

Question 3

2 out of 2 points



Which SQL statement is used to create new records in a database?

Selected Answer: ☒ d. INSERT INTO

- Answers:
- a. INSERT NEW
 - b. ADD RECORD
 - c. ADD NEW
 - ☒ d. INSERT INTO

Question 4

2 out of 2 points



Which SQL keyword is used to sort the result-set?

Selected Answer: ☒ c. ORDER BY

- Answers:
- a. ORDER
 - b. SORT
 - ☒ c. ORDER BY
 - d. SORT BY

Question 5

2 out of 2 points



The inner query of a nested query may be executed independently of the outer query **in which scenario?**

Selected Answer: ☒ d. When the inner query is *not* correlated with the outer query.

- Answers:
- a. When the inner query references that same tables as the outer query.
 - b. When the inner query is correlated with the outer query.
 - c. Any inner query return set that is NOT NULL
 - ☒ d. When the inner query is *not* correlated with the outer query.

Question 6

2 out of 2 points



What are the options for dealing with a **DELETE** action of a tuple which has a foreign key constraint (i.e. a tuple in another relation references it)?

Selected Answers: ☒ a. Reject the delete

☒ b. Cascade the delete back to also delete the referencing tuple

Answers: ☒ a. Reject the delete

☒ b. Cascade the delete back to also delete the referencing tuple

- c. Remove the tuple and allow a null pointer from the referencing tuple
- d. Remove the entire table

Question 7

2 out of 2 points



Consider the following SQL query?

```
SELECT *  
FROM project
```

WHERE (pnumber = 1) AND NULL;

Hint: You must use Three-Valued Logic to evaluate the truth value of the WHERE clause.

The following is a possible result set:

pname	pnumber	plocation	dnum
ProductX	1	Bellaire	5

Selected Answer: ☒ False

Answers: ☐ True

☒ False

Question 8

2 out of 2 points



In a SQL **WHERE** clause, what can be said about the nested *subquery* in the following code snippet to avoid a runtime error?

```
WHERE Dnumber = (subquery)
```

Selected Answer: ☒ b. The subquery must return exactly one row and one column.

Answers:

☐ a. The subquery cannot be correlated with the outer query.

☒ b. The subquery must return exactly one row and one column.

☐ c. The subquery cannot return more than one row, but potentially multiple columns.

☐ d. The subquery cannot return more than one column, but potentially multiple rows.

Question 9

2 out of 2 points



Select all of the following that may be valid interpretations of the value NULL in the Relational Model?

☒ d. value unknown

☒ e. attribute does not apply to this tuple

☒ f. value exists but is not available

Answers: ☐ a. attribute is numerical zero

☐ b. attribute does not apply for any tuple

☐ c. attribute is the empty string

☒ d. value unknown

☒ e. attribute does not apply to this tuple

☒ f. value exists but is not available

Question 10

4 out of 4 points



In the Three Schema Architecture

- User view
- Conceptual Schema
- Internal Schema

...there are different database languages to manage each tier (or combinations of tiers) of the system.

In modern DBMSs, these four different database languages are all implemented by SQL, but they each have a distinct name for each sub-language. Match the description below to each.

Question

Correct Match

Selected Match

The first step is to specify **conceptual schema** and **internal schema** for the

☒ A.

☒ A.

database and any mappings between the two. In many DBMSs where no strict separation of levels is maintained a single language is used by the DBA and by database designers to define both schemas. This language is called the...

In DBMSs where a clear separation is maintained between the **conceptual schema** and **internal schema** levels. In this case, this language is used to specify the **internal schema** only.

Once the database schemas are compiled and the database is populated with data, users must have some means to operate on the database. Typical operations include retrieval, insertion, deletion, and modification of the data. The DBMS provides a set of operations or a language called the...

For a true three-schema architecture, we would need another language to specify **user views** and their mappings to the **conceptual schema**. This language is called the...

Data Definition Language (DDL)

✓ B. **Storage Definition Language (SDL)**

✓ C. **Data Manipulation Language (DML)**

✓ D. **View Definition Language (VDL)**

Data Definition Language (DDL)

✓ B. **Storage Definition Language (SDL)**

✓ C. **Data Manipulation Language (DML)**

✓ D. **View Definition Language (VDL)**

All Answer Choices

- A. **Data Definition Language (DDL)**
- B. **Storage Definition Language (SDL)**
- C. **Data Manipulation Language (DML)**
- D. **View Definition Language (VDL)**

Question 11

4 out of 4 points



Match the descriptions to different types of keys in the Relational Model.

Question

It is common to designate one of the (potentially multiple) keys as the main key of a relation, which is used by the database to uniquely identify each tuple. This key is called the...

A relation schema may have more than one key. In this case, each of the keys is called a...

An attribute of a relation that contains a reference to the primary key of a tuple in a different relation is called a...

A key may have multiple attribute. Not all of which are necessary to uniquely identify a tuple. A key that may contain additional attributes is called a...

Correct Match

✓ A. **Primary Key**

✓ B. **Candidate Key**

✓ C. **Foreign Key**

✓ D. **Superkey**

Selected Match

✓ A. **Primary Key**

✓ B. **Candidate Key**

✓ C. **Foreign Key**

✓ D. **Superkey**

All Answer Choices

- A. **Primary Key**
- B. **Candidate Key**
- C. **Foreign Key**
- D. **Superkey**

Question 12

6 out of 6 points



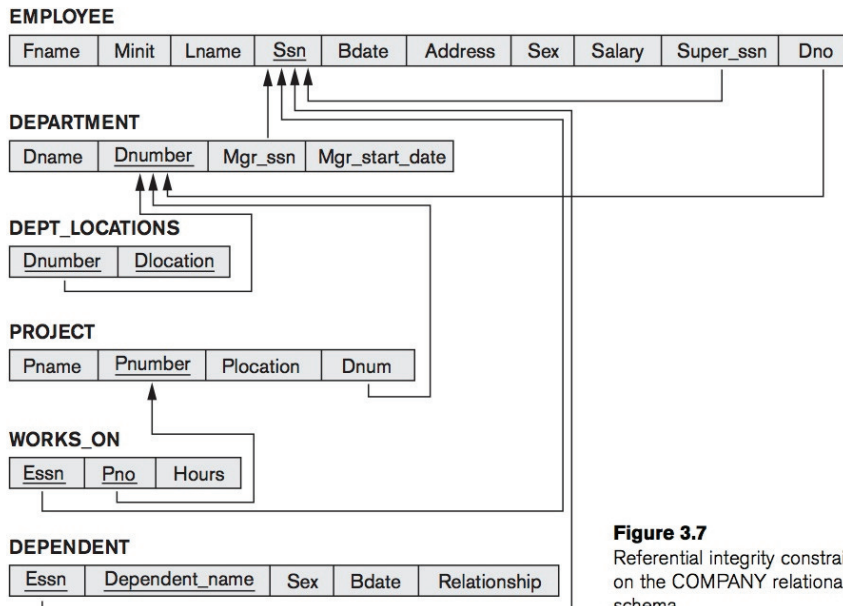


Figure 3.7
Referential integrity constraints displayed
on the COMPANY relational database
schema.

Consider the COMPANY relational database schema in Figure 3.7 above.

It is usually possible to write an SQL query many different ways that return the same result set. Check all of the SQL queries below that return the following:

"Display the department number, department name, and number of employees for every department with more than two employees."

- ☐ `SELECT Dnumber, Dname, COUNT(*)`
`FROM Department, Employee`
`WHERE Dno=Dnumber`
`GROUP BY Dname`
☒ `HAVING COUNT(*) > 2;`
- ☐ `SELECT Dnumber, Dname, COUNT(*)`
`FROM Department JOIN Employee ON Dno=Dnumber`
`GROUP BY Dnumber`
☒ `HAVING COUNT(*) > 2;`

Answers: `SELECT Dnumber, Dname, COUNT(*)`

- `FROM Department, Employee`
`WHERE Dno=Dnumber`
`GROUP BY Department`
`HAVING COUNT(*) > 2;`
- ☒ `SELECT Dnumber, Dname, COUNT(*)`
`FROM Department, Employee`
`WHERE Dno=Dnumber`
`GROUP BY Dname`
☒ `HAVING COUNT(*) > 2;`
- ☐ `SELECT Dnumber, Dname, COUNT(*)`
`FROM Department JOIN Employee ON Dno=Dnumber`
`GROUP BY Department`
`HAVING COUNT(*) > 2;`
- ☐ `SELECT Dnumber, Dname, COUNT(*)`
`FROM Department, Employee`
`WHERE Dno=Dnumber AND COUNT(*) > 2`
`GROUP BY Dnumber;`
- ☐ `SELECT Dnumber, Dname, COUNT(*)`
`FROM Department JOIN Employee ON Dno=Dnumber`
`WHERE COUNT(*) > 2`
`GROUP BY Dnumber;`
- ☒ `SELECT Dnumber, Dname, COUNT(*)`
`FROM Department JOIN Employee ON Dno=Dnumber`
`GROUP BY Dnumber`
☒ `HAVING COUNT(*) > 2;`

Question 13

6 out of 6 points



Consider the COMPANY relational database schema in Figure 3.7 above.

It is usually possible to write an SQL query many different ways that return the same result set. Check all of the SQL queries below that return the following:

"Display the ssn, first name, last name, and total number of hours worked for each employee who worked a total of more than 40 hours."

Selected Answers:

```

SELECT Ssn, Fname, Lname, SUM(hours)
FROM Works_on, Employee
WHERE Ssn=Essn
GROUP BY Essn
HAVING SUM(hours) > 40;
SELECT Ssn, Fname, Lname, SUM(hours)
FROM Works_on JOIN Employee ON Ssn=Essn
GROUP BY Essn
HAVING SUM(hours) > 40;
SELECT Ssn, Fname, Lname, SUM(hours)
FROM Works_on, Employee
WHERE Ssn=Essn
GROUP BY Ssn
HAVING SUM(hours) > 40;

```

Answers:

```

SELECT Ssn, Fname, Lname, SUM(hours)
FROM Works_on, Employee
WHERE Ssn=Essn
GROUP BY Essn
HAVING SUM(hours) > 40;
SELECT Ssn, Fname, Lname, SUM(hours)
FROM Works_on JOIN Employee ON Ssn=Essn
GROUP BY Essn
HAVING SUM(hours) > 40;
SELECT Ssn, Fname, Lname, SUM(hours)
FROM Works_on JOIN Employee ON Ssn=Essn
WHERE SUM(hours) > 40
GROUP BY Ssn;
SELECT Ssn, Fname, Lname, COUNT(hours)
FROM Works_on JOIN Employee ON Ssn=Essn
GROUP BY Ssn
HAVING COUNT(hours) > 40;
SELECT Ssn, Fname, Lname, SUM(hours)
FROM Works_on, Employee
WHERE Ssn=Essn
GROUP BY Ssn
HAVING SUM(hours) > 40;

```

Question 14

12 out of 12 points



A database includes information about manufacture data of automobiles. Consider the following two relation schemas.

- Each model name (*model*) is the primary key of *MAKERS*. Each maker (*maker_name*) may produce one or more different models, indicated in the *MAKERS* table.
- The combined model name (*model*) and year (*year*) is the primary key for the *PRODUCTION* table. model name (*model*) is a foreign key that references *MAKERS.model*. The number of units manufactured (*units_made*) of each model is noted for each year (*year*) in the *PRODUCTION* table.

MAKERS

<u>model</u>	maker_name
--------------	------------

PRODUCTION

<u>model</u>	<u>year</u>	units_made
--------------	-------------	------------

Write two different SQL queries:

(a) Write a SQL query that displays the **maker_name** and number of different models produced by each maker.

(b) Write a SQL query that displays the **maker_name** and overall total number of **units produced** for each maker whose total production is more than 10000 units.

Selected Answer:

```
(a)
SELECT maker_name, COUNT(model)
FROM MAKERS
GROUP BY maker_name;
(b)
SELECT M.maker_name,SUM(P.units_made)
FROM MAKERS AS M JOIN PRODUCTION AS P ON M.model=P.model
GROUP BY maker_name
HAVING SUM(P.units_made)>10000;
```

Correct Answer:

```
SELECT maker_name, COUNT(model)
FROM MAKERS
GROUP BY maker_name;

SELECT M.maker_name, SUM(P.units_made)
FROM MAKERS M, PRODUCTION P
WHERE M.model=P.model
GROUP BY maker_name
HAVING SUM(P.units_made) > 10000;
```



Response Feedback: "PRODUCCION" typo

Question 15

6 out of 6 points



Write an SQL query that displays the Dno and total combined salaries (displayed as "dept_payroll") for each Dno that has more than 2 Employees.

EMPLOYEE

<u>Ssn</u>	Fname	Minit	Lname	Bdate	Address	Salary	Dno
------------	-------	-------	-------	-------	---------	--------	-----

Selected Answer:

```
SELECT Dno, SUM(Salary) AS dept_payroll, COUNT(*)
FROM EMPLOYEE
GROUP BY Dno
HAVING COUNT(*)>2;
```

Correct Answer:

```
SELECT Dno, SUM(Salary) AS dept_payroll
FROM EMPLOYEE
GROUP BY Dno
HAVING COUNT (*) >2;
```



Response Feedback: [None Given]

Question 16

8 out of 8 points



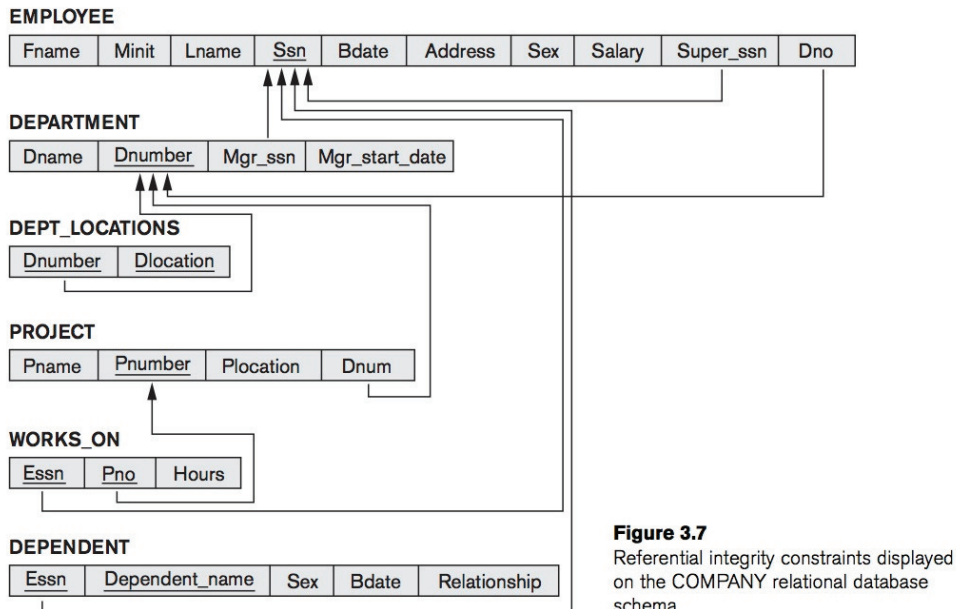


Figure 3.7
Referential integrity constraints displayed on the COMPANY relational database schema.

Write an SQL query that returns the following information from the COMPANY database (Fig. 3.7 above)

Display the **Ssn**, **Fname**, **Lname**, **Salary**, and **Dependent_name** for every Employee whose salary is more than 70000.

Hint: Some employees who earn more than 70000 may not have any dependents. These employees should be included in the result set with **Dependent_name** as NULL. Employees with more than one dependent should have multiple rows (i.e. one for each dependent).

A sample output of your query should be formatted like this:

```
+-----+-----+-----+-----+-----+
| Ssn      | Fname | Lname  | Salary | Dependent_name |
+-----+-----+-----+-----+-----+
| 111111100 | Jared | James  | 85000.00 | NULL           |
| 222222200 | Evan  | Wallis | 92000.00 | NULL           |
| 333333300 | Kim   | Grace  | 79000.00 | NULL           |
| 444444400 | Alex  | Freed  | 89000.00 | Johnny         |
| 444444400 | Alex  | Freed  | 89000.00 | Tommy          |
| 555555500 | John  | James  | 81000.00 | NULL           |
| 666666600 | Bob   | Bender | 96000.00 | NULL           |
+-----+-----+-----+-----+-----+
```

Write your query in the space below.

Selected Answer: `SELECT Ssn,Fname,Lname,Salary,Dependent_name
FROM EMPLOYEE LEFT JOIN DEPENDENT ON Ssn=Essn
WHERE Salary>70000;`

Correct Answer: `SELECT Ssn, Fname, Lname, Salary, Dependent_name
FROM Employee LEFT JOIN Dependent ON Ssn = Essn
WHERE Salary > 70000;
OR
SELECT Ssn, Fname, Lname, Salary, Dependent_name
FROM EMPLOYEE, DEPENDENT
WHERE Ssn = Essn AND Salary > 70000
UNION
SELECT Ssn, Fname, Lname, Salary, NULL
FROM EMPLOYEE
WHERE Salary>70000 AND Ssn NOT IN (SELECT Essn FROM DEPENDENT);`

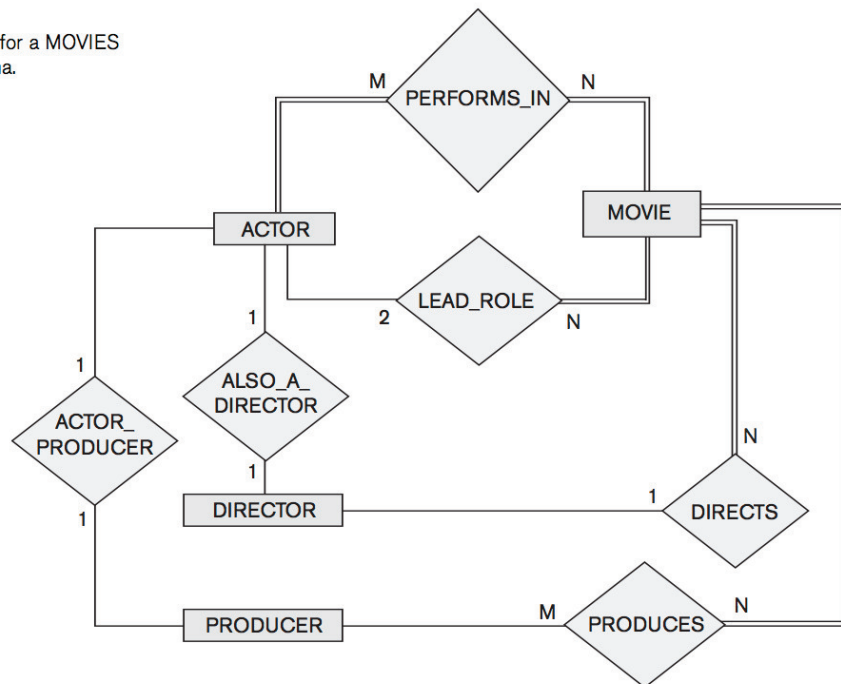
Response Feedback: [None Given]

Question 17

2 out of 2 points



Figure 7.24
An ER diagram for a MOVIES database schema.



This and the next few questions are True/False about this Figure 7.24.

Answer "True" if the ER diagram requires it to be true.

Answer "False" if the ER diagram either requires it to be false, or is not *required* to be true.

There are no actors in this database that have not performed in any movies.

Selected Answer: ☒ True

Answers: ☒ True

☐ False

Question 18

2 out of 2 points



Refer to Figure 7.24 above.

Answer "True" if the ER diagram requires it to be true.

Answer "False" if the ER diagram either requires it to be false, or is not *required* to be true.

It is possible that an Actor has been in a Lead Role, Directed, and Produced in the same Movie.

Selected Answer: ☒ True

Answers: ☒ True

☐ False

Question 19

2 out of 2 points



Refer to Figure 7.24 above.

Answer "True" if the ER diagram requires it to be true.

Answer "False" if the ER diagram either requires it to be false, or is not *required* to be true.

A MOVIE must have exactly two ACTORS participating in a LEAD_ROLE.

Selected Answer: ☒ False

Answers: ☐ True

☒ False

Question 20

2 out of 2 points



Refer to Figure 7.24 above.

Answer "True" if the ER diagram requires it to be true.

Answer "False" if the ER diagram either requires it to be false, or is not *required* to be true.

Some producers have been a director as well.

Selected Answer: ☒ False

Answers: ☐ True

☒ False

Question 21

2 out of 2 points



Refer to Figure 7.24 above.

Answer "True" if the ER diagram requires it to be true.

Answer "False" if the ER diagram either requires it to be false, or is not *required* to be true.

Each movie must have exactly one Director.

Selected Answer: ☒ True

Answers: ☒ True

☐ False

Question 22

2 out of 2 points



Refer to Figure 7.24 above.

Answer "True" if the ER diagram requires it to be true.

Answer "False" if the ER diagram either requires it to be false, or is not *required* to be true.

An ACTOR may participate in a LEAD_ROLE in 3 different MOVIES

Selected Answer: ☒ True

Answers: ☒ True

☐ False

Question 23

0 out of 2 points



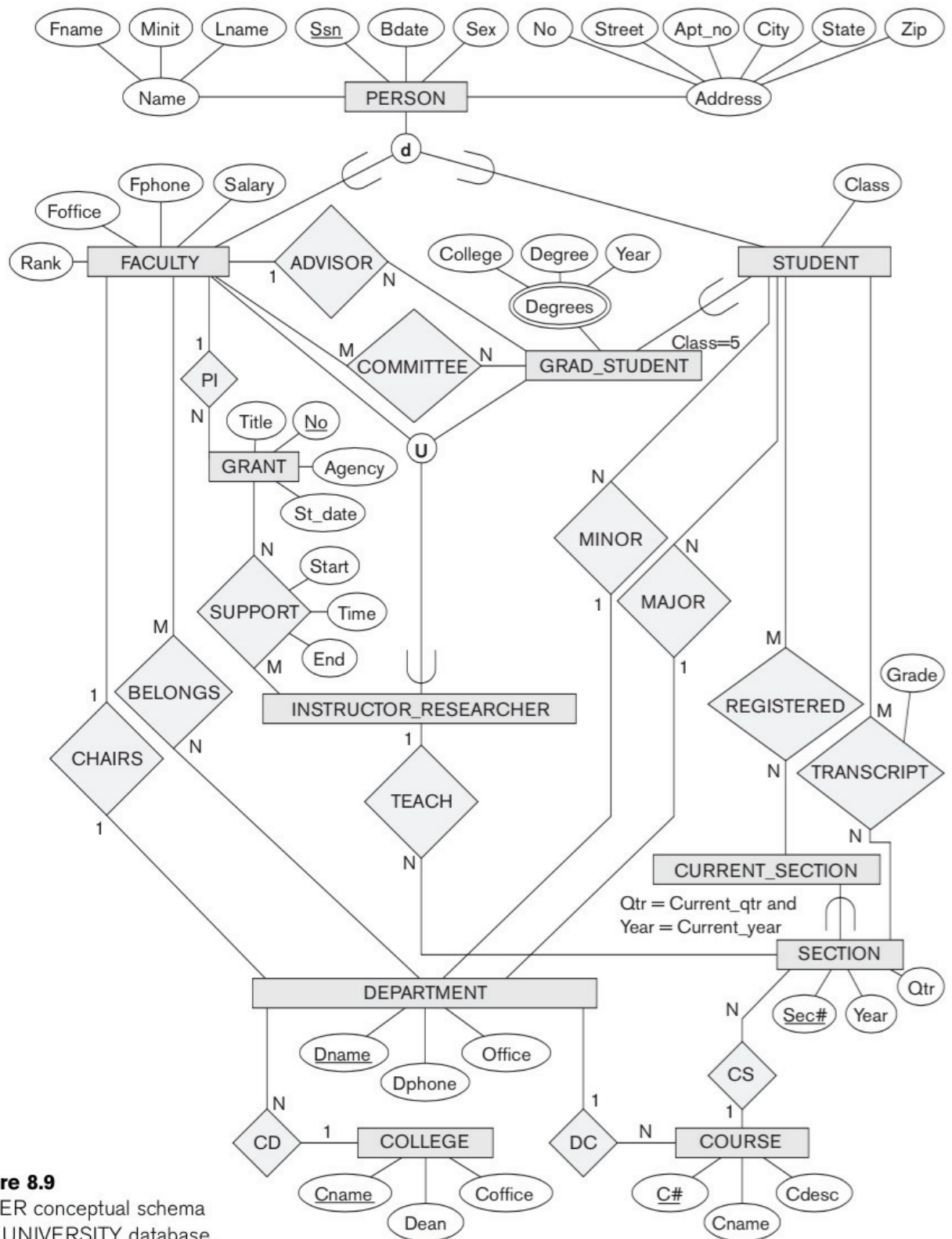


Figure 8.9
An EER conceptual schema
for a UNIVERSITY database.

Answer the following questions about the EER diagram in Figure 8.9 above.

Restrict your answers to what is allowed by or prohibited by the schema (i.e. assume no semantic constraints).

An INSTRUCTOR_RESEARCHER may be both a FACULTY member and a STUDENT.

Selected Answer: ☒ True

Answers: ☐ True

☒ False



Answer the following questions about the EER diagram in Figure 8.9 above.
Restrict your answers to what is allowed by or prohibited by the schema (i.e. assume no semantic constraints).

A STUDENT may have dual (i.e. 2) MAJORS.

Selected Answer: ☒ False

Answers: ☐ True
☒ False

Question 25

2 out of 2 points



Answer the following questions about the EER diagram in Figure 8.9 above.
Restrict your answers to what is allowed by or prohibited by the schema (i.e. assume no semantic constraints).

A FACULTY member may be an ADVISOR to three GRAD_STUDENTS.

Selected Answer: ☒ True

Answers: ☒ True
☐ False

Question 26

2 out of 2 points



Answer the following questions about the EER diagram in Figure 8.9 above.
Restrict your answers to what is allowed by or prohibited by the schema (i.e. assume no semantic constraints).

Every DEPARTMENT must have a FACULTY member as a CHAIR

Selected Answer: ☒ False

Answers: ☐ True
☒ False

Question 27

2 out of 2 points



Answer the following questions about the EER diagram in Figure 8.9 above.
Restrict your answers to what is allowed by or prohibited by the schema (i.e. assume no semantic constraints).

A GRAD_STUDENT may have more than one existing degrees.

Selected Answer: ☒ True

Answers: ☒ True
☐ False

Question 28

2 out of 2 points



Answer the following questions about the EER diagram in Figure 8.9 above.
Restrict your answers to what is allowed by or prohibited by the schema (i.e. assume no semantic constraints).

A GRAD_STUDENT is not necessarily also a STUDENT.

Selected Answer: ☒ False

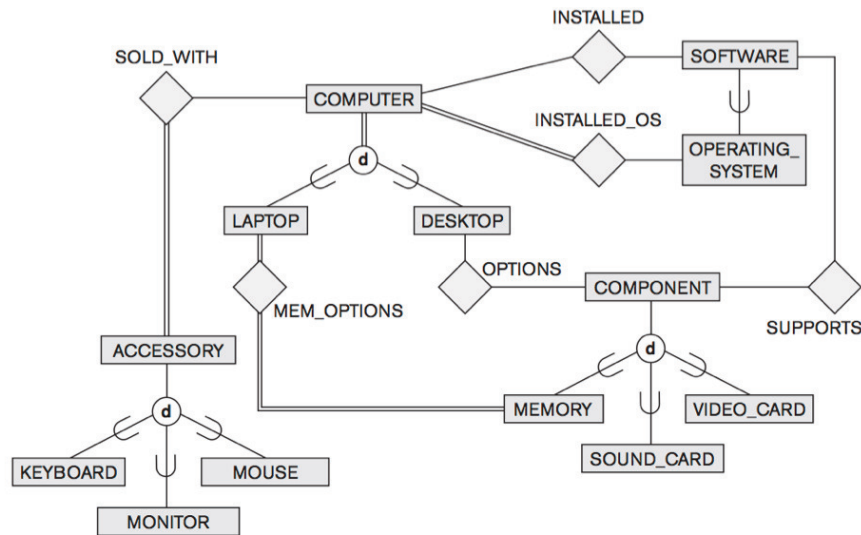
Answers: ☐ True
☒ False

Question 29

12 out of 12 points



Consider the following EER diagram below that describes the computer systems at a company.



Describe how to modify the above diagram to accommodate each of the following:

- Add a key attribute "Serial_num" for COMPUTER.
- Add a multi-valued attribute "Supported_resolution" for VIDEO_CARD.
- Add a new ACCESSORY that is a KEYBOARD with a built-in trackball.
- Require that any ACCESSORY must be one of KEYBOARD, MONITOR, or MOUSE.
- Require that each COMPUTER must have at least 4 SOFTWARE installed, and each SOFTWARE may not be installed on more than one COMPUTER. Note: It is not required every SOFTWARE must be installed on some COMPUTER.
- Add two new types of COMPONENT (DIGITAL_OUT and ANALOG_OUT) that are both of type SOUND_CARD. It should be possible that a SOUND_CARD may be both, but at least one.

Selected Answer: a. Attach an oval naming "Serial_num" (underlined) to the rectangle "COMUTER" using a single line
 b. Attach an double line oval naming "Supported_resolution" to the rectangle "VIDEO_CARD" using a single line
 c. Attach an rectangle naming "KEYBOARD" to the rectangle "KEYBOARD" using a single line. Add "buit-in trackball" to the side of the line
 d. Change the single line between the rectangle "ACCESSORY" and circle "d" to double line
 e. Add (4,N) to the line between COMPUTER and INSTALLED and add (0,1) to the line between INSTALLED and SOFTWARE
 f. Add a circle naming "o" to rectangle "SOUND_CARD" using single line. Then attach two new rectangles naming "DIGITAL_OUT" and "ANALOG_OUT" respectively to the circle "o"

Correct Answer: [None]
 Response: [None Given]
 Feedback:

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