1

1) ∏**id**, **person_name** (*σ***company_name = "BigBank"(works)**)
2) ∏**id**, **person_name**, **city (employee**
⋈**employee.id=works.id**(*σ***company_name="BigBank"** (**works**)))
3)∏**id**, **person_name**, **street**, **city**(**employee** ⋈
employee.id=works.id(*σ*(**company_name="BigBank"** ∧ **salary** > **10000(works)**))))
4) ∏**id**, **person_name** (*σ***employee.city=company.city**
(**employee** ⋈ **employee.id=works.id works**
⋈ **works.company_name=company.company_name company**))

2

1. ∏**id**, **person_name** (*σ***company_name ¬="BigBank"(works)**)
2. ∏**id,person_name (σworks.salary>MIN(works.salary) (works** ⋈ **works.id = employee.id employee))**

3

To the instructor relationship, we might attempt to insert a row with a non-existing department. This would violate the foreign-key constraint.

Additionally, the foreign-key restriction will be violated if we attempt to delete a record from the department relation (given that there is an instructor in this department).

4 The primary key of employee database is id.