DB - HW5

Construct an E-R diagram for a car insurance company whose customers own one or more cars each. Each car has associated with it zero to any number of recorded accidents. Each insurance policy covers one or more cars and has one or more premium payments associated with it. Each payment is for a particular period of time, and has an associated due date, and the date when the payment was received.
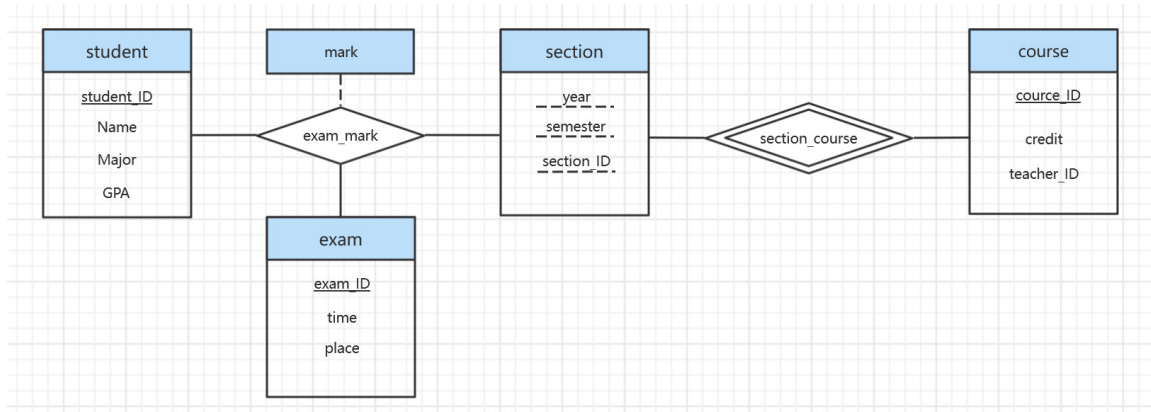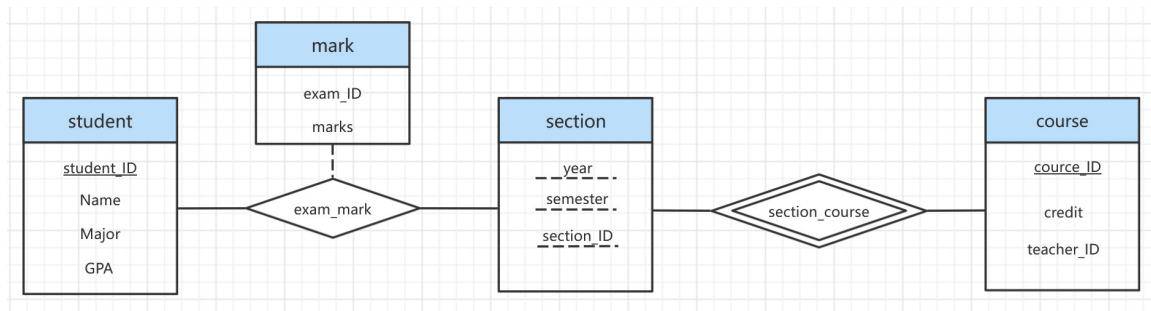
Answer：
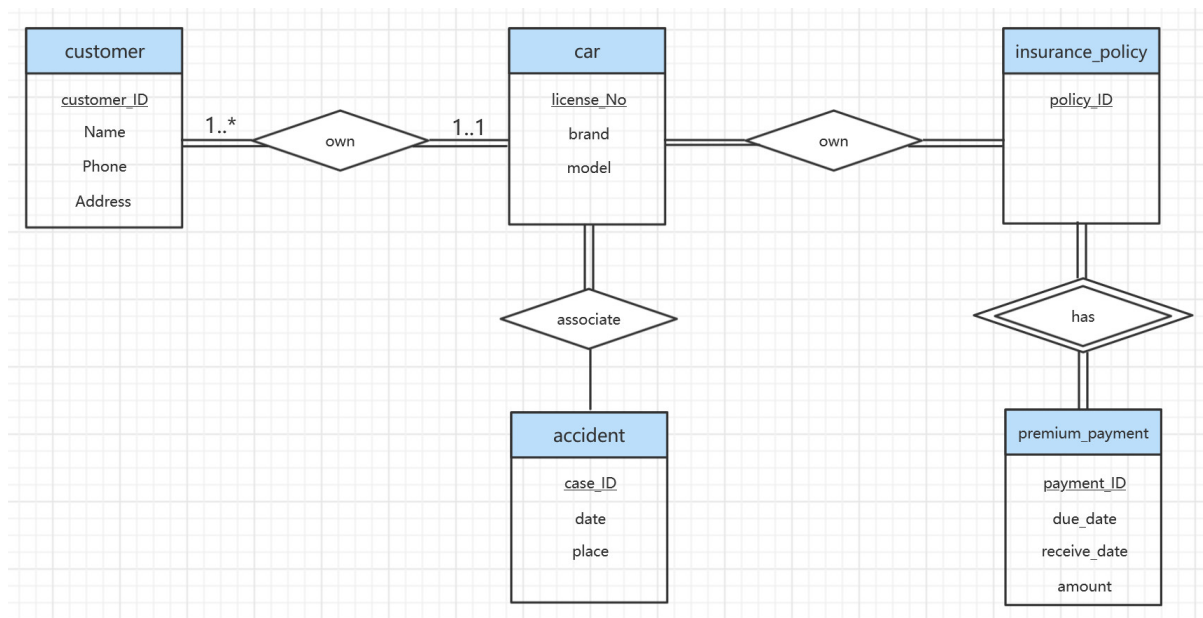
6.2

Consider a database that includes the entity sets *students, course,* and *section* from the university schema and that additionally records the marks that students receive in different exams of diffrent sections.

  a. **Construct an E-R diagram that models exams as entities and uses a ternary relationship as part of the design.**

  b. **Construct an alternative E-R diagram that uses only a binary relationship between *student* and *section*. Make sure that only one relationship exists between a particular *student* and *section* pair, yet you can represent the marks that a student gets in diffrent exams.**

Answer：

a.

student
- student_ID
- Name
- Major
- GPA

mark

exam_mark

section
- year
- semester
- section ID

section_course

course
- cource_ID
- credit
- teacher_ID

exam
- exam_ID
- time
- place

b.

mark
- exam_ID
- marks

student
- student_ID
- Name
- Major
- GPA

exam_mark

section
- year
- semester
- section ID

section_course

course
- cource_ID
- credit
- teacher_ID

6.21

Consider the E-R diagram in Figure 6.30, which models an online bookstore.

a. **Suppose the bookstore adds Blu-ray discs and downloadable video to its collection. The same item may be present in one or both formats, with differing prices. Draw the part of the E-R diagram that models this addition, showing just the parts related to video.**

b. **Now extend the full E-R diagram to model the case where a shopping basket may contain any combination of books, Blu-ray discs, or downloadable video.**

Answer：
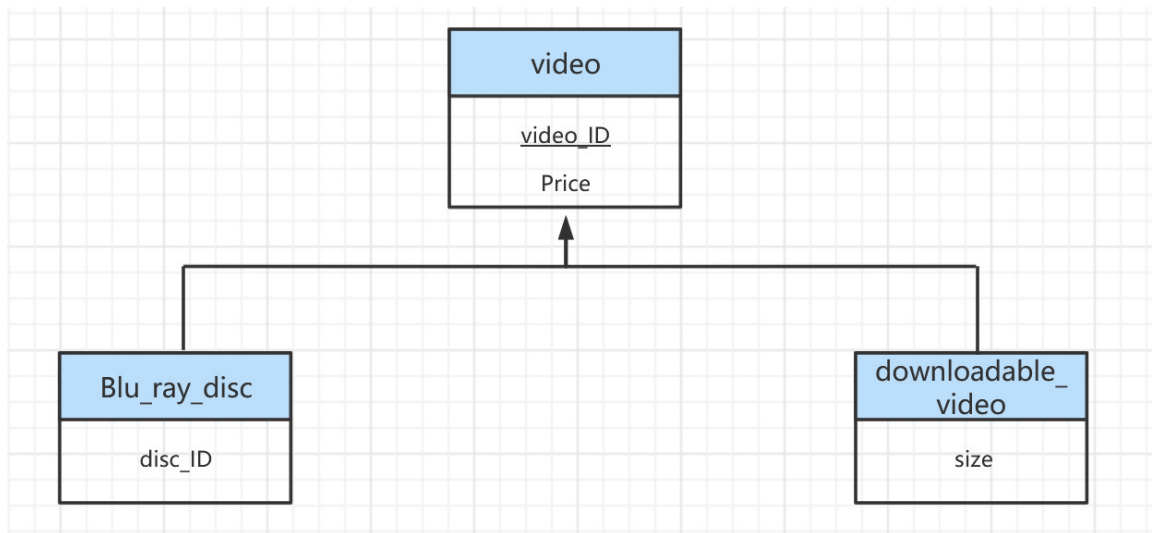
a.
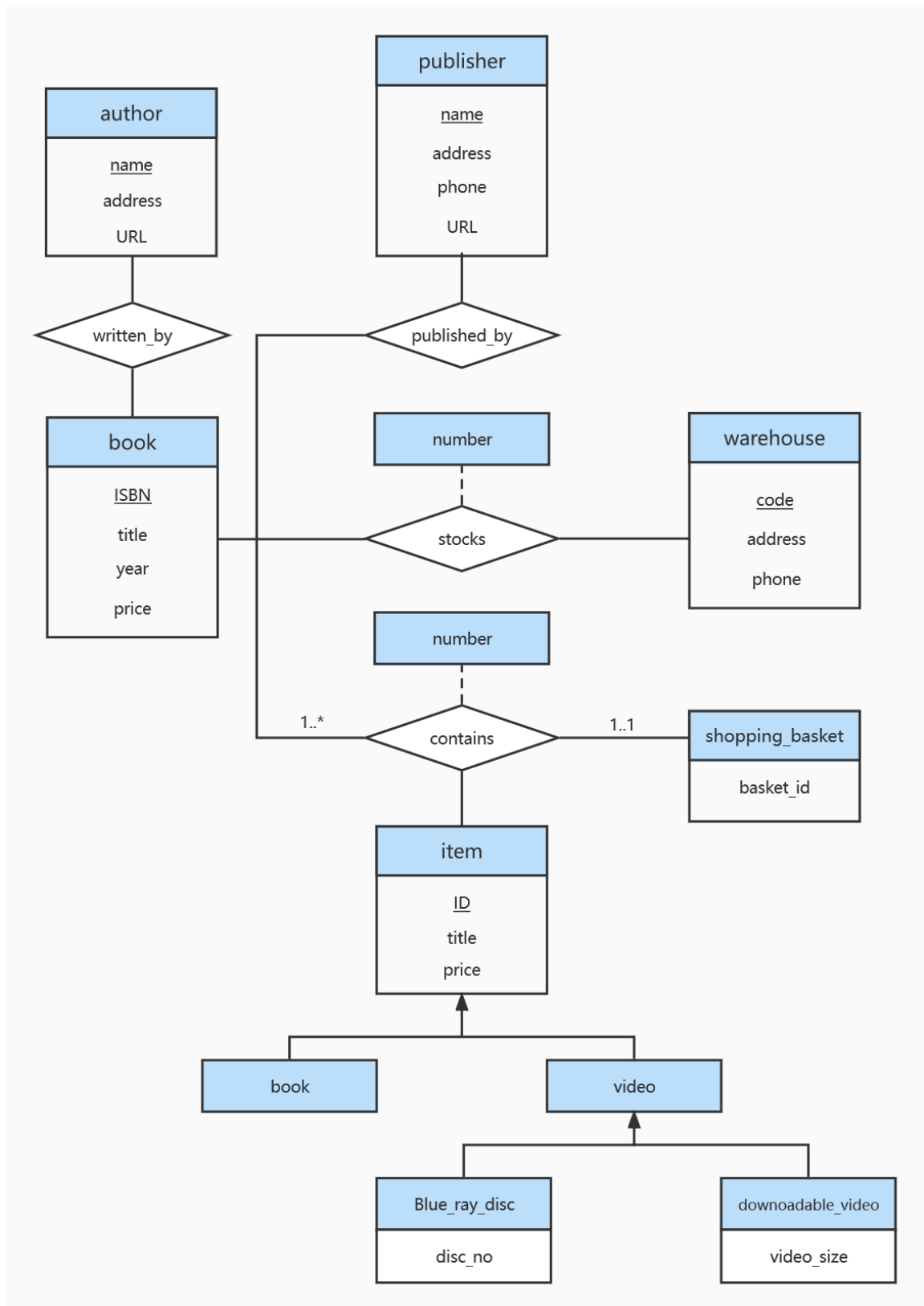
b.

6.22

Design a database for an automobile company to provide to its dealers to assist them in maintaining customers records and dealer inventory and to assist sales staff in ordering

cars.

Each vehicle is identified by a vehicle identification number (VIN). Each individual vehicle is a particular model of a particular brand offered by the company (e.g. the XF is a model of the car brand Jaguar of Tta Motors). Each model can be offered with a variety of options, but an individual car may have only some (or none) of the available options. The database needs to store information about models, brands, and options, as well as information about individual dealers, customers, and cars.

Your design should include an E-R diagram, a set of relational schemas, and a list of constraints, including primary-key and foreign-key constraints.

Answer：
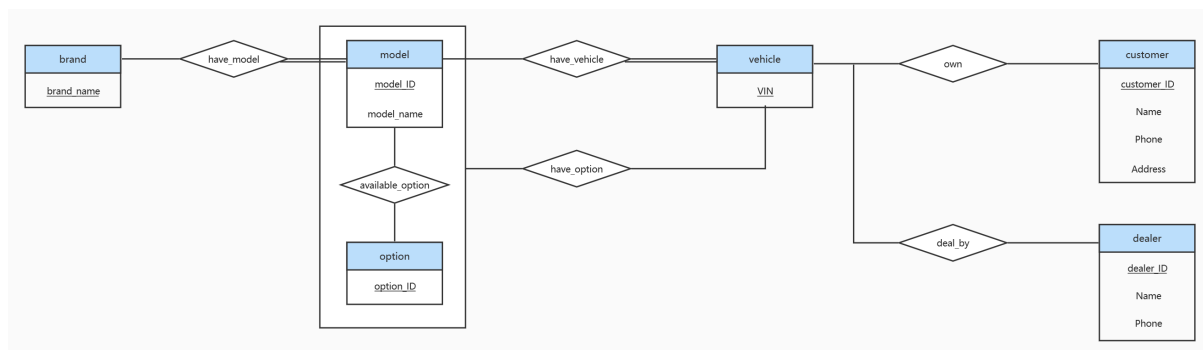

```
brand ( name );
model ( model_ID, nodel_name);
option ( option_ID );
vehicle ( VIN );
customer ( customer_ID, Name, Phone, Address);
dealer ( dealer_ID, Name, Phone);
have_model ( brand_name, model_ID,
             FOREIGN KEY brand_name REFERENCES brand,
             FOREIGN KEY model_ID   REFERENCES model);
availabel_option (model_ID, option_ID,
             FOREIGN KEY model_ID   REFERENCES model,
             FOREIGN KEY option_ID  REFERENCES option);
have_vehicle ( model_ID, VIN,
             FOREIGN KEY model_ID   REFERENCES model,
             FOREIGN KEY VIN        REFERENCES vehicle);
have_option ( VIN, option_ID,
             FOREIGN KEY VIN        REFERENCES vehicle
             FOREIGN KEY option_ID  REFERENCES option);
own        ( customer_ID, VIN,
             FOREIGN KEY customer_ID REFERENCES customer,
             FOREIGN KEY VIN         REFERENCES vehicle);
deal_by    ( dealer_ID, VIN,
             FOREIGN KEY dealer_ID REFERENCES dealer,
             FOREIGN KEY VIN       REFERENCES vehicle);
```

6.24

Design a database for an airline. The database must keep track of customers and their reservations, flights and their status, seat assignments on individual flights, and the schedule and routing of future flights.

Your design should include an E-R diagram, a set of relational schemas, and a list of constraints, including primary-key and foreign-key constraints.

Answer：
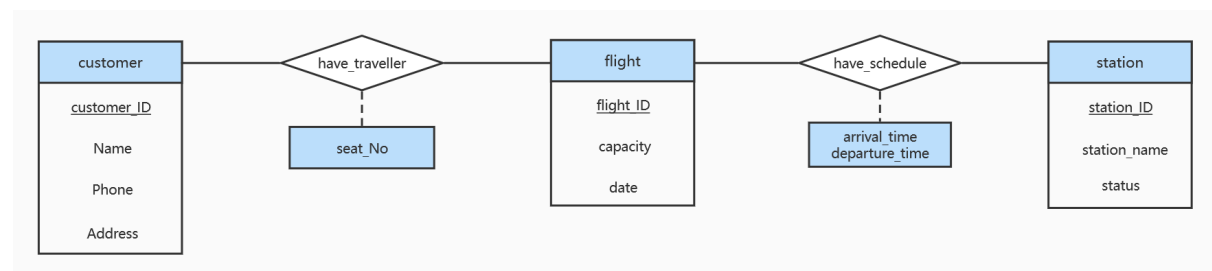

```
customer ( customer_ID, Name, Phone, Address);
flihgt   ( flihgt_ID, capacity, date);
station  ( station_ID, station_name, status);
have_traveller ( customer_ID, flight_ID, seat_No,
                FOREIGN KEY customer_ID REFERENCES customer,
                FOREIGN KEY flight_ID   REFERENCES flight);
have_schedule  ( flight_ID, station_ID, arrival_time, departure_time,
                FOREIGN KEY flight_ID   REFERENCES flight,
                FOREIGN KEY station_ID  REFERENCES station);
```