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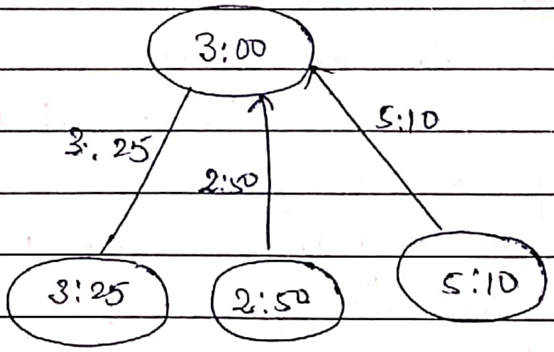
Distributive Systems

Mini Test

(Q.1) **Berkley Algorithm**

Berkeley's Algorithm is a clock synchronization technique used in distributed systems.
The Algorithm assumes that each machine node in the network either doesn't have an accurate time source or doesnot have an UTC server.



(1) average fault tolerant

$$\Rightarrow \frac{+25+10+130}{3} \Rightarrow \frac{165}{3} = 55$$

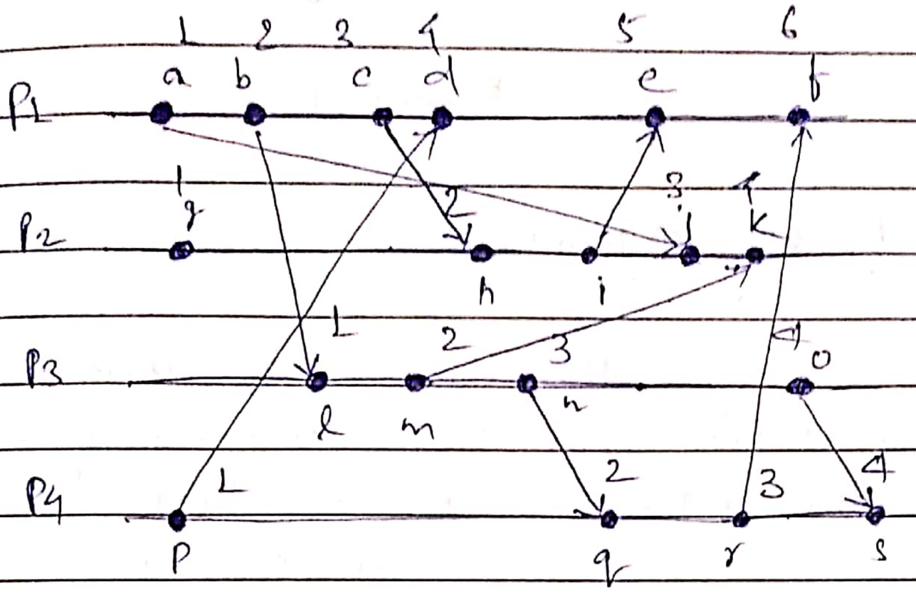
(2) Adjusted time send to each client

$\Rightarrow$ 3:25 $\Rightarrow -25+55 \Rightarrow$ 30

2:50 $\Rightarrow 10+55 \Rightarrow$ 65

5:10 $\Rightarrow 130-55 \Rightarrow$ 75

(Q.2)



Each process maintains a single lampost timestamp counter. Each event in the process is tagged with a value from this counter.

The counter is incremented before the event timestamp is assigned

In the figure, event j in Process P_2 is the receipt of the message sent by event a in P_1

If event j was just a normal local event P_2 would assign it a timestamp of 3. However, since the received timestamp is 3 which is greater than or equal to 3, the timestamp counter is set to 3+1, or 4. Event j gets the timestamp of 4. This preserves the relationship a → j, that is a happened before j. ~~A local event j would gets a timestamp~~

so, a → j ⇒ (1 → 4) ✓

b → l ⇒ (2 → 1) x   so now b $\xrightarrow{2+1}$ l ⇒ 3

c → h ⇒ (3 → 2) x   c $\xrightarrow{3+1}$ h ⇒ 4

p → d ⇒ (1 → 4) ✓

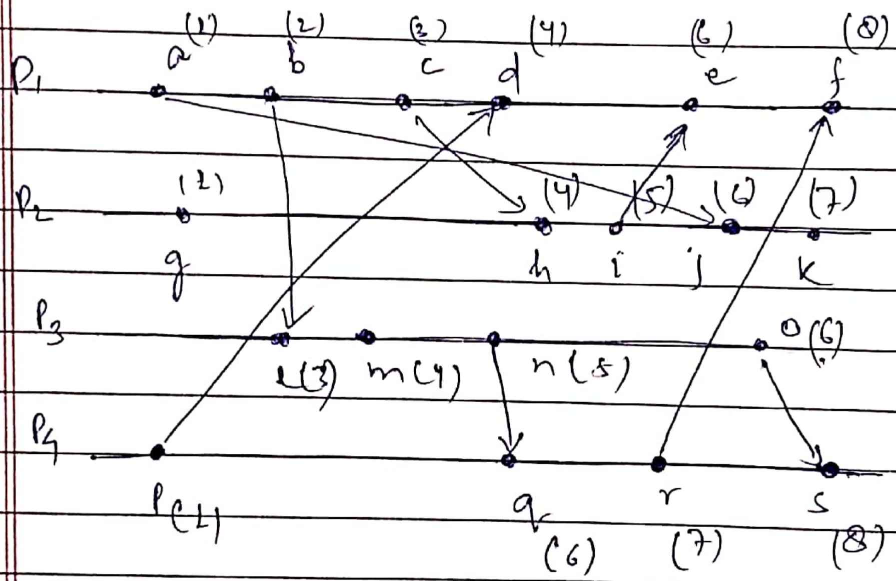
i → e ⇒ (5 → 5) x   now i $\xrightarrow{5+1}$ e ⇒ 6

m → k ⇒ (2 → 7) ✓

n → q ⇒ (5 → 2) x   now n $\xrightarrow{5+1}$ q ⇒ 6

r → f ⇒ (7 → 7) x   now r $\xrightarrow{7+1}$ f ⇒ 8

o → s ⇒ (6 → 8) ✓



~~[illegible]~~