1.

1) $\pi_{name}(\sigma_{takes.course\_id = course.course\_id}(\sigma_{dept\_name='Comp\_Sci'}(takes \times course)))$

2) $S \leftarrow \pi_{s\_ID}(\sigma_{takes.course\_id = course.course\_id}(\sigma_{dept\_name='EE'}(take \times course)))$

$\pi_{s\_ID, name}(student) - \pi_{s\_ID, name}(S \bowtie Student)$

3) $\pi_{i\_ID}(instructors) - \pi_{i\_ID}(\sigma_{instructors.salary < d.salary}(instructors \times \rho_d(instructors)))$

2.

1) $\pi_{person\_name}(\sigma_{company\_name='First\ Bank\ Corporation'})$

2) $\pi_{person\_name, city}(\sigma_{company\_name='First\ Bank\ Corporation}(employee \bowtie works))$

3) $\pi_{person\_name, street, city}(\sigma_{company\_name='First\ Bank\ Corporation' \wedge salary > 10000}(employee \bowtie works))$

4) $\pi_{person\_name}(company \bowtie employee \bowtie works)$

5) $\pi_{person\_name}(\sigma_{employee.person\_name = d.person\_name}(employee \times (employee \bowtie manages)))$

6) $\pi_{person\_name}(employee) - \pi_{person\_name}(employee \bowtie_{company\_name='First\ Bank\ Corporation'} works)$

7) $\pi_{person\_name}(employee) - \pi_{person\_name}(\sigma_{salary < d.salary}((employee \bowtie works) \times \rho_d(employee \bowtie works)))$