

Which among the below is true.

- ☐ The global state should be taken at the same physical time on all machines
- ☐ There can be multiple consistent global snapshots
- ☐ A consistent global snapshot always represents a true state that the system has been through

Which among the below are true: Let the process sending the msg be Process P_i . Consider Matrix clocks.

1. the value of $mt[i,k]$ is greater than equal to $mt[p,k]$ for all p .
2. the value of $mt[i,k]$ is independent of $mt[p,k]$ for all p .
3. the value of $mt[k,i]$ is greater than equal to $mt[k,p]$ for all p .
4. the value of $mt[i,i]$ is greater than equal to $mt[p,i]$ for all p .

☐ 1 and 3

☐ 1 and 4

☐ 2 and 3

☐ 2 and 4

☐ Only 1

☐ Only 2

☐ Only 3

☐ Only 4

The conditions for a consistent snapshot is:

C1: $\text{send}(m_{ij}) \text{ in } LSi \Rightarrow m_{ij} \text{ in } SC_{ij} \text{ OR } \text{rec}(m_{ij}) \text{ in } LS_j$.

C2: $\text{send}(m_{ij}) \text{ in } LSi \Rightarrow m_{ij} \text{ in } SC_{ij} \wedge \text{rec}(m_{ij}) \text{ in } LS_j$.

☐ True

☐ False

For snap short recording algorithm; which among the below are true.

1. An algorithm that works for causal ordering will work for FIFO ordered messages too
2. An algorithm that works for non FIFO ordering will work for FIFO ordered messages too
3. An algorithm that works for FIFO will work for causal messages as well
4. An algorithm that words for causal ordering will work for non-FIFO ordered messages too

- ☐ 1 and 2
- ☐ 1 and 3
- ☐ 1 and 4
- ☐ 2 and 3
- ☐ 2 and 4
- ☐ 3 and 4
- ☐ 1, 2 and 3

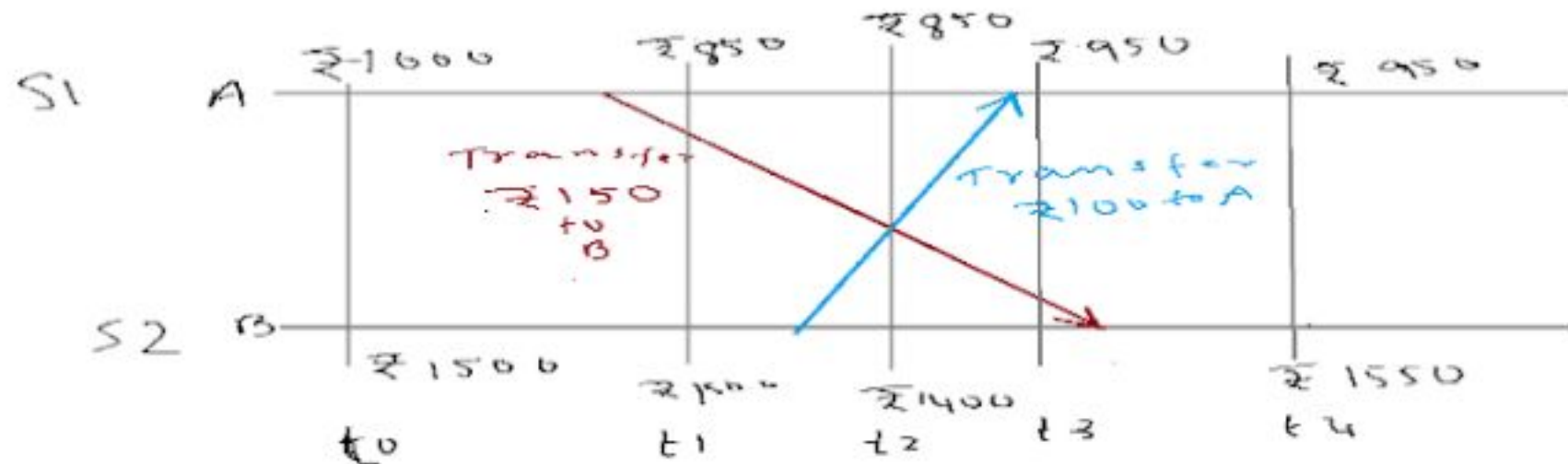
We did Teaser-2 in class that considers vector clocks and causal ordering:

"Suppose a broadcast msg is sent by process D at time t ; and B sends a msg to me. Looking at B's msg; can I conclude whether B has received the broadcast from D?"

Now, let us say; all values in B's vector are greater than equal to t . Which among the below are true

- ☐ When I receive B's msg I may not know yet that D sent its broadcast at t (as I have not received D's broadcast). Hence can not detect that B has received D's broadcast
- ☐ When I receive B's msg I would know by then, that D sent its broadcast at t . Hence can detect that B has received the broadcast
- ☐ B's vector could show values greater than t ; due to a msg received by B from some other process
- ☐ If and only if all the values in B's vector are greater than equal to t ; then B has received the broadcast from D

In the attached picture: let us say we take the global snapshot at t_0 for S1. At which time should we NOT take a snapshot for S2



- ☐ t_1
- ☐ t_2
- ☐ t_3
- ☐ t_4
- ☐ All of the above
- ☐ None of the above