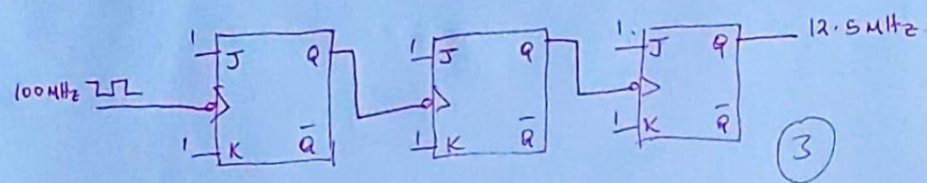


Q5

2) $\log_2 \left\lceil \frac{100}{12.5} \right\rceil = 3$ flip-flops ~~(in 8-100)~~ (1)

In asynchronous mode, ripple counter can be used

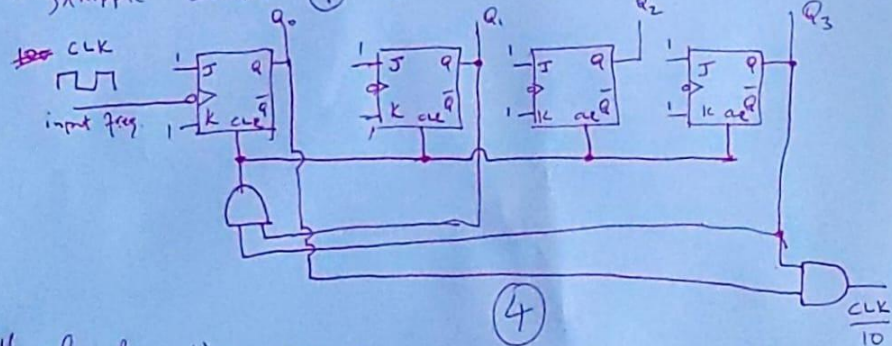


Alternatively: use a synchronous counter counting 0 to 7 and outputting a pulse when 7 is detected

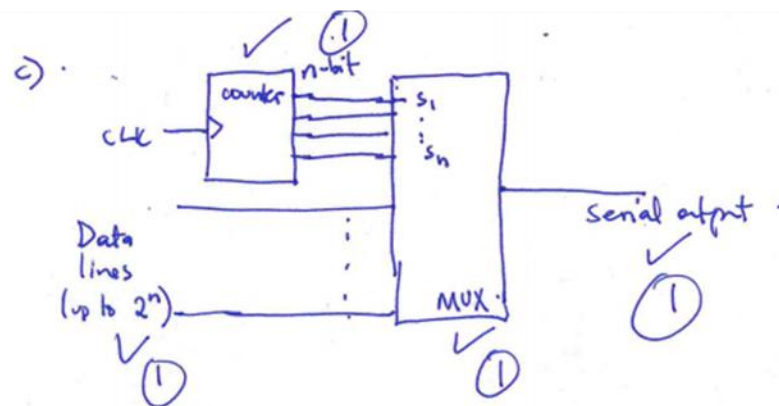
b) A place required every $\frac{10}{1} = 10$ cycles. (MOD 10 counter)

alternative A # of FFs = $\lceil \log_2 10 \rceil = 4$ (1)

Using ripple counter (1) (output a pulse at 1001, reset at 1010)



Alternative B - Use a synchronous counter



d) 3-bit shift-left register using T-flip-flops.

