

Solution for CS6400 EXAM1

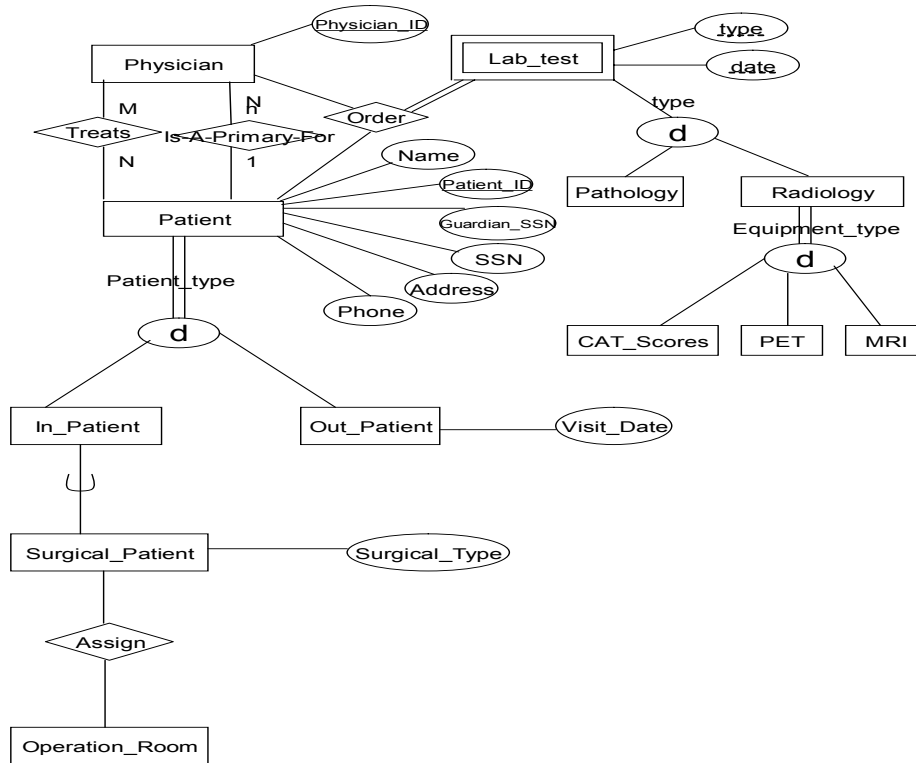
(Given Feb 19, 2002)

Q1. Multiple Choice Answers

babec abbad

Q2. (I omit the key since there are so many answers)

Q3. make the Order diamond double-lined to indicate that it is identifying.



Another alternate for “Treats” -relationship is to set “Treatment” as an entity and relate to Physician and Patient.

Most students missed the keys of Physician and lab_test.

Some students put a primary physician_ID as an attribute of patient. This is wrong since we know we need to use a relationship to represent this. I have reminded you about this when I gave your homework2 back.

Some students put a lab_test_id as primary key of lab_test and didn't set it as weak entity. This is wrong since the requirement states clearly that Lab_tests are identified by type of test and date for each patient.

Q4 Relational Model

a) Referential Integrity Constraints

Order(C#) -> Customer(Cust#)

Order_Item(O#)-> Order(O#)

Order_Payment(O#)-> Order(O#)

Overdue_Notice(Order#)-> Order(O#)

Order_Item(Item#)-> Item(Item#)

b)

* checking for duplicates

*check if 25110 is a valid order#

*check if I10 is a valid Item#

* Quantity can be null since there are no constraints for it (it is not a part of primary key).

c)

1. T1 Equijoin T2 where T1.P = T2.A (Showing both P and A is OK)

P	Q	R	B	C
10	a	5	b	6
10	a	5	b	5
25	a	b	c	3

2. T1 Equijoin T2 where T1.Q < T2.B

P	Q	R	A	B	C
10	a	5	10	b	6
10	a	5	25	c	3
10	a	5	10	b	5
15	b	8	25	c	3
25	a	6	10	b	6
25	a	6	25	c	3
25	a	6	10	b	5

3. T1 Leftouterjoin T2 where T1.P = T2.A

P	Q	R	A	B	C
10	a	5	10	b	6
10	a	5	10	b	5
25	a	6	25	c	3
15	b	8	null	null	null

4. T1 Rightouterjoin T2 where T1.Q = T2.B

P	Q	R	A	B	C
15	b	8	10	b	6
15	b	8	10	b	5
null	null	null	25	c	3

5. T₁ Union T₂

P/A	Q/B	R/C
-----	-----	-----

10	a	5
15	b	8
25	a	6
10	b	6
25	c	3
10	b	5

6. T1 Equijoin T2 where T1.P = T2.A and T1.R = T2.C

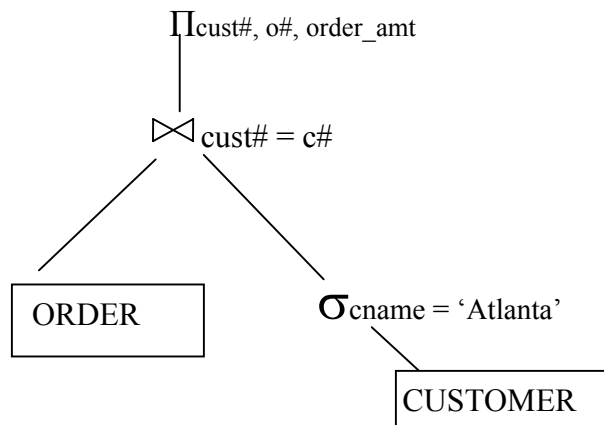
P	Q	R	A	B	C
10	a	5	10	b	5

Q5.

(a) $C1 \leftarrow \Pi_{\text{cust\#}}(\sigma_{\text{city} = \text{'Atlanta'}}(\text{CUSTOMER}))$

Result $\leftarrow \Pi_{\text{cust\#, order\#, order_amt}}(C1 \bowtie_{\text{cust\#} = \text{c\#}} \text{ORDER})$

(b)



```
SELECT Cust#, O#, Order_amt
FROM Customer C, Order O
WHERE C.cname = 'Atlanta'
AND C.cust# = O.c#;
```

(c)

$T1 \leftarrow \sigma_{\text{c\#} = \text{'c50'}}(\text{ORDER})$

$T2 \leftarrow T1 * \text{ORDER_ITEM}$

Result $\leftarrow \Pi_{\text{item\#, item_descr, qty}}(T2 * \text{ITEM})$

(d)

Payments(O#, Total_pay) $\leftarrow O\# \cup \text{Sum pay_amt ORDER_PAYMENT}$

Result $\leftarrow \Pi_{\text{o\#, total_pay}}(\text{Payments} \bowtie_{(\text{o\#} = \text{o\#}) \text{ and } (\text{total_pay} < \text{order_amt})} \text{Order})$

Some students try to use

Payments(O#, Total_pay, order_amt) ← O# ∪ sum pay_amt (ORDER_PAYMENT * ORDER)

Then compare total_pay and order_amt to get the result.

This is not going to work since either order_amt has to be in the grouping attributes or you can't put order_amt there when you use group function.

This is similar to SQL statement:

```
SELECT O#, SUM(pay_amt)
FROM ORDER_PAYMENT
GROUP BY O#
```