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DB HW4



**B1**

- (a) false
- (b) true
- (c) false

**B2**

(a) R1(X), W2(X), W2(Y), W3(Y), W1(Y), C1, C2, C3

T1	R(X)		W(Y) C1
T2		W(X) W(Y)	C2
T3		W(Y)	C3

Steps

T3 X lock on y

T3 commits

T2 being blocked

T1 S lock on X

T1 X lock on Y

T1 commits

T2 X lock on X, X lock on Y

No Deadlock

(b) R1(X), W2(Y), W2(X), W3(Y), W1(Y), C1, C2, C3

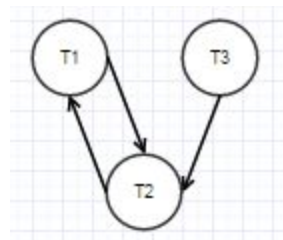
T1	R(X)		W(Y) C1
T2		W(Y) W(X)	C2
T3		W(Y)	C3

Step:

T1 S lock on X

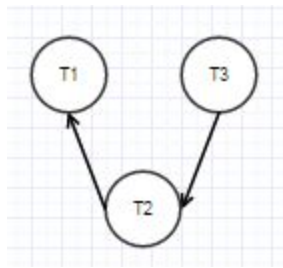
T2 X lock on Y

T3 block and wait Y  
deadlock

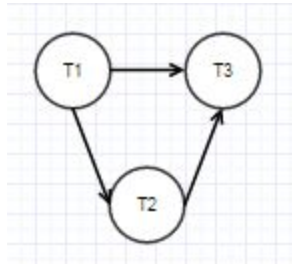


**B3**

(a) T3T2T1

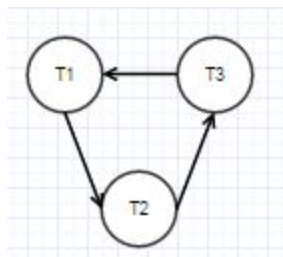


(b) T1T2T3



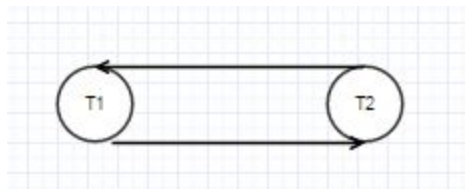
(c)

no

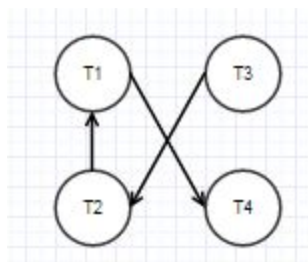


(d)

no



(e) T4T1T2T3



**B4**

T1:W(A),W(B),C

T2:R(A).R(B),C

that is a conflict serializable schedule. While it is inconsistent with 2PL

**C1**

a false

b true

c true

d false

**C2**

(a)

LSN	LOG
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00	Update T1 writes P2
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10	Update T1 writes P1
----	---------------------

20	Update T2 writes P5
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30	Update T3 writes P3
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40	T3 commit
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50	Update T2 writes P5
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60	Update T2 writes P3
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70	T2 abort
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(b)

Avort at LSN 70, and previous LSN is 60. SO first undone LSN 6, and then read prevLSN 50, then undone LSN50. Then read previous LSN value 20, undone LSN20, then there is no more prove LSN on LSN20. So Undo is done. T2 ends.

(c)

LSN	LOG	prvLSN
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00	Update T1 writes P2	
----	---------------------	--

10	Update T1 writes P1	00
----	---------------------	----

20	Update T2 writes P5	
----	---------------------	--

30	Update T3 writes P3	
----	---------------------	--

40	T3 commit	30
----	-----------	----

50	Update T2 writes P5	20
----	---------------------	----

60	Update T2 writes P3	50
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70	T2 abort	60
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80	CLR undo T2 LSN 60	50
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90	CLR undo T2 LSN 50	20
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100	CLR undo T2 LSN 20, T2 end	
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**C3**

(a)

transaction table

transaction ID	Status	LastLSN
T1	IN progress	40
T2	Aborted	110

Dirty Page Table

pageIDRecLSN

P1	40
P2	30
P3	60
P5	50

(b)

as same as part a

(c)

LSN	LOG	
120	UNDO T2 LSN 110	
130	UNDO T2 LSN 90	
140	UNDO T2 LSN 80	
150	UNDO T2 LSN 50	T2 ends
160	UNDO T1 LSN 40	
170	UNDO T1 LSN 30	T1 ends