X

Week 7 : Assignment 7

Your last recorded submission was on 2025-03-09, 18:59 IST Due date: 2025-03-12, 23:59 IST.

1) *1 point*

Consider the following `lock compatibility matrix` where S denotes a `shared lock` and X denotes an `exclusive lock`:

	S	X
S	True	False
X	False	False

Which of the following statements about lock compatibility is (are) correct?

a) A transaction holding an `S lock` on a data item allows other transactions to acquire an `S lock` but not an `X lock` on the same data item.

b) A transaction holding an `S lock` on a data item allows other transactions to acquire an `X lock` on the same data item.

c) A transaction holding an `X lock` on a data item allows other transactions to acquire another `X lock` on the same data item.

d) A transaction holding an `X lock` on a data item prevents other transactions from acquiring an `S lock` on the same data item.

- [x] a
- [ ] b
- [ ] c
- [x] d

2) *1 point*

Consider the following schedule S involving five transactions T_1, T_2, T_3, T_4, and T_5:

T_1	T_2	T_3	T_4	T_5
	W(X)			
R(X)				
W(Y)				
		W(X)		
	R(Z)			
			W(Y)	
				R(X)
				W(Z)

R(X) denotes read operation on data item X by transaction T_i.
W(X) denotes write operation on data item X by transaction T_i.
Choose the correct option for the above transaction schedule.

a) The schedule is neither conflict serializable nor view serializable.

b) The schedule is both conflict serializable and view serializable.

c) The schedule is only view serializable.

d) The schedule is only conflict serializable.

- ○ a
- ○ b
- ◉ c
- ○ d

3) ***1 point***

Consider the following schedule S involving five transactions T_1, T_2, T_3, T_4 and T_5:

T_1	T_2	T_3	T_4	T_5
R(Z)				
R(X)				
		R(Y)		
	W(X)			
		W(X)		
			W(Z)	
				W(Z)

R(X) denotes read operation on data item X by transaction T_i.
W(X) denotes write operation on data item X by transaction T_i.
Identify the incorrect option(s) regarding the order of execution of all transactions in the above schedule S.

a) T1→T4→T5→T2→T3

b) T1→T2→T3→T4→T5

c) T1→T2→T4→T5→T3

d) T1→T4→T3→T5→T2

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Week 8 ()

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- a
- b
- c
- d

4) ***1 point***

Consider the following `schedule S` involving five transactions T_1, T_2, T_3, T_4 and T_5:

T_1	T_2	T_3	T_4	T_5
R(Z)				
	R(X)			
	W(X)			
		R(X)		
			R(Z)	
		W(X)		
			W(Z)	
W(Y)				
				W(Z)
	W(Y)			
				W(Y)

`R(X)` denotes read operation on data item `X` by `transaction` T_i.
`W(X)` denotes write operation on data item `X` by `transaction` T_i.
Identify the possible number of `conflict serializable` schedules of the above `schedule S`.

a) 1

b) 2

c) 3

d) 5

- a
- b
- c
- d

5) ***1 point***

Consider the following `schedule S` of transactions T_1 and T_2.
The read operation on data item `A` is denoted by `read(A)` and the write operation on data item `A` is denoted by `write(A)`.

T_1	T_2
read(A)	
A:=A-500	
	read(C)
write(A)	
read(B)	
	temp:=C*0.5
	C:=C-temp
B:=B+500	
	write(C)
write(B)	
	read(B)
	B:=B+temp
	write(B)

Which of the following is `TRUE` about the `schedule S`?

a) S is serializable both as T_1, T_2 and T_2, T_1.

b) S is not serializable neither as T_1, T_2 nor T_2, T_1.

c) S is serializable only as T_1, T_2.

d) S is serializable only as T_2, T_1.

- ○ a
- ○ b
- ◉ c
- ○ d

6) ***1 point***

Consider the following `schedule S`.

T1	T2	T3
		R(Y)
	W(Y)	
R(Y)		
		W(Y)
W(Y)		

`R(Y)` denotes read operation on data item Y by Transaction T_i.
`W(Y)` denotes write operation on data item Y by Transaction T_i.
Identify the possible number of `view serializable` schedule of the above schedule S.

a) 1

b) 2

c) 4

d) 6

- ○ a
- ○ b
- ◉ c
- ○ d

7) **1 point**

Consider two transactions given below where `lock-X(A)` denotes T_i has obtained an `Exclusive-mode` lock on item A and `lock-S(A)` denotes T_i has obtained a `Shared-mode` lock on item A.

T_1	T_2
lock-X(A)	lock-X(A)
read(A)	read(A)
lock-X(B)	A:= A-100
read(B)	write(A)
B:= B+100	lock-S(B)
write(B)	read(B)
lock-S(C)	lock-S(C)
read(C)	read(C)
unlock(C)	unlock(B)
commit	unlock(C)
unlock(A)	commit
unlock(B)	unlock(A)

Which of the following statement is (are) `true`?

a) T_2 follows the `rigorous two-phase locking protocol`, but T_1 follows the `strict two-phase locking protocol` only .

b) T_1 follows the `rigorous two-phase locking protocol`, but T_2 follows the `strict two-phase locking protocol` only.

c) Both T_1 and T_2 follow the `strict two-phase locking protocol`.

d) Both T_1 and T_2 follow the `rigorous two-phase locking protocol`.

- ◉ a
- ○ b
- ○ c
- ○ d

8) **1 point**

Consider the following schedule S.

T_1	T_2
R(X)	
W(X)	
R(Y)	
W(Y)	
COMMIT	
	R(X)
	W(X)
	R(Y)
	W(Y)
	COMMIT

R(X) denotes read operation on data item X by Transaction T_i.
W(X) denotes write operation on data item X by Transaction T_i.
Choose the correct options for the above schedule.

a) The schedule is only `recoverable schedule`.

b) The schedule is only `cascadeless schedule`.

c) The schedule is `recoverable schedule` and `cascadeless schedule` both.

d) The schedule is neither `recoverable nor cascadeless schedule`.

- ○ a
- ○ b
- ◉ c
- ○ d

9) ***1 point***

Consider the following `schedule` S.

T1	T2	T3
R(X)		
W(X)		
	R(X)	
	W(X)	
	R(Y)	
	W(Y)	
		R(Y)
		W(Y)
	abort	

`R(X)` denotes a read operation on data item `X` by transaction T_i.
`W(X)` denotes a write operation on data item `X` by transaction T_i.
Transaction `T3` commits before `T2` aborts.
Identify the correct statement(s) based on the above schedule S.

a) If `T2` fails (aborts), only `T1` will be rolled back, while `T3` will remain unaffected.

b) If `T2` fails (aborts), only `T3` will be rolled back, while `T1` will remain unaffected.

c) If `T2` fails (aborts), no other transaction will be rolled back.

d) If `T2` fails (aborted), both transactions `T1`, and `T3` must also be rolled back.

- ○ a
- ◉ b
- ○ c
- ○ d

10) ***1 point***

Suppose in a database, there are three transactions T_1, T_2, and T_3 with timestamps 20, 21, and 22 respectively. T_2 is holding some data items which T_1 and T_3 are requesting to acquire. Which of the following statement(s) is (are) correct in respect of `Wait-Die Deadlock Prevention Scheme`?

a) Transaction T_1 will rollback.

b) Transaction T_3 will wait for T_2 to release the data item.

c) Transaction T_1 will wait for T_2 to release the data item and Transaction T_3 will rollback.

d) Both Transactions T_1 and T_3 will rollback.

- ○ a
- ○ b
- ◉ c
- ○ d

You may submit any number of times before the due date. The final submission will be considered for grading.

Submit Answers