**4 Dependencies and Normalization**

4.1 BloodBank

There exists one functional dependency {Blood\_bank\_ID → State,city} ,

Both are fully functional dependent on the

Blood\_bank\_ID. The table is in BCNF.

**4.2 Donor**

The functional dependencies are

{Donor\_ID→ Donor\_Name,gender, Blood\_group,Date\_of\_birth,city,phone\_no,blood\_bank\_id} .

There exists full functional

dependency. Hence table is in 3NF.

**4.3 Employee**

The functional dependencies are {EmployeeID → Email} , {EmployeeID → Name},{EmployeeID → Salary},{EmployeeID → Joining\_date}

{EmployeeID → Blood\_bank\_id}.Since all the attributes depend on primary key and has no transitive dependency, the table is in 3NF.

**4.4 Employee\_Phone**

The functional dependencies are {EmployeeID ,Phone\_no→ phone\_no},

The attributes depend only on primary key. Therefore, the table is in

3NF.

**4.5 Hospital**

The functional dependencies are {HospitaID → Hospital\_name,street,city} .

There exists fully functional dependency. Therefore, the table is in

3NF.

**4.6 Patient**

The functional dependencies are {PatientID → patient\_name,date\_of\_birth,blood\_group,gender,address,quantity,blood\_bank\_id} ,

{parient\_ID,hospital\_id → Date\_of\_receiving,admission time, discharge\_time} Table is in 3NF.

**4.7 Volunteer**

The functional dependencies are {VolunteerID → Volunteer\_Name} ,{VolunteerID → service\_start,service\_end},{VolunteerID → email},

{VolunteerID → Blood\_bank\_id}.There exists partial dependency and transitive

dependency. Therefore, the table is in 3NF.

**4.8 Equipment**

The functional dependencies are {Equipment\_ID → Blood\_bank\_id},{Equipment\_ID → Equipment\_name,date\_of\_purchase,maintainance\_due} ,

{Equipment\_ID → price,remarks}

The table is in 3NF.

**4.9 Volunteer\_Phone**

The functional dependencies are {VolunteerID,phone\_no1,phone\_no2 → phone\_no1,phone\_no2}

The attributes are fully functional dependent on EmergencyID. The table is in 3NF.

**4.10 Blood**

The functional dependencies are {Donor\_id,blood\_group,quantity → blood\_group,quantity} .

The attributes are fully functional dependent on ResID. The table is in 3NF.