create table Doctor(

Doc\_ID varchar2(5) primary key CHECK(Doc\_ID like 'D%' and length(Doc\_ID)=5),

Doc\_Name varchar2(25) not null,

Gender char(1) not null,

DOB date not null,

Specialist varchar2(25) not null CHECK(Specialist in ('Neurology','Diabetes','Ophthalmology','Cardiology','General medicine')),

Qualification varchar2(25) not null CHECK(Qualification in ('MBBS', 'MS', 'MD', 'BDS', 'MDS')),

Contact number(10) not null,

Address varchar2(30) not null,

Dept\_No varchar2(4) not null

);

create table Department(

Dept\_No varchar2(5) primary key CHECK(Dept\_No like 'D%' and length(Dept\_No)=4),

Dept\_Name char(20) not null CHECK(Dept\_Name in('Cardiology','Intensive care unit','Neurology','Oncology','Obstetrics and gynaecology','Diabetes')),

Dept\_Room\_No number(4) not null,

Dept\_Floor number(2) not null,

Dept\_HOD varchar2(10) not null,

Dept\_Estd\_Date date not null CHECK(Dept\_Estd\_Date > '01-Jan-2010')

);

create table Staff(

Staff\_ID varchar2(5) primary key not null CHECK(Staff\_ID like 'S%' and length(Staff\_ID)=5),

Staff\_Name varchar2(20) not null,

Categoryy varchar2(20) not null check(Categoryy in ('Nurse','Lab Technician','Attender','Helper')),

dob date,

Contact number(10) not null,

Address varchar2(100),

Dept\_No varchar2(4),

Designation varchar2(100) not null check (Designation in ('Staff Nurse','Head Nurse','Technician','Senior Attender','Junior Attender'))

);

create table Patient(

Pat\_ID varchar2(5) primary key check( Pat\_ID like 'PT%' and length(Pat\_ID)=5),

Pat\_Name varchar2(25) not null,

DOB date not null,

Gender char(1) not null check(Gender in ('M','F','T')),

Contact number(10) not null,

Address varchar2(30) not null

);

create table In\_Patient(

Pat\_ID varchar2(5) not null,

Date\_of\_admission date not null,

Bed\_No number(4) not null,

Start\_Time timestamp not null,

End\_Time timestamp not null,

CHECK(Start\_Time BETWEEN Date\_of\_admission AND End\_Time)

);

create table In\_Patient\_Prescription(

Pat\_ID varchar2(5) not null CHECK( Pat\_ID like 'PT%' and length(Pat\_ID)=5),

Pres\_ID varchar2(7) not null CHECK(Pres\_ID like 'PR%' and length(Pres\_ID)=7)

);

create table Appointment(

App\_ID varchar2(5) primary key CHECK( App\_ID like 'APP%' and length(App\_ID)=5),

Pat\_ID varchar2(5) not null,

Doc\_ID varchar2(5) not null CHECK(Doc\_id like 'D%' and length(Doc\_ID)=5),

Nurse\_ID varchar2(5) not null,

Consult\_Room\_No number(4) not null,

Date\_ date not null,

time\_ timestamp not null

);

create table Prescription(

Pres\_ID varchar2(7) primary key CHECK(Pres\_ID like 'PR%' and length(Pres\_ID)=7),

App\_ID varchar2(5) CHECK( App\_ID like 'APP%' and length(App\_ID)=5),

Date\_ date not null,

time\_ timestamp not null,

Diagnosis\_Detail varchar(30) not null

);

create table Prescribed\_Medicines(

Pres\_ID varchar2(7) CHECK(Pres\_ID like 'PR%' and length(Pres\_ID)=7),

Medicine\_Name varchar2(15) not null,

Dosage varchar2(15) not null,

Brand varchar2(15) not null

);

create table Hospital\_Bill(

Inv\_No varchar2(6) unique,

Inv\_Date date not null,

Pat\_ID varchar2(5) CHECK(Pat\_ID like 'PT%' and length(Pat\_ID)=5),

Bill\_Amount number(8) not null,

Payment\_Type varchar2(15) not null,

discount number(2) not null

);

create table Lab\_Tests(

Test\_ID varchar2(5) primary key CHECK(Test\_ID like 'TI%' and length(Test\_ID)=5),

Pat\_ID varchar2(5) CHECK( Pat\_ID like 'PT%' and length(Pat\_ID)=5),

Date\_ date not null,

time\_ timestamp not null

);

create table Test\_results(

Test\_ID varchar2(5) primary key CHECK(Test\_ID like 'TI%' and length(Test\_ID)=5),

TT\_ID varchar2(5) CHECK( TT\_ID like 'TT%' and length(TT\_ID)=5),

Result varchar2(10) not null

);

create table Test\_Types(

TT\_ID varchar2(5) primary key CHECK( TT\_ID like 'TT%' and length(TT\_ID)=5),

Description varchar2(20) not null CHECK(Description in('Blood test','Urine test','Ultrasound test','Biopsy')),

Low\_value number(4) not null,

High\_value number(4) not null,

Test\_method varchar2(15) not null,

Technician varchar2(5) not null

);

insert into Doctor values('D0001','Vibhu Kumar Singh','M','01-Jan-1990','Neurology','MBBS',8529759229,'Vasundhara','D102');

insert into Doctor values('D0002','Lionel Messi','F','02-Jan-1990','Ophthalmology','MD',8529759230,'Ghaziabad','D102');

insert into Doctor values('D0003','Akansha Sharma','F','03-Jan-1990','Cardiology','MDS',8529759231,'Kavi Nagar','D100');

insert into Doctor values('D0004','Sanjay Kumar','M','01-Jan-1990','General medicine','MBBS',8529759232,'Shastri Nagar','D103');

insert into Doctor values('D0005','Zaheer Khan','M','01-Jan-1990','Neurology','BDS',8529759233,'South Delhi','D102');

insert into Department values('D102','Cardiology',1001,01,'D0001','1-Jan-2020');

insert into Department values('D100','Intensive care unit',1002,01,'D0002','2-Jan-2020');

insert into Department values('D101','Neurology',1003,03,'D0003','3-Jan-2020');

insert into Department values('D103','Oncology',1004,04,'D0004','4-Jan-2020');

insert into Department values('D190','Diabetes',1005,05,'D0005','5-Jan-2020');

insert into Staff values('S0005','Sania','Nurse','01-Jan-1990',1234567892,'Jhotwara','D102','Staff Nurse');

insert into Staff values('S0001','Sam','Lab Technician','02-Jan-1990',1234567893,'Jaipur','D102','Technician');

insert into Staff values('S0002','Ramesh','Attender','03-Jan-1990',1234567894,'Jaisalmer','D100','Junior Attender');

insert into Staff values('S0003','Suresh','Nurse','04-Jan-1990',1234567895,'Goa','D101','Staff Nurse');

insert into Staff values('S0004','Manju','Nurse','05-Jan-1990',1234567891,'Pakistan','D190','Junior Attender');

insert into Patient values('PT001','Sam','01-Jan-2000','M',8529759249,'Thane West');

insert into Patient values('PT002','mary','02-Jan-2000','F',8529759257,'Thane East');

insert into Patient values('PT003','Kevin','03-Jan-2000','M',8340613668,'Chennai');

insert into Patient values('PT004','Jay','04-Jan-2000','M',8529659228,'Borivali West');

insert into Patient values('PT005','Nancy','05-Jan-2000','F',8526759234,'Worli');

insert into In\_Patient values('PT001','01-Jan-2020',1010,to\_timestamp('2020-11-03:08:49:01','YYYY-MM-DD HH24:MI:SS'),to\_timestamp('2020-11-03:09:49:01','YYYY-MM-DD:HH24:MI:SS'));

insert into In\_Patient values('PT002','02-Jan-2020',1012,to\_timestamp('2020-10-04:09:34:01','YYYY-MM-DD:HH24:MI:SS'),to\_timestamp('2020-10-04:11:34:01','YYYY-MM-DD:HH24:MI:SS'));

insert into In\_Patient values('PT001','03-Jan-2020',1013,to\_timestamp('2020-04-11:10:23:01','YYYY-MM-DD:HH24:MI:SS'),to\_timestamp('2020-04-11:12:23:01','YYYY-MM-DD:HH24:MI:SS'));

insert into In\_Patient values('PT004','04-Jan-2020',1014,to\_timestamp('2020-06-20:11:55:01','YYYY-MM-DD:HH24:MI:SS'),to\_timestamp('2020-06-20:13:55:01','YYYY-MM-DD:HH24:MI:SS'));

insert into In\_Patient values('PT005','05-Jan-2020',1015,to\_timestamp('2020-05-07:07:23:01','YYYY-MM-DD:HH24:MI:SS'),to\_timestamp('2020-05-07:09:23:01','YYYY-MM-DD:HH24:MI:SS'));

insert into In\_Patient values('PT004','01-May-2020',100,to\_timestamp('2020-11-03:08:49:01','YYYY-MM-DD HH24:MI:SS'),to\_timestamp('2020-11-03:09:49:01','YYYY-MM-DD:HH24:MI:SS'));

insert into In\_Patient values('PT002','01-May-2020',100,to\_timestamp('2020-11-03:08:49:20','YYYY-MM-DD HH24:MI:SS'),to\_timestamp('2020-11-03:09:49:01','YYYY-MM-DD:HH24:MI:SS'));

insert into In\_Patient\_Prescription values('PT001','PR00001');

insert into In\_Patient\_Prescription values('PT002','PR00002');

insert into In\_Patient\_Prescription values('PT003','PR00003');

insert into In\_Patient\_Prescription values('PT004','PR00012');

insert into In\_Patient\_Prescription values('PT005','PR00005');

insert into Appointment values('APP01','PT001','D0001','S0003',111,'01-Jan-2020',to\_timestamp('2020-11-01:09:49:01','YYYY-MM-DD:HH24:MI:SS'));

insert into Appointment values('APP02','PT002','D0002','S0005',111,'02-Jan-2020',to\_timestamp('2020-10-22:11:30:01','YYYY-MM-DD:HH24:MI:SS'));

insert into Appointment values('APP03','PT003','D0003','S0005',111,'03-Jan-2020',to\_timestamp('2020-04-13:08:49:01','YYYY-MM-DD:HH24:MI:SS'));

insert into Appointment values('APP04','PT004','D0004','S0003',112,'04-Jan-2020',to\_timestamp('2020-06-23:12:34:01','YYYY-MM-DD:HH24:MI:SS'));

insert into Appointment values('APP05','PT005','D0005','S0003',113,'05-Jan-2020',to\_timestamp('2020-05-16:13:40:01','YYYY-MM-DD:HH24:MI:SS'));

insert into Appointment values('APP06','PT003','D0001','S0003',111,'11-Jan-2020',to\_timestamp('2020-11-01:09:49:01','YYYY-MM-DD:HH24:MI:SS'));

insert into Appointment values('APP07','PT002','D0001','S0003',111,'11-Jan-2020',to\_timestamp('2020-11-01:09:49:01','YYYY-MM-DD:HH24:MI:SS'));

insert into Prescription values('PR00001','APP01','01-Jan-2020',to\_timestamp('2020-11-01:09:49:01','YYYY-MM-DD:HH24:MI:SS'),'High BP');

insert into Prescription values('PR00002','APP02','02-Jan-2020',to\_timestamp('2020-10-22:11:30:01','YYYY-MM-DD:HH24:MI:SS'),'Low Vitamins');

insert into Prescription values('PR00003','APP03','03-Jan-2020',to\_timestamp('2020-04-13:08:49:01','YYYY-MM-DD:HH24:MI:SS'),'Low Bone Density');

insert into Prescription values('PR00012','APP04','04-Jan-2020',to\_timestamp('2020-06-23:12:34:01','YYYY-MM-DD:HH24:MI:SS'),'Anaemia');

insert into Prescription values('PR00005','APP05','05-Jan-2020',to\_timestamp('2020-05-16:13:40:01','YYYY-MM-DD:HH24:MI:SS'),'Fracture');

insert into Prescribed\_medicines values('PR00001','crocin','10mg','Hamway');

insert into Prescribed\_medicines values('PR00002','Combiflame','15mg','Hamway');

insert into Prescribed\_medicines values('PR00003','SHA256','10ml','HDM');

insert into Prescribed\_medicines values('PR00012','SHA1','20ml','HDM');

insert into Prescribed\_medicines values('PR00005','SHA128','15ml','Hamway');

insert into Hospital\_Bill values('4072','01-Jan-2020','PT001',150000,'cash',5);

insert into Hospital\_Bill values('4073','02-Jan-2020','PT002',200000,'credit card',10);

insert into Hospital\_Bill values('4074','03-Jan-2020','PT003',40000,'debit card',5);

insert into Hospital\_Bill values('4075','04-Jan-2020','PT004',3000,'cash',10);

insert into Hospital\_Bill values('4078','05-Jan-2020','PT005',5000,'debit card',15);

insert into Lab\_tests values('TI001','PT001','01-Jan-2020',to\_timestamp('2020-11-03:08:49:01','YYYY-MM-DD:HH24:MI:SS'));

insert into Lab\_tests values('TI002','PT002','02-Jan-2020',to\_timestamp('2020-10-04:09:34:01','YYYY-MM-DD:HH24:MI:SS'));

insert into Lab\_tests values('TI003','PT003','03-Jan-2020',to\_timestamp('2020-04-11:10:23:01','YYYY-MM-DD:HH24:MI:SS'));

insert into Lab\_tests values('TI004','PT004','04-Jan-2020',to\_timestamp('2020-06-20:11:55:01','YYYY-MM-DD:HH24:MI:SS'));

insert into Lab\_tests values('TI005','PT005','05-Jan-2020',to\_timestamp('2020-05-07:07:23:01','YYYY-MM-DD:HH24:MI:SS'));

insert into Test\_results values('TI001','TT001','Positive');

insert into Test\_results values('TI002','TT002','Positive');

insert into Test\_results values('TI003','TT003','Negative');

insert into Test\_results values('TI004','TT004','Negative');

insert into Test\_results values('TI005','TT005','Positive');

insert into Test\_Types values('TT001','Blood test',26,66,'Blood sample','S0004');

insert into Test\_Types values('TT002','Blood test',23,65,'Blood sample','S0004');

insert into Test\_Types values('TT003','Urine test',30,74,'Urine sample','S0004');

insert into Test\_Types values('TT004','Urine test',11,23,'Urine sample','S0004');

insert into Test\_Types values('TT005','Urine test',15,24,'Urine sample','S0004');

alter table Doctor add constraint fk\_Doc\_Dept\_No foreign key(Dept\_No) references Department(Dept\_No);

alter table Department add constraint fk\_Dept\_HOD foreign key(Dept\_HOD) references Doctor(Doc\_ID);

alter table Staff add constraint fk\_S\_Dept\_No foreign key(Dept\_No) references Department(Dept\_No);

alter table In\_Patient add constraint fk\_In\_Pat\_ID foreign key(Pat\_ID) references Patient(Pat\_ID);

alter table In\_Patient\_Prescription add constraint fk\_InP\_Pat\_ID foreign key(Pat\_ID) references Patient(Pat\_ID);

alter table In\_Patient\_Prescription add constraint fk\_InP\_Pres\_ID foreign key(Pres\_ID) references Prescription(Pres\_ID);

alter table Appointment add constraint fk\_App\_Pat\_ID foreign key(Pat\_ID) references Patient(Pat\_ID);

alter table Appointment add constraint fk\_App\_Doc\_ID foreign key(Doc\_ID) references Doctor(Doc\_ID);

alter table Appointment add constraint fk\_App\_Nurse\_ID foreign key(Nurse\_ID) references Staff(Staff\_ID);

alter table Prescription add constraint fk\_Pres\_App\_ID foreign key(App\_ID) references Appointment(App\_ID);

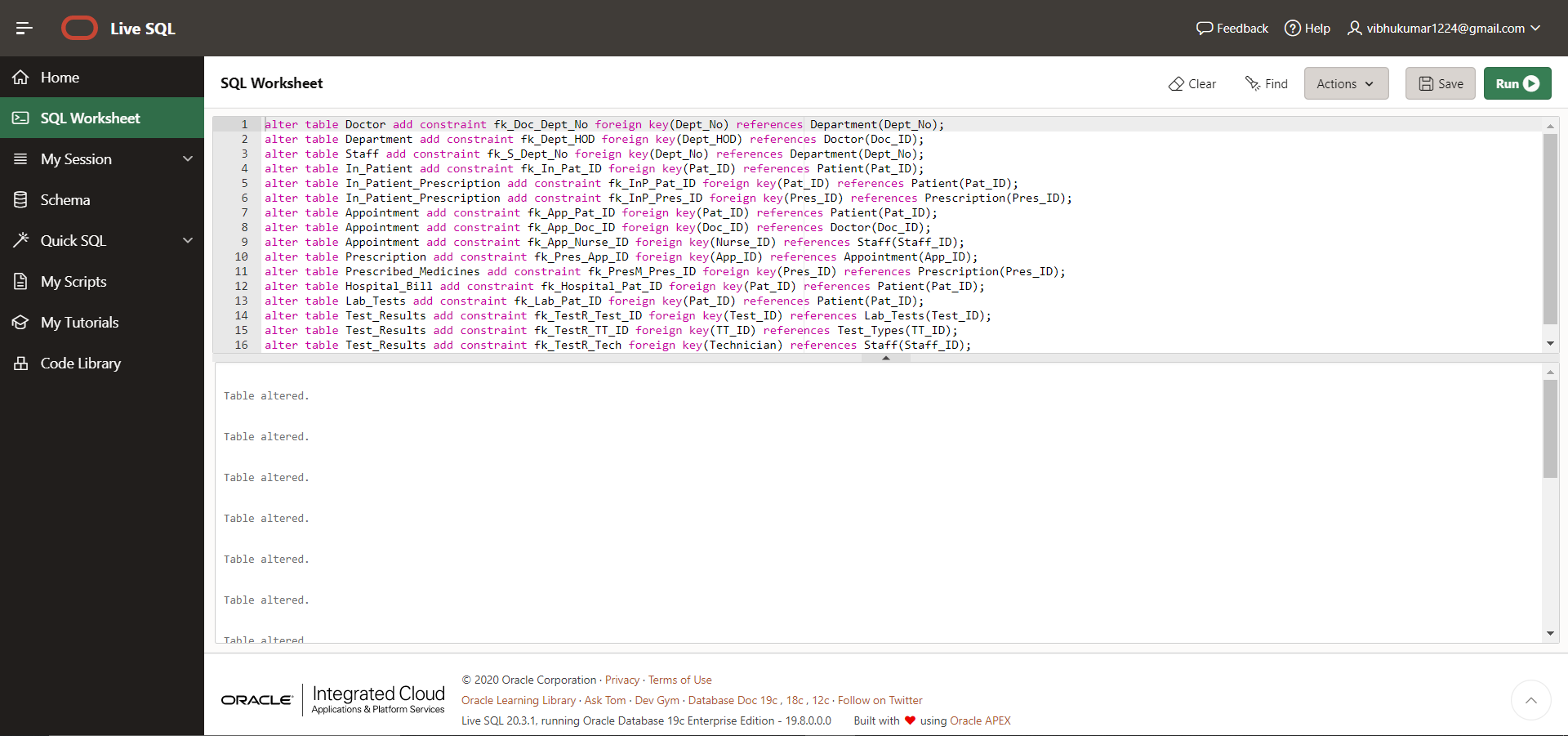
alter table Prescribed\_Medicines add constraint fk\_PresM\_Pres\_ID foreign key(Pres\_ID) references Prescription(Pres\_ID);

alter table Hospital\_Bill add constraint fk\_Hospital\_Pat\_ID foreign key(Pat\_ID) references Patient(Pat\_ID);

alter table Lab\_Tests add constraint fk\_Lab\_Pat\_ID foreign key(Pat\_ID) references Patient(Pat\_ID);

alter table Test\_Results add constraint fk\_TestR\_Test\_ID foreign key(Test\_ID) references Lab\_Tests(Test\_ID);

alter table Test\_Results add constraint fk\_TestR\_TT\_ID foreign key(TT\_ID) references Test\_Types(TT\_ID);

alter table Test\_Results add constraint fk\_TestR\_Tech foreign key(Technician) references Staff(Staff\_ID);  




1. select Dept\_HOD from Department, Doctor where Department.Dept\_No = Doctor.Dept\_No and Doc\_Name = 'Raghavan';

select h.Dept\_HOD from Department h inner join Doctor d on d.Dept\_No = h.Dept\_No where d.Doc\_Name = 'Raghavan';

1. select Pat\_Name from Patient,In\_Patient where Patient.Pat\_ID = In\_Patient.Pat\_ID and Bed\_No = 'B101';

select distinct p.Pat\_Name from Patient p inner join In\_Patient i on p.Pat\_ID = i.Pat\_ID and i.Bed\_No = 'B101';

**DDL statements (ALTER, CONSTRAINT etc):**

Q1)

alter table Hospital\_Bill add consulting\_physician varchar2(5);

alter table Hospital\_Bill add constraint fk\_con\_physician foreign key(consulting\_physician) references Doctor(Doc\_ID);

Q2)

alter table Patient drop column Address;

alter table Patient add Street varchar2(15);

alter table Patient add City varchar2(15);

alter table Patient add Pincode number(6);

Q3)

alter table Patient add Test\_Time varchar2(15);

alter table Patient add constraint ck\_Test\_Time check(Test\_Time in (‘Before Food’,’After Food’));

Q4)

alter table Patient drop constraint ck\_Test\_Time;

Q5)

alter table Staff drop column Address;

alter table Staff add Door\_No number(5);

alter table Staff add Street varchar2(15);

alter table Staff add City varchar2(15);

alter table Staff add Pincode number(6);

Q6)

create table Medicines(

Medicine\_Name varchar2(15) primary key,

Brand varchar2(15) not null,

Dosage varchar2(15) not null,

Manufacture date not null,

Expiry date not null,

constraint ck\_Manu\_date check(Manufacture < Expiry)

);

Q7)

alter table Prescribed\_Medicines drop column Dosage;

alter table Prescribed\_Medicines drop column Brand;

alter table Prescribed\_Medicines add constraint fk\_Medicine\_Name foreign key(Medicine\_Name) references Medicines(Medicine\_Name);

Q8)

create view Cardiology\_Doctors as select Doc\_ID, Doc\_Name, Gender from Doctor where specialist = 'Cardiology';

Q9)

alter table Department add No\_of\_Staff number(2);

alter table Department add constraint ck\_No\_of\_Staff check(No\_of\_Staff > 0);

Q10)

alter table In\_Patient\_Prescription add Room\_Type varchar2(8);

alter table In\_Patient\_Prescription add constraint ck\_Room\_Type check(Room\_Type = 'AC' or Room\_Type = 'Non-AC');

**SQL queries with JOIN operation**

**Q1)**