

**0/8** Questions Answered

# Vitamin 9

**STUDENT NAME****Q1**

5 Points

**Q1.1 Setup**

1 Point

A crash occurs and the database goes down. When it comes back up this is what the log looks like:

LSN	Xact	page	type
10	T1	C	Update
20	T3	B	Update
30			Begin Checkpoint
40	T4	D	Update

50	T2	B	Update
<hr/>			
60			End Checkpoint
<hr/>			
70	T5	A	Update
<hr/>			
80	T1		Commit
<hr/>			
90	T1		End
<hr/>			
100	T3		Abort
<hr/>			

What transactions are in the Transaction table at the beginning of the checkpoint (assume it was empty before LSN 10)?

☐ T1☐ T2☐ T3☐ T4☐ T5

What pages were in the DPT before the checkpoint (assume it was empty before LSN 10)?

☐ A☐ B☐ C

☐ DSave Answer

### Q1.2 Analysis (Part 1)

1 Point

At the end of the Analysis phase which transactions are in the transaction table (assume the xact table and DPT table from the checkpoint are empty)?

☐ T1☐ T2☐ T3☐ T4☐ T5Save Answer

### Q1.3 Analysis (Part 2)

1 Point

What is the lastLSN of T1?

☐ 10☐ 20☐ 30☐ 40

- ☒ 40
- ☐ 50
- ☐ 60
- ☐ T1 is not in the Transaction Table

What is the lastLSN of T2?

- ☐ 10
- ☐ 20
- ☐ 30
- ☐ 40
- ☐ 50
- ☐ 60
- ☐ T2 is not in the Transaction Table

What is the lastLSN of T3?

- ☐ 10
- ☐ 20
- ☐ 30
- ☐ 40
- ☐ 50
- ☐ 60
- ☐ 70
- ☐ 80
- ☐ 90
- ☐ 100
- ☐ T3 is not in the Transaction Table

What is the lastLSN of T4?

- ☐ 10
- ☐ 20
- ☐ 30
- ☐ 40
- ☐ 50
- ☐ 60
- ☐ 70
- ☐ 80
- ☐ 90
- ☐ 100
- ☐ T4 is not in the Transaction Table

What is the lastLSN of T5?

- ☐ 10
- ☐ 20
- ☐ 30
- ☐ 40
- ☐ 50
- ☐ 60
- ☐ 70
- ☐ 80
- ☐ 90
- ☐ 100
- ☐ T5 is not in the Transaction Table

Save Answer

**Q1.4 Analysis (Part 3)**

1 Point

Given that pages A, B, C, and D exist, which pages are in the DPT?

☐ A☐ B☐ C☐ D

What is the recLSN of A?

☐ 10☐ 20☐ 30☐ 40☐ 50☐ 60☐ 70☐ A is not in the DPT

What is the recLSN of B?

☐ 10☐ 20☐ 30☐ 40

- ☐ 50
- ☐ 60
- ☐ B is not in the DPT

What is the recLSN of C?

- ☐ 10
- ☐ 20
- ☐ 30
- ☐ 40
- ☐ 50
- ☐ 60
- ☐ C is not in the DPT

What is the recLSN of D?

- ☐ 10
- ☐ 20
- ☐ 30
- ☐ 40
- ☐ 50
- ☐ 60
- ☐ D is not in the DPT

Save Answer

**Q1.5** Redo

1 Point

Assume the following table lives in the database.

Page	pageLSN
A	0
B	20
C	10
D	0

Using the DBMS table above consider the following redo operations.

Will the update to C that occurs at LSN 10 be redone?

- ☐ Yes
- ☐ No

Will the update to B that occurs at LSN 20 be redone?

- ☐ Yes
- ☐ No

Will the update to D that occurs at LSN 40 be redone?

- ☐ Yes
- ☐ No

Will the update to B that occurs at LSN 50 be redone?

- ☐ Yes



☒ Yes☐ No

Will the update to A that occurs at LSN 70 be redone?

☐ Yes☐ NoSave Answer

## Q2

1 Point

Consider the following log. If the flushedLSN is 50, under WAL, which of the following scenario(s) are possible?

LSN	Record	prevLSN
10	UPDATE: T1 writes P1	null
20	UPDATE: T2 writes P2	null
30	Begin Checkpoint	-
40	End Checkpoint	-
50	UPDATE: T2 writes P2	20
60	UPDATE: T1 writes P3	10

☐ A. No dirty pages have been flushed to disk.

☐ B. The page updated at LSN 50 has been flushed to disk but the page updated at LSN 10 has not.

☐ C. The page updated at LSN 50 has been flushed to disk but the page updated at LSN 20 has not.

☐ D. All dirty pages have been flushed to disk.

Save Answer

### Q3 Potpourri

2 Points

#### Q3.1

1 Point

1. A property of transactions is \_\_\_\_, which refers to the idea that we will never lose the result of a committed transaction.
  - ☐ Atomicity
  - ☐ Consistency
  - ☐ Isolation
  - ☐ Durability
2. The idea that pages cannot be evicted from memory (and thus written to disk) until the transaction commits refers to the \_\_\_\_ policy.
  - ☐ Steal
  - ☐ No-Steal

3. In the forward processing portion of ARIES recovery (as covered in this course), we choose to use the \_\_\_\_ policy, which allows us to avoid immediately flushing dirty pages to disk upon commit.

- ☐ Force
- ☐ No-Force

Save Answer

### Q3.2

1 Point

4. Log records must be written to disk when a transaction  $t$  commits. The inequality that must be true in order to achieve this is:  $\text{lastLSN}(t)$  \_\_\_\_  $\text{flushedLSN}$ .

- ☐ >
- ☐ >=
- ☐ <
- ☐ <=

5. Log records must be on disk before data page  $i$  gets written to disk. The inequality that must be true in order to achieve this is:  $\text{pageLSN}(i)$  \_\_\_\_  $\text{flushedLSN}$ .

- ☐ >
- ☐ >=
- ☐ <
- ☐ <=

Save Answer

Save All Answers

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