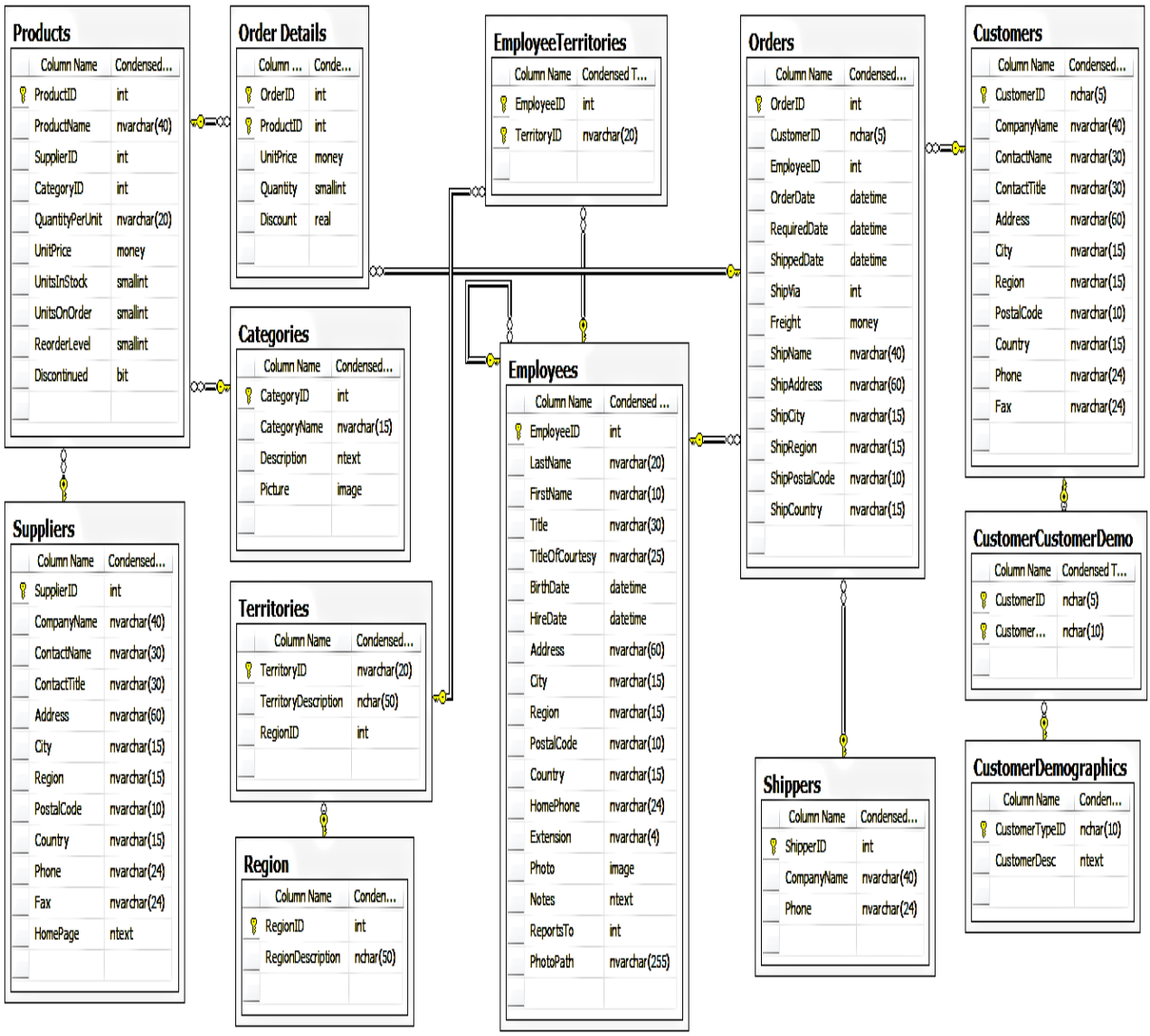
CAIRO UNIVERSITY
FACULTY OF COMPUTERS AND INFORMATION
IS211 COURSE
DATABASE SYSTEMS 1
SPRING 2016
DURATION: 45 MINUTES

STUDENT NAME: **ID:** **Group No.:**

QUIZ 2 (Model 1)

Q1: Write the corresponding SQL statement for each of the following questions using the Northwind DB:



1. **Display the last name, job title and city of all employees working as same as the employee with last name Davolio, and live in London. Don't display the employee with last name Davolio. (5 marks)**

```
SELECT E.LastName, E.Title, E.City     0.5 mark
FROM Employees E, Employees S          0.5 mark
WHERE S.LastName = 'Davolio'           1 mark
AND E.LastName <> 'Davolio'            1 mark
AND E.Title = S.Title                  1 mark
AND E.City = 'London'                  1 mark
```

2. **For countries alphabetically between Brazil and USA, display the country name in addition to the number of suppliers living in this country and don't have a Homepage. Restrict the Result to countries having more than one supplier. Sort the result according to the highest number of suppliers first. Give a meaningful name(s) for any un-named column(s). (5 marks)**

```
SELECT Country, Count (SupplierID) AS "Number of Suppliers"      1 mark
FROM Suppliers                                                   0.5 mark
WHERE Country BETWEEN 'Brazil' AND 'USA'                         0.5 mark
AND HomePage IS NULL                                             0.5 mark
GROUP BY Country                                                 1 mark
HAVING Count (SupplierID) > 1                                    1 mark
ORDER BY Count (SupplierID) DESC                                 0.5 mark
```

3. **Get the product name, quantity per unit and the corresponding category name for seafood products having their quantities measured in jars. Fully optimize your query to minimize the cost of accessing any unneeded columns and/or rows from the relevant tables. (5 marks)**

```
SELECT C.CategoryName, P.ProductName, P.QuantityPerUnit    0.5 mark
FROM (SELECT ProductName, QuantityPerUnit, CategoryID FROM Products WHERE
QuantityPerUnit LIKE '%jars%') AS P      2 marks (1 for select + 1 for where)
INNER JOIN (SELECT CategoryName, CategoryID FROM Categories WHERE CategoryName =
'Seafood') AS C            2 marks (1 for inner join+0.5 for select+0.5 for where)
ON P.CategoryID = C.CategoryID      0.5 mark
```

Q2: Write the corresponding Relational Algebra Expression for each of the following questions

Consider the following relational schema, where the primary keys are underlined:

Manufacturer (ManufacturerID, ManufacturerName, ManufacturerCity)
Product (ProductID, ProductName, Model)
Description (ManufacturerID, ProductID, Price)

*ManufacturerID in Description refers to its corresponding column in Manufacturer.

* ProductID in Description refers to its corresponding column in Product.

1. **Find the manufacturer names who sell products of model 2 with price equals to 1000. (5 marks)**

$\pi_{ManufacturerName}(((\sigma_{Model=2}\ Product) \bowtie_{Product.ProductID=Description.ProductID\ \wedge\ Price=1000}\ Description) \bowtie_{Description.ManufacturerID=\ Manufacturer.ManufacturerID}\ Manufacturer)$

1 for joining 3 tables
1 for projection
1 for selection
1 for join condition b/w product & description
1 for join condition b/w description & Manufacturer

2. **Find the id of manufacturers who are located in Cairo. (5 marks)**

$\pi_{ManufacturerID}\ (\sigma_{\ ManufacturerCity='Cairo'}\ Manufacturer)$

1 for Manufacturer
2 for selection
2 for projection