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Final Exam

Started: Jul 6 at 9:33am

Quiz Instructions

Please read the study guide first.

You must complete the exam independently.

Unauthorized copying of the exam is prohibited.

You will get a F in this course if you:

1) Post or release any exam question in any format at any time, no matter it is during the exam or after the exam

2) Post or release your answer of any question in any format at any time, no matter it is during the exam or after the exam

3) Request any exam question from others in any format at any time

4) Request answer of any question in any format at any time

In addition, all cheating cases will be reported to the university.

If the violation is found and verified after your grade is posted, your grade will be changed to F.

For all SQL queries: please use one line for each clause.

For example, there are two lines since there are two clauses in the following query:

SELECT FNAME

FROM EMPLOYEE;

Questions

[Question 1](#)[Question 2](#)[Question 3](#)[Question 4](#)[Question 5](#)[Question 6](#)[Question 7](#)[Question 8](#)

Time Running:

Hide Time

Attempt due: Jul 6 at 10pm

1 Hour, 39 Minutes, 50 Seconds

Question 1

36 pts

Given relation R(a, c, d, e, f, w) where there are two keys: (c, d,e) and (f). Given a set of functional dependencies

F = {fd1: {c, d, e} -> {a, f, w},

fd2: f -> {a, c, d, e, w},

fd3: a -> c},

Which normal form is R in? Explain why. You must answer the question using the normal form definitions we covered in the class. Use any other definitions will get a Zero.

Its in 3rd normal form. Because from 3NF definition we have

A relation schema R is in 3NF if, whenever a non-trivial functional dependency X --> A holds in R, then either.

(1) X is a superkey of R, or

(2) A is a prime attribute of R

both conditions of 3NF satisfied in given relation R and functional dependencies.

p

0 words

Question 2

40 pts

Please answer the question using SQL based on the company schema on your study guide. Retrieve dependents of the employees who work for the "CE" department. "CE" is a department name. In your result, list dependent name and SSN of the employee. Order your result by dependent name in descending order.

select d.DEPENDENT_NAME, e.SSN

from EMPLOYEE as e

join DEPENDENT as d

on e.SSN=d.ESSN

join DEPARTMENT as dp

on DNUMBER=DNO

where DNAME='CE'

order by d.DEPENDENT_NAME desc;

p

0 words | </> ↗ ⋮



Question 3

40 pts

This question is based on the Bank database schema on the study guide. Please use SQL to answer this query. For each account that has a balance of 300 or more, and has more than 3 owners, please list the account number and account balance.

```
select Account.acc_no, balance
from Account
INNER JOIN Owns
On Account.acc_no=Owns.acc_no
where balance >= 300
group by Owns.acc_no
having count(*) > 3;
```

p

0 words | </> ↗ ⋮



Question 4

12 pts

A data file is physically ordered based on key employeeID. The record in the data file consists of employeeID (key), first Name (not unique), last Name (not unique), and zip code (not unique). *The data file is physically ordered based on employeeID.* Suppose it is not allowed to change the structure of the data file.

Statement: it is possible to build a clustering index on zip code.

- ☐ True
- ☒ False

Ans



Question 5

12 pts

We can use master and overflow files to make insertion more efficient on sorted files. When insert, insert to the _____ first, then periodically, do file reorganization.

- ☐ None of the answers
- ☐ master file and overflow at the same time
- ☒ master file
- ☐ overflow file

Ans



Question 6

12 pts

A data file is physically ordered based on key employeeID. The record in the data file consists of employeeID (key), first name (not unique), last name (not unique), and zip code (not unique). *The data file is physically ordered based on employeeID.* Suppose it is not allowed to change the structure of the data file.

Statement: it is possible to build a primary index on employeeID.

- ☒ True
- ☐ False

Ans



Question 7

12 pts

R(a,b,c,d,e,t,g,w), there are two keys: (a,b,c) and d.

Given the following functional dependencies:

{a,b,c} -> {d,e,t,g,w}

{d} -> {a,b,c,e,t,g,w}

{a} -> g

Statement: g is fully functionally dependent on {a,b,c}.

- ☐ True

☒ True

☐ False

Ans



Question 8

12 pts

$R(a,b,c,d,e,t,g,w)$, there are two keys: (a,b,c) and d .

Given the following functional dependencies:

$\{a,b,c\} \rightarrow \{d,e,t,g,w\}$

$\{d\} \rightarrow \{a,b,c,e,t,g,w\}$

$\{a\} \rightarrow g$

Statement: t is fully functionally dependent on $\{a,b,c\}$.

☐ True

☐ False

Ans



Question 9

12 pts

Based on the inference rules, the following statement is _____.

$\{pnumber, plocation\} \rightarrow \{plocation\}$

☐ True

Ans

☐ False



Question 10

12 pts

$R(a,b,c,d,e,t,g,w)$, there are two keys: (a,b,c) and d .

Given the following functional dependencies:

$\{a,b,c\} \rightarrow \{d,e,t,g,w\}$

$\{d\} \rightarrow \{a,b,c,e,t,g,w\}$

$\{a\} \rightarrow g$

Statement: w is fully functionally dependent on $\{a,b,c\}$.

☐ True

Ans

☐ False



Question 11

12 pts

Based on the inference rules, the following statement is _____.

If $\{pnumber\} \rightarrow \{pname\}$, then $\{pnumber, plocation\} \rightarrow \{pname, plocation\}$

☐ True

Ans

☐ False



Question 12

12 pts

Based on the inference rules, the following statement is _____.

if $\{ssn, pnumber\} \rightarrow \text{hours}$, then $ssn \rightarrow \text{hours}$ and $pnumber \rightarrow \text{hours}$

☐ True

Ans

☐ False



Question 13

12 pts

Given two sets of functional dependencies F and G , if F and G contain exactly the same functional dependencies, F and G are equivalent.

☐ True

Ans

☐ False



Question 14

12 pts

_____ statement can remove the definition of a table.

- ☐ alter table
- ☒ drop table **Ans**
- ☐ update
- ☐ delete



Question 15

12 pts

Select the best answer from the given choices:

To add a new attribute (column) to an existing table, use _____ statement

- ☐ None of the answers
- ☐ insert
- ☒ alter table **Ans**
- ☐ update



Question 16

12 pts

Select the best answer from the given choices:

Using the company schema, when creating the "works_on" table, the primary key should be specified as

- ☐ primary key (essn) and primary key(pno)
- ☒ primary key (essn, pno) **Ans**
- ☐ All of the answers are correct
- ☐ primary key (essn), primary key(pno)



Question 17

12 pts

By default, a SQL query returns a bag of tuples.

- ☒ True **Ans**
- ☐ False



Question 18

12 pts

Using the company schema, when creating the "works_on" table, the foreign key should be specified as:

- ☐ foreign key (essn)
- ☐ foreign key (essn, pno) references employee (ssn) and project(pnumber)
- ☐ foreign key (pno)
- ☒ foreign key (essn) references employee(ssn), foreign key (pno) references project(pnumber) **Ans**



Question 19

12 pts

Select the best answer from the given choices:

Which constraint(s) can be specified in a create table statement:

- ☐ Domain constraint
- ☐ Key constraint
- ☐ Entity integrity constraint
- ☒ All of the answers **Ans**



Question 20

12 pts

Assume that alter table statements will NOT be used in this question. Using the company schema, in

order to create tables with all constraints, the dependent table must be created before the employee table.

☐ True

☐ False

Ans

Quiz saved at 9:33am

Submit Quiz