1. Suppose you are developing a database for a drug store. The name and phone number of each drug manufacturer must be recorded. Each drug is identified by its generic name, and may be supplied by several different manufacturers. The type of each drug (sedative, antibiotic, etc.) and the price each manufacturer charges must be recorded. Each time a prescription is filled, the patient, doctor, drug, quantity, and date must be recorded. Patients and doctors are identified by SSN. The name and age of each patient, and the name and specialty of each doctor must be recorded. Each patient may receive prescriptions from several different doctors. Sometimes a doctor gets sick and becomes a patient.

Draw an E/R diagram to model the information given above as completely and accurately as possible.

2. The E/R diagram below models some of the information that a university must maintain about current course offerings and enrollments. Write a relational schema for the E/R diagram given below.
3. Consider the following relational schema for an airline database:

Aircraft(aid, aname, range)
Certified(eid, aid)
Employees(eid, ename, salary)

By definition, pilots are those employees who are certified on at least one aircraft. Write a query using relational algebra to find:

a) Names of aircraft with a range of at least 1000 miles.

b) Names of all pilots.

c) Names of pilots who are certified on an aircraft with a range between 500 and 800 miles (inclusive).

4. Recall the example application we did in class (using servlets, not JSP) that displays a table of campus enrollments, and allows the user to insert new entries.

```
<table>
<thead>
<tr>
<th>Campus</th>
<th>Enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCC</td>
<td>2000</td>
</tr>
<tr>
<td>UMASS</td>
<td>5000</td>
</tr>
<tr>
<td>HARVARD</td>
<td>20000</td>
</tr>
<tr>
<td>UCON</td>
<td>30000</td>
</tr>
</tbody>
</table>
```

List the sequence of interactions between the browser, web server, servlet, and database management system as the user requests the page, adds an entry, and views the result. It is not necessary to show any code. Just describe the interactions in English:

1. The browser sends a GET request to the web server with the URL of the campus page.

2. The web server ...