2020年数据库系统期末考试野生答案(国语&双语)

一、选择题

1	2	3	4	5	6	7	8	9	10
C	B	A	C	D	D	B	D	C	C

二、语句题

本题各小题方法可能有多种，答案符合题意即可

双语1.

```
select name
from Supplier
where exists (
    select *
    from Product
    where Supplier.sID=Product.sID and price>2000
)
```

国语1.&双语2.

```
select Supplier.name,count(distinct pID),count(distinct category)
from Supplier left join Product on Supplier.sID=Product.sID
group by Supplier.name
```

国语2.&双语3.

```
select name,count(distinct oID)
from Retailer natural join Order
where year=2020
group by name
having count(distinct oID)>=10
#最后一行双语班为having count(distinct oID)>10
```

国语3.&双语4.

```
select oID,type,shipType
from Order
where status='finished' and year=2020 and oID in (
    select oID
    from OdrDetail
    where sum(itemPrice)>2000
    group by oID
)
```

国语4.&双语5.

```
select oID,type,shipType
from Order
where status='finished' and year=2020 and exists (
    select *
    from OdrDetail
    where Order.oID=OdrDetail.oID and sum(itemPrice)>2000
)
```

国语5.&双语6.

```
select name,(
    select count(*)
    from Retailer r2
    where r1.rID=r2.rID and r2.type='online'
),(
    select count(*)
    from Retailer r2
    where r1.rID=r2.rID and r2.type='offline'
)
from Retailer r1
```

国语6.

```
with ret_price as (
    select name,credit,oID,odID,itemPrice
    from (Retailer left join Order on Retailer.rID=Order.rID) natural join
OdrDetail
)
select name,credit,max(itemPrice),avg(itemPrice)
from ret_price
group by name
```

7.

$$\Pi_{rID,rName}(\sigma_{credit>1000}(Retailer))$$

8.

$$\Pi_{name,price}(Product \bowtie OdrDetail)$$

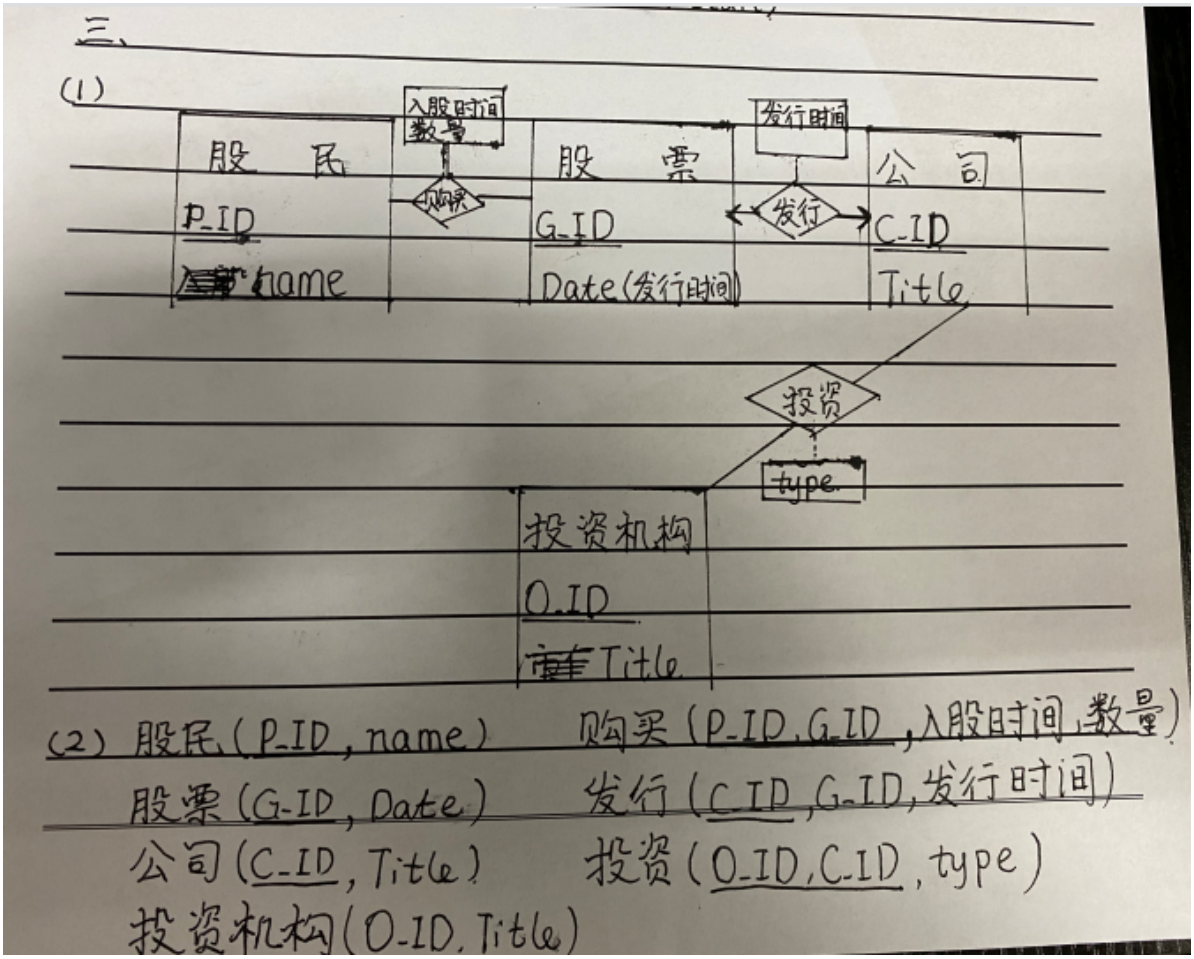
9.

$$\Pi_{name}(Retailer) - \Pi_{name}(Retailer \bowtie Order)$$

10.

$$_{oID}\mathcal{G}_{sum(itemPrice)}(OdrDetail)$$

三、设计题



四、分析题

(1)在R中，易知A、C一定属于候选码，D、E一定不属于候选码

$A^+ = \{A, B\}$

$C^+ = \{C, D\}$

$(AC)^+ = \{A, B, C, D, E\}$

$\therefore R$的候选码为AC

(2)$R \in 1NF$，因为存在$AC \to BC$，$BC \nrightarrow AC$，$BC \to E$，所以$R \notin 3NF$

(3)$\because A^+ \neq S$，$A \to B$

$\therefore$将$R(A, B, C, D, E)$分解为$R_1(A, B)$和$R_2(A, C, D, E)$

$\because C^+ \neq R_2$，$C \to D$

$\therefore$将$R_2(A, C, D, E)$分解为$R_3(C, D)$和$R_4(A, C, E)$

$\therefore$将R分解为$BCNF$后得到$R_1(A, B)$、$R_3(C, D)$、$R_4(A, C, E)$