**Lab 1 : Algebraic query language**

**We have the database consist of 5 relations:**

Product (ProductCode, Name, PurchasePrice, SellPrice, Type, SupplierCode)

Supplier (SupplierCode, SupplierName, Address)

Employee (EmloyeeID, FullName, Gender, BirthDate, Address)

Invoice (InvoiceID, SellDate, EmployeeID)

InvoiceLine(ProductCode, InvoiceID, Quantity)

**Write expressions of relational algebra to answer the following queries:**

1. Find name and sell price of televisions supplied by Sony.

Solution:

R1 = Product Supplier

R2 = SupplierName = Sony&& Type = televisions(R1)

R3= Product(Name, SellPrice) (R2)

1. Find name and address of all suppliers who supply television product.

R1 = Product Supplier

R2 = Product(Type=television) (R1)

R3 = Supplier(SupplierName, Address) (R2)

1. Find name of all employee who were born in 1986.

R1 = Employee(Birthdate.year = 1986)

R2 = (FullName) (R1)

1. Find name and type of all products sold in ‘23/05/2020’.

R1 = Invoice InvoiceLine

R2 = R1 Product

R3 = Selldate = “23/05/2020” (R2)

R4 = (Name, Type) (R3)

1. Find name of female employees who sold televisions.

R1 = Invoice InvoiceLine

R2 = R1 Product

R3 = R2 Employee

R4 = (Type = Television) (R3)

R5 = (Gender = Female) (R4)

R6 = (FullName) (R5)

E1 : Find name of female employees who sold televisions and not sold mobile.

R1 = Invoice ⋈ InvoiceLine

R2 = R1⋈ Employee

R3 = R2⋈ Product

R4 = σ Gender=”female” and (Type =”tellevisions” or Type =”mobile”)(R3)

R5 = σ Gender=”female” and (Type =”tellevisions”)(R3)

R6 = σ Gender=”female” and (Type =”mobile”)(R3)

R7 = R5 giao R6

R8 = R5 – R7

1. Find name and address of suppliers who supply both television and mobile.

R1 = Product Supplier

R2 = (Type = Tv,Mobile) (R1)

R3 = (SupplierName, Address) (R2)

F1: Find name and address of suppliers who supply both only television or only mobile.

R1 = Product Supplier

R2 =  **(**type=television or type !=mobile)(R1)

R3 =

1. List name and price of all product sold by employee “Nguyễn Văn A” in April 2020.

R1 = Invoice invoiceLine

R2 = R1 Employee

R3 = R2 Product

R4 = (SellDate.month.year = April 2020) (R3)

R5 = (FullName=Nguyễn Văn A) (R4)

R6 = (Name, SellPrice) (R5)

1. Find name and price of all mobile products of LG sold in April 2020.

R1 = Invoice InvoiceLine

R2 = R1 Product

R3 = R2 Supplier

R4 = (SellDate.month.year=April 2020) (R3)

R5 = SupplierName = LG (R4)

R6 = (Type=Mobile) (R5)

R7 = (Name, SellPrice) (R6)

1. Find the product with highest SellPrice
2. Find the amount (quantity \* sellPrice) of each invoice line of product sold in 30/04/2020.

R1 = Invoice InvoiceLine

R2 = R1 Product

R3 = (SellDate = 30/04/2020) (R2)

R4 = (amount = quantity\*SellPrice) (R3)