Answers of Problem 1(每小题 3 分)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
B	A	D	D	A	C	D	B	C	A	B	C

第（9）小题答 A 给 2 分

Answers of problem 2(每小题 4 分)

（每错一处语法或语义，扣 1 分）

1)

```
select * from course
where department='CS' and
        credits =( select max(credits) from course where departmet='CS');
```

或：

```
select * from course
where department='CS' and
        credits >=all ( select credits from course where departmet='CS');
```

或：

```
select * from course
where department='CS'
order by credits desc
limit 1;
```

2)

```
select department
from course
group by department
having sum(credits)>=all( select sum(credits) from course    group by department);
```

或：

```
select department
from course
group by department
order by sum(credits) desc
limit 1;
```

3)

```
select title
from course C1
where exists (select * from course C2 where C2.title=C1.title and C2.course-id !=
                    C1.course-id)
```

或:

```
select C1.title
from course C1, course C2
where C1.title=C2.title and C1.course-id!= C2.course-id;
```

或

```
select C1.course-id, C2.course-id, C1.title
from course C1，course C2
where C1.title=C2.title and C1.course-id!= C2.course-id;
```

或:

```
select title
from course
group by title
having count(*)>1;
```

4)

```
select course.course-id, count(*)
from course, prereq
where course.course-id= prereq. prereq-id or course.course-id not in
                        (select prereq-id from prerequisite )
group by course.course-id
```

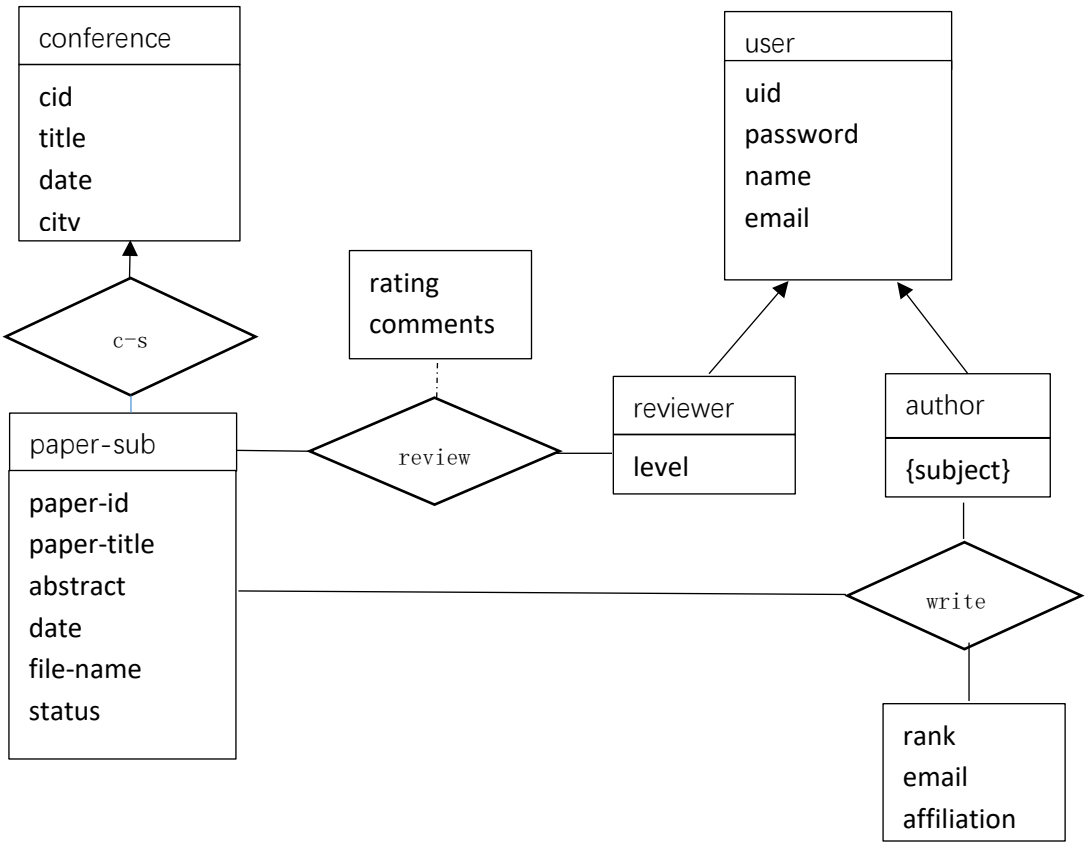
或：

```
select course.course-id, count(prereq-id)   // 或 count（prereq.course-id）
from course left outer join prereq on (course.course-id= prereq. prereq-id)
group by course.course-id
```

Answers of problem 3.

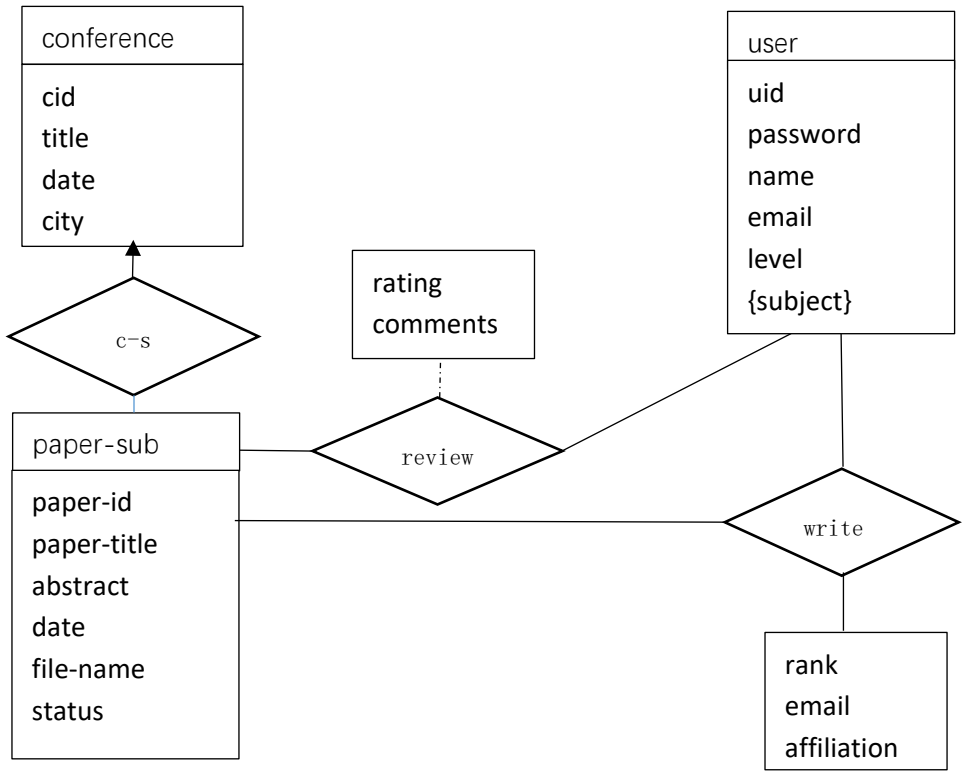
（1）8 分

（每个 Entity 或 Relationship 或 Mapping Cardinality 错扣一分）



或：

reviewer 和 author 不单列，它们的属性 level 和 {subject}合并到 user 中，也对。



（2）8 分，

（每个 relation 错扣 1 分）

user(uid, password, name , email)
*author(uid)
author-subject(uid, subject)
reviewer(uid, level)
conference(cid, title, date ,city)
paper-submission(pid, title, abstract ,file-name, status, date, cid)
write(uid, pid, rank, affiliation, email)
review(pid,uid, rating, comments)
→
user(uid, password, name , email, level)
author-subject(uid, subject)
conference(cid, title, date ,city)
paper-submission(pid, title, abstract ,file-name, status, date, cid)
write(uid, pid, rank, affiliation, email)
review(pid,uid, rating, comments)

Answers of problem 4:

给出正确的调度得 4 分，

说明非 2PL(如画出 precedence graph 、转化成串行调度)得 2 分

说明串行调度（如给出一个等价的串行调度），得 2 分。

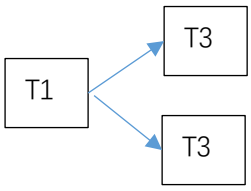
用树形协议的调度例子来说明也对。

下面是调度的一个例子。

T1	T2	T3
lock-x(A)		
write(A)		
unlock(A)		
	lock-x(A)	
	write(A)	
	unlock(A)	
lock-s(B)		
read（B）		
Unlock(B)		
		lock-x(B)
		write(b)
		unlock(B)

T1 doesn't follow 2PL.

The precedence graph is following



T1 doesn't follow 2PL. But the schedule is conflict serializable.

The serial order is T1→T2→T3 , or T1→T3→T2

Answers of problem 5:（每小题 **3** 分）

1)

PageID	PageLSN	RecLSN
5001	2009	2003
5002	2013	2006
5003	2014	2014

*（错一行扣 **1** 分）*

1) T4

2) 5001.2： 222

5002.2： 666

*（错一个扣 **1** 分，错两个扣 **3** 分）*

3) 2016： <T4, 5003.1, 77>

2017： <T4, 5001.2, 222 >

2018： <T4, abort >

*（错一个扣 **1** 分）*

Answers of problem 6（每小题 **4** 分）

(1) 13 block transfers + 1 seek

*（**transfers** 、**seek** 错各扣 **2** 分）*

(2) (0+3+6)/3=3, 3 block transfers + 3 seeks

*（**transfers** 、**seeks** 错各扣 **2** 分）*

分别说明三种情况的代价估计也全对。

*但是三种情况的代价简单求和扣 **1** 分*

(3) The size (number of nodes) of L_1^1 is (30/2)+15/3+5/3+1 = 15+5+2+1=23*（ **1** 分）*

9 block reads + 1 seek for reading L_0^1. *（**1** 分）*

9 block reads + 1 seek for reading L_0^2 *（**1** 分）*

23 block writes +1 seek for writifg L_1^1 *（**1** 分）*

Total cost to construct L_1^1 is 41 block transfers and 3 seeks.