Database Design & Development: Revision Questions 1

1. A database table is shown below.

Table: DroneAddOns

Drone	AddOnID	AddOn	onOrder	Price
JK01	1092	HD Night Camera	45	74.99
JK01	1093	5K Multi-cam	27	5,990.00
PS89	2098	Lifting Gear	7	157.50
PS89	2001	Secure Ground Line	2	39.99
PS89	2002	Descent Firmware	11	102.00
PS89	2004	Ground Scanner	87	215.99
V102	7162	4K Night Camera	14	1920.99
V102	7163	Infra-red tracker	25	578.00
V102	7165	Ground Skiis Gear	12	192.44

Show the output from the following SQL statement

```
SELECT Drone, Count(Price) AS 'Number of Add Ons'
FROM DroneAddOns
GROUP BY Drone;
```

```
JK01        2
PS89        4
V102        3
```

2. Super Taxi allows users to book taxis from their smartphones. Super Taxi uses a relational database to keep a record of their cars, drivers, bookings and customers.
Each driver can only drive one car but the same car can be used by more than one driver. The cost is set at the time of booking.

Draw an entity relationship diagram to show the relationships between the four tables.

Car	Driver	Booking	Customer
Registration	Driver ID	Booking ID	Customer ID
Make	First Name	From	Known As
Model	Surname	To	Card Number
Licence Expires	Mobile	Cost	Expiry Date
	Registration*	Driver ID*	Authorisation Code
		Customer ID*	

Suitable Diagram showing the following:

All 4 entities with fields, PK & FKs underlined or * where correct.
Relationships with cardinality etc included.

3. The Woody Furniture Company uses a relational database to hold data about its business. Extracts from the database are shown below.

Customer				
CustomerID	**CustName**	**CustAddress**	**CustTelNo**	**CreditLimit**
...	...	...	...	...
1311	Smith, K	12 West St	01920 928189	6700
1312	Shaw, M	15 South Dr	020 2928 9291	2000
1313	Proudfoot, D	99a Baker Rd	0141 929 9991	2500
1314	Chisholm, C	The Archers	01293 929101	9000
...	...	...	...	...

Order					
DateOfSale	CustomerID	OrderID	OrderVAT	Shipping	OrderTotal
...	...	...	...	...	...
14/02/2019	1311	82719	240.6	17.99	1220.99
14/02/2019	1311	82720	48	0.00	240.00
15/02/2019	1313	82721	156	10.00	790.00
18/02/2019	1314	82722	176	16.89	896.89
18/02/2019	1312	82723	102	0.00	510.00
...	...	...	...	...	...

OrderLine		
OrderID	ProductID	Quantity
...	...	...
82719	1239	3
82719	1291	6
82719	1290	3
82720	1291	2
82721	1293	2
82721	1291	4
...	...	...

Product				
ProductID	Description	ProductPrice	Origin	Weight
...	...	...	...	...
1239	Wooden Dining Chairs	79.00	Scotland	2.5
1290	Bedside Cabinet	82.00	Ireland	4.3
1291	Ornamental Owl	120.00	France	1.6
1293	Ornamental Cat	150.00	Scotland	1.4
...	...	...	...	...

(a) Identify the compound key used within this database

OrderID & ProductID from the OrderLine table.

(b) (i) Identify the other Primary and Foreign Keys in this database

PKs: Product – ProductID
Order – OrderID
Customer – CustomerID
FK: OrderLine – OrderID & ProductID
Order - CustomerID

(ii) Create an Entity Relationship diagram for this database

Suitable Diagram showing the following:

All 4 entities with fields, PK & FKs underlined or * where correct.
Relationships with cardinality etc included.

(c) Design a query using wildcards to find and display the total cost of orders place in February 2019 for each customer.

FIELDS: Sum(OrderTotal)
TABLES: ORDER
CRITERIA: DateOfSale = ??/02/2019
GROUPING:
SORT ORDER:

(d) The company wish to review the total weight of each type of product in each order.
The query design below is implemented for this.

Query 1- Calculate weight of each product in each order.

Field(s) and Calculation(s)	OrderID, Quantity * Weight AS TotalItemWeight
Table(s) and query	OrderLine, Product
Search criteria	OrderLine.ProductID = Product.ProductID
Grouping	
Sort order	

This answer table can then be used to find the total weight for order 82719.
Complete the design for Query 2 to find this value.

FIELDS: Sum(totalItemWeight)
TABLES: Query from Part1
CRITERIA: OrderID = 82719
GROUPING:
SORT ORDER:

(e) The company want to know the number of orders in the system and the total value of these orders.

Number Of Orders	Total Value
782	105029.89

Write the SQL statement that would produce output similar to that above.

SELECT Count(OrderID) As Number Of Orders, Sum(OrderTotal) As Total Value
FROM Order
WHERE
ORDER BY

(f) The company write the following SQL statement to find out how many orders have been placed by each customer.

```
SELECT Customer.CustomerID, Customer.CustName,
       COUNT(Order.OrderID)
FROM Customer, Order
WHERE Customer.CustomerID = Order.CustomerID
GROUP BY Customer.CustomerID
```

An example of the expected output from the SQL statement is shown below:

CustomerID	CustName	NumberOfOrders
...	...	...
1311	Smith, K	5
1312	Shaw, M	37
1313	Proudfoot, D	17
1314	Chisholm, C	2
...	...	...

When the SQL statement was tested, the actual output did not match the expected output.
Identify two errors in the SQL statement.
No Alias for the Counted field in the SQL statement.
Group by Cust Name Required.

4. The following table shows an extract from the records of a music library. It shows ARTISTs and the ALBUMs that they have made.

ARTIST	ALBUM
Janice Kay	A New Hope
Adam Carr	Let it Be
Andrew Royce	Born Forever
Janice Kay	Why
Adam Carr	Alone

Create an entity-occurrence diagram for this database.

Suitable Diagram showing the following:

All 4 entities with fields, PK & FKs underlined or * where correct.
Relationships with cardinality etc included.