# CHAPTER 14

# *Databases*

(Solutions to Odd-Numbered Problems)

## Review Questions

1. The five necessary components of DBMS are hardware, software, data, users, and procedures.

3. In the relational model, a relation is a set of data organized in a two-dimensional tables. The tables are related together.

5. Some unary operations are *insert*, *delete*, *update*, *select*, and *project*.

7. The Structured Query Language (SQL) is a language standardized by the American National Standards Institute (ANSI) and the International Organization for Standardization (ISO) for use on relational databases. Extensive Markup Language (XML) is a markup language designed to add markup information to text document, but it also has found its application as a query language in databases. SQL is used for relational databases and XML used for objected-oriented databases.

## Multiple-Choice Questions

| | | | | | |
|---|---|---|---|---|---|
| 9. c | 11. b | 13. c | 15. b | 17. c | 19. c |
| 21. b | 23. d | 25. b | | | |

## Exercises

27. The resulting relation is shown below:

| A1 | A2 |
|---|---|
| 2 | 16 |
| 3 | 16 |

29. The resulting relation is shown below:

| B1 |
|----|
| 24 |
| 29 |

31. The following shows the command:

```
select No, Unit
from COURSES
```

33. The following shows the command:

```
select Name
from PROFESSORS
```

35. The following shows the command:

```
select Courses
from STUDENTS
where ID = 2010
```

37. The following shows the command:

```
select *
from COURSE
where Unit = 3
```

39. The following shows the command:

```
select No
from DEPARTMENTS
where Name ='Computer Science'
```

41. There are many different solutions to this question. A simple one is shown in Figure S14.41.

43. There are many different solutions to this question. A simple one is shown in Figure S14.43.

45. Boyce-Codd normal form (BCNF) is the revised 3NF that covers a special case not covered by 3NF. For more information see the references at the end of the chapter of the text.
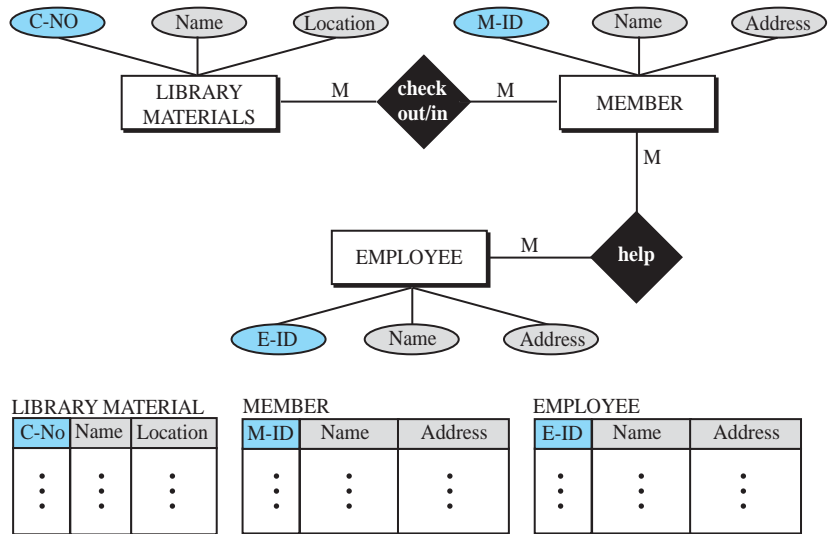
**Figure S14.41**  *Exercise 41*



| LIBRARY MATERIAL | | |
|---|---|---|
| C-No | Name | Location |
| ⋮ | ⋮ | ⋮ |

| MEMBER | | |
|---|---|---|
| M-ID | Name | Address |
| ⋮ | ⋮ | ⋮ |

| EMPLOYEE | | |
|---|---|---|
| E-ID | Name | Address |
| ⋮ | ⋮ | ⋮ |

**Figure S14.43**  *Exercise 43*



| FLIGHT | | |
|---|---|---|
| F-No | Origin | Destination |
| ⋮ | ⋮ | ⋮ |

| AIRCRAFT | | |
|---|---|---|
| A-ID | Model | Agency |
| ⋮ | ⋮ | ⋮ |

| PILOT | | |
|---|---|---|
| P-ID | Name | Address |
| ⋮ | ⋮ | ⋮ |