

Database Management System

Transaction & Concurrency

Practice Set 03

[NAT]

1. Two operations are called conflicting operations, if they satisfy which of the below conditions:
- I: They work on same data item.
 - II: Both the operations belong to different transactions.
 - III: There exists at most one write operation.
- The number of conditions satisfied for conflicting operations is/are _____.

[MSQ]

2. Consider the following schedule S:

T ₁	T ₂	T ₃
R(x)		
	W(x)	
		R(x)
W(x)		
		W(x)

Choose the correct statements from the following for above schedule S.

- (a) S is a conflict serializable schedule.
- (b) S is a view serializable schedule.
- (c) S is a serializable schedule.
- (d) None of the above.

[NAT]

3. For the given schedule S below, the number of conflict pairs is/are:

S:

T ₁	T ₂	T ₃
R(x)		
	R(x)	
		R(x)
W(y)		
	W(y)	
		W(y)

[MCQ]

4. Suppose many concurrent transactions are made to run over the same data set and the 2nd transaction updates the database before the 1st transaction is finished or completed its execution then which one among the following property is violated and the database is no longer consistent?
- (a) Durability
 - (b) Isolation
 - (c) Atomicity
 - (d) Consistency

[MCQ]

5. Consider the following statements:

S₁: If a schedule is view serializable then it may not be conflict serializable.

S₂: If a schedule is conflict serializable then it is also view serializable schedule.

- (a) Only S₁ is true
- (b) Only S₂ is true
- (c) Both S₁ & S₂ are true
- (c) Neither S₁ nor S₂ is true

[MCQ]

6. Consider the following log which consists of transactions T₁, T₂ and T₃:

Step	Details of log
1	<T ₁ Start>
2	<T ₁ , A, 200, 300>
3	<T ₁ , A, 600, 500>
4	<T ₂ start>
5	<T ₁ commit>
6	<T ₂ , B, 600, 400>
7	<T ₂ commit>
8	<T ₃ start>
9	<T ₃ , A, 600, 100>

If a crash occurs just after step 9. Which of the following is the correct way for recovery?

- (a) Undo (T₃) then Undo (T₁) then Redo (T₂)
- (b) Redo (T₃) then Undo (T₁) then Undo (T₂)

- (c) Undo (T_3) then Redo (T_1) then Redo (T_2)
 (d) None of these.

[NAT]

7. Consider the following schedule

S: $R_1(A), R_3(D), W_1(B), R_2(B), R_4(B), W_2(C), R_5(C),$
 $W_4(E), R_5(E), W_5(B)$

How many serial schedules are possible which will be view equal to S? _____.

[MCQ]

8. Consider the following schedule S of transaction T_1, T_2 and T_3 .

S: $r_1(x); r_2(x); r_3(y); w_1(x); r_2(z); r_2(y); w_2(y); w_1(z);$

Which one of the schedules below is the correct serialization of the above schedule?

- (a) $T_2 \rightarrow T_1 \rightarrow T_3$
 (b) $T_3 \rightarrow T_2 \rightarrow T_1$
 (c) $T_3 \rightarrow T_1 \rightarrow T_2$
 (d) $T_2 \rightarrow T_3 \rightarrow T_1$

[MCQ]

9. Which of the following schedule is view serializable but not conflict serializable?

- (a) $r_1(P); r_2(P); w_1(P); r_2(Q)$
 (b) $r_1(P); w_1(P); r_2(P); w_2(Q)$
 (c) $w_1(P); w_2(P); w_1(P); w_2(P); w_1(P)$
 (d) None of these.

[MCQ]

10. Consider the following transactions T_1 and T_2 :

T_1	T_2
Read(A);	Read(A);
Update $A = A + 100$;	
	Update $A = A - 50$;
Write(A);	
	Write(A);

The above transaction has _____.

- (a) Lost update problem
 (b) Dirty read problem
 (c) Unrepeatable read problem
 (d) Incorrect summary problem

[MCQ]

11. Consider a schedule S:

$r_1(x), r_2(y), w_2(x), w_3(z), r_4(z), r_3(x), w_3(y), r_4(x), w_4(y)$

Choose the correct statements for the above schedule S.

- (a) The schedule S is not serializable.
 (b) The schedule S is conflict serializable with schedule S as $T_1 \rightarrow T_2 \rightarrow T_3 \rightarrow T_4$.
 (c) The schedule S is not view serializable.
 (d) None of the above.

[MCQ]

12. Consider the below schedule.

S: $r_1(A), r_2(B), w_2(A), r_3(A), w_1(B), w_3(A)$

choose the correct statement from the following.

- (a) S is conflict serializable schedule.
 (b) S is not conflict serializable schedule.
 (c) S may or may not be view serializable schedule.
 (d) None of these

[NAT]

13. Consider the following schedule

S = $r_1(P); r_3(S); w_1(Q); r_2(Q) r_4(Q), w_2(R)$
 $r_5(R); w_4(T); r_5(T); w_5(Q)$

How many serial schedules conflict equal to schedules(S)? _____.

[NAT]

14. Consider the following schedule

S = $r_1(P); r_3(S); w_1(Q); r_2(Q) r_4(Q), w_2(R);$
 $r_5(R); w_4(T); r_5(T); w_5(Q)$

How many serial schedules view equal to schedule(S)_____?

[MCQ]

15. Consider the following transactions

$T_1: r_1(P); w_1(P); r_1(Q); w_1(Q)$

$T_2: r_2(P); r_2(Q)$

$T_3: w_3(P); w_3(Q)$

How many concurrent schedules between T_1, T_2 and T_3 transactions _____?

- (a) 400
 (b) 410

- (c) 420
(d) None

[NAT]

16. How many views equivalent serial schedules are possible for the given schedules below _____
S: $w_1(P) r_2(P) w_3(P) r_4(P) w_5(P) r_6(P)$

[MCQ]

17. The goal of concurrency control on database system is to
- Only allow concurrent execution of transaction that correspond to serial execution of some of the transactions.
 - Allow only transactions that don't access common relationship to run concurrently.
 - Execute transactions serially.
 - None of the above.

[MCQ]

18. What problem can occur when a DBMS executes multiple transactions concurrently?
- Lost update problem.
 - Dirty read problem.
 - Incorrect summary problem.
 - All of the above.

[MCQ]

19. Consider the following schedule involving two transactions
- S₁:** $r_1(A); r_2(A); w_2(A); r_3(A); w_1(A); w_2(B); r_3(B); c_2, w_3(A); c_1, c_3$
- S₂:** $r_2(A); r_1(A); w_1(A); w_2(A); r_3(A); w_3(A); r_2(B); c_1, c_3; c_2$

Which one of the following statements is TRUE?

- S_1 is recoverable and S_2 is not recoverable.
- S_1 is not recoverable and S_2 is recoverable.
- Both S_1 and S_2 are recoverable.
- Both S_1 and S_2 are not recoverable.

[MCQ]

20. Consider the following schedule:

S: $r_1(A); r_2(C); w_1(A); r_3(A) r_2(B); w_2(B), w_3(A); r_3(B); r_2(A)$

for the schedule S given above two orderings of commits (c_i) operations are specified as

I. $c_1; c_3; c_2$

II. $c_1; c_2; c_3$

Which of the above ordering ensures recoverability of schedule S?

- Only I
- Both I and II
- Only II
- None of these

[MCQ]

21. Consider the following partial schedule 'S' involving two transaction T_1 and T_2

Time	T_1	T_2
t_0	read(P);	
t_1	write(P);	
t_2		read(R);
t_3		write(R);
t_4		read(Q);
t_5		write(Q);
t_6		read(P);
t_7		commit;
t_8	read(Q);	

Suppose that the transaction T_1 fails immediately after time instance 8. Which one of the following is correct?

S₁: Schedule S is non recoverable and cannot ensure transaction atomicity

S₂: Only T_2 should be aborted and then restarted to ensure truncation atomicity

- Only S_1 is true
- Only S_2 is true
- Both S_1 and S_2 are true
- Both S_1 and S_2 are false

[MCQ]

22. Consider the following statements:

P: If a schedule is allowed by 2PL, it guarantee conflict serializable.

Q: A conflict serializable schedule is always allowed by 2PL.

Which of the following is/are correct?

- (a) P only
- (b) Q only
- (c) Both P and Q
- (d) Neither P nor Q

[MSQ]

23. Consider the following schedule: -

S: $R_1(P); W_1(P); R_2(P); R_2(Q); R_1(Q); W_1(Q); C_1; C_2;$
Which of the following is correct?

- (a) S is conflict serializable.
- (b) S is not conflict serializable.
- (c) S is allowed by 2PL.
- (d) S is not allowed by 2PL.

[MSQ]

24. Consider the following schedule –

S : $R_x(A); W_y(A); W_y(B); R_z(B); R_z(C); W_x(C); C_x;$
 $C_y; C_z;$

Which of the following is/are CORRECT?

- (a) The given schedule is conflict serializable.
- (b) The given schedule is allowed by 2PL.
- (c) The given schedule is not allowed by 2PL.
- (d) The given schedule is not conflict serializable.

[MSQ]

25. Consider the following schedule –

S : $W_2(P); W_1(P); W_2(Q); W_3(P); W_1(Q); W_3(Q); C_1;$
 $C_2; C_3;$

Which of the following is/are correct?

- (a) S is not allowed by 2PL.
- (b) S is allowed by 2PL.
- (c) The equivalent serial schedule to S is $T_3 \rightarrow T_2 \rightarrow T_1$.

- (d) The equivalent serial schedule to S is $T_2 \rightarrow T_1 \rightarrow T_3$.

[MSQ]

26. Consider the following schedule –

S : $W_2(P); W_1(P); W_3(P); W_2(Q); W_1(Q); W_3(Q); C_1;$
 $C_2; C_3;$

Which of the following is/are correct?

- (a) S is conflict serializable.
- (b) S is allowed by 2PL.
- (c) S is not allowed by 2PL.
- (d) Serial schedule equivalent to S is $T_2 \rightarrow T_1 \rightarrow T_3$.

[MCQ]

27. Consider the following transaction for schedule(S)

S:

T ₁	T ₂	T ₃
R(A)		
	W(A) W(B)	
		R(B) R(C)
W(C)		

For schedule(S) which of the following is true?

- (a) Conflict serializable and allowed by 2PL.
- (b) Not conflict serializable and not allowed by 2PL.
- (c) Conflict serializable but not allowed by 2PL.
- (d) None of the above.

Answer Key

1. (2)	8. (b)	15. (c)	22. (a)
2. (b, c)	9. (c)	16. (2)	23. (b, d)
3. (3)	10. (a)	17. (a)	24. (c, d)
4. (b)	11. (b)	18. (d)	25. (b, d)
5. (c)	12. (c)	19. (a)	26. (a, c, d)
6. (c)	13. (10)	20. (d)	27. (b)
7. (10)	14. (10)	21. (a)	



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