***Database Concepts***

**Chapter 1 Getting Started**

1) The purpose of a database is to help people keep track of things.

Answer: TRUE

Diff: 1 Page Ref: 4

2) A possible problem with keeping data in lists is that if you delete a row of data from a list, you may also delete some data items that you want to keep.

Answer: TRUE

Diff: 1 Page Ref: 4

3) An advantage of keeping data in lists is that if you update a data value in one row of data in a list, other occurrences of the same data item in other rows will be automatically updated as well.

Answer: FALSE

Diff: 1 Page Ref: 4

4) An advantage of keeping data in lists is that if you add a new row of data to the list, you will never have null values occurring for any data item in the row.

Answer: FALSE

Diff: 1 Page Ref: 4-5

5) One problem with storing duplicated data is the potential for inconsistent values.

Answer: TRUE

Diff: 2 Page Ref: 4-5

6) A relational database stores data in the form of lists.

Answer: FALSE

Diff: 1 Page Ref: 6

7) Usually, a database table containing both rows and columns is designed to store data for exactly two themes.

Answer: FALSE

Diff: 2 Page Ref: 6

8) By separating data into tables containing data on only one theme each, making changes to the data is simplified.

Answer: TRUE

Diff: 2 Page Ref: 7

9) SQL stands for Structural Question Language.

Answer: FALSE

Diff: 1 Page Ref: 12

10) Relational database tables are commonly combined, queried, and processed using Structured Query Language (SQL).

Answer: TRUE

Diff: 1 Page Ref: 12

11) Although users use database systems, they are not considered part of a database system.

Answer: FALSE

Diff: 1 Page Ref: 13

12) A database is a set of one or more computer programs that serves as an intermediary between the users and the database management system (DBMS).

Answer: FALSE

Diff: 2 Page Ref: 13

13) A relational database can be defined as a self-describing collection of related tables.

Answer: TRUE

Diff: 1 Page Ref: 13

14) A database is self-describing because the user maintains a record of the database structure outside the database itself.

Answer: FALSE

Diff: 2 Page Ref: 13

15) Metadata is the user data stored in the database.

Answer: FALSE

Diff: 1 Page Ref: 14

16) Most organizations create and use their own database management system (DBMS) products.

Answer: FALSE

Diff: 1 Page Ref: 14

17) The DBMS is used to create the database itself.

Answer: TRUE

Diff: 1 Page Ref: 14

18) Referential integrity constraints must be enforced by the application program.

Answer: FALSE

Diff: 2 Page Ref: 15

19) Application programs are responsible for creating, maintaining, and supporting database backup and recovery systems.

Answer: FALSE

Diff: 2 Page Ref: 15

20) The DBMS receives data update requests from the application program.

Answer: TRUE

Diff: 3 Page Ref: 15-16

21) In the general division of labor between database applications and the DBMS, the processing of forms is considered a DBMS task.

Answer: FALSE

Diff: 3 Page Ref: 15

22) In the general division of labor between database applications and the DBMS, the application program determines which tables need to be modified.

Answer: TRUE

Diff: 3 Page Ref: 15

23) In the general division of labor between database applications and the DBMS, the application program formats the results of a query into a report.

Answer: TRUE

Diff: 3 Page Ref: 16

24) Personal DBMS products, such as Microsoft Access, create a clear distinction between the DBMS and the database application.

Answer: FALSE

Diff: 2 Page Ref: 20

25) There is no reason for serious database developers to learn many aspects of database processing technology because DBMS products like Microsoft Access hide these aspects.

Answer: FALSE

Diff: 1 Page Ref: 20

26) Microsoft Access 2010 is a personal database that combines a DBMS with an application generator.

Answer: TRUE

Diff: 1 Page Ref: 24

27) The Microsoft Access 2010 application generator provides the ability to create and store forms, reports, and queries.

Answer: TRUE

Diff: 2 Page Ref: 24

28) Microsoft Access 2010 databases are stored using the file extension .accdb.

Answer: FALSE

Diff: 3 Page Ref: 25

29) Microsoft Access 2010 uses the Access 2003 .mdb file format as the default file format for database files.

Answer: FALSE

Diff: 2 Page Ref: 25

30) Microsoft Access 2010 uses the AutoNumber data type to create surrogate keys.

Answer: TRUE

Diff: 2 Page Ref: 31

31) A database may be used to help people:

A) track which student is assigned to a particular advisor.

B) know the current inventory levels of products their company sells.

C) check on the estimated arrival time of an incoming flight at an airport.

D) look up their checking account balance over the Internet.

E) All of the above

Answer: E

Diff: 2 Page Ref: 4

32) Which of the following problems associated with storing data in a list is avoided by storing data in a relational database?

A) Maintaining the data may require changing the same data value in many locations.

B) Inconsistency when a data item is used multiple times

C) Inability to store partial data

D) Duplication of data items

E) All of the above

Answer: E

Diff: 2 Page Ref: 4-5

33) Today almost every commercial database is based on:

A) lists.

B) the hierarchical model.

C) the linked-list model.

D) the relational model.

E) the object-oriented model.

Answer: D

Diff: 1 Page Ref: 6

34) A relational database stores data in the form of:

A) lists.

B) forms.

C) columns.

D) tables.

E) spreadsheets.

Answer: D

Diff: 1 Page Ref: 6

35) SQL stands for:

A) Standard Query Language.

B) Structural Question Language.

C) Structured Query Language.

D) Standard Question Language.

E) Structured Question Language.

Answer: C

Diff: 1 Page Ref: 12

36) The statement

SELECT STUDENT.StudentNumber, STUDENT.StudentName,

FROM STUDENT

WHERE STUDENT.StudentNumber = S12345678;

is an example of:

A) QBE.

B) SQL.

C) QLE.

D) C++.

E) Java.

Answer: B

Diff: 2 Page Ref: 12

37) Which of the following is not a basic component of a database system?

A) Database

B) User

C) ERD

D) DBMS

E) Data applications

Answer: C

Diff: 2 Page Ref: 13

38) A relational database is:

A) a self-describing collection of related tables.

B) a collection of forms and reports that support a given purpose.

C) a library of queries and data files for querying.

D) a set of applications and the data sets for those applications.

E) a set of metadata.

Answer: A

Diff: 2 Page Ref: 13

39) The component of a database that makes it self-describing is the:

A) related tables.

B) applications.

C) library.

D) data set.

E) metadata.

Answer: E

Diff: 2 Page Ref: 13-14

40) Which of the following would not be an example of database metadata?

A) Names of tables in a database

B) Properties of tables in a database

C) Names of columns in a database and their associated tables

D) Properties of columns

E) Queries against records in the database tables

Answer: E

Diff: 2 Page Ref: 13-14

41) The creation of a database and its tables is a function of which component of the database system?

A) Users

B) Application

C) DBMS

D) Database

E) Web server

Answer: C

Diff: 2 Page Ref: 14

42) Which of the following is a function of the DBMS in a database system?

A) Create and transmit queries

B) Control applications

C) Create and process forms

D) Perform backup and recover

E) Process Web page requests

Answer: D

Diff: 3 Page Ref: 14-15

43) Which of the following is a function of the database application in a database system?

A) Create and transmit queries

B) Update database data

C) Maintain database structures

D) Create tables

E) Backup and restore data

Answer: A

Diff: 2 Page Ref: 15-17

44) Which of the following is not a function of the database application in a database system?

A) Execute application logic

B) Control concurrency

C) Create and process forms

D) Create and transmit queries

E) Create and process reports

Answer: B

Diff: 3 Page Ref: 15-17

45) Microsoft SQL Server is an example of a:

A) database.

B) database management system.

C) data manipulation system.

D) table.

E) list manager.

Answer: B

Diff: 1 Page Ref: 14

46) Microsoft Access is a personal database system, and a personal database system is characterized by:

A) the DBMS removing the metadata from the database.

B) the DBMS product taking the role of the DBMS and the database application generator.

C) the database being stored inside the DBMS.

D) the DBMS product being limited to a maximum of ten tables in any given database.

E) the DBMS not supporting indexes.

Answer: B

Diff: 1 Page Ref: 18-20

47) The Microsoft Access application generator is not responsible for:

A) creating forms.

B) creating reports.

C) creating queries.

D) creating tables.

E) storing queries.

Answer: D

Diff: 3 Page Ref: 18-20

48) Microsoft Access 2010 database files are stored using the file extension:

A) .adb.

B) .asp.

C) .accdb.

D) .mdb.

E) .sql.

Answer: C

Diff: 2 Page Ref: 25

49) The default file format for Microsoft Access 2010 database files is the:

A) Access 2007 format.

B) Access 2003 format.

C) Access XP format.

D) SQL Server format .

E) XBD format.

Answer: A

Diff: 2 Page Ref: 25

50) The Microsoft Access 2010 data type of AutoNumber is used when there is a specific need for a:

A) foreign key.

B) primary key.

C) surrogate key.

D) spare key.

E) secondary key.

Answer: C

Diff: 3 Page Ref: 31

51) The purpose of a database is to help people \_\_\_\_\_\_\_\_.

Answer: keep track of things

Diff: 1 Page Ref: 4

52) A relational database stores data in the form of \_\_\_\_\_\_\_\_.

Answer: tables

Diff: 2 Page Ref: 6

53) It is almost always best to design a table in a database so that it contains data on \_\_\_\_\_\_\_\_ theme.

Answer: one

Diff: 2 Page Ref: 6

54) In relational databases, query requests use a language called \_\_\_\_\_\_\_\_.

Answer: Structured Query Language (SQL)

Diff: 1 Page Ref: 12

55) Data that the database keeps about its own structure is called \_\_\_\_\_\_\_\_.

Answer: metadata

Diff: 1 Page Ref: 13-14

56) The purpose of the \_\_\_\_\_\_\_\_ in a database system is to receive requests from applications and to translate those requests into reads and writes on the database files.

Answer: DBMS

Diff: 3 Page Ref: 14-15

57) \_\_\_\_\_\_\_\_ constraints are rules that the DBMS enforces to ensure that data values in one table have corresponding values in another related table.

Answer: Referential integrity

Diff: 2 Page Ref: 15

58) The DBMS controls \_\_\_\_\_\_\_\_ by ensuring that one user's work does not inappropriately interfere with another user's work.

Answer: concurrency

Diff: 2 Page Ref: 15

59) A(n) \_\_\_\_\_\_\_\_ is a set of one or more computer programs that serves as an intermediary between the user and the DBMS.

Answer: database application

Diff: 2 Page Ref: 13

60) In a database system, the \_\_\_\_\_\_\_\_ creates and processes forms.

Answer: database application

Diff: 3 Page Ref: 15

61) Microsoft Access is a \_\_\_\_\_\_\_\_, which combines a DBMS and an application generator.

Answer: personal database

Diff: 1 Page Ref: 17

62) The Microsoft Access application generator adds the ability to create and store \_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_.

Answer: forms; reports; queries

Diff: 3 Page Ref: 18-20

63) Microsoft Access 2010 database files are stored using the \_\_\_\_\_\_\_\_ file extension.

Answer: .accdb

Diff: 2 Page Ref: 22

64) By default, Microsoft Access 2010 saves data files in the \_\_\_\_\_\_\_\_ file format.

Answer: Access 2007

Diff: 2 Page Ref: 22

65) Microsoft Access 2010 generates surrogate key values when the \_\_\_\_\_\_\_\_ data type is used.

Answer: AutoNumber

Diff: 2 Page Ref: 31

66) What problems with storing data on two themes in a list are addressed by database technology?

Answer: First, data updates are simplified because the number of updates is reduced when data appears in more than one location in the list. Second, the possibility of incorrectly entering duplicate data is reduced. Third, the problem of inconsistently entering data values is removed. Finally, the ability to enter data on one theme in the list without having data for the other theme is enhanced.

Diff: 2 Page Ref: 4-5

67) Briefly describe the four components of a database system.

Answer: The components of a database system are: (1) the users, (2) the application programs, (3) the DBMS, and (4) the database. The users are the people that will employ the system to input new data, modify existing data, and delete data in order to perform their jobs. The application programs are computer programs that act as intermediaries between the users and the DBMS. The application programs produce forms, reports, and queries; they also translate user actions into data management requests for the DBMS. The DBMS manipulates the database. It receives data management requests from the computer applications and translates them into read and write commands for the database. The database contains the actual user data that the users need to perform their jobs.

Diff: 2 Page Ref: 13-17

68) What components are included in a database?

Answer: The database contains user data, metadata, indexes and other overhead data, and application metadata. User data is the data from the users' environment that they want to track. Metadata is data about the structure of the database. Indexes and other overhead data are structures that the database uses to improve performance. Finally, the application metadata is data about forms, reports, and other application components that some databases, particularly those created with desktop DBMS products, store with the database.

Diff: 2 Page Ref: 13-14

69) What is "metadata," and how does it relate to the definition of a database?

Answer: Metadata is data about the structure of the database itself. This includes data about the names of all the tables in the database, the names of all the columns in each of the tables, the data type of each column in each table, the properties of the tables and the columns, etc. Metadata accounts for the "self-describing" aspect of the definition of a database as a "self-describing collection of integrated tables."

Diff: 2 Page Ref: 13-14

70) Briefly describe the function of the DBMS in a database system.

Answer: The DBMS creates the database and the tables and structures within it. The DBMS also reads and updates the database data. It receives requests from application programs to perform data maintenance tasks. These requests are translated into actions that are performed on the database. In addition to maintaining the user data within the database, the DBMS also maintains the database structures. The DBMS also enforces any rules that have been defined to govern the values of the data, such as data type requirements and referential integrity constraints. The DBMS controls concurrency issues, which deal with the unwanted interruption of one user's work by another user's work. As the only point of entry into the database, the DBMS also provides security for the database to restrict users' access to only the data that they have authority to read or modify. Finally, the DBMS is responsible for the creation of backup copies of the database data and for restoring the database in case a recovery is required.

Diff: 2 Page Ref: 14-15

71) What are "referential integrity constraints"? Give an example.

Answer: A referential integrity constraint is a rule that restricts certain actions on the database data. A referential integrity constraint is used to ensure that the values in a field in one table have matching values in a corresponding field in another table. These constraints are enforced by the DBMS, which will not allow changes to the values of the database that would result in violations of this rule. For example, a database has an EMPLOYEE table and a VEHICLE table that are used to store data on employees and the vehicles that they are assigned to drive. The EMPLOYEE table has a column called EmployeeID that is used to distinguish one employee record from another. The VEHICLE table also has an EmployeeID column that is used to associate a vehicle with the appropriate employee. A referential integrity constraint could be used to prevent a vehicle from being assigned to an employee with an EmployeeID that does not appear in the EMPLOYEE table by requiring that all values in EmployeeID in the VEHICLE table have a matching value in EmployeeID in the EMPLOYEE table.

Diff: 3 Page Ref: 15

72) Briefly describe the function of an application program in a database system.

Answer: The application program is responsible for creating and processing forms. The application displays the form to the user, allows the user to complete the data entry, evaluates the form to determine which data management tasks need to be performed, and transmits the appropriate requests to the DBMS. The application creates and transmits queries. The queries are requests for data that are created in a language like SQL, and transmitted to the DBMS to have the requested data returned to the application program. The application also creates and processes reports. The query to retrieve the necessary data for the report is sent to the DBMS. When the DBMS returns the needed data, the application manipulates it as necessary to create the requested report. The application program also applies application logic to control the manipulation of data in accordance with the business rules. Finally, the application program is responsible for providing control. Control must be exercised to allow the users to make choices for functions and tasks as appropriate for their jobs. Also, control must be exercised to manage the activities of the DBMS.

Diff: 2 Page Ref: 16-18

73) What are the advantages and disadvantages of personal DBMS products hiding the complexity of database systems?

Answer: The advantage of hiding the complexity of database systems is that it makes database systems easier for novices to create. Using the graphical tools and wizards of a desktop DBMS product, databases and application programs can be created without developing much database expertise. The disadvantage of hiding the complexity is that the developer does not understand what the desktop DBMS product is doing on the developer's behalf. This limits the developer's ability to create systems with functions not anticipated by the DBMS design team. Further, the developer is limited in their ability to develop systems on a larger scale.

Diff: 3 Page Ref: 18-23

74) Microsoft Access is considered a "personal database" product. What is a personal database?

Answer: A personal database combines a DBMS with an application generator. The DBMS performs the functions expected of a DBMS such as database creation, processing, and administration. The application generator adds the ability to create and store forms, reports and queries, as well as some other application-related functions.

Diff: 1 Page Ref: 18-20

75) What Microsoft Access file format is used by default in Microsoft Access 2010?

Answer: By default, Microsoft Access 2010 supports Access 2007 files formats. Microsoft Access 2007 database files are stored using the *.accdb* file extension.

Diff: 1 Page Ref: 25

76) What is a surrogate key and how does Microsoft Access 2010 create surrogate keys?

Answer: A surrogate key is usually a computer-generated unique number that serves as the identifier of each row in a table. Microsoft Access 2010 generates surrogates keys by using the Access AutoNumber data type.

Diff: 1 Page Ref: 31