ECE213: Digital Electronics

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The Course Contents

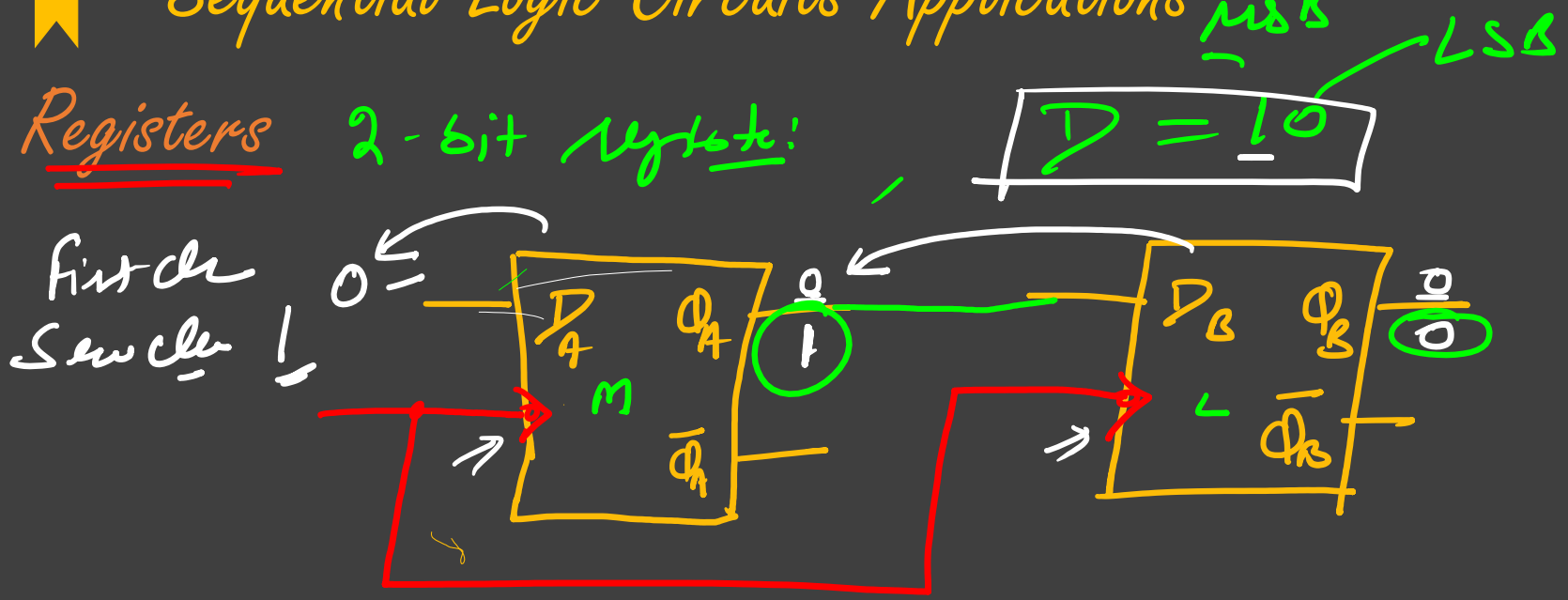
Unit V

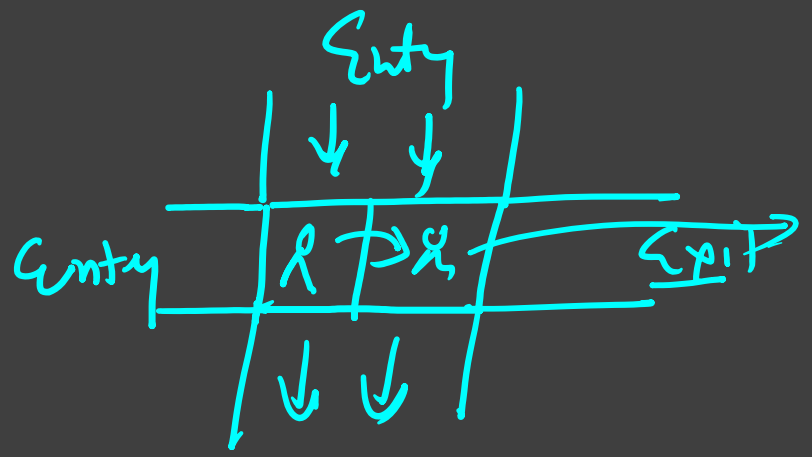
Sequential Logic Circuits Applications : Registers: Operation of all basic Shift Registers, Counters: Design of Asynchronous and Synchronous counters, Ring counter and Johnson ring counter

Sequential Logic Circuits Applications

Registers

2-bit register:





O/P
- Serial
- Parallel

O/P
- Serial
- Parallel

Sequential Logic Circuits Applications

Registers — Shift registers

1) SISO (Serial in Serial out)
2) SIPO (Serial in Parallel out)
3) PIPO (Parallel in Parallel out)
4) PISO (Parallel in Serial out)

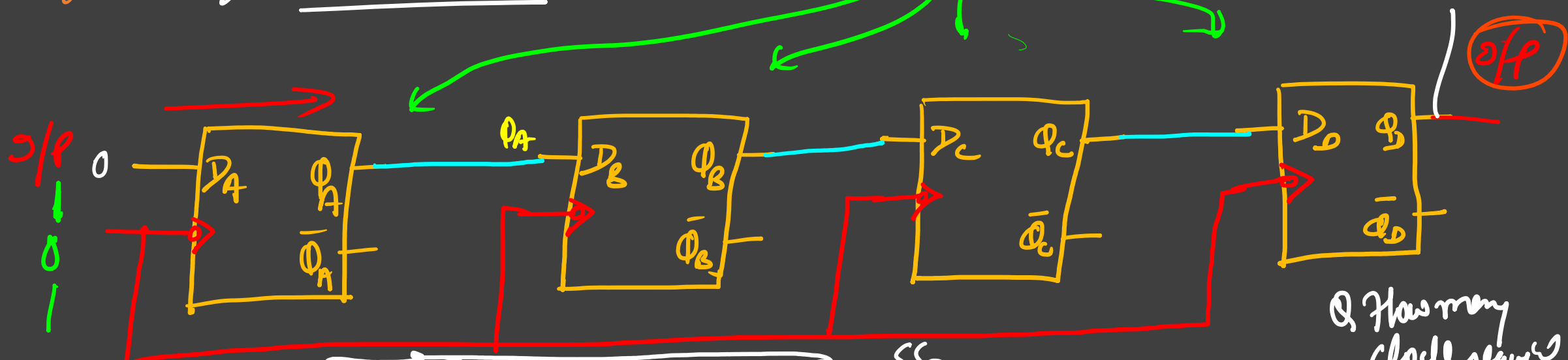
Q: What is the need of shift register

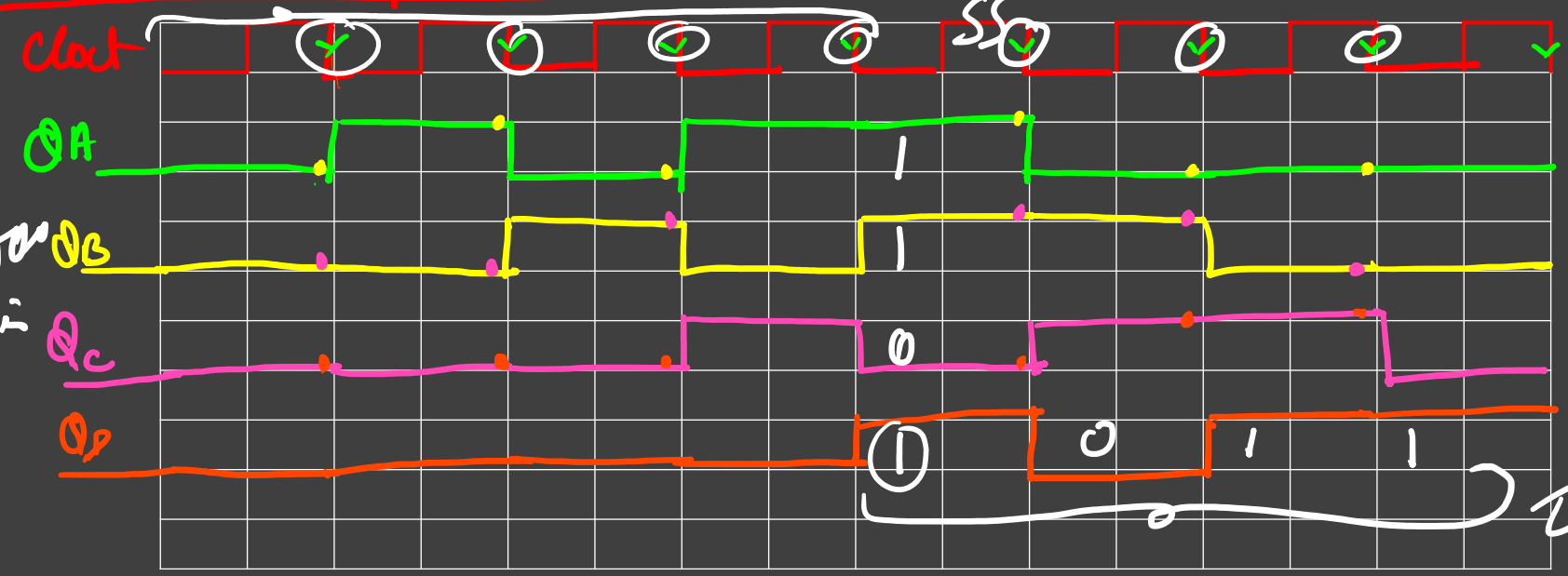
A:
- To shift the data
- To store the data
- To produce delay
- To convert S/P Serial or Parallel

Sequential Logic Circuits Applications

Registers ★ 4-bit SISO

D = 1 1 0 1





Q How many total no of clock required to store n bit data in serial mode

A: n clock

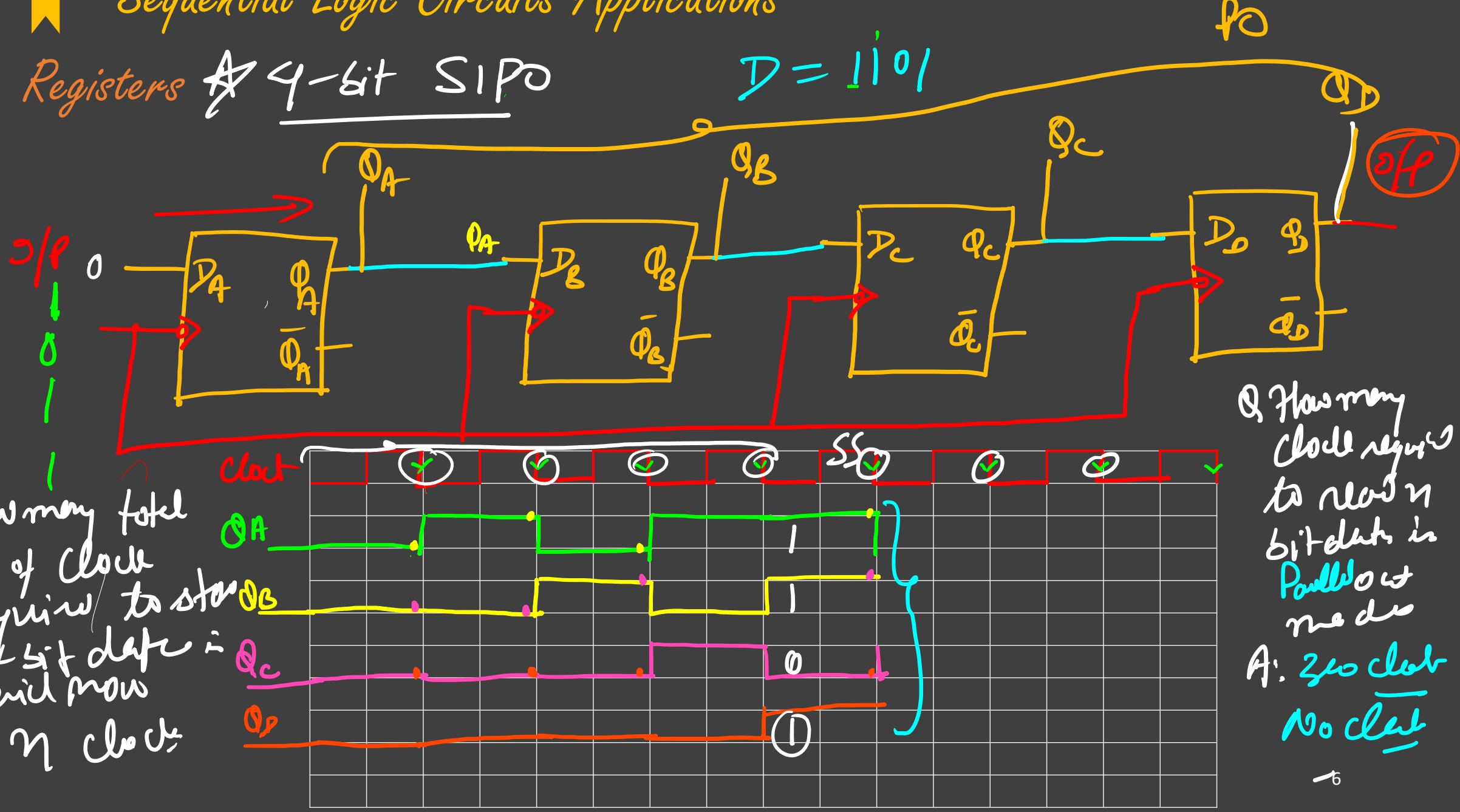
Q How many clock required to read n bit data in serial out mode

A: n-1

Sequential Logic Circuits Applications

Registers ☆ 4-bit SIPO

$D = 1101$



Q How many total no of clock required to store n bit data in Serial mode

A: n clock

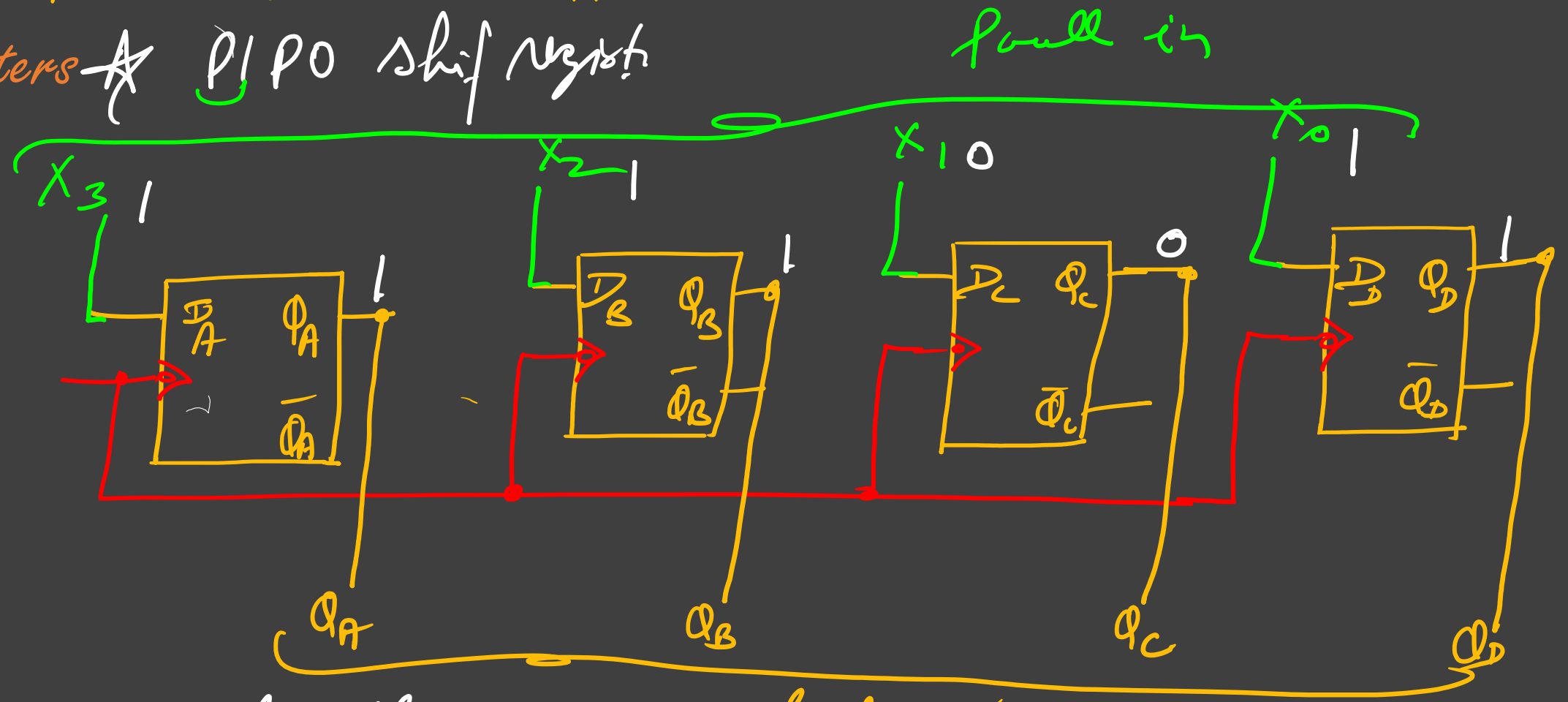
Q How many clock required to read n bit data in Parallel out mode

A: Zero clock

No clock

Sequential Logic Circuits Applications

Registers: PIPO shift register



Q: How many clock pulses are required to write the 4-bit data Parallel in mode?

A: One clock pulse.