Translate the following queries into Relational Algebra and also Draw an optimized query tree starting from the initial query tree:

Q1. Given the relation below

Employee (E_name, street, city)
Works (E_name, comp_name, salary)
Company (comp_name, city)
Manages (E_name, mgr_name)

a) Select E_name
From Employee E, Works W
Where E.E_name = W.E_name and salary > 50000 and comp_name = 'First Bank Corp.';

b) Select E.E_name, W.comp_name
From Employee E, Works W
Where E.E_name = W.E_name and W.salary > (Select Avg(salary)
From Works)
Group By W.comp_name;

Q2. Given the relation below

Salesperson (Name, Quota%, Salary)
Order (Number, CustName, SalespersonName, Amt)
Customer (Name, City, IndustryType)

a) Select Name
From Salesperson
Where Quota% < 30;

b) Select Name
From Salesperson
Where Quota% = (Select Max(Quota%)
From Salesperson);

Q3. Given the relation below

Student (SID, Name, Major, GradeLevel)
Class (Name, Time, Room)
Junior (SNum, Name, Major)
HonorStudent (Number, Name, Interest)
Enrollment (StdNo, ClassName, PositionNo)
Faculty (FID, Name, Dept)

a) Select Name
From Student
Where Major in ('Math', 'Accounting');

b) Select Name
From Student
Where SID in (Select StdNo
From Enrollment
Where ClassName = 'BD445');

c)
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Select distinct StdNo
From Enrollment A
Where Exists (      Select *
                    From Enrollment B
                    Where A.StdNo = B.StdNo and A.ClassName Not =
B.ClassName);
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