

Title: SQL Constraints

Aim : To create tables, add constraints and alter commands.

Theory :

18eeI Shah
A - 53

Experiment 6

→ What are constraints?

- i) Mainly security and integrity of a database are the most important factors in judging the success of system.
- ii) Integrity constraint is a mechanism to prevent invalid data entry into table. The whole purpose of constraints is to maintain the data integrity during the various transactions like update/delete/insert on a table.
- iii) There are different types of constraints
 - a) Domain Integrity Constraints
 - b) Entity Integrity Constraints
 - c) Referential Integrity Constraints
 - d) Enterprise Constraints

A] Domain Integrity Constraints

- Domain is a set of permitted values for an attribute. For attribute it defines the default value, the range value or specific value.
- ii) The domain integrity constraints check whether the attribute has proper and right value in the database or not.

Constraints :-

- a) Not Null
- b) Unique
- c) Default
- d) Check

a) Not Null constraints

- i) NULL means nothing. By default a table can contain

FOR EDUCATIONAL USE

NULL values, that means we can leave any field empty.

- i) By setting the NOT NULL constraint we can assure that a column does not hold a NULL value

Syntax :-

```
Create table emp (eno number(5) constraint ens3  
not null, ename varchar2(10));
```

Example:-

Consider table student having 'name' field with NOT NULL constraint.

- b) Unique

UNIQUE constraint on the name suggest, can only take only unique values in a column or set of columns. It keeps uniqueness of the table.

Syntax :-

```
Create table emp (eno number(5) constraint ens2  
unique, ename varchar2(10));
```

Example:-

We can set UNIQUE constraint for emp_id column in employee table, each employee should have different emp_id which means this column cannot be duplicated.

- c) Default

When a user does not provide a value to the column while inserting, the DEFAULT constraints provides a value.

Syntax :-

```
Create table emp (eno number(5) constraint ens2  
default 10, ename varchar2(10));
```

d) Check

The constraint is used to set user defined constraint for the column. As per requirements of business for which we are developing the application, we may have to set some rules while inserting or updating data on specific field.

Syntax :-

Create table stud (eno number(5), ename varchar(10), age number(5) constraint con4 check age between 15 and 20);

B] Entity Integrity Constraints

- i) Primary key uniquely identifies each record in a table. It must have unique values and cannot hold null values i.e. primary key is the combination of NOT NULL and UNIQUE constraints.

Syntax :-

Create table emp (eno number(5) constraint con1 primary key)

Example :-

The field acts as primary key cannot contain null.

c) Referential Integrity Constraint

- i) Foreign Key represent relationships between tables. There is parent child relationship between two tables having common column.

- ii) The master table can be referenced as parent while

the transaction table is considered as child. The common field will work as primary key in parent table while foreign key in child table.

- iii) If a record in the parent table is deleted then the corresponding records in the child table will automatically get deleted. This is called as on delete cascade.

Syntax :-

Create table student (stud_id number(5), course_code references course_details (course_code));

Examples :-

Course Details (Parent Table)			Student (Child Table)		
Course Code	Course Name	Fees	Stud_id	Name	Course Code
Ox	Oracle	5000	01	Preet	Jv
Jv	Java	4000	02	Mast	Ox
Cp	(program	3000	03	Jeet	Cp

0] Enterprise Constraints

- i) Enterprise constraints are additional rules specified by users or database administrators.
- ii) These rules depends upon the requirements and constraints of the business.
- iii) For example, in college system a class have a maximum of 30 students. A teacher can teach a maximum of 4 classes a semester.

Query 1 :

```
CREATE TABLE STUDT (
    ROLL_NO INT NOT NULL
        CHECK ( ROLL_NO > 0 AND ROLL_NO < 40 ),
    STU_NAME VARCHAR (35) NOT NULL,
    STU_AGE INT NOT NULL,
    EXAM_FEE INT DEFAULT 1000,
    STU_ADDRESS VARCHAR(35),
    CONTACTNO VARCHAR(10) UNIQUE,
    PERCENTAGE INT NOT NULL
        CHECK(PERCENTAGE > 0 AND PERCENTAGE < 100)
)
```

The screenshot shows the Oracle SQL Workshop interface. The SQL Commands editor contains the CREATE TABLE statement for STUDT. The results tab displays the message "Table created." and a timestamp of "0.08 seconds". The status bar at the bottom right indicates the application version is Application Express 20.2.0.0.0.20.

Query 2 :

```
DESC STUDT;
```

The screenshot shows the Oracle SQL Workshop interface. The SQL Commands editor contains the DESC STUDT; command. The results tab displays the table structure for STUDT, listing columns: ROLL_NO, STU_NAME, STU_AGE, EXAM_FEE, STU_ADDRESS, CONTACTNO, and PERCENTAGE. The status bar at the bottom right indicates the application version is Application Express 20.2.0.0.0.20.

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
STUDT	ROLL_NO	NUMBER	22	-	0	-	-	-	-
STUDT	STU_NAME	VARCHAR2	35	-	-	-	-	-	-
STUDT	STU_AGE	NUMBER	22	-	0	-	-	-	-
STUDT	EXAM_FEE	NUMBER	22	-	0	-	✓	1000	-
STUDT	STU_ADDRESS	VARCHAR2	35	-	-	-	✓	-	-
STUDT	CONTACTNO	VARCHAR2	10	-	-	-	✓	-	-
STUDT	PERCENTAGE	NUMBER	22	-	0	-	-	-	-

Query 3 : `SELECT * FROM STUDT;`

The screenshot shows a browser window with multiple tabs open, including 'docs - Yahoo India Search Result', 'Personal Interview - Google Drive', 'DBMS Experiment 53 - Google Doc', 'SQL Commands', and 'DBMS Experiment 6 - Google Doc'. The 'SQL Commands' tab is active, displaying the SQL query `SELECT * FROM STUDT;`. Below the query, the results are shown in a table:

ROLL_NO	STU_NAME	STU_AGE	EXAM_FEE	STU_ADDRESS	CONTACTNO	PERCENTAGE
2	Dhamnik Siroya	21	10000000	Charni Road	789878878	1
1	Preet Shah	20	1000	B hayander	9950085787	88

Below the table, it says '2 rows returned in 0.02 seconds'.

Query 4 : `INSERT INTO STUDT VALUES(NULL, 'Ronak', 18, 1000, 'Mumbai', 11112332, 32);`

The screenshot shows the same browser setup as the previous one. The 'SQL Commands' tab is active, displaying the SQL query `INSERT INTO STUDT VALUES(NULL, 'Ronak', 18, 1000, 'Mumbai', 11112332, 32);`. Below the query, an error message is displayed in a yellow box:

```
ORA-01400: cannot insert NULL into ("WKSP_PREETSHAH53"."STUDT"."ROLL_NO")
ORA-06512: at "SYS.DBMS_SQL", line 1721
1. INSERT INTO STUDT VALUES(NULL, 'Ronak', 18, 1000, 'Mumbai', 11112332, 32);
```

At the bottom, it says '0.00 seconds'.

Query 5 :

```
INSERT INTO STUDT VALUES(33, NULL, 18, 1000, 'Mumbai',
11112222, 32);
```

The screenshot shows the Oracle SQL Workshop interface. A red box highlights the error message in the results window:

```
ORA-01400: cannot insert NULL into ("WKS_PREETISHAHS5"."STUDT"."STU_NAME")
ORA-06512: at "SYS.DBNS_SQL", line 1721
1. INSERT INTO STUDT VALUES(33, NULL, 18, 1000, 'Mumbai', 11112222, 32);
```

Below the results window, the status bar indicates "0.00 seconds".

Query 6 :

```
INSERT INTO STUDT VALUES(33, 'Nilesh', 18, 1000, 'Mumbai',
11112222, 32);
```

The screenshot shows the Oracle SQL Workshop interface. A red box highlights the error message in the results window:

```
ORA-00001: unique constraint (WKS_PREETISHAHS5.SYS_C0010616932) violated
ORA-06512: at "SYS.DBNS_SQL", line 1721
1. INSERT INTO STUDT VALUES(33, 'Nilesh', 18, 1000, 'Mumbai', 11112222, 32);
```

Below the results window, the status bar indicates "0.00 seconds".

Query 7 : `INSERT INTO STUDT VALUES(33, 'Nilesh', 18, 1000, 'Mumbai', 11112222, NULL);`

The screenshot shows the Oracle APEX SQL Workshop interface. The query `INSERT INTO STUDT VALUES(33, 'Nilesh', 18, 1000, 'Mumbai', 11112222, NULL);` is entered in the SQL Commands panel. The results panel displays an error message:

```
ORA-01400: cannot insert NULL into ("WKS_PREETSHAH53"."STUDT"."PERCENTAGE")
ORA-00512: at "SYS.DBMS_SQL", line 1721
1. INSERT INTO STUDT VALUES(33, 'Nilesh', 18, 1000, 'Mumbai', 11112222, NULL);
```

The execution time is listed as 0.00 seconds.

Query 8 : `INSERT INTO STUDT VALUES(33, 'Nilesh', 18, 1000, 'Mumbai', 11112222, -1);`

The screenshot shows the Oracle APEX SQL Workshop interface. The query `INSERT INTO STUDT VALUES(33, 'Nilesh', 18, 1000, 'Mumbai', 11112222, -1);` is entered in the SQL Commands panel. The results panel displays an error message:

```
ORA-02290: check constraint (WKS_PREETSHAH53.SYS_C001061659H) violated
ORA-00512: at "SYS.DBMS_SQL", line 1721
1. INSERT INTO STUDT VALUES(33, 'Nilesh', 18, 1000, 'Mumbai', 11112222, -1);
```

The execution time is listed as 0.01 seconds.

Query 9 :

```
INSERT INTO STUDT VALUES(33, 'Nilesh', 18, 1000, 'Mumbai',
11112222, 110);
```

The screenshot shows the Oracle SQL Developer interface. In the SQL Commands tab, the following SQL code is entered:

```
1 INSERT INTO STUDT VALUES(33, 'Nilesh', 18, 1000, 'Mumbai',
2 11112222, 110);
```

When run, the command fails with the following error message:

```
ORA-02290: check constraint (KRSF_FREELN4053.SYS_C0018616591) violated
ORA-06512: at "SYS.0895_SQL", line 1721
1. INSERT INTO STUDT VALUES(33, 'Nilesh', 18, 1000, 'Mumbai',
2 11112222, 110);
```

The execution time is listed as 0.00 seconds.

Query 10 :

```
CREATE TABLE E (
    EMPID INT,
    ENAME VARCHAR2(35) NOT NULL,
    ADDRESS VARCHAR2(35),
    SALARY INT NOT NULL,
    DEPTNO INT NOT NULL UNIQUE,
    CONTACTNO VARCHAR2(10) NOT NULL UNIQUE,
    PRIMARY KEY (EMPID),
    FOREIGN KEY (DEPTNO) REFERENCES DEPARTMENT (DEPTNO)
)
```

The screenshot shows the Oracle SQL Developer interface. In the SQL Commands tab, the following SQL code is entered:

```
1 CREATE TABLE E(
2     EMPID INT,
3     ENAME VARCHAR2(35) NOT NULL,
4     ADDRESS VARCHAR2(35),
5     SALARY INT NOT NULL,
6     DEPTNO INT NOT NULL UNIQUE,
7     CONTACTNO VARCHAR2(10) NOT NULL UNIQUE,
8     PRIMARY KEY (EMPID),
9     FOREIGN KEY (DEPTNO) REFERENCES DEPART (DEPTNO)
10 )
```

When run, the command successfully creates the table, as indicated by the message:

```
Table created.
```

The execution time is listed as 0.10 seconds.

Query 11 : DESC E;

The screenshot shows the Oracle Application Express interface. In the top navigation bar, there are several tabs like 'docs - Yahoo India Search Result', 'Personal Interview - Google Drive', 'DBMS Experiment 53 - Google Doc', 'SQL Commands', 'DBMS Experiment 6 - Google Doc', and others. Below the navigation bar, the main area is titled 'APEX' and 'SQL Workshop'. A sub-menu for 'SQL Commands' is open. The SQL editor window contains the command 'DESC E;'. Below the command, there is a table structure for the 'E' table:

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
E	EMPID	NUMBER	22	-	0	1	-	-	-
E	ENAME	VARCHAR2	35	-	-	-	-	-	-
E	ADDRESS	VARCHAR2	35	-	-	-	✓	-	-
E	SALARY	NUMBER	22	-	0	-	-	-	-
E	DEPTNO	NUMBER	22	-	0	-	-	-	-
E	CONTACTNO	VARCHAR2	10	-	-	-	-	-	-

At the bottom of the interface, there are tabs for 'Results', 'Explain', 'Describe', 'Saved SQL', and 'History'. The 'Describe' tab is currently selected. The status bar at the bottom right shows the application version as 'Application Express 20.2.0.0.20' and the date as '18-03-2021'.

Query 12 : CREATE TABLE DEPART (

```
    DEPTNO INT ,  
    DEPTNAME VARCHAR2(35) NOT NULL UNIQUE,  
    DEPTHEAD VARCHAR2(35) NOT NULL UNIQUE,  
    PROJ VARCHAR2(50) NOT NULL UNIQUE,  
    PRIMARY KEY (DEPTNO)  
)
```

The screenshot shows the Oracle Application Express interface. The top navigation bar and the main 'APEX SQL Workshop' area are visible. The SQL editor window contains the 'CREATE TABLE' command for 'DEPART' table:

```
CREATE TABLE DEPART(  
    DEPTNO INT ,  
    DEPTNAME VARCHAR2(35) NOT NULL UNIQUE,  
    DEPTHEAD VARCHAR2(35) NOT NULL UNIQUE,  
    PROJ VARCHAR2(50) NOT NULL UNIQUE,  
    PRIMARY KEY (DEPTNO)  
)
```

Below the command, the results of the execution are shown:

Table created.
0.11 seconds

The status bar at the bottom right indicates the application version as 'Application Express 20.2.0.0.20' and the date as '18-03-2021'.

Query 13: `DESC DEPART;`

The screenshot shows the Oracle Application Express interface. In the top navigation bar, there are several tabs: 'docs - Yahoo India Search Result', 'Personal Interview - Google Drive', 'DBMS Experiment 53 - Google Doc', 'SQL Commands', and 'DBMS Experiment 6 - Google Doc'. Below the tabs, the 'APEX' logo and 'SQL Workshop' are visible. The main area is titled 'SQL Commands' with a dropdown menu showing 'Language: SQL'. A text input field contains the command: '1 DESC DEPART;'. Below the command, the results are displayed in a table:

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
DEPART	DEPTNO	NUMBER	22	-	0	1	-	-	-
	DEPTNAME	VARCHAR2	35	-	-	-	-	-	-
	DEPTHEAD	VARCHAR2	35	-	-	-	-	-	-
	PROJ	VARCHAR2	50	-	-	-	-	-	-

At the bottom of the interface, it says 'Copyright © 1999, 2020, Oracle and/or its affiliates. All rights reserved.' and 'Application Express 20.2.0.0.20 2008 18-03-2021 100% ENG'.

Query 14 : `CREATE TABLE HOSPITAL (`

```
HID INT,  
HNAME VARCHAR2(35) NOT NULL UNIQUE,  
HADD VARCHAR2(35),  
HPINCODE INT NOT NULL UNIQUE,  
HDEPOSIT INT DEFAULT 5000  
CHECK (HDEPOSIT > 5000),  
HCONTACTNO VARCHAR2(10) NOT NULL UNIQUE,  
PRIMARY KEY (HID)  
)
```

The screenshot shows the Oracle Application Express interface. In the top navigation bar, there are several tabs: 'docs - Yahoo India Search Result', 'Personal Interview - Google Drive', 'DBMS Experiment 53 - Google Doc', 'SQL Commands', and 'DBMS Experiment 6 - Google Doc'. Below the tabs, the 'APEX' logo and 'SQL Workshop' are visible. The main area is titled 'SQL Commands' with a dropdown menu showing 'Language: SQL'. A text input field contains the CREATE TABLE command. Below the command, the results are displayed:

```
Table created.  
0.10 seconds
```

At the bottom of the interface, it says 'Copyright © 1999, 2020, Oracle and/or its affiliates. All rights reserved.' and 'Application Express 20.2.0.0.20 2012 18-03-2021 100% ENG'.

Query 15 : **DESC HOSPITAL;**

The screenshot shows the Oracle Application Express interface with the SQL Workshop tab selected. The command entered is `DESC HOSPITAL;`. The results pane displays the structure of the `HOSPITAL` table:

Object Type	TABLE	Object	HOSPITAL							
Table		Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
<code>HOSPITAL</code>	<code>HID</code>		NUMBER	22	-	0	1	-	-	-
	<code>HNAME</code>		VARCHAR2	35	-	-	-	-	-	-
	<code>HADD</code>		VARCHAR2	35	-	-	-	✓	-	-
	<code>HPCODE</code>		NUMBER	22	-	0	-	-	-	-
	<code>HDEPOSIT</code>		NUMBER	22	-	0	-	✓	5000	-
	<code>HCONTACTNO</code>		VARCHAR2	10	-	-	-	-	-	-

Query 16 : **ALTER TABLE STUDT ADD UNIQUE(STU_NAME);**

The screenshot shows the Oracle Application Express interface with the SQL Workshop tab selected. The command entered is `ALTER TABLE STUDT ADD UNIQUE(STU_NAME);`. The results pane displays the message: "Table altered." and "0.08 seconds".

Query 17 : `DESC STUDT;`

The screenshot shows the Oracle SQL Workshop interface. In the top navigation bar, the schema is set to 'WKSP_PREETSHAH55'. The main area displays the SQL command 'DESC STUDT;' in the editor. Below the editor, the results pane shows the structure of the 'STUDT' table:

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
STUDT	ROLL_NO	NUMBER	22	-	0	-	-	-	-
STUDT	STU_NAME	VARCHAR2	35	-	-	-	-	-	-
STUDT	STU_AGE	NUMBER	22	-	0	-	-	-	-
STUDT	EXAM_FEE	NUMBER	22	-	0	-	✓	1000	-
STUDT	STU_ADDRESS	VARCHAR2	35	-	-	-	✓	-	-
STUDT	CONTACTNO	VARCHAR2	10	-	-	-	✓	-	-
STUDT	PERCENTAGE	NUMBER	22	-	0	-	-	-	-

Query 18 : `ALTER TABLE STUDT MODIFY (CONTACTNO NOT NULL);`

The screenshot shows the Oracle SQL Workshop interface. In the top navigation bar, the schema is set to 'WKSP_PREETSHAH55'. The main area displays the SQL command 'ALTER TABLE STUDT MODIFY (CONTACTNO NOT NULL);' in the editor. Below the editor, the results pane shows the output of the command:

```
Table altered.  
0.11 seconds
```

Query 19 : DESC STUDT;

The screenshot shows the Oracle Application Express interface with the SQL Commands workspace selected. The command entered is `DESC STUDT;`. The results pane displays the structure of the `STUDT` table, which has seven columns: `ROLL_NO`, `STU_NAME`, `STU_AGE`, `EXAM_FEE`, `STU_ADDRESS`, `CONTACTNO`, and `PERCENTAGE`. The `EXAM_FEE` column is defined as a NUMBER type with a default value of 1000.

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
STUDT	ROLL_NO	NUMBER	22	-	0	-	-	-	-
STUDT	STU_NAME	VARCHAR2	35	-	-	-	-	-	-
STUDT	STU_AGE	NUMBER	22	-	0	-	-	-	-
STUDT	EXAM_FEE	NUMBER	22	-	0	-	✓	1000	-
STUDT	STU_ADDRESS	VARCHAR2	35	-	-	-	✓	-	-
STUDT	CONTACTNO	VARCHAR2	10	-	-	-	-	-	-
STUDT	PERCENTAGE	NUMBER	22	-	0	-	-	-	-

Query 20 : ALTER TABLE HOSPITAL ADD CHECK (HDEPOSIT > 5000 AND HDEPOSIT < 100000);

The screenshot shows the Oracle Application Express interface with the SQL Commands workspace selected. The command entered is `ALTER TABLE HOSPITAL ADD CHECK (HDEPOSIT > 5000 AND HDEPOSIT < 100000);`. The results pane shows the message "Table altered." and "0.04 seconds".

Query 21 : DESC HOSPITAL;

The screenshot shows the Oracle Application Express interface with the SQL Workshop tab selected. The command entered is `DESC HOSPITAL`. The results pane displays the structure of the `HOSPITAL` table:

Object Type	TABLE	Object	HOSPITAL							
Table		Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
<code>HOSPITAL</code>	<code>HID</code>		NUMBER	22	-	0	1	-	-	-
	<code>HNAME</code>		VARCHAR2	35	-	-	-	-	-	-
	<code>HADD</code>		VARCHAR2	35	-	-	-	✓	-	-
	<code>HPCODE</code>		NUMBER	22	-	0	-	-	-	-
	<code>HDEPOSIT</code>		NUMBER	22	-	0	-	✓	5000	-
	<code>HCONTACTNO</code>		VARCHAR2	10	-	-	-	-	-	-

Query 22 : ALTER TABLE HOSPITAL ADD PRIMARY KEY (HID);

The screenshot shows the Oracle Application Express interface with the SQL Workshop tab selected. The command entered is `ALTER TABLE HOSPITAL ADD PRIMARY KEY (HID);`. The results pane displays the message "Table altered." and "0.06 seconds".

Table altered.
0.06 seconds

Query 23 : `DESC HOSPITAL;`

The screenshot shows the Oracle Application Express interface with multiple tabs open. The current tab is titled "SQL Commands". The SQL command entered is `DESC HOSPITAL;`. Below the command, there is a table showing the structure of the HOSPITAL table:

Object Type	TABLE	Object	HOSPITAL
Table	Column	Data Type	Length
HOSPITAL	HID	NUMBER	22
HOSPITAL	HNAME	VARCHAR2	35
HOSPITAL	HADD	VARCHAR2	35
HOSPITAL	HPCODE	NUMBER	22
HOSPITAL	HDEPOSIT	NUMBER	22
HOSPITAL	HCONTACTNO	VARCHAR2	10

Each row includes columns for Primary Key, Nullable, Default, and Comment. The "Primary Key" column shows values like "1", "✓", and "5000". The "Nullable" column has several "✓" marks. The "Default" column contains values like "0" and "5000". The "Comment" column is empty.

Query 24 : `CREATE TABLE PATIENT (`

```
    PID INT,  
    PNAME VARCHAR2(35) NOT NULL,  
    PADDRESS VARCHAR2(35),  
    HID INT,  
    PRIMARY KEY (PID),  
    FOREIGN KEY (HID) REFERENCES HOSPITAL (HID)  
)
```

The screenshot shows the Oracle Application Express interface with multiple tabs open. The current tab is titled "SQL Commands". The SQL command entered is the CREATE TABLE statement for PATIENT:

```
2 | CREATE TABLE PATIENT (  
3 |     PID INT,  
4 |     PNAME VARCHAR2(35) NOT NULL,  
5 |     PADDRESS VARCHAR2(35),  
6 |     HID INT,  
7 |     PRIMARY KEY (PID),  
8 |     FOREIGN KEY (HID) REFERENCES HOSPITAL (HID)  
9 | )
```

Below the command, the message "Table created." is displayed. The status bar at the bottom indicates "0.05 seconds" for the execution time.

Query 25 : DESC PATIENT;

The screenshot shows the Oracle Application Express interface with the SQL Workshop tab selected. The command entered is `DESC PATIENT;`. The results pane displays the structure of the `PATIENT` table:

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
PATIENT	PID	NUMBER	22	-	0	1	-	-	-
PATIENT	PNAME	VARCHAR2	35	-	-	-	-	-	-
PATIENT	ADDRESS	VARCHAR2	35	-	-	-	✓	-	-
PATIENT	HID	NUMBER	22	-	0	-	✓	-	-

Query 26 : ALTER TABLE PATIENT DROP PRIMARY KEY;

The screenshot shows the Oracle Application Express interface with the SQL Workshop tab selected. The command entered is `ALTER TABLE PATIENT DROP PRIMARY KEY;`. The results pane displays the message: "Table altered." and "0.08 seconds".

Query 27 : DESC PATIENT;

The screenshot shows the Oracle Application Express SQL Workshop interface. The query entered is `DESC PATIENT;`. The results pane displays the description of the `PATIENT` table, which has four columns: `PID`, `PNAME`, `PADDRESS`, and `HID`. The `PID` column is defined as a NUMBER(22) with precision 0 and scale 0, and it is marked as a primary key and nullable. The `PNAME` and `PADDRESS` columns are VARCHAR2(35) and the `HID` column is NUMBER(22) with precision 0 and scale 0.

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
PATIENT	PID	NUMBER	22	-	0	-	✓	-	-
	PNAME	VARCHAR2	35	-	-	-	-	-	-
	PADDRESS	VARCHAR2	35	-	-	-	✓	-	-
	HID	NUMBER	22	-	0	-	✓	-	-

Query 28 : ALTER TABLE HOSPITAL DROP UNIQUE(HPINCODE);

The screenshot shows the Oracle Application Express SQL Workshop interface. The query entered is `ALTER TABLE HOSPITAL DROP UNIQUE(HPINCODE);`. The results pane shows the message "Table altered." indicating the successful execution of the command. The time taken for the operation was 0.07 seconds.

Query 29 : DESC HOSPITAL;

The screenshot shows the Oracle Application Express interface. In the top navigation bar, there are several tabs: 'docs - Yahoo India Search Result', 'Personal Interview - Google Drive', 'DBMS Experiment 53 - Google Doc', 'SQL Commands', 'DBMS Experiment 6 - Google Doc', and 'Preet Shah'. Below the navigation bar, the main area is titled 'APEX' and 'SQL Commands'. A sub-menu for 'SQL Workshop' is open, showing options like 'App Builder', 'Team Development', and 'App Gallery'. The 'Schema' dropdown is set to 'WKSP_PREETSHAH55'. The SQL command input field contains the command 'DESC HOSPITAL;'. Below the command, the results are displayed in a table format:

Object Type	TABLE	Object	HOSPITAL						
Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
HOSPITAL	HID	NUMBER	22	-	0	1	-	-	-
	HNAME	VARCHAR2	35	-	-	-	-	-	-
	HADD	VARCHAR2	35	-	-	-	✓	-	-
	HPINCODE	NUMBER	22	-	0	-	-	-	-
	HDEPOSIT	NUMBER	22	-	0	-	✓	5000	-
HCONTACTNO			-	-	-	-	-	-	-

At the bottom of the interface, there are tabs for 'Results', 'Explain', 'Describe', 'Saved SQL', and 'History'. The 'Describe' tab is currently selected. The status bar at the bottom right shows 'Application Express 20.2.0.0.20', '20:35', and the date '18-03-2021'.

Query 30 : ALTER TABLE HOSPITAL MODIFY (HNAME NULL);

The screenshot shows the Oracle Application Express interface, similar to the previous one. The top navigation bar and schema dropdown are identical. The SQL command input field now contains 'ALTER TABLE HOSPITAL MODIFY (HNAME NULL);'. Below the command, the results are displayed:

table altered.
0.10 seconds

At the bottom of the interface, there are tabs for 'Results', 'Explain', 'Describe', 'Saved SQL', and 'History'. The 'Results' tab is currently selected. The status bar at the bottom right shows 'Application Express 20.2.0.0.20', '20:36', and the date '18-03-2021'.

Query 31 : DESC HOSPITAL;

The screenshot shows the Oracle SQL Workshop interface. In the top navigation bar, there are tabs for APEX, App Builder, SQL Workshop, Team Development, and App Gallery. The SQL Workshop tab is active. Below the tabs, there are buttons for Language (SQL), Rows (10), Clear Command, and Find Tables. The main area contains a single line of code: `1 DESC HOSPITAL`. Below the code, the results are displayed in a table format:

Object Type	TABLE	Object	HOSPITAL						
Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
HOSPITAL	HID	NUMBER	22	-	0	1	-	-	-
	HNAME	VARCHAR2	35	-	-	-	✓	-	-
	HADD	VARCHAR2	35	-	-	-	✓	-	-
	HPCODE	NUMBER	22	-	0	-	-	-	-
	HDEPOSIT	NUMBER	22	-	0	-	✓	5000	-
	HCONTACTNO	VARCHAR2	10	-	-	-	-	-	-

At the bottom of the interface, there are tabs for Results, Explain, Describe, Saved SQL, and History. The History tab is selected. The system status bar at the bottom right shows the date as 18-03-2021 and the time as 20:38.

History :

The screenshot shows the Oracle SQL Workshop interface, identical to the previous one but with a different history. The History tab is selected. The table displays a list of SQL statements and their execution times:

Time	SQL	Schema
58 seconds ago	ALTER TABLE HOSPITAL MODIFY (HNAME NULL);	WKSP_PREETSHAH155
2 minutes ago	ALTER TABLE HOSPITAL MODIFY (HNAME NULL);	WKSP_PREETSHAH155
3 minutes ago	ALTER TABLE HOSPITAL DROP UNIQUE(HPCODE);	WKSP_PREETSHAH155
5 minutes ago	ALTER TABLE HOSPITAL DROP UNIQUE(HPCODE);	WKSP_PREETSHAH155
7 minutes ago	ALTER TABLE PATIENT DROP PRIMARY KEY;	WKSP_PREETSHAH155
8 minutes ago	CREATE TABLE PATIENT(PID INT, PNAME VARCHAR2(25) NOT NULL, PADDRESS VARCHAR2(35), H	WKSP_PREETSHAH155
9 minutes ago	CREATE TABLE PATIENT(PID INT, PNAME VARCHAR2(25) NOT NULL, PADDRESS VARCHAR2(35), H	WKSP_PREETSHAH155
15 minutes ago	ALTER TABLE HOSPITAL ADD PRIMARY KEY (HID);	WKSP_PREETSHAH155

At the bottom of the interface, there are tabs for Results, Explain, Describe, Saved SQL, and History. The History tab is selected. The system status bar at the bottom right shows the date as 18-03-2021 and the time as 20:39.

Conclusion : The constraints were studied.