

# Database Management Systems

DBA 372

Final Exam Model Answer

Spring 2016/2017

---

## Question #1:

a)

1. C

2. C

3. D

4. A

5. B

6. B

7. A

8. E

9. B

10. C

b) attribute domain: data type associated with a column

relation schema: basic information describing a relation

relation instance: set of tuples that each conform to the schema of relation.

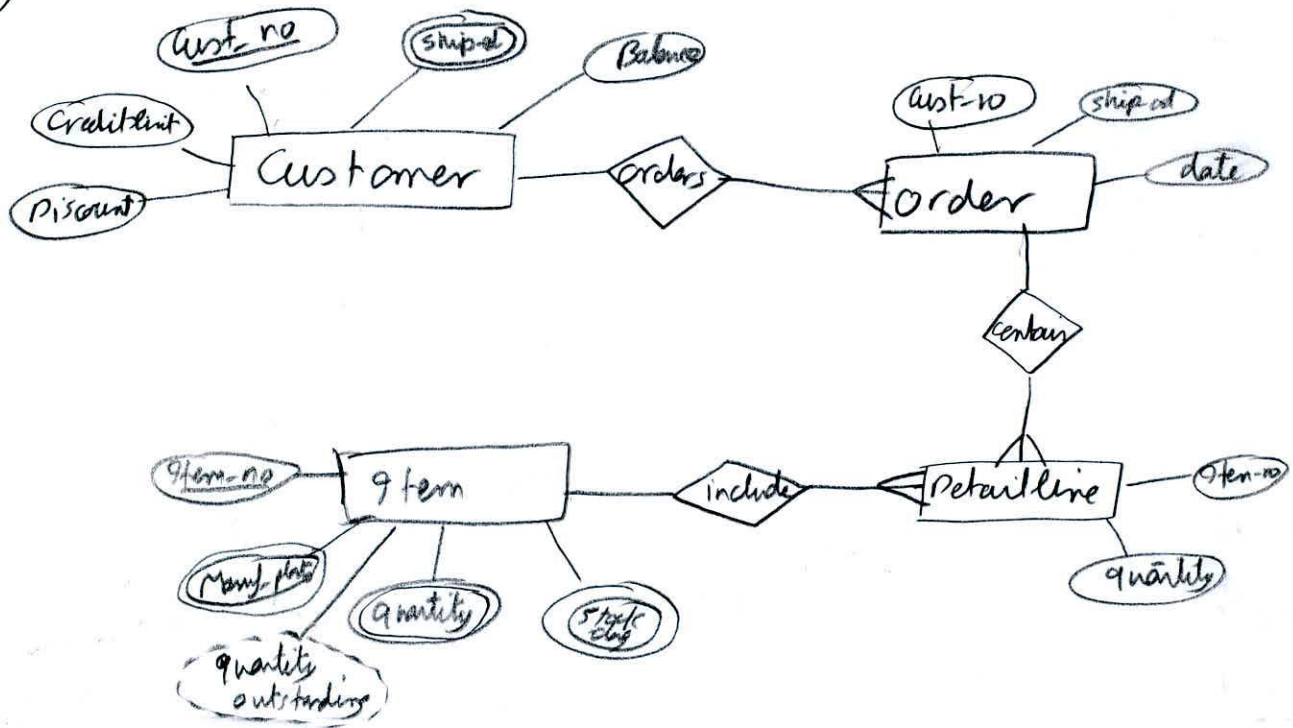
relation cardinality: number of tuples in the relation

relation degree: number of fields in the relation

---

# Question #2:

a)



b)

Customer ( Cust-no, Balance, credit-limit, Discount )

Customer-addr ( Cust-no, ship-add )

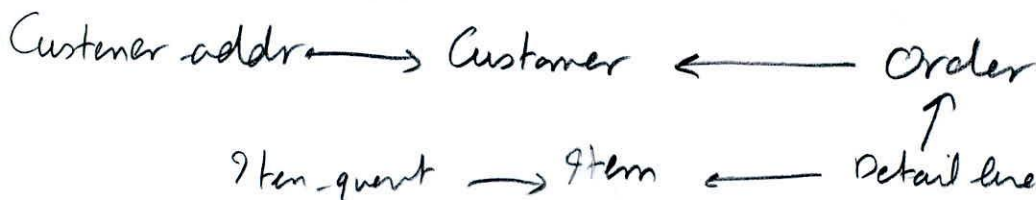
Order ( order-no, cust-no, ship-ad, date )

Retailline ( order-no, item-no, quantity )

Item ( item-no, Manuf. plants, quantity, stock days )

Item-quant ( item-no, quantity-outstanding )

c)

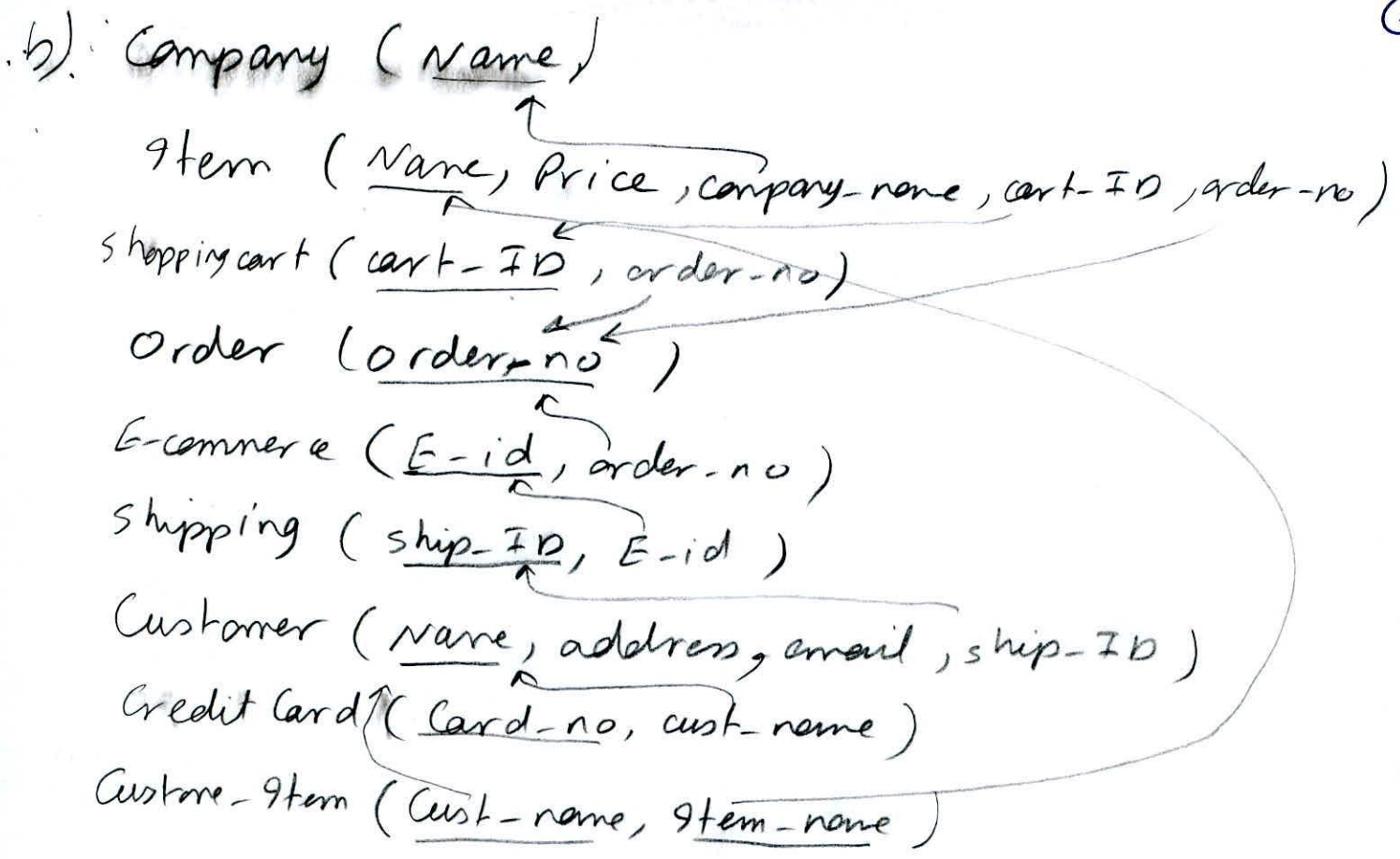


Question # 3:

- a) Select s.first\_name, s.last\_name  
 From employee e, e.supervises s  
 where e.first\_name = 'Arvid' And  
 e.last\_name = 'Lavigne';
  
- b) Select department.department\_name, count(\*), avg(employee.salary)  
 From department, employee  
 where department.department\_no = employee.department\_no  
 Group by department.department\_name;
  
- c) Select department.department\_name, count(employee.id\_no)  
 From department, employee  
 where department.department\_no = employee.department\_no  
 Group by department.department\_name  
 having avg(employee.salary) > 50 000;
  
- d) delete from employee where salary > 100 000;
  
- e) update employee set salary = salary \* 1.05 where  
 department\_no IN  
 (select department\_no  
 from department  
 where department\_name = 'Research');

## Question #4:

- a)
- 1- The company produces many items but each item is produced by only one company
  - 2- The shopping cart has many items but each item is contained in only one cart
  - 3- Each order contains many items but each item is included in only one order
  - 4- Each shopping cart creates an order & the order is created by one cart
  - 5- Each order is processed by e-commerce
  - 6- Each e-commerce forwards order to one shipping
  - 7- Each shipping ships items to many customers but customer take items from one shipping
  - 8- Each customer has only one credit card & each card is owned by only one customer
  - 9- The customer order 1 or more items while each item may be ordered by zero or more customers



c) create Table Company ( Name char(30),  
Primary Key (Name));

create Table Item ( Name char(30),  
Price Number(10),  
Company-name char(30),  
Cart-ID Number(10),  
Order-no Number(10),  
Primary Key Name,  
Foreign Key company-name references Company,  
Foreign Key Cart-ID references shopping cart,  
Foreign Key Order-no references Order);

Create table shopping cart ( Cart-ID Number(10);  
order-no Number(10),  
Primary Key Cart-ID,  
Foreign Key order-no references order);

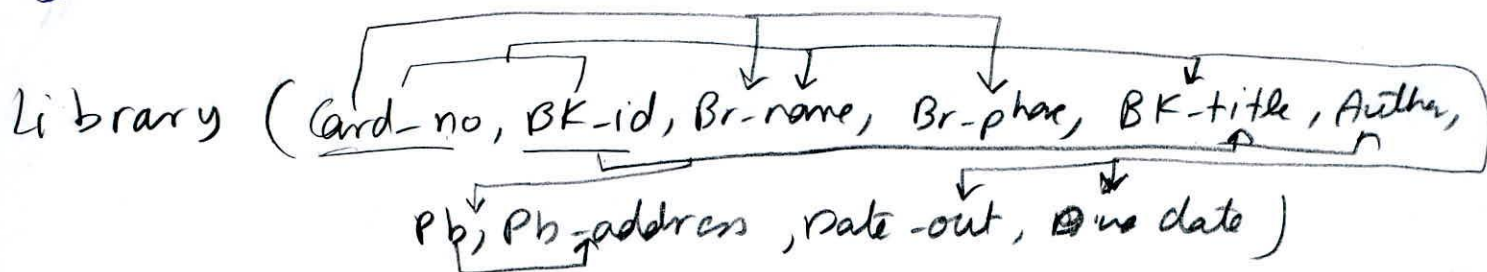
create table order ( Order-no Number(10),  
Primary Key order-no);

Create table E-commerce ( E-id Number(10),  
order-no Number(10),  
Primary Key E-id,  
Foreign Key order-no references order);

Create table Shipping ( ship-id Number(10),  
E-id Number(10),  
Primary Key ship-id,  
Foreign Key E-id references E-commerce);

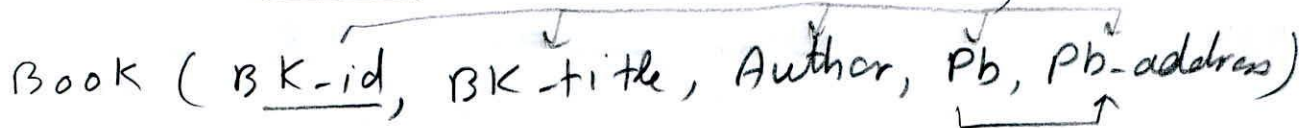
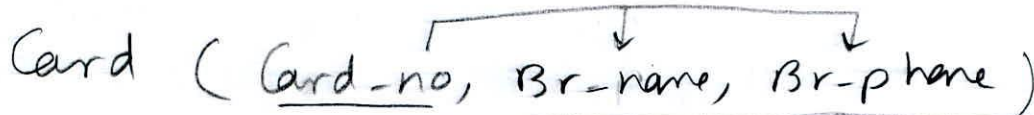
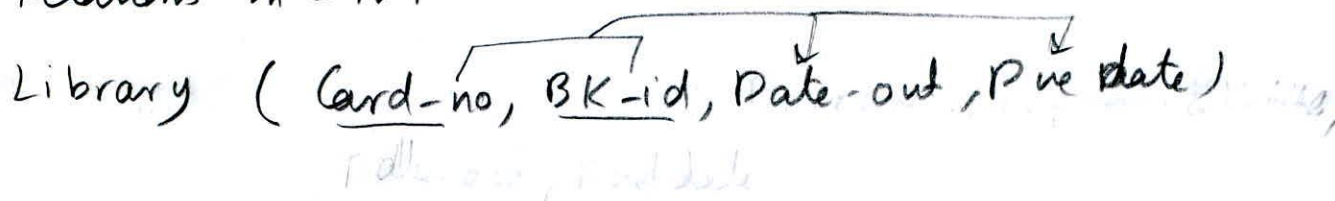
Create table Customer ( name char(30),  
address char(20),  
email char(20),  
ship-id Number(10),  
Primary Key name,  
Foreign Key ship-id references shipping);

Question # 5:

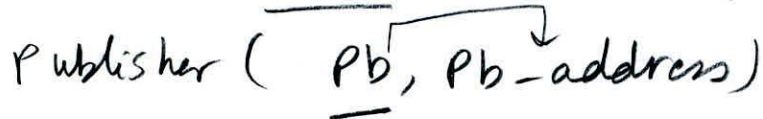
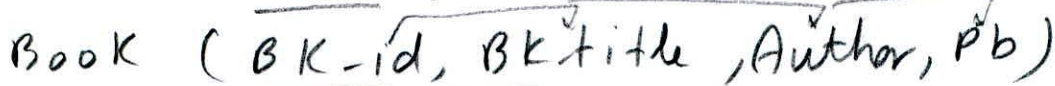
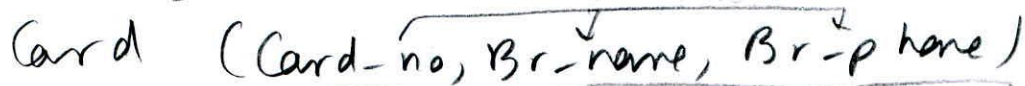
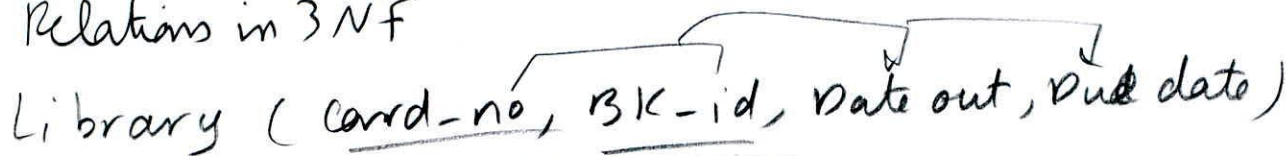


a) These relations are in 1NF because there is no multi-valued attribute & there is a violation of 2NF as there is a partial dependency so, they are not in 2NF

b) Relations in 2NF



c) Relations in 3NF



All relations are in 3NF & there's no violation for BCNF

Create table credit-card ( Card-no Number (16); (4)  
Cust-name char (30);  
Primary Key Card-no,  
Foreign Key Cust-name references cust)

create table customer-item ( Cust-name char (30),  
Item-name char (30),  
Primary Key (Cust-name, Item-name),  
Foreign Key Cust-name references cust;  
Foreign Key Item-name references item;

d) we can combine item with company, shopping cart with order and shipping with E-commerce, The tables will be

Item ( Name, Price, company-name, order-no )

Order ( Order-no, cart-ID )

Shipping ( ship-ID, E-id-order-no )