Name: _____   Points Scored: _____ / 100

Part I — True/False

1. (2 points) True or False: An entity is always represented by one table.

   ○ True

   ○ False

2. (2 points) True or False: If **f** was a stored function with one parameter of type varchar(20) returning an integer, then the following command would work

   select **f**('HelloThere');

   ○ True

   ○ False

3. (2 points) True or False: Below is the DDL command creating table prereq in the University database. In this definition, there is no "on delete cascade" on an attribute prereq_id. Two triggers are needed in order to ensure that any tuple can be deleted from the University database.

   ```
   create table prereq
   (course_id          varchar(8),
   prereq_id          varchar(8),
   primary key (course_id, prereq_id),
   foreign key (course_id) references course(course_id) on delete cascade,
   foreign key (prereq_id) references course(course_id)
   );
   ```

   ○ True

   ○ False

Part II — Multiple choice (choose one)

4. (4 points) How many tables will be created in the database for the model depicted in the below ER Diagram?
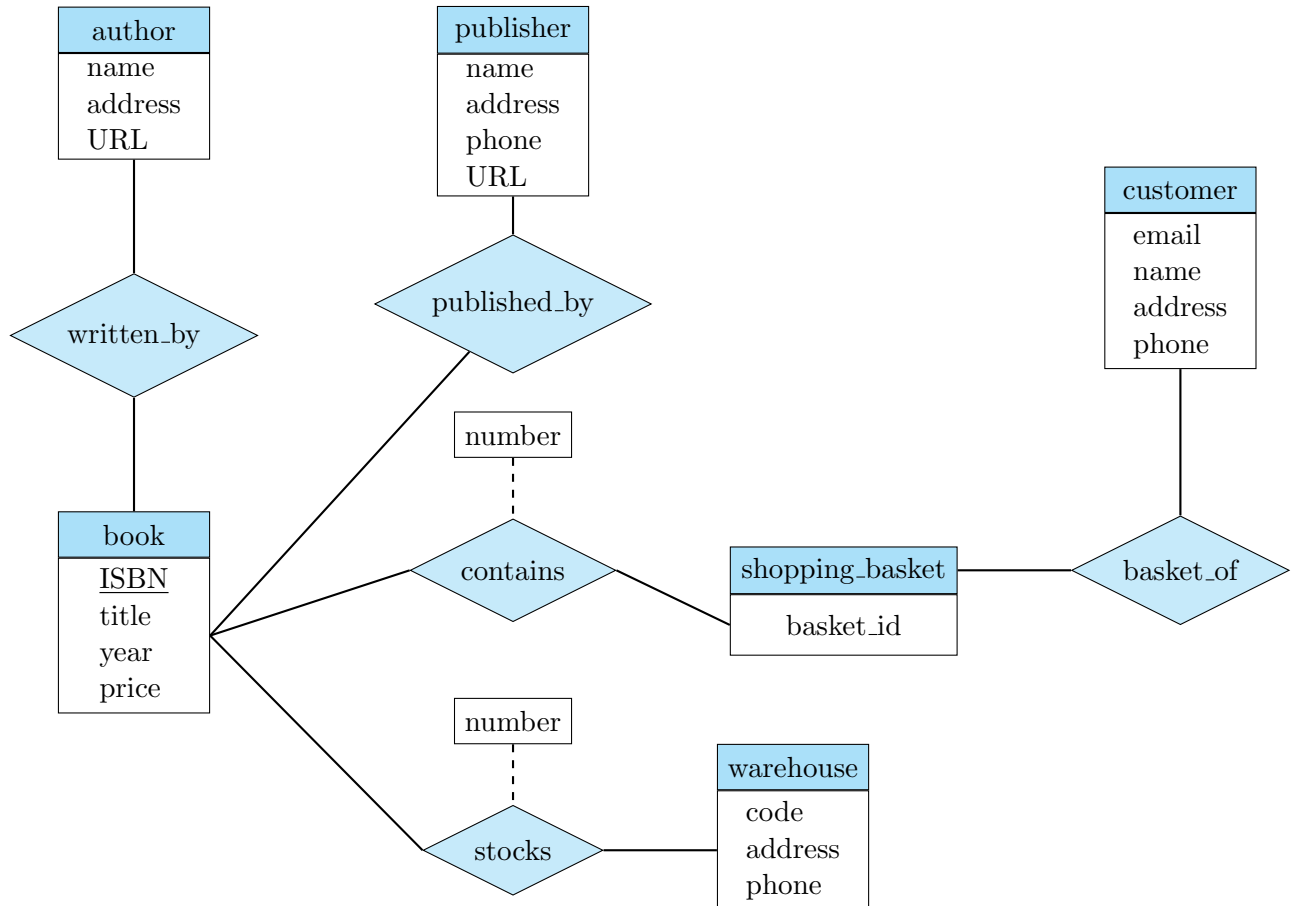
- ○ 11
- ○ 6
- ○ 9
- ○ 8

5. (2 points) What type of relationship is *prereq*?

- ○ one-to-one
- ○ one-to-many
- ○ unary
- ○ many-to-many

6. (4 points) Consider a binary ONE-TO-MANY relationship in which only the MANY side entity needs to participate. If the table resulting from the MANY side has 3 records, then the table resulting from the ONE side CANNOT have less than _____ record(s).

    ○ 1

    ○ 3

    ○ 0

    ○ 2

7. (4 points) How many tables will be created for the schema modeled with the below E-R diagram?
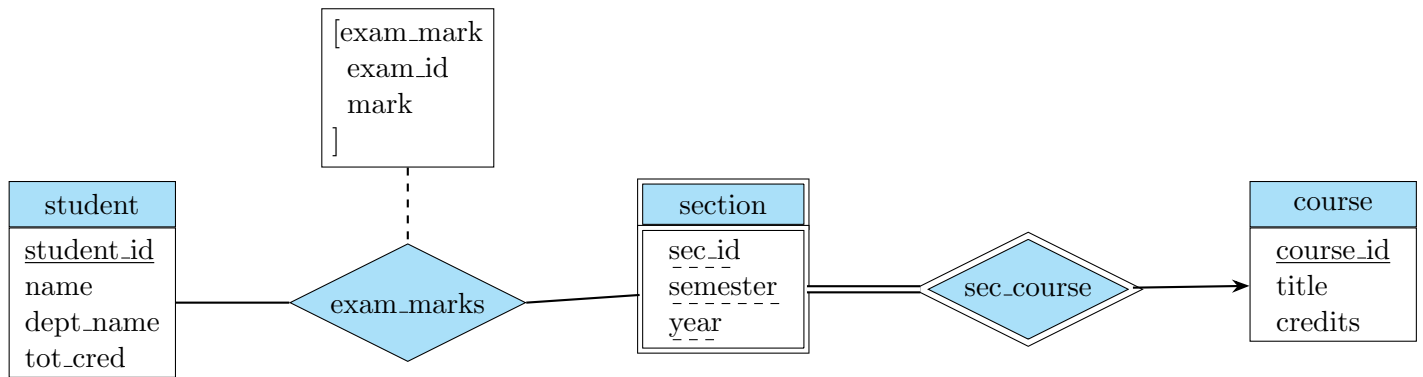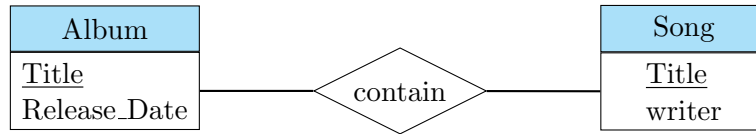

    ○ 4

    ○ 5

    ○ 3

    ○ 2

8. (2 points) What is the name of an attribute, in an E-R Diagram, whose value can be calculated on the basis of the values of other attributes?

    ○ simple

    ○ composite

    ○ multivalued

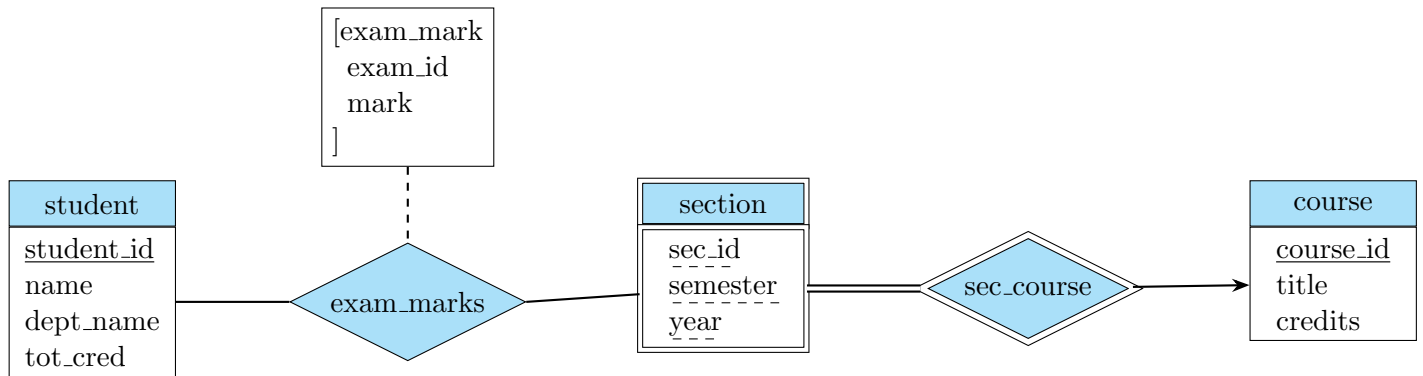   ○ derived

9. (4 points) What is the *best* way to reduce the following subset of an ERD to a set of relations?

○ *Album(Album_Title, Release_Date)*
   Song(Album_Title, Song_Title, writer)

○ *Album(Album_Title, Release_Date)*
   Song(Song_Title, writer)
   Song_Album(Album_Title, Song_Title)

○ *Album(Album_Title, Release_Date, Song_Title, writer)*

○ *Album(Album_Title, Release_Date)*
   Song(Album_Title, Song_Title, writer)

○ *Album(Album_Title, Song_Title, Release_Date)*
   Song(Song_Title, writer)

Part III — Multiple select (select all that apply)

10. (16 points) What is true about the below diagram?
    (Select all that apply.)

- ○ There is one multivalued attribute.

- ○ There is one derived attribute.

- ○ Every object of type *section* is associated with exactly one object of type *course*.

- ○ *sec_id* doesn't uniquely identify a section.

- ○ There may be no sections for a course.

- ○ Grades that students get in different exams of different course offerings (sections) are recorded in the database.

- ○ One relationship is of type one-to-one

- ○ Student has to receive at least one grade for some test of a course section.

11. (4 points) Choose triggering events.
    (Select all that apply)

    - ○ update

    - ○ insert
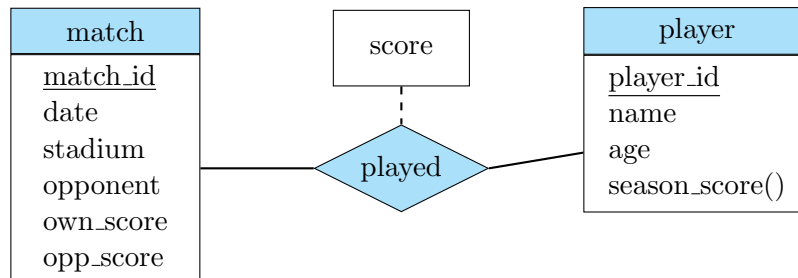
    - ○ create

    - ○ delete

12. (8 points) Which statements, if any, are true about the below trigger?

```
create trigger t1
before update on takes
for each row
begin
  if (new.grade = '')
  then set new.grade = null;
  end if;
end
```

(Select all that apply)

○ It ensures the grades are not equal to an empty string ('').

○ It doesn't work because there is no access to the variable new in the trigger with condition "**before update**"

○ If the first occurrence of the variable new was replaced with the variable old, then the trigger would ensure the updated grade is not an empty string ('')

○ None of the statements are true.

13. (12 points) What is true about the below diagram?

match		player
match_id	score	player_id
date		name
stadium	played	age
opponent		season_score()
own_score		
opp_score		

(Select all that apply)

○ Table *player* will have 3 attributes in the database.

○ There will be two foreign keys in the database in some table(s)

○ At least one player needs to play in a match.

○ *player_id* uniquely identifies a player

14. (18 points) What is true about the below diagram?
(Select all that apply.)
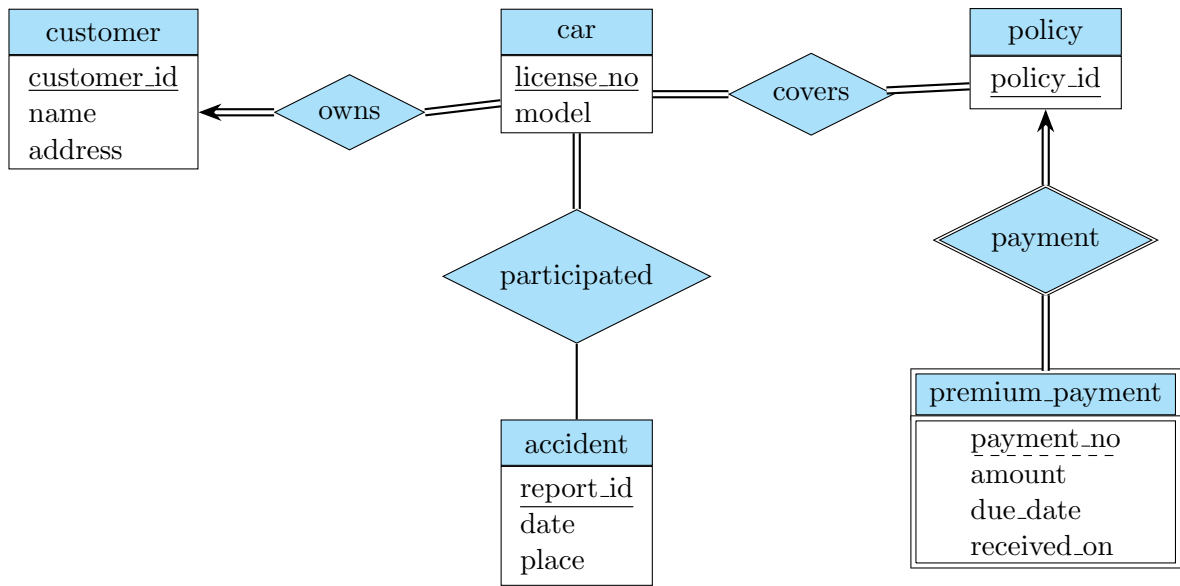
○ Car has to participate in at least one accident.

○ Policy covers one or more cars and car is covered by at least one policy.

○ A car can have many owners.

○ 8 tables will be created in the database.

○ *premium_payment* table will have two primary keys in the database

○ There can be more than one tuple with value 1 for the attribute *payment_no* in the database

Part IV — Fill In The Blank

15. (2 points) An entity whose existence depends on another entity is called a _____entity.

16. (4 points) Based on the "E-R Diagram for a University Enterprise" relation corresponding to the sec_time_slot relationship should have a primary key consisting of _____attributes.

17. (10 points) Construct an E-R diagram for a car insurance company whose customers own one or more cars and no two customers own the same car. Customer is uniquely identified by a customer number. Each car has associated with it zero to any number of recorded accidents. Car is uniquely identified by a car number. An accident may be associated with 1 or more cars and is assigned unique identifier. Each insurance policy, identified uniquely by policy number, covers one or more cars and has one or more premium payments associated with it. Each payment, uniquely identified within the context of the policy, is associated with a specific period and has a due date. Additionally, the payment information includes the date on which the payment was received. There are _____strong entities and _____weak entity set(s). There are _____relationships. The relationship between CAR entity and ACCIDENT entity is of type _____. The relationship between entity CUSTOMER and entity CAR is of type _____.