**Question 01:**

**Branch Table:**

No composite key possible except BranchNo. which is already primary key. The rest of the attributes like street, city and postcode can’t be regarded as composite key because of their non-unique nature.

**Staff Table:**

No composite key possible except StaffNo which is already the primary key. The rest of the attributes can’t be regarded as composite keys because of their non-unique nature.

**Property for Rent table:**

No composite key possible except PropertyNo which is already the primary key. The rest of the attributes can’t be regarded as composite keys because of their non-unique nature.

**Client Table:**

TelNo and email can be considered composite keys since they will be unique and not null for every record. We will have to use unique constraints on these attributes if we make them primary key.

**PrivateOwner Table:**

TelNo and email can be considered composite keys since they will be unique and not null for every record. We will have to use unique constraints on these attributes if we make them primary key.

**Viewing Table:**

No composite key possible except ClientNo and propertyNo which is already the primary key. The rest of the attributes can’t be regarded as composite keys because of their non-unique nature.

**Registration Table:**

No composite key possible except ClientNo and BranchNowhich is already the primary key. The rest of the attributes can’t be regarded as composite keys because of their non-unique nature.

**Question 02:**

**Branch Table:**

No foreign key

**Staff Table:**

Staff Table has branchno as foreign key from the branch table.

**Property for Rent table:**

Property for rent table has StaffNo as foreign key from the staff table.

Property for rent table has BranchNo as foreign key from the Branch table.

**Client Table:**

No foreign key.

**PrivateOwner Table:**

No foreign key

**Viewing Table:**

Viewing table has propertyno. from Property from Rent table.

Viewing table has Clinetno from client table.

**Registration Table:**

Registration table has clientno from the client table.

Registration has staffno from the staff table.

**Question 03:**

1. Primary key violated since it can’t be duplicate, sex is a char while the inserted entry is int this will violate the domain constraint.
2. ClientNo and branchNo can’t be kept null since the are composite key of primary key. In the current query branchNo is null which violates the primary key constraint.
3. No constraints violated
4. Referential integrity constraint violated since ownerNo is a foreign key in the PropertyForRent table.
5. Clientno ‘CR97’ doesn’t exist in the base table’s primary key column, this will violate the referential integrity constraint.
6. Viewing table is using the propertyNo ‘PA14’ already, this query will violate the referential integrity.
7. No constraint violated.

**Question 04:**

**Staff:**

CREATE TABLE Staff(

    staffNo VARCHAR2(10) PRIMARY KEY,

    fName VARCHAR2(10) NOT NULL,

    IName VARCHAR2(10) NOT NULL,

    position VARCHAR2(10) NOT NULL,

    sex CHAR NOT NULL,

    DOB DATE NOT NULL CHECK(TO\_CHAR(DOB,'DD-MON-YYYY') > '09-OCT-1961'),

    salary NUMBER(6) NOT NULL CHECK (salary >= 9000 and salary <= 30000),

    branchNo VARCHAR2(5) NOT NULL,

    FOREIGN KEY (branchNo) REFERENCES Branch(branchNo)

);

**PropertyForRent:**

CREATE TABLE PropertyForRent (

    propertyNo VARCHAR2(10) PRIMARY KEY,

    street VARCHAR2(20),

    city VARCHAR2(10),

    postcode VARCHAR2(10),

    type VARCHAR2(10) DEFAULT 'House',

    rooms NUMBER(2) CHECK(rooms>=3),

    rent NUMBER(5),

    ownerNo VARCHAR2(10),

    staffNo VARCHAR2(10),

    branchNo VARCHAR2(5),

    FOREIGN KEY (ownerNo) REFERENCES PrivateOwner(ownerNo),

    FOREIGN KEY (staffNo) REFERENCES Staff(staffNo),

    FOREIGN KEY (branchNo) REFERENCES Branch(branchNo)

);

**PrivateOwner:**

CREATE TABLE PrivateOwner(

    ownerNo VARCHAR2(10) primary key,

    fName VARCHAR2(10),

    IName VARCHAR2(10),

    address VARCHAR2(10),

    telNo VARCHAR2(20) UNIQUE,

    eMail VARCHAR2(20) UNIQUE,

    password VARCHAR2(10)

);

**Viewing:**

CREATE TABLE Viewing (

    clientNo VARCHAR2(10),

    propertyNo VARCHAR2(10),

    viewDate DATE,

    commment VARCHAR2(30),

    PRIMARY KEY(clientNo,propertyNo),

    FOREIGN KEY (clientNo) REFERENCES client(clientNo),

    FOREIGN KEY (propertyNo) REFERENCES PropertyForRent(propertyNo)

);

**Question 05:**

**a)** SELECT propertyNo FROM PropertyForRent WHERE staffNo IN

(SELECT staffNo FROM Staff WHERE sex = ‘F’);

**b)** SELECT fName, lName FROM privateOwners WHERE ownerNo IN

(SELECT ownerNo FROM PropertyForRent WHERE type = ‘House’);

**c)** SELECT fName, lName , salary AS “Old Salary”, salary+ (salary\*0.15) AS “New Salary” FROM staff WHERE branchNo IN (SELECT branchNo FROM Branch WHERE city = ‘London’);

**d)** Select \* FROM PropertyForRent WHERE propertyNo IN

(SELECT propertyNo FROM Viewing WHERE to\_char(hire\_date,'Mon-yyyy') = ‘May-2013)’

**e)** SELECT \* FROM Staff where fName LIKE ‘D%’ OR lName LIKE ‘W%’;