

## Chapter 1: Client/Server Databases and the Oracle10g Relational Database

---

### TRUE/FALSE

1. In a data file, a record contains one piece of information such as a person's last name.

ANS: F                      PTS: 1                      REF: 2

2. A DBMS is usually administered by several programmers.

ANS: F                      PTS: 1                      REF: 4

3. Redundant data is a big problem because it can become inconsistent.

ANS: T                      PTS: 1                      REF: 4

4. A relational database was the earlier type of database, but is no longer used in modern computing.

ANS: F                      PTS: 1                      REF: 5

5. Relationships between entities in database tables are maintained using key fields.

ANS: T                      PTS: 1                      REF: 5

6. NULL is a valid value for a primary key.

ANS: F                      PTS: 1                      REF: 6

7. A candidate key for a database table can change often as long as it is unique.

ANS: F                      PTS: 1                      REF: 6

8. Oracle can automatically generate surrogate keys.

ANS: T                      PTS: 1                      REF: 7

9. A customer database table with columns first\_name, last\_name, and phone\_number would probably need to use a surrogate key.

ANS: T                      PTS: 1                      REF: 7

10. A foreign key value must exist in the table where it is a primary key.

ANS: T                      PTS: 1                      REF: 9

11. A composite key usually comprises fields that are foreign keys in other tables.

ANS: F                      PTS: 1                      REF: 10

12. Database design is usually a very simple task since it is always obvious what tables should be created and how they are related.
- ANS: F                      PTS: 1                      REF: 11
13. There are two main tasks involved with the design of a database: developing an entity-relationship (ER) model and regulating the database tables.
- ANS: F                      PTS: 1                      REF: 11
14. In an ER diagram a 1:M relationship shows a simple straight line between two entities.
- ANS: F                      PTS: 1                      REF: 11-12
15. A student can take many different classes in the same term, and each class can be composed of many different students; this is an example of a many-to-many relationship.
- ANS: T                      PTS: 1                      REF: 12
16. During the design of the actual database tables, the N:M relationship is broken down into a series of two or more 1:M relationships through the use of a linking table in the process of normalization.
- ANS: T                      PTS: 1                      REF: 12
17. The purpose of normalization is to store data efficiently in the least possible amount of space.
- ANS: F                      PTS: 1                      REF: 12
18. Data is considered to be normalized as long as a primary key has been designated.
- ANS: F                      PTS: 1                      REF: 13
19. First normal form means that the data has been organized in such a manner that it has a primary key and no repeating groups.
- ANS: T                      PTS: 1                      REF: 14
20. A shorthand method of identifying a table and its contents is to give the name of the table followed by a list of the column names and data types, separated by commas, within a set of square brackets.
- ANS: F                      PTS: 1                      REF: 14
21. A transitive dependency means that the fields within the table are dependent only on part of the primary key.
- ANS: F                      PTS: 1                      REF: 16
22. The final step in the normalization process is to convert the tables to fourth normal form (4NF).
- ANS: F                      PTS: 1                      REF: 16

23. During the normalization process, it is common to decrease the number of tables in the database design.
- ANS: F                      PTS: 1                      REF: 16-17
24. A terminal is a program that requests and uses server resources.
- ANS: F                      PTS: 1                      REF: 17
25. MS Access is an example of a client/server database.
- ANS: F                      PTS: 1                      REF: 18
26. It is possible to use a personal database in a multiuser environment.
- ANS: T                      PTS: 1                      REF: 18
27. A personal database should only be used for non-mission-critical applications.
- ANS: T                      PTS: 1                      REF: 19
28. Personal databases are preferred for database applications that retrieve and manipulate small amounts of data from databases containing large numbers of records.
- ANS: F                      PTS: 1                      REF: 21
29. Client/server databases create a lot of network traffic because the entire database is sent between the client and server for every request.
- ANS: F                      PTS: 1                      REF: 21
30. It is not necessary to specify a data type for all database columns - only the ones that you want the database to perform error checking on.
- ANS: F                      PTS: 1                      REF: 23

## **MULTIPLE CHOICE**

1. In a data file, fields are also called \_\_\_\_.
- |            |             |
|------------|-------------|
| a. columns | c. rows     |
| b. records | d. entities |
- ANS: A                      PTS: 1                      REF: 2
2. Who typically installs and maintains a database?
- |                       |                   |
|-----------------------|-------------------|
| a. the project leader | c. a dba          |
| b. a manager          | d. any programmer |
- ANS: C                      PTS: 1                      REF: 4

3. Most modern databases are \_\_\_\_ databases.
- a. hierarchical
  - b. relational
  - c. object-oriented
  - d. structured

ANS: B                      PTS: 1                      REF: 5

4. What is the preferred data type for primary key fields?
- a. text
  - b. date
  - c. numeric
  - d. character

ANS: C                      PTS: 1                      REF: 6

5. Why is an address a bad choice for a primary key?
- a. it can change
  - b. it is too long
  - c. it contains letters and numbers
  - d. not everyone has an address

ANS: A                      PTS: 1                      REF: 6

6. If no candidate keys exist in a table, which of the following is used?
- a. surrogate key
  - b. dummy key
  - c. primary key
  - d. index key

ANS: A                      PTS: 1                      REF: 7

7. Which data type do surrogate keys have?
- a. numeric
  - b. boolean
  - c. character
  - d. text

ANS: A                      PTS: 1                      REF: 7

8. What type of key may be helpful in eliminating redundant data from a table?
- a. link
  - b. foreign
  - c. duplicate
  - d. composite

ANS: B                      PTS: 1                      REF: 8

9. If your database table has a lot of redundant data, how can you fix it?
- a. delete the redundant data
  - b. eliminate the table
  - c. split the table into two and use a foreign key
  - d. split the table into two and use a composite key

ANS: C                      PTS: 1                      REF: 8

10. When two fields are combined to form a unique value, this is known as a \_\_\_\_ key.
- a. double
  - b. composite
  - c. surrogate
  - d. foreign

ANS: B                      PTS: 1                      REF: 10

11. Which of the following is used to represent entities in ER models?

- a. squares
- b. lines
- c. circles
- d. diamonds

ANS: A                      PTS: 1                      REF: 11

12. Which relationship type cannot be physically represented in the database and requires the use of a link table?

- a. one-to-one
- b. many-to-one
- c. one-to-many
- d. many-to-many

ANS: D                      PTS: 1                      REF: 12

13. Which normal form is the highest level usually achieved by database designers?

- a. unnormalized
- b. first normal form
- c. second normal form
- d. third normal form

ANS: D                      PTS: 1                      REF: 16

14. Which of the following characterizes unnormalized data?

- a. does not have a foreign key identified
- b. does not have a primary key identified and/or contains repeating groups
- c. has transitive dependencies
- d. has partial dependencies

ANS: B                      PTS: 1                      REF: 13

15. A \_\_\_\_ dependency means that a field is dependent on another field within the table that is not the primary key field.

- a. indirect
- b. direct
- c. transitive
- d. partial

ANS: C                      PTS: 1                      REF: 16

16. In a relational database which of the following allows a user to interact with the database?

- a. database applications
- b. dba
- c. database server process
- d. database server

ANS: A                      PTS: 1                      REF: 17

17. A \_\_\_\_ does not perform any processing - it sends keyboard input and displays output from a central computer.

- a. workstation
- b. server
- c. terminal
- d. laptop

ANS: C                      PTS: 1                      REF: 17

18. What is the definition of a server?
- a. an expensive computer
  - b. a computer with more than one processor
  - c. a computer that shares resources with other computers
  - d. a computer that is used by many people
- ANS: C                      PTS: 1                      REF: 17
19. How many users typically use a personal database?
- a. 1
  - b. 5
  - c. 20
  - d. 4000
- ANS: A                      PTS: 1                      REF: 18
20. When a personal database is shared by more than one user, where do the database files typically reside?
- a. on one user's workstation
  - b. on the Internet
  - c. on a file server
  - d. on a cd
- ANS: C                      PTS: 1                      REF: 18-19
21. What is a disadvantage of using a personal database over a network?
- a. slow
  - b. creates a lot of network traffic
  - c. hard to save data
  - d. not secure
- ANS: B                      PTS: 1                      REF: 19
22. What is meant by the term "transaction processing"?
- a. processing over a network
  - b. processing by a bank or other financial institution
  - c. grouping database changes into one unit of work that must succeed or fail together
  - d. pre-processing data with a separate program before it is saved in the database
- ANS: C                      PTS: 1                      REF: 19
23. What is the term for reversing changes to a database?
- a. undo
  - b. roll back
  - c. delete
  - d. backup
- ANS: B                      PTS: 1                      REF: 20
24. The name of the utility which handles all client and server communication in Oracle is \_\_\_\_.
- a. Oracle Server
  - b. Oracle Net
  - c. Oracle Socket
  - d. Oracle Protocol
- ANS: B                      PTS: 1                      REF: 21
25. Which of the following is the utility used for creating and testing queries in Oracle 10g?
- a. Forms Builder
  - b. Reports Builder
  - c. SQL\*Plus
  - d. EnterpriseManager
- ANS: C                      PTS: 1                      REF: 22

26. A field is also called a(n) \_\_\_\_.

- a. row
- b. column
- c. table
- d. item

ANS: B                      PTS: 1                      REF: 2

27. A(n) \_\_\_\_ stores all organizational data in a central location.

- a. database administrator
- b. record
- c. database
- d. index

ANS: C                      PTS: 1                      REF: 4

28. In database terminology, a(n) \_\_\_\_ is an object about which you want to store data.

- a. component
- b. record
- c. file
- d. entity

ANS: D                      PTS: 1                      REF: 5

29. A \_\_\_\_ key is a field in a relational database table whose value must be unique for each row.

- a. foreign
- b. primary
- c. secondary
- d. link

ANS: B                      PTS: 1                      REF: 6

30. A \_\_\_\_ key is any column that could be used as the primary key.

- a. surrogate
- b. foreign
- c. possible
- d. candidate

ANS: D                      PTS: 1                      REF: 6

31. To connect information about different entities, you must create \_\_\_\_, which are links that show how different records are related.

- a. relationships
- b. records
- c. rows
- d. foreign keys

ANS: A                      PTS: 1                      REF: 5

32. A \_\_\_\_ key is a column that you create to be the record's primary key identifier.

- a. foreign
- b. secondary
- c. surrogate
- d. composite

ANS: C                      PTS: 1                      REF: 7

33. \_\_\_\_ relationships are rare in a relational database; usually you work with \_\_\_\_ relationships.

- a. One-to-many, one-to-one
- b. One-to-one, one-to-many
- c. One-to-one, many-to-one
- d. Many-to-one, many-to-many

ANS: B                      PTS: 1                      REF: 11

34. A table is in 2NF if it fulfills these two conditions: it is in 1NF, and it has \_\_\_\_ dependencies.

- a. no partial
- b. no total
- c. all partial
- d. all total

ANS: A                      PTS: 1                      REF: 14

35. A \_\_\_\_ is a computer that shares its resources with other computers.

- a. client
- b. server
- c. parallel
- d. user

ANS: B                      PTS: 1                      REF: 17

36. The Microsoft Access personal database stores all data for a database in a single file with a(n) \_\_\_\_ extension.

- a. .doc
- b. .xls
- c. .mdb
- d. .odb

ANS: C                      PTS: 1                      REF: 19

37. As a general rule, database developers should use a personal database only for \_\_\_\_ applications.

- a. business
- b. experimental
- c. mission-critical
- d. non-mission-critical

ANS: D                      PTS: 1                      REF: 19

38. A \_\_\_\_ key is a unique key that you create by combining two or more columns.

- a. composite
- b. primary
- c. foreign
- d. secondary

ANS: A                      PTS: 1                      REF: 10

39. \_\_\_\_ data takes up extra storage space.

- a. Inconsistent
- b. Redundant
- c. Overused
- d. Foreign

ANS: B                      PTS: 1                      REF: 8

40. In Oracle, you can use a(n) \_\_\_\_ to automatically generate surrogate keys.

- a. algorithm
- b. generating key
- c. link
- d. sequence

ANS: D                      PTS: 1                      REF: 7

## COMPLETION

1. In a data file describing a student, each characteristic of the student such as first name, last name, telephone number is known as a(n) \_\_\_\_\_.

ANS: field

PTS: 1                      REF: 2



2. In a data file, a(n) \_\_\_\_\_ is a collection of related fields that contain related information.

ANS: record

PTS: 1 REF: 2

3. A(n) \_\_\_\_\_ stores all organizational data in a central location.

ANS: database

PTS: 1 REF: 4

4. In a database, the \_\_\_\_\_ performs all routine data handling operations.

ANS:  
DBMS  
database management system

PTS: 1 REF: 4

5. A(n) \_\_\_\_\_ database stores data in tabular format.

ANS: relational

PTS: 1 REF: 5

6. In a database, a(n) \_\_\_\_\_ is an object about which you want to store data.

ANS: entity

PTS: 1 REF: 5

7. In a relational database, relationships among entities are established through \_\_\_\_\_ fields.

ANS: key

PTS: 1 REF: 5

8. It is best to use \_\_\_\_\_ values for primary keys rather than text values.

ANS:  
number  
numeric

PTS: 1 REF: 6

9. A(n) \_\_\_\_\_ key has no real relationship to the row to which it is assigned, other than to identify the row uniquely.
- ANS: surrogate
- PTS: 1 REF: 7
10. A(n) \_\_\_\_\_ is a sequential list of numbers that the database automatically generates and that guarantee that each primary key value will be unique.
- ANS: sequence
- PTS: 1 REF: 7
11. A(n) \_\_\_\_\_ key is a column in a table that is a primary key in another table.
- ANS: foreign
- PTS: 1 REF: 8
12. In a relational database, relationships are created using \_\_\_\_\_ keys.
- ANS: foreign
- PTS: 1 REF: 8
13. A(n) \_\_\_\_\_ model is designed to help you identify which entities need to be included in the database.
- ANS:  
ER  
Entity-Relationship
- PTS: 1 REF: 11
14. When depicting a one-to-many relationship, the ER model uses a straight line with a(n) \_\_\_\_\_ on the 'many' portion of the relationship.
- ANS: crow's foot
- PTS: 1 REF: 12
15. The shorthand for a many-to-many relationship is \_\_\_\_\_.
- ANS: N:M
- PTS: 1 REF: 12

16. To convert a table to 1NF, \_\_\_\_\_ groups must be removed.

ANS: repeating

PTS: 1 REF: 14

17. A table that is in 1NF and does not have a(n) \_\_\_\_\_ key must be in 2NF.

ANS: composite

PTS: 1 REF: 15-16

18. The normal procedure to follow after converting all tables in the database to 3NF is to double-check each table and make certain that all tables representing entities that have a relationship are linked through the use of \_\_\_\_\_ keys.

ANS: foreign

PTS: 1 REF: 16

19. A(n) \_\_\_\_\_ key is a unique key that you create by combining two or more columns.

ANS: composite

PTS: 1 REF: 10

20. A(n) \_\_\_\_\_ is a program that listens for requests for resources from clients and responds to those requests.

ANS: server process

PTS: 1 REF: 17

21. When the DBMS and the database applications run on the same workstation and appear to the user as a single integrated application this is known as a(n) \_\_\_\_\_ database.

ANS: personal

PTS: 1 REF: 18

22. \_\_\_\_\_ is the dominant personal database on the market today.

ANS:

Microsoft Access

MS Access

Access

PTS: 1 REF: 18

23. In a(n) \_\_\_\_\_ database, the DBMS server process runs on one workstation, and the database applications run on separate client workstations across the network.

ANS: client/server

PTS: 1 REF: 20

24. Oracle 10g is a(n) \_\_\_\_\_ database.

ANS:  
client/server  
relational

PTS: 1 REF: 21

25. The Oracle 10g \_\_\_\_\_ is used for developing database applications.

ANS: Developer Suite

PTS: 1 REF: 22

## ESSAY

1. What is normalization? Why is it performed?

ANS:

Normalization is a step-by-step process used by database designers to determine which data elements should be stored in which tables. The purpose of normalization is to eliminate data redundancy. Beginning with unnormalized data, the designer can complete a series of steps to convert the data to a normalized form. Although there are several normalized forms, most designers are concerned only with first, second, and third normal forms.

PTS: 1 REF: 12-13

2. As a general rule, database developers should use a personal database only for applications that are not mission critical. What are some of the reasons for this?

ANS:

In a personal database system, when a client workstation requests a data file, data within the file is locked and unavailable to other users. If a client workstation fails because of a software malfunction or power failure during a database operation, the data file that is locked remains unavailable to other users, and sometimes becomes damaged. The central database file might be repairable, but all users must quit using the database during the repair process, which could take several hours. Updates, deletions, and insertions taking place at the time of the failure often cannot be reconstructed.

PTS: 1 REF: 19

3. When creating a database and inserting data values, you must specify the data type for each column. What are some data types that are commonly found in databases?

ANS:

Different database management systems have specific names for their data types, but in general, data types include numbers, text strings, date/time values, time interval values, or binary data such as images or sounds. In general, you should use only a number data type for columns that store numerical values that are involved in calculations.

PTS: 1

REF: 23

4. What is a partial dependency and how do you remove it?

ANS:

The basic procedure for identifying a partial dependency is to look at each field that is not part of the composite primary key and make certain you are required to have *both* parts of the composite field to determine the value of the data element and not just one part of the composite field.

To remove partial dependencies from a table, list each part of the composite key, as well as the entire composite key, as separate entries. Then examine the remaining fields, and determine which attribute, or characteristic, is determined by each portion of the composite primary key.

PTS: 1

REF: 14

5. When is a table considered to be in 3NF?

ANS:

A table is considered to be in 3NF if it is in 2NF and does not have any transitive dependencies. A transitive dependency means that a field is dependent on another field within the table that ~~is~~ *is not* the primary key field.

PTS: 1

REF: 16