4.7

```sql
create table employee(
    ID char(10) not null,
    person_name varchar(20) not null,
    street varchar(20) not null,
    city varchar(10) not null,
    primary key (ID)
);

create table works(
    ID char(10) not null,
    company_name varchar(20) not null,
    salary int not null,
    primary key (ID),
    foreign key (ID) references employee(ID) on delete cascade on update cascade,
    foreign key (company_name) references company(company_name) on delete cascade on update cascade
);

create table company(
    company_name varchar(20) not null,
    city varchar(10) not null,
    primary key (company_name)
);

create table manages(
    ID char(10) not null,
    manager_id char(10) not null,
    primary key (ID),
    foreign key (ID) references employee(ID) on delete cascade on update cascade,
    foreign key (manager_id) references employee(ID) on delete cascade on update cascade
);
```

4.9

When a tuple in relation manager is deleted, the tuple of manager whose employee_ID is equal to the manager_ID of the tuple will also be deleted because there is a cascade delete.

4.15

```
select * from section inner join classroom on
section.room_number=classroom.room_number;
```

4.17

```
select ID from student left outer join advisor on ID=s_id where
advisor.i_ID is null;
```

4.20

```
select year,sum(credits) from takes natural join course where
grade <> 'F' and grade is not null group by year;
```