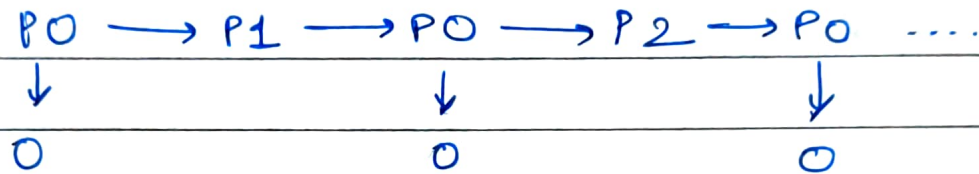


//_

Case III :

$$S_0 = X \emptyset X \emptyset 1, S_1 = \emptyset X \emptyset 1, S_2 = \emptyset X X 0$$



This can go on & on.

\therefore Answer is atleast twice.

Q2. Given, W and X reads x from memory, increments by 1 & stores it to memory.

Y and Z reads x from memory, decrements by 2 & stores it to memory.

Semaphore is initialised to 2, $x = 0$

$S \boxed{2}$

- 1.) W executes, $S \boxed{2} 1$, $x = 1$, this is not stored.
- 2.) Y executes, $S \boxed{1} 0$, decrements x , $x = 0 - 2 = -2$
UP/Release = $S \boxed{1}$
- 3.) Z executes, $S \boxed{1} 0$, $x = -2 - 2 = -4$
UP/Release = $S \boxed{0} 1$
- 4.) W executes, updates $x = -4$ to 1 as it resumes
& $S \boxed{1} 2$
- 5.) X executes, $x = 1 + 1 = 2$