CISC437/637 Database Systems Midterm Exam

You have from 2:00 to 3:15pm to complete the following questions. Use the back of the page if you need more space. Good luck!

Multiple Choice (2 point each; 40 total)

1. In a relational database management system, a rule that ensures that every record in a table is unique is called a ...

   (a) candidate key constraint

   (b) referential integrity constraint

   (c) key constraint

   (d) participation constraint

2. Which of the following is allowed for relations?

   (a) There can be a field with a non-atomic value.

   (b) The columns can be in any order.

   (c) Some of the values of a field can come from a domain that is not the same as the field's domain.

   (d) Two rows may be identical.

3. Which of the following is used in an E-R diagram to represent many-to-many total participation?

   (a) An unweighted arrow from an entity set to an entity set.

   (b) A thick line from an entity set to a relationship set.

   (c) An unweighted arrow from an entity set to a relationship set.

   (d) A thick arrow from an entity set to a relationship set.

   (e) An unweighted line from an entity set to an entity set.

4. "Each case is handled by exactly one lawyer." Which ER diagram best captures this requirement?

   (a)
   

   (b)
   

   (c)
   

   (d)
   

   (e)
   

5. A referential integrity constraint policy that ensures that records with a foreign key are updated when the primary key of the referring record in the reference relation is updated is called a

   (a) incremental delete

   (b) incremental update

(c) cascading delete

(d) cascading update

6. A "candidate key" is:

   (a) any set of fields that determines the values of all other fields

   (b) functionally dependent on non-key attributes

   (c) an attribute or set of attributes that can be the primary key

   (d) the primary key of a relation

7. Which pair of SQL keywords is used to create and delete a table?

   (a) CREATE, DROP

   (b) CREATE, DELETE

   (c) CREATE, ALTER

   (d) INSERT, DROP

   (e) INSERT, DELETE

   (f) INSERT, ALTER

8. Which built-in SQL function computes the number of rows in a table?

   (a) AVG

   (b) MAX

   (c) COUNT

   (d) SUM

   (e) MIN

9. Which pair of SQL keywords is used to create and delete records in a table?

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   (b) CREATE, DELETE

   (c) CREATE, ALTER

   (d) INSERT, DROP

   (e) INSERT, DELETE

   (f) INSERT, ALTER

10. A lossless join decomposition of a relation means

    (a) none of the attributes are lost

    (b) no functional dependencies are lost

    (c) the natural join of the relations in the decomposition produces the original relation

    (d) the relation is the cross-product of the decomposition

    (e) no information of any kind is lost

The next five questions are based on the following tables:

ssn	name	firmName	firmLoc
111-11-1111	Bob Loblaw	Dewey, Cheatham, and Howe	Boston
222-22-2222	Ally McBeal	Payne and Feares	Los Angeles
222-22-3333	Maury Levy	Baker and Launder	Baltimore
333-44-5555	Saul Goodman	Recht and Greef	Albuquerque
555-55-6666	Atticus Finch	Baker and Launder	Baltimore

(a) Lawyers(ssn:string, name:string, firmName:string, firmLoc:string)

firmName	firmLoc	employees
Dewey, Cheatham, and Howe	Boston	72
Dewey, Cheatham, and Howe	San Francisco	95
Payne and Feares	Los Angeles	55
Recht and Greef	Albuquerque	120
Pope and Gentile	Milwaukee	100
Boring and Leach	Los Angeles	66

(b) Firms(firmName:string, firmLoc:string, employees:integer)

11. A natural join between Lawyers and Firms returns concatenated records with which condition?

    (a) Lawyers.firmName = Firms.firmName

    (b) Lawyers.firmLoc = Firms.firmLoc

    (c) Lawyers.firmName = Firms.firmName AND Lawyers.firmLoc = Firms.firmLoc

    (d) Lawyers.firmName = Firms.firmName OR Lawyers.firmLoc = Firms.firmLoc

12. A left outer natural join between Lawyers and Firms will return how many records?

    (a) 3

    (b) 4

    (c) 5

    (d) 6

13. Joining Lawyers to itself on firmLoc will return how many records?

    (a) 5

    (b) 6

    (c) 7

    (d) 8

    (e) 25

14. Which of the following would find the number of employees that work at law firms employing lawyers with names starting with 'B'?

    (a) SELECT F.employees FROM Lawyers L, Firms F
    WHERE L.firmName=F.firmName AND L.firmLoc=F.firmLoc AND L.name='B*';

    (b) SELECT F.employees FROM Lawyers L, Firms F
    WHERE L.firmName=F.firmName AND L.name='B*';

    (c) SELECT F.employees FROM Lawyers L, Firms F
    WHERE L.firmName=F.firmName AND L.firmLoc=F.firmLoc AND L.name LIKE 'B%';