2.1

This table is not in any normal form (unnormalized), as there are repeating groups (Invoice-No, Client-No, Client-Name).

2.2
First normalise into 1NF
Remove repeating groups (Invoice-No, Client-No, Client-Name)
Identify Primary key
Identify Dependencies

Normalise to 2NF
Remove Partial dependencies

Normalise to 3NF
Remove transative dependencies

2.3
(Invoice-No, Client-No, Client-Name, Product-No, Product-Name, Product-Price, Quantity)
filling in record 2 of (Invoice-No, Client-No, Client-Name) with (1234,4321, John) respectively.

2.4
Invoice-No, Client-No, Product-No → Client-Name, Product-Name, Product-Price, Quantity

Client-No→ Client-Name
Product-No → Product-Name, Product-Price
Invoice-No→ Client-No, Product-No
Invoice-No, Product-No → Quantity

2.5

Client(Client-No, ClientName)
Product(Product-No, ProductName, Product-Price)
InvoiceLine(Invoice-No, Product-No, Quantity)
Invoice(InvoiceNo, CLientNo, Product-No)

2.6 There are no transative dependencies, therefore 2.5 is in 3NF, therefore
3NF is

Client(Client-No, ClientName)
Product(Product-No, ProductName, Product-Price)
InvoiceLine(Invoice-No, Product-No, Quantity)
Invoice(InvoiceNo, CLientNo, Product-No)

2.7
Converting human readable tables, to DBMS readable tables.
Higher abstraction…. Unknown look textbook

2.8
slides…

3.1

```
Create Table Client(
Client-No char(10) UNIQUE NOT NULL,
Client-Name char(50) NOT NULL,
PRIMARY KEY(CLIENT-No)
);


Create Table Product(

Product-No char(10) UNIQUE NOT NULL,
ProductName char(50) NOT NULL,
Product-Price NUMERIC (10,2) NOT NULL,
PRIMARY KEY(PRODUCT-No)

);

Create Table Ivoice(

InvoiceNo char(10) UNIQUE NOT NULL,
Client-No char(10)  NOT NULL,
Product-No char(10) NOT NULL,
PRIMARY KEY(InvoiceNo),
FOREIGN KEY(Client-No) REFERENCES Client,
FOREIGN KEY(Product-No) REFERENCES Product

);


Create Table InvoiceLine(

InvoiceNo char(10) NOT NULL,
Product-No char(10) NOT NULL,
Quantity int NOT NULL,
PRIMARY KEY(InvoiceNo, Product-No),
FOREIGN KEY(Invoice-No) REFERENCES Invoice,
FOREIGN KEY(Product-No) REFERENCES Product

);
```

3.2

```
INSERT INTO PRODUCT
VALUES (‘1234567890’,’GPU’, 1000.50)
```

3.3

```
SELECT SUM(Quantity)
FROM  INvoiceLine
```

3.4

```
SELECT SUM(Quantity* ProductNo.ProductPrice)
FROM
Invoice INNER JOIN InvoiceLine
ON  Invoice.InvoiceNo =  InvoiceLine.InvoiceNo

Invoice INNER JOIN Product
ON  InvoiceLine.ProductNo =  Product.ProductNo
```

```
InvoiceNo char(10) NOT NULL,
Product-No char(10) NOT NULL,
```