

19. Which of the following schedule is allowed under basic timestamp protocol

S1: $r_1(x)$, $r_3(x)$, $w_1(x)$, $r_2(x)$, $w_3(x)$

S2: $r_1(x)$, $r_3(x)$, $w_3(x)$, $w_1(x)$, $r_2(x)$

S3: $r_3(x)$, $r_2(x)$, $w_3(x)$, $r_1(x)$, $w_1(x)$

S4: $r_1(x)$, $r_3(x)$, $r_2(x)$, $w_1(y)$, $w_3(y)$

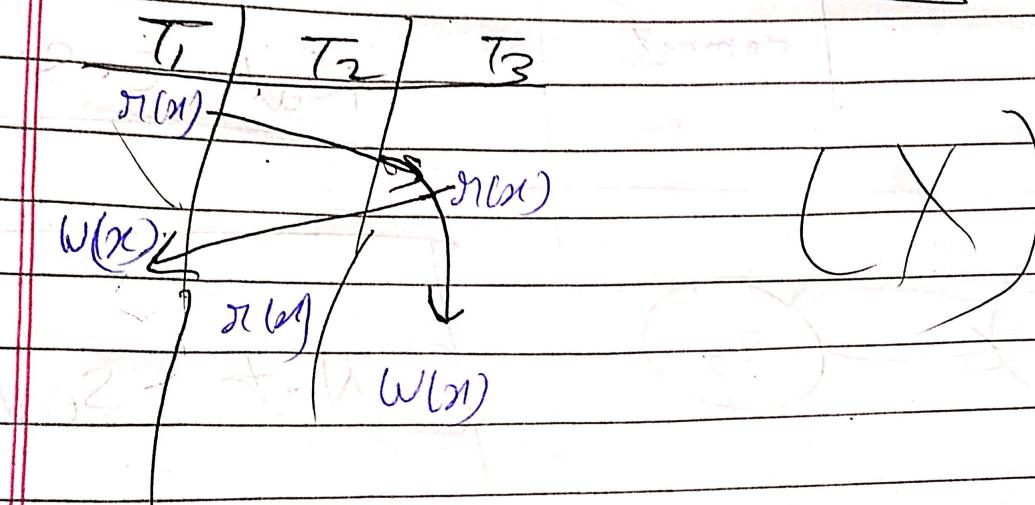
(a) S1

(b) S2

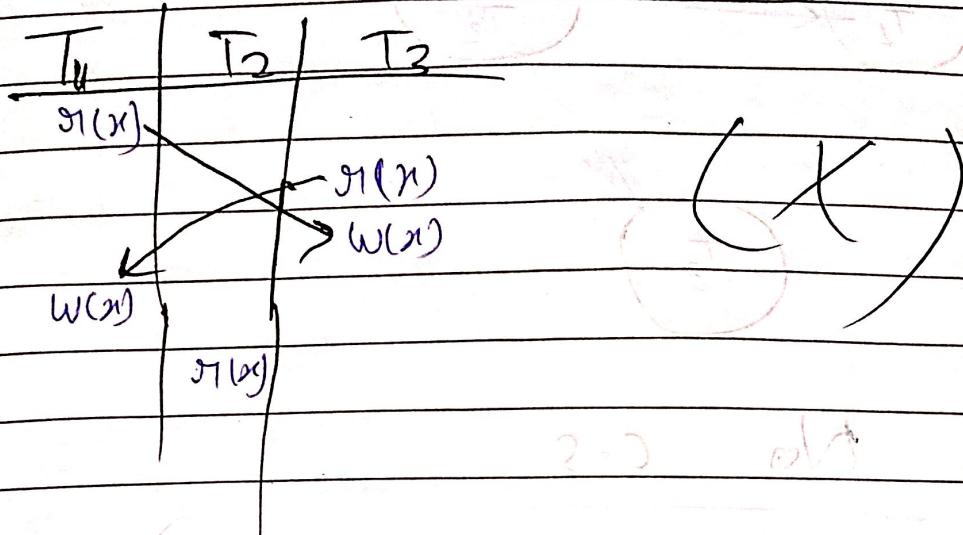
(c) S3

(d) S4

Ex 19-Sr Time stamp protocol - ?

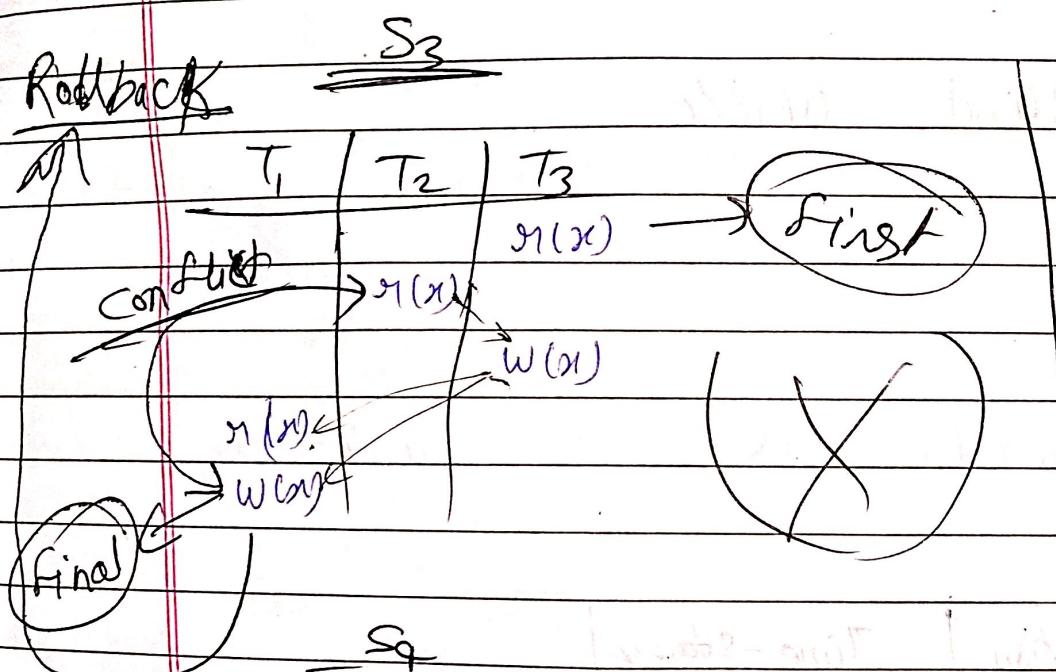


S₂



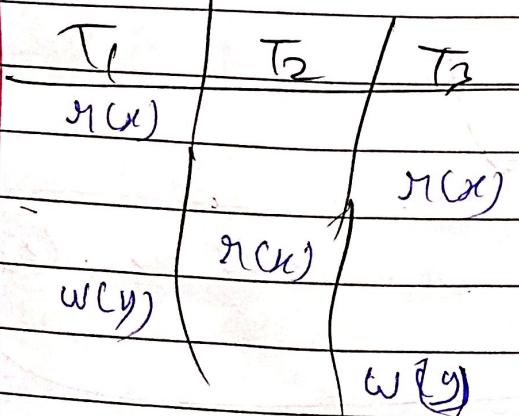
Rollback

S₃



In this, read-write conflict in T₂ & T₁,
T₁ comes 1st
it has execute
but T₂ execute
1st then
T₁ rollback.

S₄



④ S₄

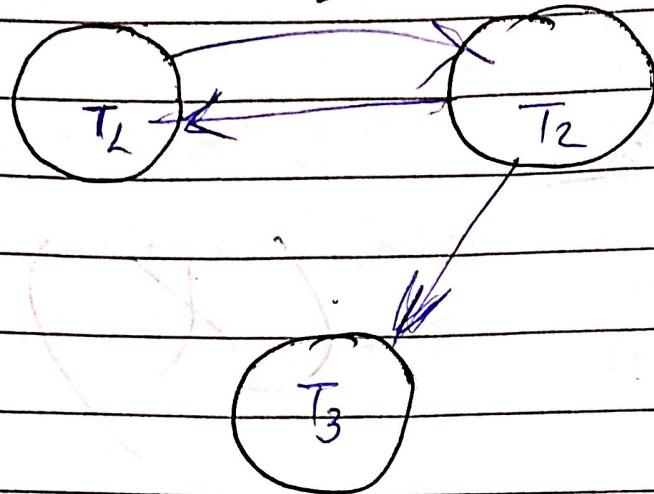
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20. Consider three data items D1, D2, D3 and the following execution schedule of transactions T1, T2 and T3. In the diagram, R(D) and W(D). Denote the actions reading and writing the data item D respectively.

| | T1 | T2 | T3 |
|------|--------|--------|--------|
| Time | | R(D3); | |
| | | R(D2); | |
| | | W(D2); | |
| | R(D1); | | R(D2); |
| | W(D1); | | R(D3) |
| | | R(D1) | W(D2) |
| | | | W(D3) |
| | R(D2); | W(D1); | |
| | W(D2); | | |

- (a) The schedule is serializable as T2;T3;T1
- (b) The schedule is serializable as T2;T1;T3
- (c) The schedule is serializable as T3;T2;T1
- (d) The schedule is not serializable

20)



No CS

No blind write

So — no V.S

(d)

schedule is not serializable.

21.

| Transaction | Time – stamp |
|-------------|--------------|
| T_{22} | 5 |
| T_{23} | 10 |
| T_{24} | 15 |

According to wait – die scheme:

- (a) If T_{22} requests a data item held by T_{24} , then T_{23} will be rolled back
- (b) If T_{24} requests a data item held by T_{23} , then T_{24} will not be rolled back
- (c) If T_{22} requests a data item held by T_{23} , then T_{22} will wait
- (d) If T_{22}, T_{23} requests a data item held by T_{24} , then T_{22} will be rolled back

(c) Q1 =>

| Transaction | Time-stamped |
|-----------------|--------------|
| T ₂₂ | 5 |
| T ₂₃ | 10 |
| T ₂₉ | 15 |

(c) If T₂₂ request data item held by T₂₃
then T₂₂ waits.

~~Because transaction has to wait for~~

~~younger one to request data item held by~~
~~older one.~~

Teacher's Signature

22. In the following schedule transaction T_1 and T_2 are running concurrently. The execution of operation is given. Find which of the following problems it is suffering from.

| T_1 | T_2 |
|-------------------------------------|-------------------------------------|
| Read A $A = A - 100$ Read B | |
| | Read A Read B $A = A + 100$ |
| | $B = B + 100$ Write A Write B |
| $B = B + 100$ Write A Write B | |

(a) phantom phenomenon

(b) repeatable read

(c) uncommitted read

(d) lost update problem

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| | T_1 | T_2 |
|--|-----------|------------|
| | $R(A)$ | |
| | $A = 100$ | |
| | $R(B)$ | |
| | | $R(A)$ |
| | | $R(B)$ |
| | | $A += 100$ |
| | | $B += 100$ |
| | | $W(A)$ |
| | | $W(B)$ |
| | | $B += 100$ |
| | | $W(A)$ |
| | | $W(B)$ |

lost update

(d) Lost update problem

23. Consider a tablespace is having two tables T_1 and T_2 , each table is collection of pages, each page is collection of rows. Which of the following locking sequence is invalid in multiple Granularity protocol. The locking sequence is given in the order of table space, table, page and row.

- (a) 1X, 1X, 1S, S (b) 1X, S1X, 1X, X
(c) S1X, S1X, 1X, X (d) S1X, 1X, 1S, S

Q 23 → Table → T₁ → T₂
each Table → collection of pages
each page → collection of rows
which lock invalid for multiple granularity protocol

Locking order → Table space, Table, Page, Row

(d) Shared → Intention-Exclusive (SIX), Intention-Exclusive
Intention-shared (IS), Shared (S)

24. Which of the following is a false statement?
- (a) A schedule which is allowed under strict 2PL is always allowed under Basic 2PL.
 - (b) A Schedule which is allowed under Basic Timestamp protocol is always allowed under Thomas write rule.
 - (c) A Schedule which is allowed under Basic 2PL is always allowed under multiversion2PL.
 - (d) A Schedule which is allowed under multiversion 2PL is always allowed under multiversion Timestamp protocol.

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False Statement

- (d) A schedule which is allowed under multidivision 2PL is always allowed under multidivision time-stamp protocol. (False)

25. Which of the following is a false statement?

- (a) Conflict serializable Schedules are allowed under Thomas write rule.
- (b) Wound-wait protocol prevents starvation.
- (c) Timer out can be used for deadlock recovery.
- (d) Thomas Write rule allows all view serializable schedules.

(d) ~~25~~ False Statement

(d) Thomas write rule allows all view
serializable schedule. (False)

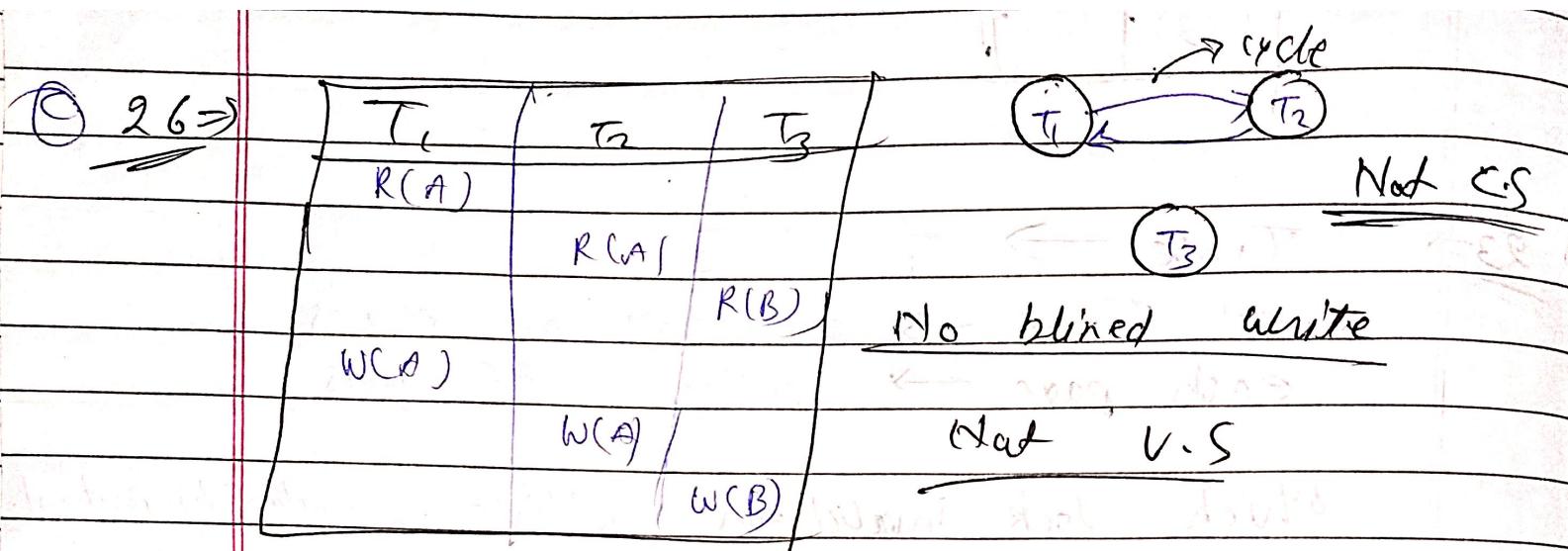
26. Consider the below nonserial schedule S :

| T ₁ | T ₂ | T ₃ |
|----------------|----------------|----------------|
| R(A) | | |
| W(A) | R(A) | R(B) |
| | W(A) | |
| | | W(B) |

Assertion [A]: The given non serial Schedule is a view serializable.

Reason [R]: The given schedule S is conflict serializable.

- (a) Both (a) and (r) are true and (r) is the correct reason for (a).
- (b) Both (a) and (r) are true but (r) is not the correct reason for (a).
- (c) Both (a) and (r) are false.
- (d) (a) is true but (r) is false.



X [A] — The given non-serial schedule is V.S.

X [R] — The given schedule S is C.S.

(C) Both [A] & [R] False

Teacher's Signature

27. Match the following:

IITB Best (a)

List-I

- P. Atomocity
- Q. Isolation
- R. Durability
- S. Consistency Preservation

| | | | |
|-----|-----|-----|-----|
| 1 | 2 | 3 | 4 |
| (a) | (b) | (c) | (d) |

List-II

- 1. Recovery Manager
- 2. User
- 3. Concurrency Control Sub system
- 4. Transaction Manager

(a) P-4, Q-3, R-1, S-2

(b) P-2, Q-4, R-1, S-3

(c) P-1, Q-3, R-4, S-2

(d) P-1, Q-3, R-4, S-2

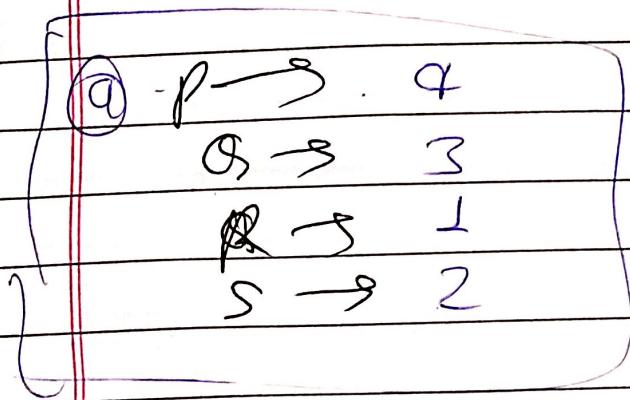
① 27-8

List - I

- P. Atomicity
- S. Isolation
- R. Durability
- S. Consistency
Preservation

List - II

- 1. Recovery Manager
- 2. User
- 3. Concurrency Control Subsystem
- 4. Transaction Manager



28. In a non serial schedule one transaction is waiting for other transaction as below.

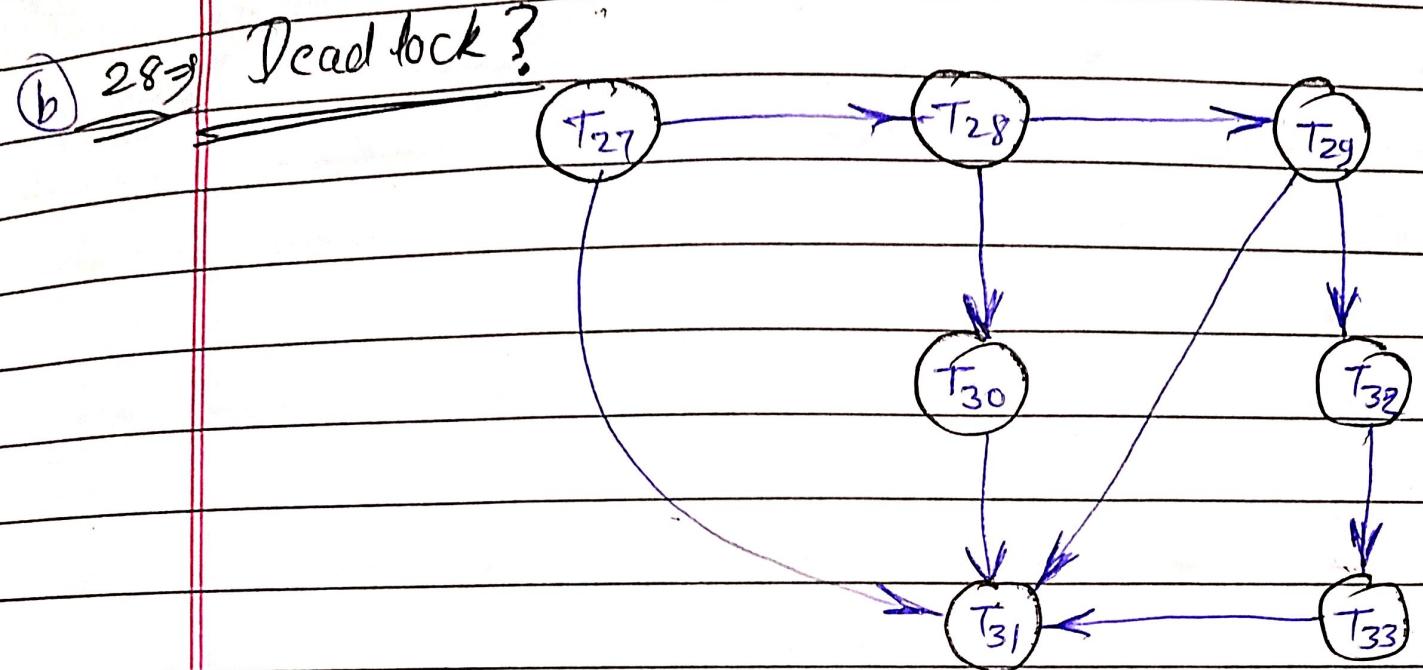
- Transaction T27 is waiting for data items locked by transaction T28 and T31
- Transaction T28 is waiting for data items locked by transaction T29 and T30
- Transaction T33 is waiting for data items locked by transaction T31
- Transaction T29 is waiting for data items locked by transaction T31 and T32

- Transaction T32 is waiting for data items locked by transaction T33
- Transaction T30 is waiting for data items locked by transaction T31

The above Schedule is having a deadlock.

(a) True

(b) False



No Deadlock

(b) False