

1.a

π (id, name, post.title, Current_staff) (δ institute_id = 1 (staff \bowtie post_id=id post))

1.b

π (id, transaction_date, transaction_type, amount) (δ institute_id = 1 (institute_financial_Records))

1.c

π (name) (σ institute_id = 1 (specialized_Fields_Of_ReasechActivity \bowtie research_Activity.id = specialized_Fields_Of_ReasechActivity.research_Activity_Id research_Activity \bowtie research_Activity.id = reasercher_researchActivity_institute.research_Activity_Id reasercher_researchActivity_institute))

1.d

π (Research_Activity.*) (σ institute_id = 1 (Research_Activity \bowtie Research_Activity.id = reasercher_researchActivity_institute.research_Activity_Id reasercher_researchActivity_institute))

2.a

π (reasercher.*, reasercher_researchActivity_institute.*, research_Areas_Of_Interest_researcher.*, academic_Records_Of_A_Researcher.*)

(reasercher \bowtie reasercher.id = academic_Records_Of_A_Researcher.researcherId

(reasercher \bowtie reasercher.id = research_Areas_Of_Interest_researcher.researcherId

(reasercher \bowtie reasercher.id = reasercher_researchActivity_institute.reasercher_Id

(σ (reasercher_Id = 1) (reasercher_researchActivity_institute))))))

2.b

σ (reasercher_Id = 1 AND agrement_end_time < '2013-5-6' AND agrement_start_time > '2012-5-6')
(reasercher_researchActivity_institute)

2.c

π (reasercher_Id, case_Payments, wage) (σ (reasercher_Id = 1) (reasercher_researchActivity_institute))

3.a

$$\pi (\text{research_Activity_Id}) ((\text{reasercher_researchActivity_institute} \bowtie (\sigma (\text{reasercher_Id} = 2) (\text{reasercher_researchActivity_institute}))) \bowtie (\sigma (\text{reasercher_Id} = 1) (\text{reasercher_researchActivity_institute})))$$

3.b

$$\pi (\text{research_Activity_id}) ((\sigma (\text{reasercher_Id} = 1) (\text{reasercher_researchActivity_institute})) \bowtie (\pi (\text{research_Activity_id}) ((\sigma (\text{reasercher_Id} = 2) (\text{reasercher_researchActivity_institute}))) \bowtie (\sigma (\text{reasercher_researchActivity_institute.research_Activity_Id} = \text{research_Activity.id}) (\text{research_Activity})))) \bowtie (\sigma (\text{r1.research_Activity_Id} = \text{research_Activity.id}) (\text{specialized_Fields_Of_ReasechActivity})))$$

4.a

$$\pi (\text{reasercher_Id}) (\sigma (\text{agrement_end_time} < '2013-5-6' \text{ AND } \text{agrement_start_time} > '2012-5-6') (\text{reasercher_researchActivity_institute}))$$

4.b

$$\pi (\text{reasercher_Id}, \text{case_Payments}, \text{wage}, \text{act}) (\sigma (\text{research_Activity_Id} = 1) (\text{reasercher_researchActivity_institute}))$$