concept.
- Database link use in client server model.

**Data base-----data base link----- user.**

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Database links tell oracle how to get from one database to another.

If you will frequently use the same connection to a remote database then a database link is appropriate.

Database links specify the following connection information:

- 1) The communications protocol (such as TCP/ IP) to use during the connection.
- 2) The host on which the remote database resides.
- 3) The name of the database on the remote host.
- 4) The name of a valid account in the remote database.

## EXPLAIN INDEX IN DETAIL.

- Indexes are data structures that have to improve speed in obtaining specific row from table.
- Indexing a table is an access strategy that is a way to short and search records in the table.
- An index is an order list of the content of column.
- Index should be created on a column that is queried frequently.

Usually to major types of indexes are used:

- 1) B-TREE index
- 2) BITMAP index

B-TREE index:

Oracle allows the creation of two types of indexes:

- 1) Duplicate index
- 2) Unique index

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## **Duplicate index:**

Index that allows duplicate value for the indexed column.

## **Unique index:**

Index that only unique value for the indexed column.

- Indexes are further divided into two group based on the number of columns

- 1) Simple index
- 2) Composite index

## **Duplicate index:**

- 1) Simple duplicate index

An index created on a single column of a table is called simple index.

## **Syntax:**

Create index <index name> on <table name>  
(<columnname>);

## **Example:**

Create index i1 on emp (empno);

- 2) Composite duplicate index

An index created on a multiple column of a table is called composite index.

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## **Syntax:**

Create index <index name> on <table name>  
(<columnname1>, <column name2>...);

## **Example:**

Create index i1 on emp (empno,ename);

Unique index:

### **1) Unique simple index:**

## **Syntax:**

Create unique index <index name> on <table

## **Example:**

Create unique index i1 on emp (empno);

### **2) Unique Composite index:**

## **Syntax:**

Create unique index <index name> on <table name> (<column name1>,  
<column name2>);

## **Syntax:**

Create unique index <index name> on <table name> (<column name1>,  
<column name2>);

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## Example:

Create unique index i1 on emp (empno, ename)

## EXPLAIN GRANT AND REVOKE COMMAND WITH EXAMPLE.DETAILING:

### ■ Grant:-

- The Grant statement provides various types of access to database objects such as tables, views and sequences and so on.

### Syntax:

- GRANT <Object Privileges> ON <Object Name> TO <User Name> [WITH GRANT OPTION];

### Object Privileges:

A user can grant all the privileges or grant only specific object privileges.

ALTER	Allows the grantee to change the table definition with the ALTER TABLE command
DELETE	Allows the grantee to remove the records from the table with the DELETE command.
INDEX	Allows the grantee to create an index on the table with the CREATE INDEX command.
INSERT	Allows the grantee to add the records to the table with the INSERT command.
SELECT	Allows the grantee to query the table definition with the SELECT command.

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**UPDATE**

Allows the grantee to modify the records in the tables with the UPDATE command.

**With Grant Option:**

It allows the grantee to in turn grant object privileges to other users.

**EXAMPLE:**

GRANT select, update ON emp TO bca15;

**Revoke**

- The REVOKE statement is used to deny the grant given on an object.

**Syntax:**

REVOKE <Object Privileges> ON <Object Name> FROM <User Name>;

**EXAMPLE:**

REVOKE delete ON emp FROM pgdca20;

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## HOW TO CREATE USER

The create user command is used to create database user accounts.

When creating a user account with the create user command one can:

- Define the user name
- Define the password associated

with the database user

- Define the default table space for the user
- Define the temporary table space for the user
- Allocate space quotas to various

table spaces to the user.

- Assign attributes to the user account

### Syntax:

```
CREATE USER username  
IDENTIFIED BY password;
```

### Example:

```
CREATE USER ABC IDENTIFIED BY aa1234;
```



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**Q- EXPLAIN COMMIT, ROLLBACK AND SAVEPOINT.**

**Commit**

- Oracle treats changes to table data as a two-step process.
  1. The changes requested are done.
  2. To make these changes permanent a **COMMIT** statement has to be given at the SQL prompt.
    - A **COMMIT** statement makes changes permanent. These changes are done due to the execution of series of SQL Statements.
    - A **COMMIT** ends the current transaction and makes permanent any changes made during the transaction.

**Syntax:**  
**COMMIT**

**Rollback**

- A **ROLLBACK** does exactly the opposite of **COMMIT**.
- It ends the transaction but undoes any changes made during the transaction.
- All transactional locks acquired on tables are released.

**Syntax:**

**ROLLBACK [WORK] [TO [SAVEPOINT] <Save Point Name>];**

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- 
- WORK Is optional and is provided for ANSI compatibility.
  - SAVEPOINT Is optional and used to rollback a transaction partially, as far as the specified save point.
  - SAVEPOINT NAME Is a name of save point created during the current transaction.
    - A **ROLLBACK** operation performed without the SAVEPOINT will work as under:
      - Ends the transaction
      - Undo all the changes in the current transaction
      - Erases all save points in that transaction
      - Releases the transactional locks
    - **Save Point**
      - SAVEPOINT marks and saves the current point in the processing of a transaction.
      - When a SAVEPOINT is used with a ROLLBACK statement, parts of a transaction can be undone.

### **Syntax:**

SAVEPOINT <Save Point Name>;

A **ROLLBACK** operation performed with the TO SAVEPOINT will work as under:

- A predetermined portion of the transaction is rolled back
- Retains the save point rolled back to, but loses those created after the named savepoint
- Releases all transactional locks that were acquired since the savepoint was taken

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## Example with SAVEPOINT:

```
insert into emp values (151,'Disha','Manager', 5000, 10);  
savepoint s1;
```

## Q- WHAT IS TRANSACTION ?

### **DETAILING:-**

\*\* a series of one or more sql statement that are logically related.

\*\* a series of operation perform on oracle data is known as **transaction.**

The transaction has two parts like

- 1) **Beginning of transaction**
- 2) Ending and closing of transaction

### 1) Starting /beginning of transaction.

- Transaction begins first execute sql statement.
- **When we start oracle and work it is called starting transaction.**  
\*When we save work and then again start work is also called transaction.

### 2) Closing or ending of transaction:-

\*When we close oracle it is called closing or ending transaction

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- When we write commit command it is also called transaction ending.

**Q- EXPLAIN TRANSACTION CONTROL COMMAND.**

**DETAILING:**

- THERE ARE THREE TYPES OF TRANSACTION CONTROL COMMAND. LIKE COMMIT ,ROLLBACK AND SAVEPOINT.

■ **COMMIT:-**

- **COMMIT STATEMENT IS USED TO SAVE WORK IN DATA BASE.**
  - COMMIT IS EXECUTE ALL THE SQL STATEMENT.
- **COMMIT ALSO USED TO END OF TRANSACTION.**

■ **ROLLBACK :-**

- **ROLLBACK STATEMENT IS USED TO UNDO THE WORK .**
  - ROLLBACK CAN PERFORM DISCARD CHANGES.
- **THE SUCCESSFUL END OF TRANSACTION.**

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■ SAVE POINT:-

- **IT IS USED TO IDENTIFY A POINT IN TRANSACTION.**
- **SAVE POINT IS POINT BY POINT DATASAVING COMMAND.**
- **SAVE POINT IS LIKE MARKER TO DEVICE THAT CONVERT LENGTHLY TRANSACTION INTO SMALLER ONE.**

**Q- EXPLAIN LOCK IN DETAIL.(3 MARKS**

- **WHILE DESIGNING ANY DATA BASE APPLICATION FOR MULTIPLE USER ENVIRONMENT, PROGRAMMER MUST KEEP IN MIND THE ISSUES OF CONCURRENT ACCESS OF DATA BASE.**
- **THIS IS MAJOR ISSUES OF ANY DATABASE APPLICATION.**
- **AND IT IS NOT MANAGE PROPERLY BY DEVELOPER THEN THE WHOLE DATA BASE IS FAIL.**
- **SO ORACLE PROVIDE LOCK TO HELP THEN DEVELOPER TO SOLVE THIS PROBLEM.**
- **DATA CONCURRENCY MEANS MANY USER CAN ACCESS SAME DATA AT THE SAME TIME.**

**ORACLE PROVIDE VARIOUS TYPES OF LOCK**

- **TYPES OF LOCK :**
- **THERE ARE THREE TYPES OF LOCK IN ORACLE.**

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- 
- DDL LOCK,DML LOCK AND TABLE LOCK.

**1) DDL LOCK:-**

- DDL MEANS DATA DEFINITION LANGUAGE.
- DDL LOCK DDL STATEMENT LIKE CREATE,ALTER,GRANT AND REVOKE.

**2) DML LOCK:-**

- DML MEANS DATA MANIPULATION LANGUAGE.
- IT PROTECT DML STATEMENT.
- LIKE INSERT, UPDATE AND DELETE STATEMENT LOCK .

**3) TABLE LOCK OR INTERNAL LOCK:**

- TABLE LOCK IS ALSO CALLED INTERNAL LOCK.
- USING TABLE LOCK WE CAN PROTECT TABLE'S ROW AND COLUMN.

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**Q- EXPLAIN ORDER BY CLAUSE.**

**\*\* ORACLE ALLOW DATA FROM A TABLE TO BEVIEWD  
IN A SORTED FORM LIKE ASCENDING AND  
DESCENDING.**

**-SYNTAX:**

**SELECT \* FROM TABLE NAME ORDER BY COLUMN  
NAME:**

**EX:-**

**SELECT \* FROM BCA ORDER BY NAME;**

**EX.**

**SELECT \* FROM BCA ORDER BY NAMEDESC;**

**Q- EXPLAIN DISTINCT CLAUSE.**

**\* \* A TABLE CAN HAVE DUPLICATE ROWS.  
\*\*TO SEE ONLY UNIQUE ROWS, WE CAN USED TO  
DISTINCT CLAUSE.**

**SYNTAX:- SELECT DISTINCT COLUMN NAME  
FROMTABLE NAME;**

**EX: SELECT DISTINCT CITY FROM BCA;**

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**CH-4:- PL/SQL**

**Difference between SQL and PL/SQL.**

<b>Sql</b>	<b>PL/SQL</b>
SQL statements are passed to the OracleEngine <b>one</b> at a time. Each time an SQL statement is executed, a call is made to the engine’s resources, which increases network traffic.	PL/SQL sends an <b>entire block</b> of SQL statements to the Oracle engine all in one go. Since the Oracle engine got the SQL statements as a single block, it processes this code much faster than one sentence at a time.
SQL does not have any <b>procedural capabilities</b> like Conditional checking using conditional statement, looping and branching, declaration and use of variable to store intermediate result.	PL/SQL is development tool that supports facilities of conditional checking, branching and looping, declaration and use of variable to store intermediate result.
SQL has no facility for programmed handling of errors and so if an error occurs, the Oracle engine displays its own error messages.	PL/SQL also permits dealing with errors as required, and facilitates displaying user- friendly messages, when errors are encountered.
In SQL it is not possible to perform calculations without the use of the Oracle Engine.	PL/SQL facilitates all sorts of calculations can be done quickly and efficiently without the use of the Oracle engine.
Structured query language.	Procedural language structure query language.



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## EXPLAIN PL/SQL BLOCK STRUCTURE

- A single PL/SQL code block consists of a set of SQL statements, clubbed together, and passed to the Oracle engine entirely.
- A PL/SQL block has a definite structure, which can be divided into sections.

The sections of PL/SQL block are:

- The Declare section.
- The Begin Section.
- The Exception section is optional.
- The end section.

### The Declare Section

- PL/SQL block start with a declaration section, in which, memory variables and other Oracle objects can be declared and initialized.

### The Begin Section

- It consists of a set of SQL and PL/SQL statements.
- Data manipulation statements, retrieval of data using SELECT, conditional statements, looping and branching statements are specified in this section.

### The Exception Section

- This section deals with handling of errors that arise during execution of the data manipulation statements and also user can generate its own user-defined error message.

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**The End Section**

**DECLARE**

Declarations of memory variables, constants, cursors, etc. in  
PL/SQL

**BEGIN**

SQL executable statements  
PL/SQL executable statements

**EXCEPTION**

SQL or PL/SQL code to handle errors that may arise during the  
execution of the code block between **BEGIN** and **EXCEPTION**  
section

**END;**

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## ■ EXPLAIN DIFFERENTS TYPES OF LOOP IN PL/SQL.

- Iterative control indicates the ability to repeat sections of a code block.
- A **loop** marks a sequence of statements that has to be repeated.
- The keyword **loop** has to be placed before the first statement in the sequence of statements to be repeated, while the keyword **end loop** is placed immediately after the last statement in the sequence.

PL/SQL supports the following structures for iterative control:

### Simple Loop

- In simple loop, the keyword **loop** should be placed before the first statement in the sequence and the keyword **end loop** should be written at the end of the sequence to end the loop.

### Syntax:

Loop  
Sequence of statements;  
End loop;

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## The WHILE loop

### **Syntax:**

WHILE condition  
LOOP

Action;  
END LOOP;

## The FOR Loop

### Syntax:

FOR variable IN [REVERSE] start..end  
LOOP  
Action;  
END LOOP

**Note:** The variable in the FOR loop need not be declared. Also the increment value cannot be specified. By default the for loop variable is always incremented by 1.

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## EXPLAIN %TYPE AND %ROWTYPE WITH EXAMPLE.

### **%TYPE**

- PL/SQL uses the %TYPE attribute to declare variables based on definitions of columns in a table so user doesn't need to remember data type and size of column of table.
- If a column's attributes change, the variable's attributes will change as well.
- This provides for data independence, reduces maintenance costs, and allows program to adapt to changes made to the table.

### **Syntax:**

**Tablename.columnname%TYPE**

### **%ROWTYPE**

- PL/SQL uses the %ROWTYPE attribute to declare variables based on definitions of entire column in a table so user doesn't need to remember data type and size of columns of table.
- If a column's attributes change, the variable's attributes will change as well.
- This provides for data independence, reduces maintenance costs, and allows program to adapt to changes made to the table.

### ■ **Syntax:**

**tablename%ROWTYPE**

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## ■ What is cursor?

- The Oracle Engine uses a work area for its internal processing in order to execute an SQL statement.
- This work area is called a **Cursor**. A cursor is opened at the **client end**.
- The data is stored in the cursor is called the **Active Data Set**.
- The size of the cursor in memory is the size required to hold the number of rows in the **Active Data Set**.

### **Example:**

When a user fires a select statement as:

```
SELECT empno, ename, sal FROM emp WHERE deptno=10;
```

## Types of Cursors

Cursors are classified into two types.

1. Implicit Cursor
2. Explicit Cursor

■ A cursor that is created, opened and managed by Oracle Engine for its internal processing is known as **Implicit Cursor**.

■ A cursor that is created, opened and managed through PL/SQL block by the user is known as **Explicit Cursor**

## Cursor Attributes:

- Cursor Attributes are a set of four system variables, which keep track of the **Current** status of a cursor.
- Both **Implicit** and **Explicit** cursors have four attributes.

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Attribute:-

Attribute Name	Description
%ISOPEN	Returns TRUE if cursor is open, FALSE otherwise.
%FOUND	Returns TRUE if record was fetched successfully, FALSE otherwise.
%NOTFOUND	Returns TRUE if record was not fetched successfully, FALSE otherwise.
%ROWCOUNT	Returns number of records processed from the cursor.

■ **Q-explain implicit cursor**

- A cursor that is created, opened and managed by Oracle Engine for its internal processing is known as **Implicit Cursor**.
- Since the implicit cursor is opened and managed by the Oracle engine internally, the function of reserving an area in memory, filling this area with appropriate data, processing the data in the memory area, releasing the memory area when the processing is completed, is taken care of by the Oracle engine.
- The name of implicit cursor is always **SQL**.

■ **EXPLAIN EXPLICIT CURSOR WITH EXAMPLE.**

- When individual records in a table have to be processed inside a PL/SQL code block, a cursor is used. This cursor will be declared and mapped to a SQL query in the Declare Section of the PL/SQL block and used within its Executable Section.
- A cursor thus created and used is known as **Explicit Cursor**.

The steps involved in using an explicit cursor and manipulating data in its activeset are:

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- ✓ Declare a cursor mapped to a SQL select statement that retrieves data for processing.
  - ✓ Open the cursor.
- ✓ Fetch data from the cursor one row at a time into memory variables.
- ✓ Process the data held in the memory variables as required using a loop.
- ✓ Exit from the loop after processing is complete.
  - ✓ Close the cursor.

## \*\* Cursor Declaration

- ✓ A cursor is defined in the declarative part of a PL/SQL block.
- ✓ Naming the cursor and mapping it to a SELECT query is done at this stage.
  - ✓ When a cursor is declared, the Oracle engine is informed that a cursor of the said name needs to be opened. The declaration is only information.
- ✓ There is no memory allocation at this point in time.

### Syntax

**CURSOR CursorName IS SELECT statement;**

### ■ The Functionality of Open, Fetch and Close Commands

Initialization and Opening of a cursor takes place via the **Open** statement. OpenStatement will:

- Executes a query associated with the cursor.
- Creates the **Active Data Set** that contains all rows, which meet the query search criteria
- Sets the row pointer in the **Active Data Set** to the **first** record.

### **Syntax:**

Open <cursorname>;



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**Fetching Data from Cursor**

- ✓ A **fetch** statement then moves the data held in the **Active Data Set** into memory variables.
- ✓ Data held in the memory variables can be processed as desired.
- ✓ The **fetch** statement is placed inside a **Loop...End Loop** construct, which causes the data to be fetched into the memory variables and processed until all the rows in the **Active Data Set** are processed.
- ✓ The **fetch** loop then exits.

**Syntax:**

**FETCH CursorName INTO Variable1, Variable2,...;**

■ **Closing a Cursor**

- The Close Statement will release the memory occupied by the cursor and its DataSet both on the Client and on the Server.

■ **Syntax: CLOSE <Cursor Name>;**

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## ■ WHAT ARE FUNCTION AND PROCEDURE? DETAILING:

- A **Procedure** or **Function** is a logically grouped set of SQL and PL/SQL statements that perform a specific task.
- A **stored procedure** or function is a named PL/SQL code block that has been compiled and stored in one of the Oracle engine's system tables.

Procedures and Functions are made up of:

- A declarative part
- An executable part
- An optional exception-handling part

### **Declarative Part**

- The declarative part may contain the declarations of cursors, constants, variables, exceptions and subprograms. These objects are local to the procedure or function.

### **Executable Part**

- The executable part is a PL/SQL block consisting of SQL and PL/SQL statements that assign values, control execution and manipulate data.
- The data that is to be returned back to the calling environment is also returned from here. The variables declared are put to use within this block.

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## Exception Handling Part

- This part contains code that deals with exceptions that may be raised during the execution of code in the **executable** part.
  - An Oracle exception handler can be redirected to the exception handling section of the procedure or function where the procedure or function determines the actual action that must be carried out by Oracle's exception handler.
- **Procedures and Functions** are stored in the Oracle database. Before a procedure or function is stored, the Oracle engine **parses** and **compiles** the procedure or function.

### The Oracle engine while creating a procedure performs the following steps automatically:

- Compiles the procedure or function
- Stores the procedure or function in the database

### Note:

- The compilation process does not display the errors. These errors can be viewed by giving
- “**show err**” command at sql prompt or by using “**SELECT \* FROM USER\_ERRORS**” statement.

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■ **EXPLAIN HOW TO CREATE FUNCTION?**

**Syntax:**

```
CREATE OR REPLACE FUNCTION <Function Name> (Argument IN Data
type...)RETURN <Data type> {IS, AS}
    Variable declarations;
    Constant declarations;
BEGIN
    PL/SQL subprogram body;
EXCEPTION
    Exception PL/SQL blocks;
END;
```

**DELETING A STORED PROCEDURE OR FUNCTION**

**Syntax:**

```
DROP FUNCTION <Function Name>;
```

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## ■ EXPLAIN HOW TO CREATE PROCEDURE?

### Syntax:

```
CREATE OR REPLACE PROCEDURE <Procedure Name>
(Argument {IN, OUT, IN OUT) Data Type ...) {IS, AS} Variable declarations;
    Constant declarations;
BEGIN
    PL/SQL subprogram body;EXCEPTION
    Exception PL/SQL blocks;
END;
```

## DELETING A STORED PROCEDURE OR FUNCTION

### Syntax:

```
DROP PROCEDURE <Function Name>;
```

## ■ EXPLAIN PACKAGE IN DETAIL.

- :-
- A package is an Oracle object, which holds other objects within it.
- Objects commonly held within a package are procedures, functions, variables, constants, cursors and exceptions.
- The tool used to create a package is SQL\* Plus.
- It is a way of creating generic, encapsulated, re-useable code.
- A package once written and debugged is compiled and stored in an Oracle Database.
- All users who have executed permissions on the Oracle Database can then use the package.

A package has usually two components:

1. **Package specification**
2. **Package body.**

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- 
- A package's **specification** part declares functions, procedures, global memory variables, constants, exceptions, cursors, etc.
  - A package's **body** fully defines procedures, functions, and cursors that are defined in specification part.
  
  - **Packages offer the following advantages:**
  
  - Packages enable the organization of commercial applications into efficient modules.
  
  - Each package is easily understood and the interfaces between packages are simple, clear and well defined.
  
  - Packages allow granting of privileges efficiently.
  
  - A package's public variables and cursors persist for the duration of the session.
  
  - Therefore all cursors and procedures that execute in this environment can share them.
  
  - Packages enable the overloading of procedures and functions when required.
  
  - Packages improve performance by loading multiple objects into memory at once.
  
  - Therefore, subsequent calls to related subprograms in the package require no I/O.
  
  - Packages promote code reuse through the use of libraries that contain stored procedures and functions, thereby reducing redundant coding.

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**Syntax of Package Specification:**

CREATE OR REPLACE PACKAGE package  
name IS Declaration of function;  
Declaration of procedure; Variable  
declaration;  
END packagename;

**Syntax of Package Body:**

CREATE OR REPLACE PACKAGE BODY packagebodyname IS  
Definition of function;  
Definition of procedure; Variable  
declaration;  
END packagebodyname  
■ **EXECUTE PACKAGE**

- 1) VERIFY USER
- 2) VERIFY PROCEDURE
- 3) EXECUTE

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## WHAT IS TRIGGER?

- Database triggers are database objects created via the SQL\*Plus tool on the client and stored on the Server in the Oracle engine's system table.
- These database objects consist of the following distinct sections:
  - ✓ A named database event
  - ✓ A PL/SQL block that will execute when the event occurs
  - The Oracle engine allows the procedures that are implicitly executed by the user when an insert, update or delete is issued against a table.
  - These procedures are called **database triggers**.
- The major issues that make these triggers standalone are that, they are fired implicitly (i.e. internally) by the Oracle engine itself and not explicitly called by the user.

**Note:** The PL/SQL block cannot contain transaction control SQL statements like COMMIT, ROLLBACK, and SAVEPOINT in trigger



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A trigger has three basic parts:

- A triggering event or statement(SQL PART)
- A trigger restriction (WHEN CLAUSE)
- A trigger action(PL/SQL COMMAND)

### **Triggering Event or Statement(SQL COMMAND OR PART)**

- It is a SQL statement that causes a trigger to be fired.
- It can be INSERT, UPDATE or DELETE statement for a specific table. (i.e.Table write operations)

### **Trigger Restriction**

- A trigger restriction specifies a Boolean (logical) expression that must be **TRUE** for the trigger to fire.
- A trigger restriction is specified using a **WHEN** clause.
- In short, when the expression given with **WHEN** true then only triggeraction becomes executes for triggering event.

### **Trigger Action(PL/SQL PART)**

- A trigger action is the PL/SQL code to be executed when a triggering eventfires and any trigger restriction (if any) evaluates to TRUE.
- The PL/SQL block can contain SQL and PL/SQL statements.

## ■ TYPES OF TRIGGERS

There are mainly two types of triggers:

1. Row Triggers
2. Statement Triggers

### **Row Triggers**

- A row trigger is fired each time a row in the table is affected by the triggeringstatement.
- For example, if an UPDATE statement updates 5 rows of a table, a row triggeris fired once for each row means it fires 5 times.

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## Statement Triggers

- A **statement trigger** is fired once on behalf of the triggering statement, independent of the number of rows the triggering statement affects.
- Even if no rows are affected, trigger fired.
- Statement triggers should be used when a triggering statement affects rows in a table but the processing required is completely independent of the number of rows affected.

**Row Trigger and Statement Triggers** are further classified into

1. Before Trigger
2. After Trigger.

## Before Triggers(PL/SQL PELA MOKLE THEN SQL PART)

**Before** triggers execute **before** the data has been committed into the database. ...

## After Triggers(PELA SQL PA6I PL/SQL)

**After** triggers execute **after** the data has been inserted or updated **in** the database. Usually **after** triggers are used because you need access to a formula field or the Id **in the** case of an insert.

### Syntax:

```
(CREATE OR REPLACE TRIGGER <trigger name>  
    BEFORE, AFTER  
    {DELETE, INSERT, UPDATE [OF Column ...]}  
    ON <table name>  
    [REFERENCING {OLD AS old, NEW AS new}]  
    [FOR EACH ROW [WHEN Condition]]]
```

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**DROP TIRGGER TRIGGER NAME;**

**Q-EXPLAIN USER DEFINED DATATYPE IN ORACLE.**

Create Type command is used to create an abstract data type or user defines Data type.

### Syntax:

```
Create type <type name> as object
(
    Name Data type (size),
    Name Data type (size),
    ...,
    ...
);
```

- The create type command is the most important command in object-relational databases.
- It will represented as having four attributes, named street, city, state, and pin using the defined data types and lengths for each column.

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### Example:

```
Create type add_type as object  
(  
    street varchar2(50),  
    city varchar2(20),  
    state varchar2(20),  
    pin number(6)  
);
```

- You can also use the user defined data type in creation of other user defined data type.

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### Example:

```
Create type person_type as object  
(  
    name varchar2(20),  
    add1 add_type  
);
```

### Use of Data type:

### Example:

```
Create table customer  
(  
    cust_id number(3),  
    person person_type  
);
```

### Inserting records in table contain user define data type:

Ex. Insert into customer values (1, person\_type('Neel', add\_type(3, south extension, New-Delhi, Delhi, 110001)));

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## Q-EXPLAIN VARRAY.

- Varray is known as collector means sets of elements that are treated as part of a single row.
- A varying array allows you to store repeating attributes of a record in a single row.
- For example, suppose Dona wants to track which of her tools were borrowed by which of her worker.
- You should create a table to keep track of this.

Example:

```
Create table borrower
(
    name varchar2(25),
    tool varchar2(25)
);
```

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**Q- EXPLAIN NESTED TABLE WITH EXAMPLE.**

**DETAILING:**

- Varray have a limited number of entries, a second type of collector is “Nested Table”.
  - Nested Table has no limit on the number of entries per row.
  - A nested table is, as its name implies, a table within a table.
  - It is a table that is represented as a column within another table.
  - You can have multiple rows in the nested table for each row in the maintable.
-

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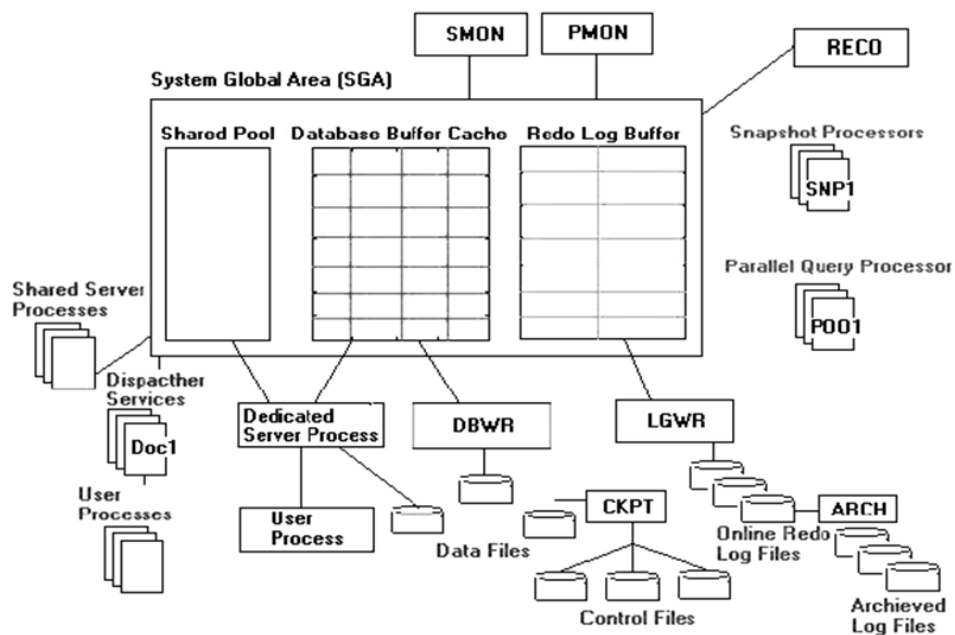
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## CH-5 ORACLE ARCHITECTURE

### Q-EXPLAIN ARCHITECTURE OF ORACLE

- When someone refers to the Oracle database, they are most likely referring to the entire Oracle database management system (DBMS).





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## ■ THE SYSTEM GLOBLE AREA (SGA)

- The SGA is the primary component of the instance.
  - It holds all the memory structures necessary for data manipulation, SQLstatement parsing, and redoes caching.
  - The SGA is shared, which means that multiple processes can access and modify the data contained within it at the same time.
- 
- All databases operations use structures contained instance the SGA at onepoint or another. As mentioned instance the previous section, the SGA is when the instance is created, during the no mount stage of the database, and is de allocated when the instance is shut down.

### **The SGA consists of the following:**

- Shared pool
- Database buffer cache
- Redo log buffer
- Multithreaded server(MTS) structures

These are explained instance the following sections.

## **THE SHARED POOL**

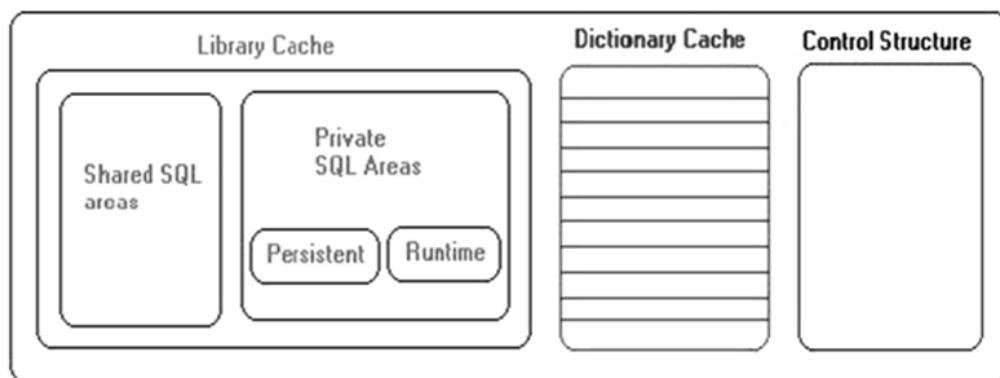
- The shared pool (see figure 2) contains the library cache, the dictionarycache nd server control structures (such as database character set).
- The library cache stores the text, parsed format, and execution plan of SQL statements that have been submitted to the RDBMS, as well as the headers of PL/SQL packages and procedures that have been executed.
- The dictionary cache stores data dictionary rows that have been used to parse SQL statements.

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## Parsing and executing SQL statements.

- The Oracle server uses the library cache to improve the performance of SQL statements. When a SQL statement is submitted, the server first

checks the library cache to see if an identical statement has already been submitted and cached.

- If it has, Oracle uses the stored parse tree and execution path for the statement, rather than rebuilding these structures from scratch.
- Although this might not affect the Performance of ad hoc queries, applications using stored code can gain significant performance improvements by utilizing this feature.

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**Q-EXPLAIN TABLESPACE:--**

- The database is divided into one or more logical pieces known as tablespaces.
- A tablespaces is used to logically group data together.
- For the different application one can create a separate tablespace.
- At the time of database creation it will automatically create SYSTEM tablespace.
- Which is used to store important internal structures such as datadictionary, the system stored procedures.
- The SYSTEM tablespace is used as the default for all database users, which is not desirable.
- The Oracle tablespace is the lowest logical layer of the oracle datastructure.
- The tablespace consists of one or more data files.
  
- Tablespace is made read-write by default, but it can be altered to becomeread-only.
- A tablespace can consist of 1022 data files.

A tablespace can create with the following options

**Online:**

This option specifies that the tablespace be brought online after creation it can beused immediately.

**Offline:**

It specifies that the tablespace is left offline after creation.

**Read only:**

It specifies that tablespace is read only.

It is of no meaning to make the tablespace read only at the time of creation. Create the tablespace and populate them, then if desire makes the tablespaceread only.

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## Permanent:

This specifies that the tablespace is for permanent objects. This is the default parameter.

This option is used for all schema objects except for temporary tablespaces.

## Temporary:

This specifies that the tablespace is for temporary objects.

## Q- EXPLAIN EXPORT AND IMPORT

- Export is logical backup of database.
- This utility copy the data and database to a binary OS file in specialformat.
- Export files store information about schema objects created for database.
- Using this utility we can backup database while it is open and avail foruse.
- There are three modes of export.

Mode	Description
User	Export all objects owned by a user.
Table	Export all or specific tables owned by a user along with index, constraints and triggers.
Full Database	Exports all objects of the database except the one owned by SYS.

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## ■ There are three types of export:

- There are three types of export:

Incremental Export	Only database data that has changed is exported. For <u>example</u> if tables A, B and C exist, and only table A's information has been modified since the last incremental export, only table A is exported.
Cumulative Export	Only database data that has been changed since the last cumulative or complete export is exported. For <u>example</u> if tables A, B and C exist and only table A's and table B's information has been modified since the last cumulative export, <b>only the changes</b> to table A and B are exported.
Completed Export	All database data is exported. ( <u>usually</u> once a month)

## IMPORT:

- The import utility allows you to restore the database information held in previously created Export files.
- It is the complement utility to Export.

### Import loads data in the following order:

- i. Table definitions
  - ii. Table Data
  - iii. Table Indexes
  - iv. Triggers/Constraints/Bitmap Index
- First, new tables are created.
  - Then data is imported and indexes are built.
  - Then triggers are imported, integrity constraints are enabled on the new tables, and any bitmap and functional indexes are built.

There are three modes of imports.

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<b>Mode</b>	<b>Description</b>
<b>User</b>	Imports all objects owned by a user.
<b>Table</b>	Imports all or specific tables owned by a user along with index, constraints and triggers.
<b>Full Database</b>	Imports all objects of the database.

**Q-EXPLAIN SQL \*LOADER**

- SQL \*LOADER is high speed data loading utility that loads data from external files into tables in an oracle database.
- It is the only way you can load data created in another DBMS into oracle.
- SQL \*LOADER loads the table using a control file.
- The Data may be in a separate file or may be included in the control file.
- The data may be in the fixed length fields.

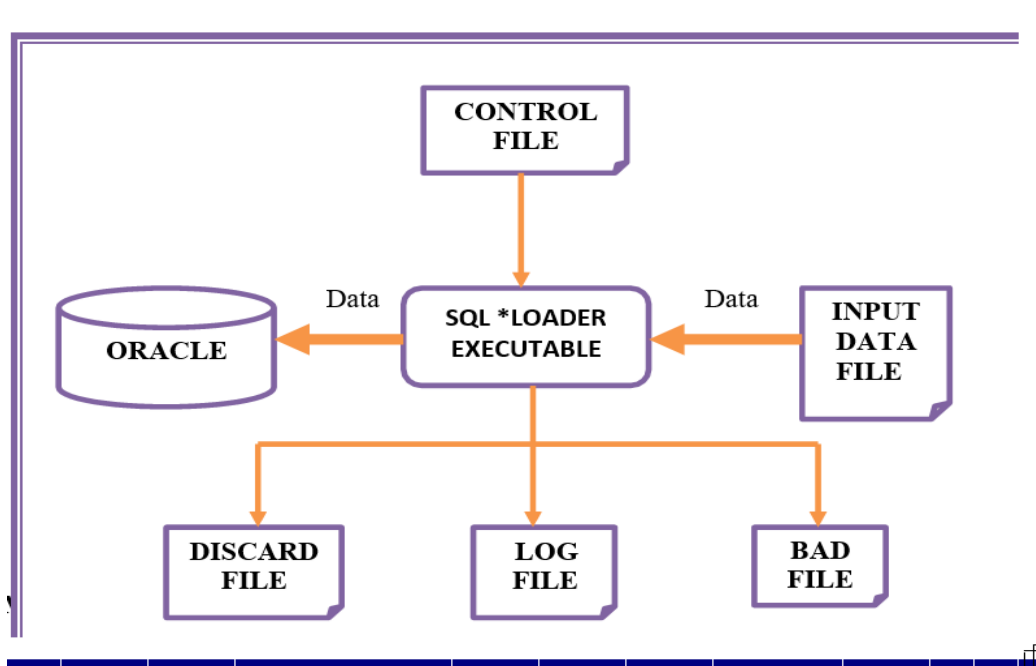
**Features:**

1. Loads data into multiple files.
2. Loads fixed/variable length data.
3. Converts data to oracle data types.
4. Combine more than one physical record into one logical record.
5. Break single physical record into multiple logical records.
6. Generates unique keys via sequence generator.
7. Use SQL function before data insert.

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**SQL \*LOADER FILES:**

- Control File
- Log File
- Bad File
- Discard File
- Data File

**Control file:**

- The control file is a text file written in a language that SQL \*LOADER understands.
- The control file tell the SQL \*LOADER where to find the data, how to parse and interpret the data, and where to insert the data.

**The control file provides the following information to the SQL \*LOADER:**

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- 
- The name and location of the input data file.
  - The format of the records in the input data file.
  - The name of the table or tables to be loaded.
  - The name and the location of the bad file and discard file.

### **Log file:**

- When SQL \*LOADER begins execution it creates a LOG FILE.
- If it cannot create a log file, execution terminates.
- The log file contains detailed summary of the load, including a description of any errors.

### **Log file contains following information:**

- The names of the control file, log file, bad file, discard file and data file.
- The values of several command line parameters.
- Error messages for records that cause errors.

### **Bad File:**

- The bad file contains the records rejected, either by SQL \*LOADER or by ORACLE.
- Lack of free space in a table space, can also cause insert operation to fail.
- Whenever SQL \*LOADER encounters a database error while trying to load a record, it writes that record to a file known as the **BAD file**.

### **Discard File:**

- The discard file contains records that were filtered out of the load because they did not match any record selection criteria specified in the control file.



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**Q- EXPLAIN BACKUP IN DETAIL**

- A backup is a duplicate copy of data.
- This copy can include important parts of a database such as the control file, redo logs and data files.
  - **Physical backups** are copies of physical database file like control files, redo log files and data files.
  - **Logical backups** store information about the schema objects created for a database.
  - It contains data that is expected using SQL commands and stored in a binary file.
  - Facilities like IMPORT/EXPORT are used for logical backup.

**BACKUP STRATEGY:**

- Run the database in ARCHIVELOG mode and archive redo logs to multiple locations.
- Maintain multiple concurrent backups of the control file.
- Take frequent backups of physical data files and store them in a safe place, making multiple copies if possible.

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## BACKUP TYPES:

1. Online Database backup (Hot backup)
  2. Offline Database backup (Cold backup)
  3. Whole Database backup
  4. Table space backup
  5. Data file backup
  6. Control file backup
  7. Archived Redo log backup
- If the database must be up and running 24 hours a day, 7 days a week then no choice but to perform **online backups** of whole database which is in ARCHIVELOG mode.
  - When database is shutdown at the time of backup, it is called **offline backup**.
  - A whole database backup contains the control file, and all database files, which belong to that database.
  - A **table space backup** is a backup of a subset of the database. A **data file backup** is back up of a single data file.

## Q- 7. EXPLAIN CONTROL FILE AND REDOLOG FILE.

### REDO LOG FILE:

- Redo log files hold information used for recovery in the event of a system failure.
- Redo log files store a log of all changes made to the database.
- This information is used in the event of a system failure.
- If redo log information is lost, you cannot recover the system.
- Since the redo log files are very important for recovery purpose, oraclerecommends that redo logs be multiplexed.
- Multiplexing is maintaining multiple copies.
- Each copy of redo log files should be of the same size and placed on separate disks.
- This will prevent loss of data in redo file in the event of the loss of a disk.

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- 
- You can transfer the redo entries to another media before overwriting them; this process is known as **archiving**.
  - Archiving can be done automatically every time a redo log file becomes full and LGWR starts writing to another file.
  - The event when LGWR stops writing to one file and starts writing to another file is called a Log Switch.
  - This all process done by oracle engine automatically.

## CONTROL FILE:

- This is very important file that is required for the oracle database to function.
- If any one of the control file is unavailable, the database is shutdown.
- Hence it is recommended that multiple copies of the control files are maintained in the database or separate disks.
- The control file keeps a record of the names, size and locations different physical files of the database.
- It contains the information used to start an instance, such as the location of the data file and redo log files.
- Oracle needs this information to start the database instance.
- Control files must be protected.

### **The entries maintained in the control file are:**

1. The database identified and name.
2. Time of database creation.
3. Table space name.
4. Name and location of data files and online redo log files.

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## Q- WHAT IS NET 8? EXPLAIN ITS FEATURES.

- Net8 is the follow-on networking product to SQL\*plus.
- It is used in client server model
- Net8 connect server and client.
- If net8 not available then we can not perform client server mode.
- Oracle used net8 from connect client and server pc.
- Its primary purpose is to enable the underlying network connectivity between remote client applications and Oracle servers.
- Net8 enables the machines in your network to "talk" with one another.
- It facilitates and manages communication sessions between a client application and a remote database.
- **Specifically, Net8 performs three basic operations**
  - Connection** - opening and closing connections between a client (or a server acting as a client) and a database server over a network protocol.
  - Data Transport** - packaging and sending data such as SQL statements and data responses so that it can be transmitted and understood between a client and a server.
  - Exception Handling** - initiating interrupt requests from the client or server.

### **Net8 provides the following benefits to users of networked applications:**

- Network Transparency
- Protocol Independence
- Media/Topology Independence
- Heterogeneous Networking
- Net8 provides support for a broad range of network transport protocols including TCP/IP, SPX/IPX, IBM LU6.2, Novell, and DECnet.
- It does so in a manner that is invisible to the application user.
- This enables Net8 to interoperate across different types of

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computers, operating systems, and networks to transparently connect any combination of PC, UNIX, legacy, and other system without changes to the existing infrastructure.

## PROTOCOL INDEPENDENCE:

- Net8 enables Oracle applications to run over any supported network protocol by using the appropriate Oracle Protocol Adapter.
- Applications can be moved to another protocol stack by installing the necessary Oracle Protocol Adapter and the industry protocol stack.
- Oracle Protocol Adapters provide Net8 access to connections over specific protocols or networks. On some platforms, a single Oracle Protocol Adapter will operate on several different network interface boards, allowing you to deploy applications in any networking environment.

## MEDIA/TOPOLOGY INDEPENDENCE:

- When Net8 passes control of a connection to the underlying protocol, it inherits all media and/or topologies supported by that network protocol stack.
- This allows the network protocol to use any means of data transmission, such as Ethernet, Token Ring, or other, to accomplish low level data link transmissions between two machines.

## HETEROGENOUS NETWORKING:

- Oracle's client-server and server-server models provide connectivity between multiple network protocols using Oracle Connection Manager.

## LARGESCALE SCALIBILITY:

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- By enabling you to use advanced connection concentration and connection pooling features, Net8 makes it possible for thousands of concurrent users to connect to a server.

**Q-WHAT IS DATA BASE?**

**ANS:**

-- DATA BASE IS A COLLECTION OF DATA FILE.

**Q- EXPLAIN ORACLE DATA BASE. OR  
EXPLAIN ORACLE LAYER**

- THE ORACLE DATABASE HAS **LOGICAL AND PHYSICAL LAYER.**

**PHYSICAL LAYER:**

- THE PHYSICAL OF DATA BASE CONSISTSO F 3 TYPES OF FILES LIKE 1)DATA FILE 2)REDO LOG FILE3)CONTROL FILE

**1) Data file:**

- Data file contain all data basedata.
- The oracle data base is madewith one or more data file.
- Two types of data are store indata file. Like **user data and system data.**

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**\*) user data:-**

- User data is our application data.
- It store all the oracle object created by user.
- It store our data.

**\*) system data**

- System data store system data.
- It store oracle's internal data.
- System data store our password and user name.

■ **2)redo log file/ transaction file:**

**Read in lithos.**

**3)control file:**

-read in lithos.

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**2) Logical layer:**

-logical layer contain **table space and data base schema.**

Table space :- (read in the lithos)

■ **Data base schema:-**

- Data base schema is collection of the structure of oracle object.
- The schema object contain structure of our object like table , view , sequence , index and more.

**Q- explain oracle process ( or ) explain server process (or) explain back ground process**

**Ans:-**

- There are two types of oracle process like **Server process and user process.**

1) **User process:-**

- User process means our process but in oracle user can not contain all the process/
- User can sent request to the server.
- Here in oracle server can done all the process.
- 

2) **Server process (back ground process):-**

- Server process take request from the user process and



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communicate with the data base.

- This server process are also called background process.
- Some important server process are follow.

1) Data base writer(dbwr):-

- Database writer is mandatory process.
- It write data into data base.

2) Check point(ckpt):-

- When the redo log file switch , a check point occur.

When this switch happen oracle goes into memory and write dirty data into disk.

3) Log writer(lgwr):-

- The log writer is a mandatory process.
- It write data into log file.

4) System monitor(smon):-

- System monitor is mandatory process.
- That perform any recovery needed at the startup.
- It can perform recovery for a failed database.

5) Process monitor(pmon):-

- Process monitor is a mandatory process.
- That perform recovery for failed user in client server model.

6) Archiver(arch):-

- Archiver is optional process.

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- 
- When data base is running in archive log mode, the data base goes out and made copy of redo log file.

This job is called archiver process.

7) Lock(lck):-

- Lock is optional process.
- It is lock whole data base and also individual statement.

8) Job queue(snp):-

- This process facility provide oracle snapshot technology.
- This process wake up time by time and take snapshot of process and data.

Q- explain memory structure.

Ans:-

- There are two parts or oracle use two types of memory structure.
  - Like 1) system global area(sga)
  - 2) program global area(pga).
- 1) Sga:--
- Read in lithos..
- 2) Program global area:-
- Pga is area of memory that is used by single oracle user.
  - The pga is not shared.

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Q- explain init.ora file. Or explain initialization parameter file.

Ans:-

- Many tools are available for running the data base.
- The initialization parameter file is a good place to start.
- A startup every database read init.ora parameter to configure itself.
  - Before a database instance can start it must read all the init.ora parameter file.
  - There are 100 different changeable entries, all affecting how our database start and process that run against our database work.
  - Some important parameters are as follows.
    - 1) Db\_block\_buffer:
      - This is data cache. This parameter increases the size of sga.
    - 2) Sort\_area\_size:-
      - This is parameter that controls the allocation of memory for starting activity.
      - This parameter is used in sql statement like order by and group by clause.
    - 3) Open\_cursor:-
      - This parameter is the maximum no. of cursor user can open at a time.
    - 4) Database\_writer:-
      - This parameter controls the no. of process that write to the data base concurrently.
    - 5) Db\_name:-
      - This parameter specifies the name of database.

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**Q- explain data block.**

- The data block is a smallest unit of storage.

**Q- explain extents.**

- Extents consist of data block.

**Q- explain segment**

- Segment is set of extents.

**Q- explain set operator**

- Whenever we have more than one query and we wish to combine the result of more than one query, set operator is used.
  - The combination of more than one query is called **compound query**. So that set operator are use in compound query.
- Types of set operator.

1) **Union:-**

- This operator combine the result of first query + result of second query.
- Duplicate row will be eliminated.

2) **Union all:-**

- It will not eliminate duplicate row.

3) **Intersect:-**

- Return only common row in both Query.

4) **Minus:-**

Retrieve all row selected by the first query that are not in second query.

Ex:-

Select \* from emp where deptno in  
( 10,20)

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Minus

Select \* from emp where deptno=20;

**Q- explain dual table.**

- Dual table is default table.
- Dual table is used to display result of function and some process.
- Dual table is blank table

**Q- explain characteristics of rdbms.**

■ **Dml compiler**

- Dml stands for data manipulation language.
- It includes facility of insert, update and delete data.

2) **Ddl compiler:-**

- Ddl means data definition language.
- Which provides facility to create table and make change into the table.
- The ddl compiler converts the ddl statement into set table.

3) **File manager**

- File manager manages the allocation of space on disk storage,

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**4)database manager:-**

- Database manager provide so many facility like interaction with file manager ,security information ,backup and recovery.

**5)query processor:-**

Query processor is used to retrivedata from the data base using different types of query