M1.1 Basic SQL

Exam Solution

Part 1: MULTIPLE CHOICES

Question 1: What is the main purpose of an ERD (Entity Relationship Diagram)?

```
A. To visualize the relationships between entities in a database
```

Question 2: What is the main difference between a primary key and a foreign key?

```
B. A primary key is a unique identifier for each row in a table,
while a foreign key is used to reference data in another table
```

Question 3: What is a one-to-many relationship in a database?

```
A. A relationship where one record in one table can be linked to
multiple records in another table
```
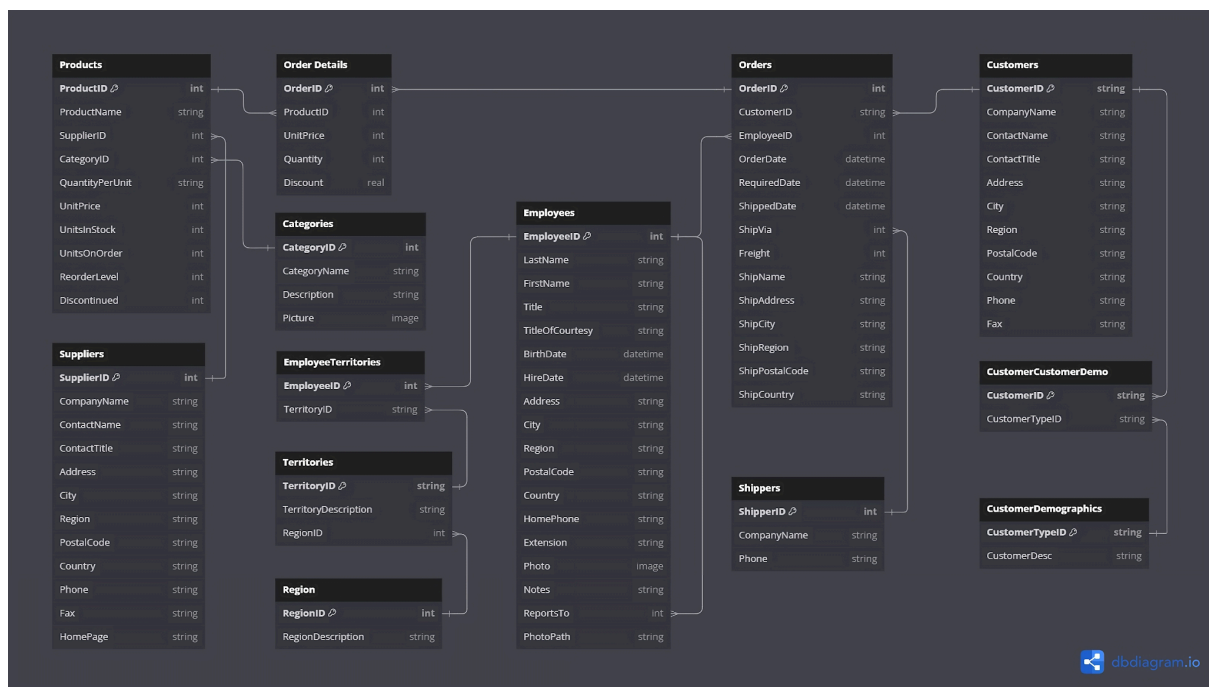
Question 4: In a database of a school, each student can only belong to one class, but each class can have many students. Which type of relationship is established between the students and the classes table?

```
B. One to Many Mandatory
```

Question 5: About the schema below, which answer is WRONG?

```
B. A customer must have at least 1 invoice
```

Part 2: SQL QUERY

Question 6: How many products have the word 'chocolate' in their product name?

```
SELECT COUNT(*) as '#ChocolateProducts'
FROM Products
WHERE ProductName like '%chocolate%';
```

Question 7: What are the names and unit prices of the five most expensive products?

```
SELECT ProductName, UnitPrice
FROM Products
ORDER BY UnitPrice desc
LIMIT 5;
```

Question 8: Get the list of five countries with the most number of customers staying there.

```
SELECT Country, COUNT(CustomerID) as '#Customers'
FROM Customers
GROUP BY Country
ORDER BY "#Customers" desc
LIMIT 5;
```

Question 9: Get the list of five countries with the least number of suppliers staying there.

```
SELECT Country, COUNT(SupplierID) as '#Suppliers'
FROM Suppliers
GROUP BY Country
ORDER BY "#Suppliers" LIMIT 5;
```

Question 10: Retrieve the list of category names with the number of products in each category.

```
SELECT CategoryName, COUNT(ProductID) as '#Products'
FROM Products p join Categories c on p.CategoryID = c.CategoryID
GROUP BY CategoryName
ORDER BY "#Products" DESC;
```

Question 11: Retrieve the names and total sales of the top 5 selling products.

```
SELECT
     p.ProductName,
     ROUND(SUM(o.UnitPrice*o.Quantity),1) as 'Total Revenue'
FROM "Order Details" o join Products p on o.ProductID =
p.ProductID GROUP BY p.ProductName
ORDER BY "Total Revenue" DESC
LIMIT 5;
```

Question 12: Which employees have sold the most?

```
SELECT e.FirstName, e.LastName, SUM(od.Quantity) as 'Total sales'
FROM Employees e
     JOIN Orders o on e.EmployeeID = o.EmployeeID
     JOIN "Order Details" od on od.OrderID = o.OrderID
GROUP BY e.EmployeeID
ORDER BY "Total sales" DESC;
```

Question 13: How many orders does the company ship to "Western Europe" each year?

```
SELECT
     STRFTIME('%Y', OrderDate) AS Year,
     COUNT(OrderID) as '#Orders',
     ShipRegion
FROM Orders
WHERE ShipRegion = 'Western Europe'
GROUP BY "Year";
```

Question 14: What are the company names of the customers who have ordered the product 'Tofu'?

```
SELECT DISTINCT c.CompanyName
FROM Customers c
     JOIN Orders o on c.CustomerID = o.CustomerID
     JOIN "Order Details" od on o.OrderId = od.OrderID
     JOIN Products p on od.ProductID = p.ProductID
WHERE p.ProductName = 'Tofu';
```

Question 15: Retrieve customer IDs and company names of customer companies that have never placed an order.

```
SELECT c.CustomerID, c.CompanyName
FROM Customers c
     LEFT JOIN  Orders o on c.CustomerID = o.CustomerID
WHERE o.OrderID IS NULL;
```

Question 16: What are the company names of the suppliers that supply only one product?

```
SELECT s.CompanyName
FROM Suppliers s
     JOIN Products p ON s.SupplierID = p.SupplierID
GROUP BY s.CompanyName
HAVING COUNT(p.ProductID) = 1;
```

Question 17: What are the names of employees who have taken orders from customers who live in the same city as the employee?

```
SELECT DISTINCT e.EmployeeID, e.LastName, e.FirstName
FROM Employees e
     JOIN Orders o ON e.EmployeeID = o.EmployeeID
     JOIN Customers c ON c.CustomerID = o.CustomerID
WHERE e.City = c.City
ORDER BY e.EmployeeID;
```

Question 18: List the top 5 products based on total quantity ordered.

```
SELECT p.ProductName, SUM(o.Quantity) as TotalQuantity
FROM Products p
     JOIN "Order Details" o ON o.ProductID = p.ProductID
GROUP BY p.ProductID
ORDER BY TotalQuantity DESC
LIMIT 5;
```

Question 19: Find the total number of orders and the total number of customers who have made orders in each country.

```
SELECT c.Country,
      COUNT(o.OrderID) as 'Total Orders',
      COUNT(DISTINCT c.CustomerID) as 'Total Customers'
FROM Customers c
      JOIN Orders o ON c.CustomerID = o.CustomerID
GROUP BY c.Country
ORDER BY "Total Orders" DESC, "Total Customers" ASC;
```

Question 20: Find the average order value for each product category.

```
SELECT
      c.CategoryName,
      ROUND(AVG(o.UnitPrice*o.Quantity), 4) as 'AVG Order Value'
FROM Categories c
      JOIN Products p ON c.CategoryID = p.CategoryID
      JOIN "Order Details" o ON o.ProductID = p.ProductID
GROUP BY c.CategoryName
ORDER BY "AVG Order Value" DESC;
```