Lab #1: Database Fundamentals

Exercise 1:

a. Select a primary key(s) for each of these relations
Products: *PRIMARY KEY(id)*
Customer: *PRIMARY KEY(id)*
Suppliers: *PRIMARY KEY(sid)*
Orders: *PRIMARY KEY (order_id)*
ItemsPurchased: *PRIMARY KEY(order_id, product_id)*

b. Is the condition (id, cname) a primary key for the Customer relation?
It can be a valid primary key for the Customer relation. However, simply the id would be enough as multiple customers can have the same name but the id will always be unique.

c. Is the condition (id, cname) a candidate key for the Customer relation?
Yes, it can be a candidate key as well because even if multiple customers have the same name, the id is what will seperate them – making them unique.

d. Define all possible foreign keys for the relations.
Orders: FOREIGN KEY(cust_id) REFERENCES Customers(id)
ItemsPurchased: FOREIGN KEY(order_id) REFERENCES Orders(order_id)
ItemsPurchased: FOREIGN KEY(product_id) REFERENCES Products(id)

**Note: Theoretically, a foreign key should also exist for *Products(supplier)->Suppliers(sup_name)*, however, it is not specified whether supplier name will be unique or not.

e. Give an example of a tuple that the DBMS would reject because it would violate a uniqueness constraint

Customers:

id(PRIMARY KEY)	cname	address	telephone	email
101	Bob	123 Random Way	123-456-7890	Bob@uoit.net
101	Ray	456 Random Way	098-765-4321	Ray@uoit.net

f. Give an example of a tuple that the DBMS would reject because it would violate a referential integrity constraint
For example, an order must be related to a customer id because a customer has to have made the order.

g. Give an example of a tuple that the DBMS would reject because it would violate a domain constraint

Products:

id(PRIMARY KEY)	title	price	quantity	category	supplier
789	iphone	-300.00	1	electronics	apple

This price would result in a domain violation as the product price cannot be a negative value.