Solutions

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/*
Q1
Objective: single-table selection
*/
create view v1  (eid) as
select distinct eid
from Works
where hours > 10;

/*
Q2
Objective: disjunctive selection predicate
*/
create view v2 (eid) as
select distinct eid
from Specializes
where aid = 'A'
and eid in (
    select eid
    from  Specializes
    where aid in ('B', 'C')
)
;



/*
Q3
Objective: multi-table selection
*/
create view v3  (eid) as
select E.eid
from (Employees E join Departments D on E.did = D.did) join Offices O on D.oid = O.oid
where address='A';


/*
Q4
Objective: simple negation
*/
create view v4  (eid) as
select eid
from Managers
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where eid not in (select eid from Projects);


/*
Q5
Objective: not exist subquery
*/
create view v5  (eid) as
select eid
from Engineers E
where not exists (
    select 1
    from  Works W
    where W.eid = E.eid
    and W.hours > 1
)
and eid in (select eid from Works);



/*
Q6
Objective: case construct
*/
create view v6  (eid, num) as
select eid,
    case
        when E.eid in (select eid from Managers) then
            (select count(*) from Departments D where D.eid = E.eid)
        when E.eid in (select eid from Engineers) then
            (select count(*) from Works W where W.eid = E.eid)
        else 0
    end as num
from Employees E;


/*
Q7
Objective: scalar subquery
*/
create view v7  (pid, eid, eid2) as
select distinct  W.pid, W.eid, W2.eid
from    Works W join Works W2 on W.pid = W2.pid and W.eid < W2.eid
where   (select count(*) from Works where pid = W.pid) = 2;
```

```
/*
Q8
Objective: outerjoins
*/
create view v8 (aid, num) as
select  A.aid, count(distinct E.did)
from Areas A left outer join
    (Specializes S  join Employees E on S.eid = E.eid)
    on A.aid = S.aid
group by A.aid
;
```

```
/*
Q9
Objective: aggregation subquery
*/
create view v9  (pid) as
select  pid
from Works W
group by pid
having count(eid) > (
    /* number of employees who belong to department managing project W.pid */
    select count(eid)
    from Employees E
    where E.did =  (
        /* identifier of department managing project W.pid */
        select E2.did
        from Employees E2  join Projects P on E2.eid = P.eid
        and P.pid = W.pid
    )
)
;
```

```
/*
Q10
Objective: Complex query.
*/
create view v10  (eid) as
select M.eid
from Managers M
where not exists (
    /* departments that are managed by M */
    select 1
    from Departments D
    where D.eid = M.eid
    and exists (
        /* employees who belong to department D (i.e., employees who are managed by M) */
        select 1
        from Employees E
        where E.did = D.did
        and E.eid in (
            /* engineers who work on some project */
            /* not supervised by M */
            select W.eid
            from Works W join Projects P on W.pid = P.pid and P.eid <> M.eid
        )
    )
);
```