STUDENT ACTIVITY 6.1.2 KEY: PRACTICE QUIZ

PRACTICE TEST

MTA Course: Database Administration Fundamentals
Topic: Master Summary, Part 2 Key
File name: DBAdminFund_SA_6.1.2_Key

Lesson Objective:

6.1: Master review of the Database Administration Fundamentals review lessons.

Resources, software, and additional files needed for this lesson:

- Copy the test and the answer key to distribute when students leave the room.

Directions to the student:

This is a formal practice test. You will need a pen or pencil.

Content:

Practice Quiz for Database Administration Fundamentals Answer Key

(The answers to some questions will vary, but should resemble the following. Where additional information is required, make up your own reasonable table and column names as needed to answer the questions.)

1. Write a SELECT example with a WHERE condition.

```
SELECT *
FROM Scholarship_info
WHERE aid_awarded > 36000
```

2. What forms of normalization are typically used and why?

   The first three forms are generally considered the best practices.

   The risk of data integrity loss is greater with higher forms (4NF and 5NF).

3. Create a table that will store the students' final grades for this class. You must include a table name and a minimum of four fields. Extra credit—add two more fields that would add value and usefulness to this table.

```
CREATE TABLE student_info (student_id char(9) not null, first_name
char(20) not null, last_name char(20) not null, finalletter_grade
varchar(3) not null)
```

   The final grade data type is `varchar`, so that both letter and number can be stored.
   Possible additional fields could include date of the course (spring 2009) and course name.

4. What data type should be used to hold student names?

   `Char` is acceptable; this data type was shown in review. The best answer is a variable-length character string.

5. What data type should be used for student IDs and why?

   `Char` is acceptable; this data type was shown in review. The best answer is any variable-length character string, though many students will say some integer type.

6. What data type should be used for a student's grade?

   The answer depends on if this is a number or a letter grade, and what type of number, real or whole?

7. Describe the relationship between tables, queries, and views.

   A database manager applies queries on tables and results are displayed in a view. Queries can be run on stored views.

8. How is T-SQL different from graphical designers?

   T-SQL uses a command-line format to work with the database. It is a procedural programming language. Graphical designers such as Microsoft[®] Access[®] are object-oriented and use drag-and-drop methodology.

9. What is the basic difference between a function and a stored procedure?

   Most functions are predefined by the SQL version. A stored procedure is custom-created. (that is, created by a user).

10. What is a subquery?

A query nested inside another query.

11. What is a `JOIN`?

A statement that joins query data from two or more tables, based upon a relationship between certain columns within these tables.

12. Create a view that will find all the male medical students in a database.

```
CREATE VIEW MaleMEDS AS
SELECT student_id, student_name
FROM medical_school_student
Where Gender = "M"
```

13. Why can a foreign key have a `NULL` value but a primary key cannot?

By definition, primary keys must not be `NULL` and foreign keys can be `NULL`.

OR

Data integrity rules of data base require entity integrity and referential integrity.

OR

Primary keys cannot be `NULL` because each row must have a unique key. Foreign keys can be `NULL` because it is acceptable for a row not to be related to another table.

14. What is the difference between a clustered and a non-clustered index?

A clustered index uses more resources and has access to the data pages; a non-clustered index has a standard index of retrieving the pointer value. Both use B-trees, just in different ways.

15. What do we add to our `sp_getclass` stored procedure (listed below) to make it more specific/useful?

```
CREATE PROCEDURE sp_getclass
@campuslocation varchar(30)
AS
SELECT ClassName, ClassSection

FROM Current_term
WHERE campus = @campuslocation
```

```
CREATE PROCEDURE sp_getclass
@campuslocation varchar(30)
AS
SELECT ClassName, ClassSection, Classtimes, Classroom# (add items)

FROM Current_term
WHERE campus = @campuslocation
```

16. What is the command that is used to keep duplicate results in UNION and INTERSECTS?

```
ALL - UNION ALL - INTERSECTS ALL
```

17. What is the difference between AND and OR?

When using an AND, all items must be true to return true.

When using an OR, only one item must be true to return true.

18. Write a SELECT example that arranges student's letter grades in ascending order?

```
SELECT *
FROM table_grades
ORDER BY grades ASC
```

19. What is the purpose of INSERT INTO?

The statement is used to insert a new row in a table.

20. Create a view that will find all students over 62.

```
CREATE VIEW seniors AS
SELECT student_id, student_name
FROM enrolled_students

Where age > 62
```

21. What happens if a column is not specified using the basic INSERT command?

The number of columns and values must be the same. If a column is not specified, the default value for the column is used.

22. What is the fastest restore method and why?

If a major rebuild is needed, a daily full backup is fastest.

If a minor rebuild is needed, a daily differential backup is fastest.

Either answer would be acceptable.

23. What command is used for a subquery with INSERT? Give an example.

```
SELECT -

INSERT INTO "table1" ("column1", "column2", ...)
SELECT "column3", "column4", ...
FROM "table ..
```

24. Define the CASE statement. Give an example.

A CASE statement is a method of using nested if–then-else logic OR "when this is true, then do that" logic.

I could update a student's sports fees by the amount of booster items sold.

If they sold over $1000.00, I would reduce sports fees to $1.

If they sold over \$500.00, I would reduce sports fees for by 60 percent.

If they sold over \$250.00, I would reduce sports fees for by 30 percent.

If they sold over \$100.00, I would reduce sports fees for by 10 percent.

Each item is a line in a **CASE** statement that updates the value of the database field sports fee.

(This is not an exact answer, but rather an answer showing the concept.)

25. What is the relationship between TRANSACTIONS, ROLLBACK, and COMMIT?

These three commands are used as a family/group of commands that work together.

TRANSACTIONS is like a group manager bringing lines together in a block on command.

ROLLBACK is like the security officer that keeps track of all actions in case you have to roll back or turn back the transactions in the group.

COMMIT is like the final OK that the changes can stay.

It is very important that **COMMIT** and **ROLLBACK** work together for the sake of the data's integrity. NOTE: **Begin Tran** starts the block, and **Commit Tran** ends the block.

26. What is the fastest backup method?

Incremental backup

27. Create a view that will find all employees that have first aid training in a database.

```
CREATE VIEW FirstAidList AS
SELECT employess_name
FROM employess_skills

Where firstaid = "Y"
```

28. What is the purpose of the UPDATE statement?

The **UPDATE** statement is used to update existing records in a table.

29. Why is it important to check for errors after every statement?

Data integrity—You need to check after *every line* or you risk corrupting the database.

Example: (2 + 3) + 5 = 10 if and only if all sections are correct.

Example: 2 + 3 = *(4)* + 5 = *9;* this first half is wrong, but the second half is right.

30. What is normalization?

Normalization is the process of organizing data in a database.

31. Why use normalization?

To reduce the amount of storage space that a database uses and ensure that data is logically stored.

32. What is the relationship between keys and data types?

Keys can be any type. However, a key must be of the type defined in the table (*domain integrity*). The key is usually a fixed size.

33. What is a security plan?

A security plan must identify which users can do which action(s) to which data in the database. It involves external and internal methods.

34. What is a foreign key?

A foreign key in one table points to a primary key in another table.

Or

A foreign key is a reference to the primary key in another table. Using this method we relate or reference all the tables together. Foreign keys need <u>not</u> have unique values. We use foreign keys as look-up items for another table.

35. What are inference and SQL injection?

Inference and SQL injection are two common database security risks. SQL injection allows a malicious individual to execute arbitrary Structured Query Language (SQL) code on your server. Inference is when users are able to piece together information at a low security level that should be available only to higher security levels.

36. What is a B-tree?

A B-tree is a balance tree.

Or

A B-tree is a data structure design for quick retrieval of pointers or data.

> **Example of a B-tree:**
>
> **50**
> **32   73**
> **11   42   59   89**

37. How are user accounts and roles different?

User accounts should be used by one user to access the database. Roles grant rights and permissions to groups of users.

38. Why do we use indexes?

To speed up retrieval of data from the database.

Or

So that we do not have to look sequentially through the data in the entire database to find what we need.

39. Describe a situation in which you might have a small-scale version of replicated services.

You might have a backup server that is a stand-alone server that you restore after each backup of the main/active server. This makes the backup server available on a moment's notice and only out-of-date since the last backup.

40. What are the three main types of backups?

- **Full backup—all files are backed up.**
- **Incremental backup—only files that have been changed since the last backup are copied.**
- **Differential backup—only files that have been changed since the last full backup are copied.**