Tests & Quizzes

final

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- For

Part 1 of 13 - 42.0 Points

Question 1 of 61
In the following query: 1.0 Points

```
SELECT R.a,R.b
from R, S
where R.c=S.c using (c)
```

- A. c must be a foreign key referencing R
- B. c must be a foreign key referencing S
- C. c must be a foreign key of either R or S
- D. c is a common field of R and S but does not have to be a foreign key

Question 2 of 61
A foreign key must reference 1.0 Points

- A. just one field of another table, even if it is not the complete primary key
- B. all the primary key fields of another table
- C. any field combination of another table
- D. some of the primary key fields of another table

Question 3 of 61
If R=ABCD and K={AC, BD} is the set of candidate keys, then the strongest normal form that R is in is at least: 1.0 Points

- A. BCNF
- B. 2NF
- C. 3NF
- D. 1NF

Question 4 of 61
The following normal form preserves all functional dependencies 1.0 Points

- A. 3NF
- B. 4NF
- C. BCNF
- D. 2NF

Question 5 of 61
The following table is in BCNF 1.0 Points

- A. R=XYZ
- B. R=ABCD
- C. Not known since we don't know the set of functional dependencies
- D. R=AB

Question 6 of 61
The moment that S-locks are released will determine 1.0 Points

- A. The compliance with ACID
- B. The look-ahead logging strategy
- C. The granularity of locks
- D. The anomalies that can happen

Question 7 of 61
If {A} is the only candidate key of R(A,B,C,D) then R must be in 1.0 Points

- A. 2NF
- B. 3NF
- C. 4NF
- D. BCNF

Question 8 of 61
If a Xact is partially executed, then the following property is not satisfied 1.0 Points

- A. Completeness
- B. Durability
- C. Independence
- D. Atomicity

Question 9 of 61
"Concurrent transactions must not interact" is 1.0 Points

- A. Isolation
- B. Durability
- C. Atomicity
- D. Independence

Question 10 of 61
A relational schema 1.0 Points

- A. can be different for different tuples
- B. is the same for every tuple in a relation
- C. includes functional dependencies
- D. must be lossless

Question 11 of 61
The strongest normal form that (R,Ø) is in is: 1.0 Points

- A. BCNF
- B. 1NF
- C. 3NF
- D. 2NF

Question 12 of 61
The following are enforced by the DBMS 1.0 Points

- A. Isolation and Consistency
- B. Consistency and Atomicity
- C. Durability and Atomicity

Question 13 of 61
To avoid a deadlock 1.0 Points

- A. WAL is used
- B. A graph can be used
- C. A log is used
- D. Isolation must be enforced

Question 14 of 61
A serial schedule 1.0 Points

- A. Needs the current Xact to finish before another one starts
- B. Can have a dirty read anomaly
- C. Is always sorted sequentially in ascending order by transaction ID
- D. Is just theoretical and cannot be implemented in real life

Question 15 of 61
The moment that X-locks are released will determine 1.0 Points

- A. X-locks are always released during commit time
- B. The anomalies present
- C. The granularity of locks
- D. The compliance with ACID

Question 16 of 61
The following normal form eliminates all anomalies 1.0 Points

- A. BCNF
- B. 2NF
- C. 3NF
- D. 1NF

Question 17 of 61
The following is a consequence of the "Principles of table design" 1.0 Points

- A. Lossless decomposition
- B. Merge rule
- C. The relational model
- D. Conceptual design

Question 18 of 61
Normalization is part of 1.0 Points

- A. The Logical Design
- B. The Application Program Design
- C. The Conceptual Design
- D. The Physical Design

Question 19 of 61
In semi-structured databases 1.0 Points

- A. the schema is part of each document
- B. there is no schema
- C. the schema is provided together with each document
- D. the schema is given as part of the collection

Question 20 of 61
`SELECT * FROM A,B;` 1.0 Points
computes

- A. The union
- B. The set difference
- C. A full join
- D. The cartesian product

Question 21 of 61
Relational algebra 1.0 Points

- A. Is declarative
- B. Is object oriented

- C. Is procedural
- D. Is functional

Question 22 of 61
The difference between data and information is: 1.0 Points

- A. hard to establish
- B. there is no difference
- C. functional

Question 23 of 61
SQL 1.0 Points

- A. Is better than NoSQL
- B. Is portable among different implementations
- C. Is object oriented
- D. Is based on relational algebra

Question 24 of 61
The strongest normal form that R=AB is in is: 1.0 Points

- A. Not known since we don't know the set of functional dependencies
- B. 2NF
- C. 3NF
- D. BCNF

Question 25 of 61
Phantom Read Anomaly is avoided 1.0 Points

- A. by the ”serializable” isolation level
- B. by the ”unrepeatable read” isolation level
- C. by the ”read committed” isolation level
- D. by the ”repeatable read” isolation level

Question 26 of 61
Every candidate key 1.0 Points

- A. is the primary key
- B. is a superkey
- C. must be a singleton
- D. is a subset of F^+

Question 27 of 61
`SELECT R.a,R.b from R join S using c` assumes that 1.0 Points

- A. c is a field of S but not R
- B. c is a field of R and S
- C. c is a filed of R but not of S
- D. c is not a commond field

Question 28 of 61
Decompositions using functional dependencies 1.0 Points

- A. Are in 2NF
- B. Are lossless
- C. Are in 3NF
- D. Are in BCNF

Question 29 of 61
Minimal cover is unique 1.0 Points

- True
- False

Question 30 of 61
If during the execution of a transaction, the database enters an inconsistent state then 1.0 Points

- A. the DBMS will ignore it
- B. the offending transaction will be aborted
- C. the offending transaction will not satisfy the Isolation property.
- D. the offending transaction will be rolled back

Question 31 of 61
If R=ABCDE and F=Ø, then 1.0 Points

- A. There are no candidate keys
- B. R is a candidate key
- C. No candidate key can be a primary key
- D. All candidate keys are singletons

Question 32 of 61
If a minimal cover has 8 fds, any set of 10 fds cannot be a minimal cover 1.0 Points

- True
- False

Question 33 of 61
If F is the set of given FDs 1.0 Points

- A. F^+ is a functional dependency
- B. $F \rightarrow F^+$ is a trivial dependency
- C. F^+ is a superkey
- D. F is a subset of F^+

Question 34 of 61
Merge rule 1.0 Points

- A. Is always applied when tables have data.
- B. Is used to reduce anomalies
- C. Is applied before the tables are instantiated.
- D. Can only be applied when the relationship is many to many

Question 35 of 61
The property XY→Z then X→Z and Y→Z 1.0 Points

- A. Is called the “divide” rule
- B. Is one of Armstrong’s axioms

- C. Is not always true
- D. Is called the “combine” rule

Question 36 of 61
Relationships in an ER diagram: 1.0 Points

- A. must always have exactly two foreign keys
- B. cannot have a primary key
- C. must always have exactly one foreign key
- D. sometimes have their own primary key

Question 37 of 61
In a lossy decomposition R=ST 1.0 Points

- A. Not all functional dependencies are preserved by both tables.
- B. There might be extra tuples in the join tables that were not in the original table
- C. There are never extra tuples in the join tables that were not in the original table
- D. There are always a less tuples in the join tables than the original table

Question 38 of 61
Dirty Read Anomaly is avoided 1.0 Points

- A. by releasing the X-lock before commit
- B. by locking indices
- C. by releasing the X-lock immediately after reading
- D. by releasing the S-lock immediately after reading

Question 39 of 61
If the application programmer is not careful, the application could violate the following properties: 1.0 Points

- A. Consistency and Atomicity
- B. Durability and Atomicity
- C. Isolation and Consistency

Question 40 of 61
A transaction 1.0 Points

- A. Is made up of reads and writes
- B. Can be partially executed if aborted
- C. Must maintain internal consistency at all times
- D. Can communicate with other transactions

Question 41 of 61
An instance of a relation 1.0 Points

- A. is static
- B. is dynamic
- C. is serializable
- D. is never empty

Question 42 of 61
If all attributes of R are prime then 1.0 Points

- A. R cannot be factored
- B. R is in BCNF
- C. R is in 3NF
- D. R has no common keys

Part 2 of 13 - 2.0 Points

Question 43 of 61
Given R=ABCD 2.0 Points
and F = {AB→C, C→D, D→A}

Which of the following is a BCNF violation?

- A.
  C→B
- B.
  ABC→D
- C.
  C→AD

- ◯ **D.**
  AB→CD

Part 3 of 13 - 2.0 Points

Question 44 of 61
Given R={A,B,C,D} 2.0 Points
and F={D→C, CB→A, DA→B, DB→A, CA→D}
When computing a minimal cover, if you process the functional dependencies in order, which is the first one that is found to be redundant?

- ◯ **A.** D→C
- ◯ **B.** DB→A
- ◯ **C.** CA→D
- ◯ **D.** CB→A
- ◯ **E.** DA→B

Part 4 of 13 - 2.0 Points

Question 45 of 61
Given R=ABCDEFG 2.0 Points
and F = {GC→B, B→G, CB→A, GBA→C, A→DE, CD→B,BE→CA, BD→GE}

The following is a minimal cover:

- ◯ **A.**
  GC→B, B→G, CB→A, A→DE, CD→B, BE→C, BD→E
- ◯ **B.**
  (GCF, CBF, BAF, BDF, BFE)
- ◯ **C.**
  GC→B, CB→A, A→DE, CD→B, BD→E
- ◯ **D.**
  GCF→BADE

Part 5 of 13 - 2.0 Points

Question 46 of 61
Given R=ABCDEFG 2.0 Points
and F = {GC→B, B→G, CB→A, GBA→C, A→DE, CD→B,BE→CA, BD→GE}

Which attribute can be removed from the left hand side of a functional dependency?

- A. B
- B. D
- C. A
- D. C
- E. G

Part 6 of 13 - 2.0 Points

Question 47 of 61
Given R(A,B,C,D,E) and E→AB, A→B, C→D. 2.0 Points
Which of the following is a correct 3NF decomposition of R?

- A. EA, BC, CD, ED
- B. EAB, EC, CD
- C. EAB, AB, CD
- D. EA, AB, CD, EC

Part 7 of 13 - 2.0 Points

Question 48 of 61
Given R=ABCDEFG 2.0 Points
and F = {GC→B, B→G, CB→A, GBA→C, A→DE, CD→B,BE→CA, BD→GE}
The following is a candidate key:

- A. CAD
- B. CBF
- C. GCB
- D. CB

- E.
  ADF

Part 8 of 13 - 2.0 Points

Question 49 of 61
Given R=ABCDEFG 2.0 Points
and F = {GC→B, B→G, CB→A, GBA→C, A→DE, CD→B,BE→CA, BD→GE}

The following is redundant:

- A.
  BD→E
- B.
  BA→C
- C.
  CB→A
- D.
  A→E

Part 9 of 13 - 16.0 Points

Question 50 of 61
Suppose that relations R and S have n tuples and m tuples respectively. What is the **maximum** number of tuples that the results of the following expression can have? 4.0 Points

$\pi_L(R) - S$, for some list of attributes L

- A. 0
- B. m
- C. n+m
- D. n
- E. max{n,m}
- F. n*m
- G. n-m
- H. min{n,m}

Question 51 of 61

Suppose that relations R and S have n tuples and m tuples respectively. What is the **maximum** number of tuples that the results of the following expression can have? 4.0 Points

$R \cup S$

- A. n+m
- B. n
- C. max{n,m}
- D. n-m
- E. min{n,m}
- F. m
- G. 0
- H. n*m

Question 52 of 61

Suppose that relations R and S have n tuples and m tuples respectively. What is the **minimum** number of tuples that the results of the following expression can have? 4.0 Points

$R \bowtie S$

- A. 0
- B. n*m
- C. n-m
- D. n+m
- E. n
- F. min{n,m}
- G. max{n,m}
- H. m

Question 53 of 61

Suppose that relations R and S have n tuples and m tuples respectively. What is the **maximum** number of tuples that the results of the following expression can have? 4.0 Points

$R \bowtie S$

- A. n+m
- B. n-m

- C. n
- D. n*m
- E. 0
- F. min{n,m}
- G. max{n,m}
- H. m

Part 10 of 13 - 2.0 Points

Question 54 of 61

Given *R=(x,y,z), S=(u,v,w,t)* The following is a valid Relational Algebra expression: 2.0 Points

- A. $\Pi_x(R \bowtie S)$
- B. $\Pi_{x,w}(R \cup S)$
- C. $\Pi_x(R \times S)$
- D. $\sigma_{R.x=S.u}(R \bowtie S)$

Part 11 of 13 - 6.0 Points

Question 55 of 61

Given the following database: 6.0 Points

```
PC(maker,model,price)
Laptop(maker,model,price)
Printer(maker,model,ppm,price)
```

Which of the following relational algebra expressions returns the model and price of all products (of any type) made by HP?

- A. $\Pi_{\text{price,mode}}(\sigma_{\text{maker='HP'}}(\Pi_{\text{maker,model,price}}(\text{Printer}) \bowtie \text{PC})) \bowtie \Pi_{\text{model,price}}(Laptop)$

- B. $\Pi_{\text{maker,model,price}}(\sigma_{\text{maker='HP'}}(\text{PC} \cup \text{Laptop}) \cup \Pi_{\text{maker,model,price}}(\text{Printer}))$
- C. $\Pi_{model,price}(\sigma_{\text{maker='HP'}}(\text{PC} \cup \Pi_{\text{maker,model,price}}(\text{Printer}) \cup \text{Laptop}))$
- D. $\Pi_{\text{model,price}}(\sigma_{\text{maker='HP'}}(\text{PC} \bowtie \text{Laptop} \bowtie \text{Printer}))$

Part 12 of 13 - 8.0 Points

Question 56 of 61
Given: 4.0 Points

```
T1: R(A)W(A-50)R(B)W(B+50)
T2: R(A)W(A*1.1)R(B)W(B*1.1)
```

Which of the following pairs of schedules are equivalent?

- A.
  S1:
  ```
  T1: R(A)W(A-50)                          R(B)W(B+50)
  T2:            R(A)W(A*1.1)R(B)W(B*1.1)
  ```
  S2:
  ```
  T1:             R(A)W(A-50)R(B)W(B+50)
  T2: R(A)W(A*1.1)                        R(B)W(B*1.1)
  ```
- B.
  S1:
  ```
  T1:R(A)W(A-50)R(B)W(B+50)
  T2:                      R(A)W(A*1.1)R(B)W(B*1.1)
  ```
  S2:
  ```
  T1:                        R(A)W(A-50)R(B)W(B+50)
  T2:R(A)W(A*1.1)R(B)W(B*1.1)
  ```
- C.
  S1:
  ```
  T1: R(A)W(A-50)             R(B)W(B+50)
  T2:            R(A)W(A*1.1)             R(B)W(B*1.1)
  ```
  S2:
  ```
  T1:             R(A)W(A-50)             R(B)W(B+50)
  T2: R(A)W(A*1.1)            R(B)W(B*1.1)
  ```
- D.
  S1:

```
T1: R(A)      W(A-50)          R(B)       W(B+50)
T2:      R(A)         W(A*1.1)       R(B)          W(B*1.1)
```

S2:

```
T1:       R(A)         W(A-50)       R(B)          W(B+50)
T2: R(A)      W(A*1.1)         R(B)      W(B*1.1)
```

- ◯ **E.** none

Question 57 of 61
Which of the following is not a correct schedule? 4.0 Points

- ◯ **A.**

```
T1: R(A)W(A)               R(B)W(B)       R(B)W(C)
T2:          R(A) W(A+10)           R(B)
```

- ◯ **B.**

```
T1:                    R(A)W(A) R(B)W(B) R(B)W(C)
T2: R(A) W(A+10) R(B)
```

- ◯ **C.**

```
T1:      R(A) W(A)         R(B)       W(B)R(B)W(C)
T2: R(A)           W(A+10)       R(B)
```

- ◯ **D.**

```
T1: R(A)W(A)          R(B)W(B)       R(B)W(C)
T2: R(A)     W(A+10)           R(B)
```

Part 13 of 13 - 12.0 Points

Question 58 of 61
Given R(A, B, C, D, E) and D→BE, C→D, AB→C 3.0 Points
Which attribute is not prime?

- ◯ **A.** A
- ◯ **B.** D
- ◯ **C.** B
- ◯ **D.** C
- ◯ **E.** E

Question 59 of 61

3.0 Points

Given R(A, B, C, D, E) and D→BE, C→D, AB→C
The following fd is not in F^+

- A. ACE → BD
- B. CDE → B
- C. ABE → CD
- D. BCD → E
- E. DE → C

Question 60 of 61
Given R(A, B, C, D, E) and D→BE, C→D, AB→C 3.0 Points
The following fd is a 3NF violation

- A. AD → B
- B. D → E
- C. AB → E
- D. ABD → CE
- E. C → B

Question 61 of 61
Given R(A, B, C, D, E) and D→BE, C→D, AB→C 3.0 Points
The closure of C is

- A. CBDE
- B. CB
- C. BDE
- D. C
- E. ABCD

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