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a.
Primary Key: Supplier, Product, ImportDate

Functional dependencies:
Supplier ID -> Supplier Name
Product Code -> Product Name
Product Code -> Unit of Measure
Product Code -> DeptCode
Supplier ID, Product Code, ImportDate -> Quantity, Cost

This problem satisfies none of the first three normal forms. Because the column Supplier and column Product contain non-atomic values, the values in column Supplier can be divided into Supplier ID and Supplier Name, and values in column Product can be divided into Product Code and Product Name, this problem is not first normal form. Therefore it cannot be 2NF or 3NF either. 2NF requires it to be 1NF and no partial dependencies. 3NF requires it to be 2NF and no transitive dependencies.

Supplier ID	Supplier Name

Product Code	Product Name	DeptCode	Unit of Measure

Supplier ID	Product Code	ImportDate	Quantity	Cost

b.
Primary Key: ProductCode, Date

Functional dependencies:
Dept -> DeptName
ProductCode -> Dept
ProductCode -> Unit of Measure
ProductCode, Date -> List Price
ProductCode, Date -> Quantity

This problem satisfies first normal form but not 2NF or 3NF. Because this database contains only atomic values, and there are no repeating groups, therefore it satisfies the first normal form. Note that for this problem, ProductCode and Date together form the primary key, so the primary key is a composite key. There are several partial dependencies, such as Dept and Unit

of Measure only depend on ProductCode. So this problem is not in 2NF, for 2NF requires a database is in first normal form and all non-key attributes are fully functional dependent on the primary key. A database is in third normal form if it is in second normal form and there is no transitive functional dependency. But for this problem, this database is not in 2NF, so it is not in 3NF.

Dept	DeptName

ProductCode	Dept	Unit of Measure

ProductCode	Date	List Price	Quantity

c.
Primary Key: ReceiptID, ProductCode

Functional dependencies:
custID -> CustName
custID -> Membership Status
Membership Status -> Discount
ReceiptID -> DateandTime
ReceiptID -> custID
ReceiptID, ProductCode -> Quantity
ReceiptID, ProductCode -> Actual Price

This problem satisfies first normal form but not 2NF or 3NF. Because this database contains only atomic values, and there are no repeating groups, therefore it satisfies the first normal form. In this problem, ReceiptID and ProductCode together form the primary key, so the primary key is a composite key. There are several partial dependencies, such as DateandTime only depends on ReceiptID, and custID only depends on ReceiptID. So this problem is not in 2NF, for 2NF requires a database is in first normal form and all non-key attributes are fully functional dependent on the primary key. A database is in third normal form if it is in second normal form and there is no transitive functional dependency. But for this problem, this database is not in 2NF, so it is not in 3NF.

ReceiptID	custID	DateandTime

custID	CustName	Membership Status

Membership Status	Discount

ReceiptID	ProductCode	Quantity	Actual Price