

# Quiz 5

Deadline	Wednesday, 27 November 2019 at 11:59PM
Latest Submission	Monday, 25 November 2019 at 4:51PM
Raw Mark	3.00/4.00 (75.00%)
Late Penalty	N/A
Final Mark	3.00/4.00 (75.00%)

## Question 1 (1 mark)

Which of the functional dependencies below can you infer do **not** hold for the following table:

A	B	C	D
1	x	a	9
2	y	b	9
3	x	b	9
4	y	a	9

(a) <input type="checkbox"/>	$A \rightarrow B$
(b) <input checked="" type="checkbox"/>	$B \rightarrow C$
(c) <input type="checkbox"/>	$C \rightarrow D$
(d) <input type="checkbox"/>	$B \rightarrow D$

✓ Your response was correct.

Mark: 1.00

$A \rightarrow B$  clearly does hold, since A is unique.

$C \rightarrow D$  and  $B \rightarrow D$  because D has only one value.

$B \rightarrow C$  does not hold because e.g. we have a B value of x associated with two different C values (a,b)

## Question 2 (1 mark)

Consider the attributes  $ABCDEF$  and functional dependencies on those attributes:  $A \rightarrow B$ ,  $C \rightarrow DE$ ,  $B \rightarrow F$

Which of the following represents a **BCNF** decomposition of  $ABCDEF$ ?

(a) <input type="radio"/>	AB, BCD, DEF
(b) <input type="radio"/>	ABC, DEF
(c) <input type="radio"/>	AB, CDE, BF
(d) <input type="radio"/>	AB, CDE, ACF
(e) <input checked="" type="radio"/>	None of the above is BCNF

✘ Your response was incorrect.

The correct response was: (d)

Mark: 0.00

A lot of people gave AB, CDE, BF as the answer. This is not correct because, it looks more like a 3NF decomposition method was used, and (b) it's lossy (you can put ABF back together using a join, but you can then connect CDE using a join)

An answer based on using the BCNF decomposition algorithm from lectures is AB, CDE, ACF

### Question 3 (1 mark)

Lock-based concurrency control reduces potential concurrency in exchange for safety.

Two other potential disadvantages of lock-based concurrency control schemes are

- dead-lock
- starvation

✔ Your response was correct.

Mark: 0.50 + 0.50 = 1.00

I was looking for **deadlock** and **starvation** .

The answer allowed for a few variations on the spelling.

Note: just fixed a bug in the spelling of one of the answers, which may have resulted in some people being marked as incorrect when they were actually correct. Any resulting mark changes will be updated in **sturec** overnight.

### Question 4 (1 mark)

Consider the following two transactions:

T1: R(X) W(X) R(Y) W(Y)  
T2: R(X) W(X) R(Y) W(Y)

Which of the following concurrent schedules for T1 and T2 are view serializable?

(a) <input checked="" type="checkbox"/>	<p>T1: R(X) W(X) R(Y) W(Y) T2: R(X) W(X) R(Y) W(Y)</p>
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(b) <input type="checkbox"/>	<pre> T1: R(X)      W(X)      R(Y)      W(Y) T2:      R(X)      W(X)      R(Y)      W(Y) </pre>
(c) <input checked="" type="checkbox"/>	<pre> T1: R(X) W(X) R(Y) W(Y) T2:                R(X) W(X) R(Y) W(Y) </pre>
(d) <input type="checkbox"/>	<pre> T1:      R(X)      W(X)      R(Y)      W(Y) T2: R(X)      W(X)      R(Y)      W(Y) </pre>

✓ Your response was correct.

Mark:  $\max(0.50 + 0.50, 0) = 1.00$

The first answer is correct. It interleaves the whole usage of variables.

Answer (c) is also correct. A serial schedule is trivially serializable.