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Shefali Emmanuel True or False (16pt)

1. Foreign keys must be unique. **Ans: FALSE**
2. A single table can contain only one primary key constraint. **Ans: TRUE**
3. A single table can contain only one foreign key constraint. **Ans: FALSE**
4. Primary keys must be unique. **Ans: TRUE**

Would the following PostgreSQL code (question 5 to 11) cause an error? If yes, please explain why (28pt)

5. CREATE TABLE company (code CHAR(5) PRIMARY KEY, city VARCHAR(30), state CHAR(2));
 CREATE TABLE employee (f_name VARCHAR(30), l_name VARCHAR(30), zip_code CHAR(5) REFERENCES company);
 INSERT INTO company VALUES('0035', 'Hattiesburg', 'MS') ;
 INSERT INTO company VALUES('0035', 'Charleston' , 'SC');

Ans: ERROR because 0035 is used 2x which violates that there can only be 1 PK per Table

6. CREATE TABLE cities (code CHAR(5) PRIMARY KEY, city VARCHAR(30), state CHAR(2));
 CREATE TABLE employee (f_name VARCHAR(30), l_name VARCHAR(30), zip_code CHAR(5) REFERENCES cites);
 INSERT INTO employee VALUES('Michael', 'Lewis', '29492') ;

Ans: ERROR because you must first INSERT INTO cities before INSERTING INTO employee

7. CREATE TABLE store (code CHAR(5) PRIMARY KEY, city VARCHAR(30), state CHAR(2));
 CREATE TABLE shopper (f_name VARCHAR(30), l_name VARCHAR(30), zip_code CHAR(5) REFERENCES place);
 INSERT INTO store VALUES('22180', 'Vienna', 'AT');
 INSERT INTO shopper VALUES('Malcolm', 'Lewis', '29492') ;

Ans: ERROR because 22180 and 29492 do not match so they can not be mapped together

8. CREATE TABLE countries (country_code char(2) PRIMARY KEY, country_name TEXT UNIQUE);
 INSERT INTO countries VALUES('ES', 'Netherlands');
 INSERT INTO countries VALUES('AT', 'Netherlands');

Ans: ERROR because Netherlands is used 2x

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9. CREATE TABLE company (name TEXT NOT NULL, employees INT, country_code CHAR(2));
INSERT INTO company VALUES(' ', 9000, 'US'); // " is two single quotations

Ans: NO ERROR

10. CREATE TABLE employee (f_name VARCHAR(30), l_name VARCHAR(30), is_manager CHAR(1) CHECK (is_manager IN ('Y', 'N')));
INSERT INTO employee VALUES('Malcolm', 'Gladwell', 'H');

Ans: ERROR because H IS NOT 'Y' or 'N'

11. CREATE TABLE hotel (name TEXT NOT NULL CHECK (name <> 'DK'), rooms INT, country_code CHAR(2));
INSERT INTO hotel VALUES('DK', 2000, 'AU');

Ans: ERROR because DK is not allowed

12. What's the PostgreSQL command that will delete the database 'data210'.

Ans: DROP DATABASE data210;

13. What's the PostgreSQL command that will change the column 'rooms' to the value 3, for all the rows that have the value 10 for the column 'size' in table 'db3'?

Ans: UPDATE db3 SET rooms = 3 WHERE size = 10;

14. What's the PostgreSQL command that will delete the rows in table 'tips' where the value of the column 'size' is equal to the number 3?

Ans: DELETE FROM tips WHERE size = 3;

15. What's the PostgreSQL command that will delete all the rows in table employee?

Ans: DELETE FROM employee;

16. What's the PostgreSQL command that will delete the table user?

Ans: DROP TABLE user;

17. What's the command that will describe the table 'faculty' in PostgreSQL?

Ans: \d faculty

18. What's the command that will list all the databases in PostgreSQL?

Ans: \list

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19. What's the command that will make the current database 'my_database' in PostgreSQL?

Ans: \connect my_database

Assume the following: (8pt)

SELECT * FROM countries;

code		name
-----	+	-----
FR		France
DE		Germany

SELECT * FROM company;

name		age		salary
-----	+	-----	+	-----
John		28		80000
Grace		26		12000
				0

What's the output of the following commands (question 20 and 21) if there is no error? If there is an error, explain why.

20. SELECT code, age FROM countries CROSS JOIN company;

Ans: CODE | AGE

FR		28
FR		26
DE		28
DE		26

21. SELECT name, age FROM countries CROSS JOIN company;

Ans: ERROR because with name you have to do countries.name
ALSO countries doesn't contain an age column

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22. Given that we have a table 'users' with the following columns: 'f_name', 'l_name', 'city', 'state', and 'zip_code', filled with 400 rows. How many data points would we save if we split our table into two tables 'users' and 'zip_codes', where 'zip_codes' has the columns 'zip_code', 'city', and 'state'. Assume that we have 30 unique zip codes.

Ans:

(user base) * (# of column in 1st) + (# of unique) * (# of column in 2nd)
 $400 * 5 - ((400 * 3) + (30 * 3)) = 710$ data points

Given that we have a table 'instructor' with the following columns: 'f_name' VARCHAR(30), 'l_name' VARCHAR(30), 'department_code' CHAR(3), 'department_name' VARCHAR(30), and 'department_address' VARCHAR(100), filled with 300 rows. We want to split the table into two tables: 'instructors' table and 'department' table to remove the data redundancy.

23. Which table should be created first, instructor or department, why? (2pts)

Ans: department since 'department_code' needs to be a primary key

24. Please write the statement to create the two tables and using foreign key to build up the relationship between the two tables. (6pts)

Ans: `CREATE TABLE department_code(
 code CHAR(3) PRIMARY KEY,
 department_name VARCHAR(30),
 department_address VARCHAR(100));`

`CREATE TABLE instructor(
 f_name VARCHAR(30),
 l_name VARCHAR(30),
 department_code CHAR(3) REFERENCES department);`

25. After to split the original instructor table, which has 300 rows, into the two tables shown above, how many data points would we save? Assume that we have 20 unique department code.

Ans:

(user base) * (# of column in 1st) + (# of unique) * (# of column in 2nd)
 $300 * 5 - ((300 * 3) + (20 * 3)) = 540$ data points