Laboratory work 1

1.Consider the employee database of figure below. Give an expression in the relational algebra to express each of the following queries:

employee (id , person_name, street , city)

works (person_name, company_name , salary)

company (company_name , city)

а)

Π id,person_name $(\sigma$ company_name="BigBank" $(\sigma$ employee.person_name=works.person_name (employee X works)))

б)

Π id,person_name,city $(\sigma$ company_name="BigBank" $(\sigma$ employee.person_name=works.person_name (employee X works)))

в)

Π id,person_name,street,city $(\sigma$ company_name="BigBank"$^\wedge$ salary>10000 $(\sigma$ employee.person_name=works.person_name (employee X works)

г)

Π id,person_name $(\sigma$ company.city=employee.city$(\sigma$ works.company_name=company.company_name (company X (σ employee.person_name=works.person_name (employee X works)

2.Consider the employee database of figure above. Give an expression in the relational algebra to express each of the following queries:

а)

Π id,person_name $(\sigma$ company_name≠"BigBank" $(\sigma$ employee.person_name=works.person_name (employee X works)))

б)

$$\Pi_{\text{id,person\_name}} \left(\sigma_{\text{salary} \geq \text{avg(salary)}} \left(\sigma_{\text{employee.person\_name=works.person\_name}} (\text{employee} \times \text{works}) \right) \right)$$

3.Consider the foreign-key constraint from the dept_name attribute of instructor to the department relation. Give examples of inserts and deletes to these relations that can cause a violation of the foreign-key constraint.

If we want to insert to dept_name attribute(of instructor relation) a value which not exist in the dept_name attribute of department relation. It can cause a violation of the foreign-key constraint. And If we want delete a single value of the dept_name attribute of department relation which exist in the dept_name attribute of instructor relation . It can cause a violation of the foreign-key constraint too.

4.Consider the employee database of figure above. What are the appropriate primary keys?

The appropriate primary keys of the employee database is the attribute "id". Because "id" attribute is unique and does not repeat itself.