

**TEST BANK**

DAVID M. KROENKE

# Database Processing

FUNDAMENTALS,  
DESIGN, AND  
IMPLEMENTATION

[www.prenhall.com/kroenke](http://www.prenhall.com/kroenke)

## CHAPTER TWO

# INTRODUCTION TO STRUCTURED QUERY LANGUAGE (SQL)

### True-False Questions

1. SQL stands for *Standard Query Language*.  
*Answer: False* *Level: easy*  
*Page: 27*
2. SQL is only a data manipulation language (DML).  
*Answer: False* *Level: hard*  
*Page: 27*
3. SQL was developed by IBM in the late 1970s.  
*Answer: True* *Level: easy*  
*Page: 28*
4. In addition to being a data sublanguage, SQL is also a programming language, like COBOL.  
*Answer: False* *Level: moderate*  
*Page: 28*
5. SQL commands can be embedded in application programs.  
*Answer: True* *Level: hard*  
*Page: 28*
6. SQL, although very popular, has never become a national standard.  
*Answer: False* *Level: moderate*  
*Page: 28*
7. The SQL keyword FROM is used to specify the table to be used.  
*Answer: True* *Level: easy*  
*Page: 31*
8. SQL can only query a single table.  
*Answer: False* *Level: moderate*  
*Page: 31-32*
9. SQL statements are ended with a colon.  
*Answer: False* *Level: easy*  
*Page: 32*

10. The columns to be obtained by an SQL command are listed after the FROM keyword.  
*Answer: False* *Level: moderate*  
*Page: 31-32*
11. The result of an SQL SELECT operation can contain duplicate rows.  
*Answer: True* *Level: moderate*  
*Page: 32*
12. To have SQL automatically eliminate duplicate rows from a result, use the keyword DISTINCT with the FROM keyword.  
*Answer: False* *Level: hard*  
*Page: 32*
13. An asterisk (\*) following the SELECT verb means that all columns are to be obtained.  
*Answer: True* *Level: moderate*  
*Page: 33*
14. The WHERE clause contains the condition that specifies which columns are to be selected.  
*Answer: False* *Level: moderate*  
*Page: 33*
15. The rows of the result table can be sorted by the values in one or more columns.  
*Answer: True* *Level: easy*  
*Page: 41*
16. Sorting is specified by the use of the SORT BY phrase.  
*Answer: False* *Level: moderate*  
*Page: 41*
17. A WHERE clause can contain only one condition.  
*Answer: False* *Level: easy*  
*Page: 41*
18. The condition in WHERE clauses can refer to a set of values by using the IN keyword.  
*Answer: True* *Level: moderate*  
*Page: 42*
19. ANSI standard SQL uses the symbol "%" to represent a series of one or more unspecified characters.  
*Answer: True* *Level: hard*  
*Page: 44*
20. The built-in function SUM can be used with any column.  
*Answer: False* *Level: hard*  
*Page: 45-47*
21. The clause SELECT COUNT (\*) results in a table with a single row and a single column.  
*Answer: True* *Level: moderate*  
*Page: 47*

22. Arithmetic in SQL statements is limited to the operations provided by the built-in functions.  
*Answer: False* *Level: easy*  
*Page: 48*
23. The SQL keyword *GROUP BY* instructs the DBMS to group together those rows that have the same value in a column.  
*Answer: True* *Level: easy*  
*Page: 50*
24. A WHERE clause can contain another SELECT statement enclosed in parenthesis.  
*Answer: True* *Level: easy*  
*Page: 56*
25. A SELECT statement used in WHERE clause is called a subquery.  
*Answer: True* *Level: easy*  
*Page: 55-58*
26. Only two tables can be queried by using a subquery.  
*Answer: False* *Level: moderate*  
*Page: 57*
27. An alternative to combining tables by a subquery is to use a join.  
*Answer: True* *Level: easy*  
*Page: 60*
28. When people use the term "join" they normally mean an "outer join."  
*Answer: False* *Level: moderate*  
*Page: 60*
29. Two or more tables are joined by giving the table names in the FROM clause and specifying the equality of the respective column names as a condition in the WHERE clause.  
*Answer: True* *Level: hard*  
*Page: 58-61*
30. Every subquery can be alternatively expressed by a join.  
*Answer: False* *Level: moderate*  
*Page: 61*

## Multiple Choice Questions

31. SQL is a(n)\_\_\_\_\_.
- a.) data sublanguage
  - b.) product of IBM research
  - c.) national standard
  - d.) combination of a data definition language and a data manipulation language
  - e.) **All of the above.**

*Level: moderate*

*Page: 27-28*

32. When making an SQL query, we are using SQL as a(n) \_\_\_\_\_.
- a.) DDL
  - b.) **DML**
  - c.) embedded language
  - d.) SET
  - e.) WHERE

*Level: moderate*

*Page: 27-28*

33. In an SQL query, which SQL keyword actually creates the query?
- a.) EXISTS
  - b.) FROM
  - c.) **SELECT**
  - d.) SET
  - e.) WHERE

*Level: easy*

*Page: 31-33*

34. In an SQL query, which SQL keyword is used to specify the table(s) to be used?
- a.) EXISTS
  - b.) **FROM**
  - c.) SELECT
  - d.) SET
  - e.) WHERE

*Level: easy*

*Page: 31-32*

35. In an SQL query, which SQL keyword must be used to remove duplicate rows from the result table?
- a.) DELETE
  - b.) DISTINCT**
  - c.) NOT EXISTS
  - d.) UNIQUE
  - e.) KEY

*Level: hard*

*Page: 32*

36. In an SQL query, which of the following symbols is used by ANSI SQL to represent all the columns in a single table?
- a.) \_ (underscore)
  - b.) ? (question mark)
  - c.) \* (asterisk)**
  - d.) % (percent)
  - e.) # (pound)

*Level: moderate*

*Page: 33*

37. In an SQL query, which SQL keyword is used to state the condition that specifies which rows are to be selected?
- a.) EXISTS
  - b.) FROM
  - c.) SELECT
  - d.) SET
  - e.) WHERE**

*Level: easy*

*Page: 33-34*

38. In an SQL query, which SQL keyword is used to join two conditions that both must be true for the rows to be selected?
- a.) AND**
  - b.) EXISTS
  - c.) HAVING
  - d.) IN
  - e.) OR

*Level: easy*

*Page: 41-42*

39. In an SQL query, which SQL keyword is used to determine if a column value is equal to any one of a set of values?
- a.) AND
  - b.) EXISTS
  - c.) HAVING
  - d.) IN**
  - e.) OR

*Level: easy*

*Page: 41-42*

40. In an SQL query, which of the following symbols is used by ANSI SQL to represent a single unspecified character?
- a.) \_ (underscore)**
  - b.) ? (question mark)
  - c.) \* (asterisk)
  - d.) % (percent)
  - e.) # (pound)

*Level: hard*

*Page: 44-45*

41. In an SQL query, which of the following symbols is used by Microsoft Access to represent a single unspecified character?
- a.) \_ (underscore)
  - b.) ? (question mark)**
  - c.) \* (asterisk)
  - d.) % (percent)
  - e.) # (pound)

*Level: hard*

*Page: 44*

42. In an SQL query, which SQL keyword is used to sort the result table by the values in one or more columns?
- a.) GROUP BY
  - b.) ORDER BY**
  - c.) SELECT
  - d.) SORT BY
  - e.) WHERE

*Level: moderate*

*Page: 43*

43. Given a table with the structure: EMPLOYEE (EmpNo, Name, Salary, HireDate), which of the following would find all employees whose name begins with the letter "S" using standard SQL?
- a.) SELECT \*  
FROM EMPLOYEE  
WHERE Name IN ['S'];
  - b.) SELECT EmpNo  
FROM EMPLOYEE  
WHERE Name LIKE 'S';
  - c.) SELECT \*  
FROM Name  
WHERE EMPLOYEE LIKE 'S\*';
  - d.) SELECT \*  
FROM EMPLOYEE  
WHERE Name LIKE 'S%';**
  - e.) None of the above.

*Level: hard*

*Page: 43-45*

44. Given a table with the structure: EMPLOYEE (EmpNo, Name, Salary, HireDate), which of the following would find all employees whose name begins with the letter "S" using Microsoft Access?
- a.) SELECT \*  
FROM EMPLOYEE  
WHERE Name IN ['S'];
  - b.) SELECT EmpNo  
FROM EMPLOYEE  
WHERE Name LIKE 'S';
  - c.) SELECT \*  
FROM Name  
WHERE EMPLOYEE LIKE 'S\*';**
  - d.) SELECT \*  
FROM EMPLOYEE  
WHERE Name LIKE 'S%';
  - e.) None of the above.

*Level: hard*

*Page: 43-45*

45. In an SQL query, which built-in function is used to total numeric columns?
- a.) AVG
  - b.) COUNT
  - c.) MAX
  - d.) MEAN
  - e.) SUM**

*Level: easy*

*Page: 45-48*

---



46. In an SQL query, which built-in function is used to compute the average value of numeric columns?
- a.) **AVG**
  - b.) MEAN
  - c.) MAX
  - d.) MIN
  - e.) SUM

**Level:** moderate

**Page:** 45-48

47. In an SQL query, which built-in function is used to obtain the largest value of numeric columns?
- a.) AVG
  - b.) COUNT
  - c.) **MAX**
  - d.) MIN
  - e.) SUM

**Level:** moderate

**Page:** 45-48

48. In an SQL query, which built-in function is used to obtain the smallest value of numeric columns?
- a.) AVG
  - b.) COUNT
  - c.) MAX
  - d.) **MIN**
  - e.) SUM

**Level:** moderate

**Page:** 45-48

49. In an SQL query, the built-in functions SUM and AVG work with columns containing data of which of the following data types?
- a.) Integer
  - b.) Numeric
  - c.) Char
  - d.) **a and b**
  - e.) a, b and c

**Level:** hard

**Page:** 45-48

50. In an SQL query, which built-in function is used to compute the number of rows in a table?
- a.) AVG
  - b.) COUNT**
  - c.) MAX
  - d.) MIN
  - e.) MEAN

**Level:** *easy*

**Page:** 45-48

51. In an SQL query, the built-in function COUNT works with columns containing data of which of the following data types?
- a.) Integer
  - b.) Numeric
  - c.) Char
  - d.) a and b
  - e.) a, b and c**

**Level:** *hard*

**Page:** 45-48

52. In an SQL query, which SQL keyword is used with built-in functions to group together rows that have the same value in a specified column?
- a.) GROUP BY**
  - b.) ORDER BY
  - c.) SELECT
  - d.) SORT BY
  - e.) DISTINCT SET

**Level:** *easy*

**Page:** 50-52

53. In an SQL query, which SQL keyword is used with GROUP BY to select groups meeting specified criteria?
- a.) AND
  - b.) EXISTS
  - c.) HAVING**
  - d.) IN
  - e.) WHERE

**Level:** *moderate*

**Page:** 50-52

54. Given a table with the structure: EMPLOYEE (EmpNo, Name, Salary, HireDate), which of the following is not a valid ANSI SQL command?
- a.) SELECT \*  
FROM EMPLOYEE  
WHERE Name LIKE 'Ja%';
  - b.) SELECT COUNT(\*)  
FROM EMPLOYEE  
WHERE Salary < 30000;
  - c.) SELECT COUNT(EmpNo)  
FROM EMPLOYEE;
  - d.) **SELECT HireDate, COUNT(\*)  
FROM EMPLOYEE  
WHERE Salary < 30000;**
  - e.) SELECT HireDate, COUNT(\*)  
FROM EMPLOYEE  
GROUP BY HireDate;

*Level: hard*

*Page: 31-52*

55. Based on the tables below, which of the following ANSI SQL commands would return the average customer balance grouped by SalesRepNo?

**GENERAL SALES DATABASE:**

**SALESREP**

<u>SalesRepNo</u>	RepName	HireDate
654	Jones	01/02/1999
734	Smith	02/03/2000
345	Chen	01/25/1998
434	Johnson	11/23/1998

**CUSTOMER**

<u>CustNo</u>	CustName	Balance	SalesRepNo
9870	Winston	500	345
8590	Gonzales	350	434
7840	Harris	800	654
4870	Miles	100	345

- a.) SELECT AVG (Balance)  
FROM CUSTOMER  
WHERE SalesRepNo;
- b.) SELECT AVG (Balance)  
FROM CUSTOMER  
GROUP BY SalesRepNo;**
- c.) SELECT AVG (Balance)  
FROM CUSTOMER, SALESREP  
WHERE SALESREP.SalesRepNo = CUSTOMER.SalesRepNo;
- d.) SELECT AVG (Balance)  
FROM CUSTOMER  
ORDER BY SalesRepNo;
- e.) SELECT AVG (Balance)  
FROM CUSTOMER, SALESREP  
WHERE CUSTOMER.SalesRepNo = CUSTOMER.SalesRepNo  
HAVING SalesRepNo;

*Level: hard*  
*Page: 31-52*

56. Based on the tables below, which of the following commands in ANSI SQL would return only the name of the sales representative and the name of the customer for each customer that has a balance greater than 400?

**GENERAL SALES DATABASE:**

**SALESREP**

<u>SalesRepNo</u>	RepName	HireDate
654	Jones	01/02/1999
734	Smith	02/03/2000
345	Chen	01/25/1998
434	Johnson	11/23/1998

**CUSTOMER**

<u>CustNo</u>	CustName	Balance	SalesRepNo
9870	Winston	500	345
8590	Gonzales	350	434
7840	Harris	800	654
4870	Miles	100	345

- a.) SELECT \*  
FROM SALESREP, CUSTOMER  
WHERE Balance > 400;
- b.) SELECT DISTINCT RepName, CustName  
FROM SALESREP, CUSTOMER  
WHERE Balance > 400;
- c.) SELECT \*  
FROM SALESREP, CUSTOMER  
WHERE SALESREP.SalesRepNo = CUSTOMER.SalesRepNo  
AND Balance > 400;
- d.) **SELECT RepName, CustName  
FROM SALESREP, CUSTOMER  
WHERE SALESREP.SalesRepNo = CUSTOMER.SalesRepNo  
AND Balance > 400;**
- e.) SELECT RepName, CustName  
FROM SALESREP, CUSTOMER  
WHERE Balance > 400  
GROUP BY SalesRepNo;

*Level: hard*  
*Page: 31-52*

57. In an SQL query, which SQL keyword is used to implement a subquery?
- a.) GROUP BY
  - b.) HAVING
  - c.) ORDER BY
  - d.) SELECT**
  - e.) SORT BY

*Level: hard*  
*Page: 56-58*

58. When one SQL query is embedded in the WHERE clause of another SQL query, this is referred to as a \_\_\_\_\_.
- a.) subset
  - b.) join
  - c.) WHERE Query
  - d.) subquery**
  - e.) set query

*Level: moderate*  
*Page: 56-58*

59. In an SQL query, which SQL keyword is used to specify the names of tables to be joined?
- a.) FROM**
  - b.) HAVING
  - c.) JOIN
  - d.) SELECT
  - e.) WHERE

*Level: easy*  
*Page: 58-61*

60. Regarding the interchangeability of subqueries and joins, \_\_\_\_\_.
- a.) a join can always be used as an alternative to a subquery, and a subquery can always be used as an alternative to a join.
  - b.) a join can sometimes be used as an alternative to a subquery, and a subquery can sometimes be used as an alternative to a join.**
  - c.) a join can always be used as an alternative to a subquery, and a subquery can sometimes be used as an alternative to a join.
  - d.) a join can sometimes be used as an alternative to a subquery, and a subquery can always be used as an alternative to a join.
  - e.) a join can never be used as an alternative to a subquery, and a subquery can never be used as an alternative to a join.

*Level: hard*  
*Page: 58-61*

## **Fill in the Blank Questions**

61. SQL stands for Structured Query Language .  
**Level:** *easy*  
**Page:** 27
62. SQL is a combination of a data definition language and a data manipulation language.  
**Level:** *moderate*  
**Page:** 27
63. SQL was developed by IBM in the late 1970's.  
**Level:** *moderate*  
**Page:** 28
64. The American National Standards Institute (ANSI) maintains the standards for SQL.  
**Level:** *hard*  
**Page:** 28
65. SQL is not a complete programming language. Rather it is a(n) data sublanguage .  
**Level:** *moderate*  
**Page:** 28
66. The SQL keyword SELECT is used to specify the columns to be obtained.  
**Level:** *moderate*  
**Page:** 31-33
67. The SQL keyword FROM is used to specify the table(s) that contains the data to be retrieved.  
**Level:** *easy*  
**Page:** 31-33
68. To remove duplicate rows from the result of a query, specify the SQL qualifier DISTINCT .  
**Level:** *hard*  
**Page:** 32
69. To obtain all columns, use a(n) asterisk (\*) instead of listing all the column names.  
**Level:** *easy*  
**Page:** 33
70. The SQL WHERE clause contains the condition that specifies which rows are to be selected.  
**Level:** *easy*  
**Page:** 33-34
71. To sort the rows of the result table, the ORDER BY clause is specified.  
**Level:** *moderate*  
**Page:** 40
-

72. Columns can be sorted in descending sequence by using the SQL keyword DESC .  
**Level:** moderate  
**Page:** 41
73. When two conditions must both be true for the rows to be selected, the conditions are separated by the SQL keyword AND .  
**Level:** easy  
**Page:** 41-43
74. To refer to a set of values needed for a condition, use the SQL operator IN .  
**Level:** hard  
**Page:** 41-43
75. To exclude one or more values using a condition, the SQL keyword NOT IN must be used.  
**Level:** hard  
**Page:** 41-43
76. To refer to a set of values in a condition, the values are placed inside parenthesis ( ) and separated by commas.  
**Level:** hard  
**Page:** 41-43
77. The SQL keyword LIKE is used in SQL expressions to select on partial values.  
**Level:** moderate  
**Page:** 44
78. The SQL-92 wildcard %(percent sign) indicates a sequence of one or more unspecified characters in an SQL query.  
**Level:** hard  
**Page:** 44
79. The Microsoft Access-92 wildcard \*(asterisk) indicates a sequence of one or more unspecified characters in an SQL query.  
**Level:** hard  
**Page:** 44
80. The SQL built-in function SUM totals values in numeric columns.  
**Level:** easy  
**Page:** 45-48
81. The SQL built-in function AVG computes the average of values in numeric columns.  
**Level:** easy  
**Page:** 45-48
82. The SQL built-in function MAX obtains the largest value in a numeric column.  
**Level:** easy  
**Page:** 45-48
-



83. The SQL built-in function MIN obtains the smallest value in a numeric column.  
**Level:** *easy*  
**Page:** 45-48
84. The SQL built-in function COUNT computes the number of rows in a table.  
**Level:** *easy*  
**Page:** 45-48
85. The SQL keyword GROUP BY is used to collect those rows that have the same value in a specified column.  
**Level:** *moderate*  
**Page:** 50
86. A nested SELECT statement (one that appears within the WHERE clause of another SQL statement) is called a subquery, and must be enclosed in parentheses.  
**Level:** *moderate*  
**Page:** 55-58
87. The names of tables to be joined are listed in the FROM clause.  
**Level:** *easy*  
**Page:** 58-61
88. A join operation is achieved by specifying the equality of the respective column names as a condition in the WHERE clause.  
**Level:** *moderate*  
**Page:** 58-61
89. When most people use the word "join," they are referring to an equijoin.
- Level:** *moderate*  
**Page:** 60
90. While many subqueries can be alternatively written as joins, correlated subqueries do work that cannot be duplicated as a join.  
**Level:** *hard*  
**Page:** 60

## **Essay Questions**

91. What is SQL?.

*Structured Query Language (SQL) is used to create and use databases, tables and relationships. SQL is divided into two categories: SQL statements for database definition and SQL statements for database processing (querying and updating). The database definition commands are referred to as a data definition language (DDL), and the database query and update commands are referred to as a data manipulation language (DML). SQL was developed by IBM, and is endorsed as a national standard by the American National Standards Institute (ANSI). Although a newer standard, SQL3, exists, the most widely implemented version of SQL is the ANSI SQL-92 standard. SQL is not a full-featured programming language, but rather it is considered to be a data sublanguage.*

**Pages:** 27-28

92. Briefly describe subqueries and joins. Explain when each is not an acceptable alternative for the other.

*Subqueries and joins are both methods for retrieving data from multiple tables. Subqueries involve nesting one SELECT statement within another. The nested SELECT is used as part of a condition in the WHERE clause of the first SELECT statement. The nested SELECT statement can return a set of records from one table, which are then used in a logical operator within the parent SELECT query. A join combines records from each table into concatenated records containing the fields of both tables. The records are concatenated based on matching values in similar columns in the two tables. Subqueries cannot be used in situations where the results to be displayed include attributes from more than one table. Joins cannot be used as an alternative to a correlated subquery.*

**Pages:** 55-61

93. The following database will be used in this question:

**GENERAL SALES DATABASE:**

**SALESREP**

<u>SalesRepNo</u>	RepName	HireDate
654	Jones	01/02/1999
734	Smith	02/03/2000
345	Chen	01/25/1998
434	Johnson	11/23/1998

**CUSTOMER**

<u>CustNo</u>	CustName	Balance	SalesRepNo
9870	Winston	500	345
8590	Gonzales	350	434
7840	Harris	800	654
4870	Miles	100	345

Explain the use of the of SQL keyword SELECT. Include an example based on the CUSTOMER table in the General Sales database.

*The SQL keyword SELECT forms the basis for all SQL querying. Although SELECT technically specifies columns to be used in a query, it is always the first SQL keyword or command in an SQL phrase that includes at least the SQL keyword FROM and often the SQL keyword WHERE. The SQL keyword WHERE is used to specify which tables are used in the query, while the SQL keyword WHERE is used to specify conditions or constraints imposed on the query. For example,*

```
SELECT *
FROM CUSTOMER
WHERE CustNo = 34567;
```

*is a query that returns all information in the table CUSTOMER about the customer whose customer number is 34567.*

**Pages:** 31-35

94. The following database will be used in this question:

**GENERAL SALES DATABASE:**

**SALESREP**

<u>SalesRepNo</u>	RepName	HireDate
654	Jones	01/02/1999
734	Smith	02/03/2000
345	Chen	01/25/1998
434	Johnson	11/23/1998

**CUSTOMER**

<u>CustNo</u>	CustName	Balance	SalesRepNo
9870	Winston	500	345
8590	Gonzales	350	434
7840	Harris	800	654
4870	Miles	100	345

Explain the use of the SQL keyword LIKE. Include an example based on the CUSTOMER table from the General Sales database.

*The LIKE keyword is used in the WHERE clause of an SQL query to select rows based on partial values. Through the use of wildcard characters that can represent one or more unspecified characters, the LIKE operator can search for a given string of characters within a column value. The ANSI wildcard "%" represents one or more unspecified characters, and the wildcard "\_" (underscore) represents any single unspecified character. For example,*

```
SELECT *
FROM CUSTOMER
WHERE CustName LIKE 'H%';
```

*is a query that returns all information in the table CUSTOMER about customers whose CustName starts with the letter H.*

**Pages:** 43-45

95. The following database will be used in this question:

**GENERAL SALES DATABASE:**

**SALESREP**

<u>SalesRepNo</u>	RepName	HireDate
654	Jones	01/02/1999
734	Smith	02/03/2000
345	Chen	01/25/1998
434	Johnson	11/23/1998

**CUSTOMER**

<u>CustNo</u>	CustName	Balance	SalesRepNo
9870	Winston	500	345
8590	Gonzales	350	434
7840	Harris	800	654
4870	Miles	100	345

Explain the use of the GROUP BY keyword. Include an example based on the CUSTOMER table from the General Sales database.

*The GROUP BY keyword is used in conjunction with the built-in functions of SQL. The GROUP BY keyword is given a column that records are to be grouped on. Records in the result table are then collected into groups based on the value of the grouping column. The built-in function is then performed on the records of each group separately. For example,*

```
SELECT AVE(Balance)
FROM CUSTOMER
GROUP BY SalesRepNo;
```

*is a query that returns the average balance of all customers associated with a specific sales representative.*

**Pages:** 45-52