1. Create a table called Employee with the following structure.

Name	Type
Empno	Number
Ename	Varchar2(20)
Job	Varchar2(20)
deptno	Number
Sal	Number

    1. Add a column commission with domain to the Employee table.
    2. Insert any five records into the table.
    3. Update the column details of job
    4. Rename the column of Employ table using alter command.
    5. Delete the employee whose empno is 19.
    6. Insert the any three records in the employee table and use rollback. Check the result.
    7. Add primary key constraint and not null constraint to the employee table.
    8. Insert null values to the employee table and verify the result.
    9. By using the group by clause, display the enames who belongs to deptno 10 along with average salary.
    10. List all employees which start with either B or C.

2. Create department table with the following structure.

Name	Type
Deptno	Number
Deptname	Varchar2(20)
location	Varchar2(20)

1. Add column designation to the department table.
2. Insert values into the table.
3. List the records of emp table grouped by deptno.
4. Update the record where deptno is 9.
5. Delete any column data from the table.
6. Add constraints like unique and not null to the department table.
7. Insert repeated values and null values into the table.

3. Create a table called Customer table

Name	Type
Cust name	Varchar2(20)
Cust street	Varchar2(20)
Cust city	Varchar2(20)

    1. Insert records into the table.
    2. Add salary column to the table.
    3. Alter the table column domain.
    4. Drop salary column of the customer table.
    5. Delete the rows of customer table whose cust_city is “hyd”.
    6. Delete any three records in the department table and use rollback.
    7. Add constraint primary key and foreign key to the table.

4. Create a table called branch table.

Name	Type
Branch name	Varchar2(20)
Branch city	Varchar2(20)
asserts	Number

1. Increase the size of data type for asserts to the branch.
2. Add and drop a column to the branch table.
3. Insert values to the table.
4. Update the branch name column
5. Delete any two columns from the table
6. Add save point after insertion of records and verify save point.
7. Add constraints not null and primary key to the sailor table.
8. Add constraint foreign key and not null.

5. Create a table called sailor table

Name	Type
Sid	Number
Sname	Varchar2(20)
rating	Varchar2(20)

1. Add column age to the sailor table.
2. Insert values into the sailor table.
3. Delete the row with rating >8.
4. Update the column details of sailor.
5. Insert null values into the table.
6. Add constraint primary key and not null to the reserves table
7. Delete constraint not null to the table column.

6. Create a table called reserves table

Name	Type
Boat id	**Integer**
sid	**Integer**
day	**Integer**

1. Insert values into the reserves table.
2. Add column time to the reserves table.
3. Alter the column day data type to date.
4. Drop the column time in the table.
5. Delete the row of the table with some condition.
6. Add constraint primary key and not null to the reserves table
7. Delete constraint not null to the table column.

CREATION OF TABLES

1) Create a table called Employee with the following structure.

Name	Type
Empno	Number
Ename	Varchar2(10)
Job	Varchar2(10)
Mgr	Number
Sal	Number

a. Add a column commission with domain to the Employee table.
b. Insert any five records into the table.
c. Update the column details of job
d. Rename the column of Employ table using alter command.
e. Delete the employee whose Empno is 105.

SOLUTION:

```
SQL> create table employee(empno number,ename varchar2(10),job varchar2(10),mgr
number,sal number);
Table created.
SQL> desc employee;
 Name                      Null?    Type
 ----------------------------------------------------------
 EMPNO                              NUMBER
 ENAME                              VARCHAR2(10)
 JOB                                VARCHAR2(10)
 MGR                                NUMBER
 SAL                                NUMBER
```

a. Add a column commission with domain to the Employee table.

```
SQL> alter table employee add(commission number);
Table altered.
SQL> desc employee;
 Name                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 EMPNO                              NUMBER
 ENAME                              VARCHAR2(10)
 JOB                                VARCHAR2(10)
 MGR                                NUMBER
 SAL                                NUMBER
 COMMISSION                         NUMBER
```

b. Insert any five records into the table.

```
SQL> insert into employee values(101,'abhi','manager',1234,10000,'70')
1 row created.

SQL> insert into employee values(102,'rohith','analyst',2345,9000,'65')
1 row created.
```

SQL
insert into employee values(103,'david','analyst',3456,9000,'65')
1 row created.

SQL
: insert into employee values(104,'rahul','clerk',4567,7000,'55')
1 row created.

SQL> /
insert into employee values(105,'pramod','salesman',5678,5000,'50')
1 row created.

SQL> select * from employee;

EMPNO ENAME JOB MGR SAL COMMISSION

101 abhi manager 1234 10000 70
102 rohith analyst 2345 9000 65
103 david analyst 3456 9000 65
104 rahul clerk 4567 7000 55
105 pramod salesman 5678 5000 50

c. Update the column details of job

SQL> update employee set job='trainee' where empno=103;
1 row updated.

SQL> select * from employee;

EMPNO	ENAME	JOB	MGR	SAL	COMMISSION
101	abhi	manager	1234	10000	70
102	rohith	analyst	2345	9000	65
103	david	trainee	3456	9000	65
104	rahul	clerk	4567	7000	55
105	pramod	salesman	5678	5000	50

d. Rename the column of Employ table using alter command.

SQL> alter table employee rename column mgr to manager_no;

Table altered.

SQL> desc employee;

Name	Null?	Type
EMPNO		NUMBER
ENAME		VARCHAR2(10)
JOB		VARCHAR2(10)
MANAGER_NO		NUMBER
SAL		NUMBER
COMMISSION		NUMBER

e. Delete the employee whose Empno is 105.

```
SQL> delete employee where empno=105;
1 row deleted.

SQL> select * from employee;
    EMPNO ENAME      JOB        MANAGER_NO        SAL COMMISSION
---------- ---------- ---------- ---------- ---------- ----------
       101 abhi       manager          1234      10000         70
       102 rohith     analyst          2345       9000         65
       103 david      trainee          3456       9000         65
       104 rahul      clerk            4567       7000         55
```

2) Create department table with the following structure.

Name	Type
Deptno	Number
Deptname	Varchar2(10)
location	Varchar2(10)

a. Add column designation to the department table.
b. Insert values into the table.
c. List the records of dept table grouped by deptno.
d. Update the record where deptno is 9.
e. Delete any column data from the table.

SOLUTION:

```
SQL> create table department(deptno number,deptname varchar2(10),location varchar2(10));
Table created.

SQL> desc department;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 DEPTNO                                             NUMBER
 DEPTNAME                                           VARCHAR2(10)
 LOCATION                                           VARCHAR2(10)
```

a. Add column designation to the department table.

```
SQL> alter table department add(designation varchar2(10));
Table altered.

SQL> desc department;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 DEPTNO                                             NUMBER
 DEPTNAME                                           VARCHAR2(10)
 LOCATION                                           VARCHAR2(10)
 DESIGNATION                                        VARCHAR2(10)
```

b. Insert values into the table.

```
SQL> insert into department values(9,'accounting','hyderabad','manager')

1 row created.

SQL> /
insert into department values(10,'research','chennai','professor')

1 row created.
SQL> /
insert into department values(11,'sales','banglore','salesman')
1 row created.
SQL> /
insert into department values(12,'operations','mumbai','operator')
```

1 row created.

insert into department values(9,'accounting','chennai','manager')
1 row created.

SQL> select * from department ;

DEPTNO	DEPTNAME	LOCATION	DESIGNATION
9	accounting	hyderabad	manager
10	research	chennai	professor
11	sales	banglore	salesman
12	operations	mumbai	operator
9	accounting	chennai	manager

c. List the records of dept table grouped by deptno.

SQL> select deptno,deptname from department group by deptno,deptname;

DEPTNO	DEPTNAME
9	accounting
12	operations
10	research
11	sales

d. Update the record where deptno is 9.

SQL> update department set designation='accountant' where deptno=9;

2 rows updated.
SQL> select * from department;

DEPTNO	DEPTNAME	LOCATION	DESIGNATION
9	accounting	hyderabad	Accountant
10	research	chennai	Professor
11	sales	banglore	Salesman
12	operations	mumbai	Operator
9	accounting	chennai	Accountant

e. Delete any column data from the table.

SQL> alter table department drop(designation);
Table altered.
SQL> select * from department;

DEPTNO	DEPTNAME	LOCATION
9	accounting	hyderabad
10	research	chennai
11	sales	banglore
12	operations	mumbai
9	accounting	Chennai

INTRODUCTION TO ORACLE

1. DDL: Data Definition Language (DDL) statements are used to define the database structure or schema.

DDL Commands: Create, Alter, Drop, Rename, Truncate

CREATE - to create objects in the database

ALTER - alters the structure of the database

DROP - delete objects from the database

TRUNCATE - remove all records from a table, including all spaces allocated for the records are removed

RENAME - rename an object

2. DML: Data Manipulation Language (DML) statements are used for managing data within schema objects and to manipulate data of a database objects.

DML Commands: Insert, Update, Delete, Select

INSERT - insert data into a table

UPDATE - updates existing data within a table

DELETE - deletes all records from a table, the space for the records remain

SELECT - retrieve data from the a database

3. DCL: Data Control Language (DCL) statements are used to create roles, permissions, and referential integrity as well it is used to control access to database by securing it. To control the data of a database.

DCL Commands: Grant, Revoke

GRANT - gives user's access privileges to database

REVOKE -withdraw access privileges given with the GRANT command

4. TCL: Transaction Control (TCL) statements are used to manage the changes made by DML statements. It allows statements to be grouped together into logical transactions.

TCL Commands: Commit, Rollback, Save point

COMMIT - save work done

SAVEPOINT - identify a point in a transaction to which you can later roll back

ROLLBACK - restore database to original since the last COMMIT

Syntax with examples

1. DDL (Data Definition Language) Commands: CREATE, ALTER and DROP.

CREATE: This command useful for creating creating table.

Syntax:

create table [table name] (column1 datatype[size], column 2 datatype[size],… column n datatype[size]);

Ex:

SQL >create table student (s_rollno number(10) primary key,s_name varchar2(10), gender varchar2(5),dob date,addr1 varchar2(10),addr2 varchar2(10),city varchar2(10), percentage number(4));

SQL> DESC STUDENT;

Name	Null?	Type
S_ROLLNO	NOT NULL	NUMBER(10)
S_NAME		VARCHAR2(10)
GENDER		VARCHAR2(5)
DOB		DATE
ADDR1		VARCHAR2(10)
ADDR2		VARCHAR2(10)
CITY		VARCHAR2(10)
PERCENTAGE		NUMBER(4)

SQL > select s_rollno,s_name from student;

no rows selected.

Create table by using Constraints:

Constraints are two types:

1. Table Level Constraints.
2. Column Level Constraints.

1. NOT NULL:

a) *Not null constraint at column level.*

Syntax:

<col><datatype>(size)not null

SQL > create table emp(e_id varchar(5) NOT NULL,e_name varchar(10), e_design varchar(10),dept varchar(10),mgr varchar(10),salary number(10));

2. UNIQUE :

Unique constraint at column level.

Syntax: <col><datatype>(size)unique

Ex:-

SQL > create table depositor(customer_name varchar(10),acc_no number(15) UNIQUE, brach_name varchar(10));

Unique constraint at table level:

Syntax:

Create table tablename(col=format,col=format,unique(<col1>,<col2>));

Ex:-

SQL > create table depositor1(customer_name varchar(10),acc_no number(15), brach_name varchar(10),UNIQUE(acc_no));

3. PRIMARY KEY:

Primary key constraint at column level

Syntax:

<col><datatype>(size)primary key;

Ex:-

SQL> create table customer(customer_id number (5) PRIMARY KEY, customer_name varchar(10),customer_street varchar(10),brach_name varchar(10));

Primary key constraint at table level.

Syntax:

Create table tablename(col=format,col=format primary key(col1>,<col2>);

Ex:-

SQL > create table customer1(customer_id number (5),customer_name varchar(10),customer_street varchar(10),brach_name varchar(10),PRIMARY KEY(customer_id));

4. CHECK:

Check constraint constraint at column level.

Syntax: <col><datatype>(size) check(<logical expression>)

Ex:-create table loan(loan_no varchar(10),customer_name varchar(10), balance number (10) CHECK(balance>1000));

Check constraint constraint at table level.

Syntax: check(<logical expression>)

Ex:- create table loan1(loan_no varchar(10),customer_name varchar(10), balance number (10), CHECK(balance>1000));

5. FOREIGN KEY:

Foreign key constraint at column level.

Syntax:

Column_name Datatype(size) REFERENCES parent_table_name (parent_column_name)

Ex:- CREATE TABLE books (book_id NUMBER(3), book_title VARCHAR2(30), book_price

NUMBER(3), book_author_id NUMBER(3) REFERENCES author(author_id));

Foreign key constraint at table level

Syntax:

CONSTRAINT constraint_name FOREIGN KEY(child_table_column) REFERENCES Parent_table_name(parent_table_column)

Ex:-CREATE TABLE books (book_id NUMBER(3) CONSTRAINT bok_bi_pk PRIMARY KEY, book_title VARCHAR2(30), book_price NUMBER(3), book_author_id NUMBER(3),CONSTRAINT bok_ai_fk FOREIGN KEY (book_author_id) REFERENCES author(author_id));

QUERIES USING AGGREGATE FUNCTIONS

AIM :- Queries using aggregate functions(COUNT,AVG,MIN,MAX,SUM),Group by,Order by,Having.

E_id	E_name	Age	Salary
101	Anu	22	9000
102	Shane	29	8000
103	Rohan	34	6000
104	Scott	44	10000
105	Tiger	35	8000
106	Alex	27	7000
107	Abhi	29	8000

(i) Create Employee table containing all Records.

```
SQL> create table emp(eid number,ename varchar2(10),age number,salary number);
        Table created.
SQL> desc emp;
 Name                      Null?                Type
 ------------------------- -----                ------------------- -------
 EID                                            NUMBER
 ENAME                                          VARCHAR2(10)
 AGE                                            NUMBER
 SALARY                                         NUMBER
```

(ii)Count number of employee names from employee table.

```
    SQL> select count(ename) from emp;
          COUNT(ENAME)
          ------------
                   7
```

(iii)Find the Maximum age from employee table.

```
     SQL> select max(age) from emp;
           MAX(AGE)
           --------
              44
```

(iv)Find the Minimum age from employee table.

```
     SQL>  select min(age) from emp;
            MIN(AGE)
            --------
               22
```

(v)Display the Sum of age employee table.

```
    SQL> select sum(age) from emp;
          SUM(AGE)
          ----------
             220
```

(vi) Display the Average of age from Employee table.

```
SQL>  select avg(age) from emp;
        AVG(AGE)
        ----------
        31.4285714
```

(vii) Create a View for age in employee table.

```
SQL> create or replace view A as select age from emp where age<30;
        View created.
```

(viii) Display views

```
SQL> select * from A;
        AGE
       --------
         22
         29
         27
         29
```

(ix) Find grouped salaries of employees.(group by clause)

```
SQL> select salary from emp group by salary;
        SALARY
        ---------
         9000
        10000
         8000
         6000
         7000
```

(x). Find salaries of employee in Ascending Order.(order by clause)

```
SQL> select ename,salary from emp order by salary;
        ENAME       SALARY
        ----------  ----------
        rohan        6000
        alex         7000
        shane        8000
        abhi         8000
        tiger        8000
        anu          9000
        scott       10000

          7 rows selected.
```

(xi) Find salaries of employee in Descending Order.

```
SQL> select ename,salary from emp order by salary desc;
        ENAME       SALARY
        ---------   ----------
        scott        10000
        anu          9000
```

shane	8000
abhi	8000
tiger	8000
alex	7000
rohan	6000

7 rows selected.

(xii) Having Clause.

SQL> select ename,salary from emp where age<29 group by ename,salary having salary<10000;

ENAME	SALARY
alex	7000
anu	9000

1:

a) By using the group by clause, display the enames who belongs to deptno 10 along with average salary.
b) Display lowest paid employee details under each department.
c) Display number of employees working in each department and their department number.
d) Using built in functions, display number of employees working in each department and their department name from dept table. Insert deptname to dept table and insert deptname for each row, do the required thing specified above.
e) List all employees which start with either B or C.
f) Display only these ename of employees where the maximum salary is greater than or equal to 5000.

2:

a) Calculate the average salary for each different job.
b) Show the average salary of each job excluding manager.
c) Show the average salary for all departments employing more than three people.
d) Display employees who earn more than the lowest salary in department 30
e) Show that value returned by sign (n) function.
f) How many days between day of birth to current date.

3:

a) Show that two substring as single string.
b) List all employee names, salary and 15% rise in salary.
c) Display lowest paid emp details under each manager
d) Display the average monthly salary bill for each deptno.
e) Show the average salary for all departments employing more than two people.
f) By using the group by clause, display the eid who belongs to deptno 05 along with average salary.

4:

a) Count the number of employees in department 20
b) Find the minimum salary earned by clerk.
c) Find minimum, maximum, average salary of all employees.
d) List the minimum and maximum salaries for each job type.

e) List the employee names in descending order.
f) List the employee id, names in ascending order by empid.

5:

a) Find the sids ,names of sailors who have reserved all boats called "INTERLAKE
b) Find the age of youngest sailor who is eligible to vote for each rating level with at least two such sailors.
c) Find the sname , bid and reservation date for each reservation.
d) Find the ages of sailors whose name begin and end with B and has at least 3 characters.
e) List in alphabetic order all sailors who have reserved red boat.
f) Find the age of youngest sailor for each rating level.

6:

a) List the Vendors who have delivered products within 6 months from order date.
b) Display the Vendor details who have supplied both Assembled and Sub parts.
c) Display the Sub parts by grouping the Vendor type (Local or Non Local).
d) Display the Vendor details in ascending order.
e) Display the Sub part which costs more than any of the Assembled parts.
f) Display the second maximum cost Assembled part.