

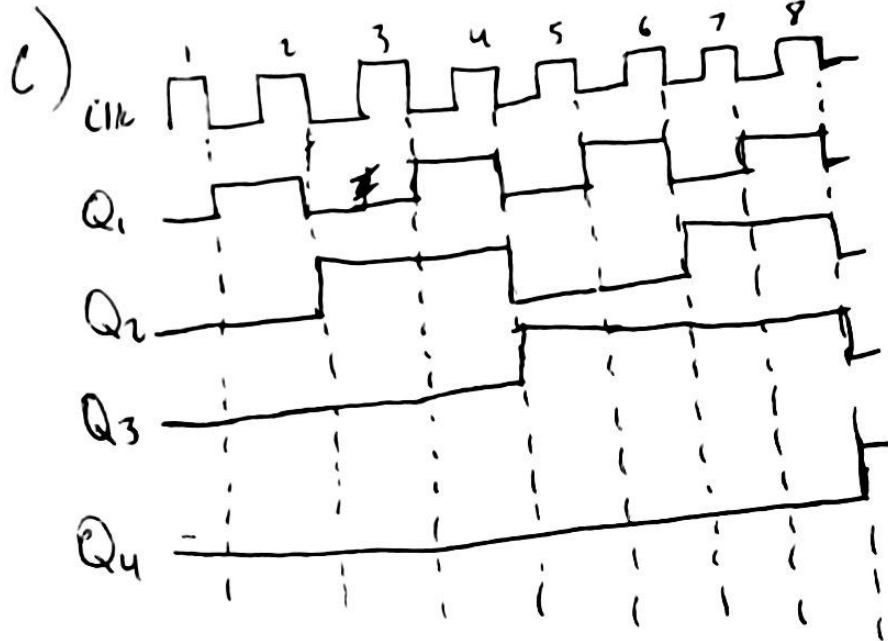
Cedric Evans

1a)

$$\frac{1}{32\text{ns}} = \cancel{\frac{1}{32}} \cdot 03125\text{ GHz}$$

b)

$$\frac{1}{64\text{ns}} = .015625\text{ GHz}$$

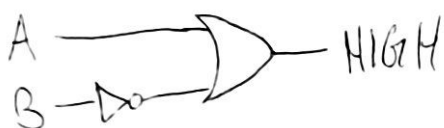


2)

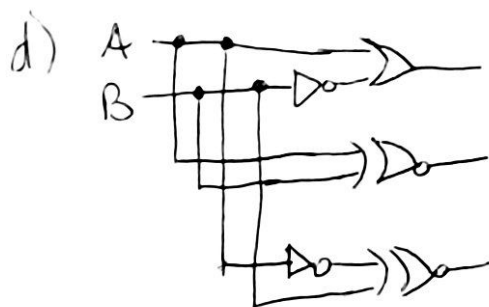
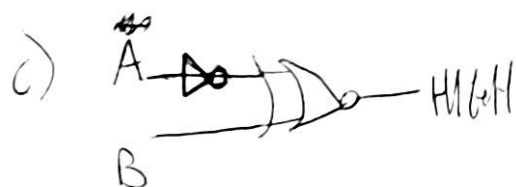
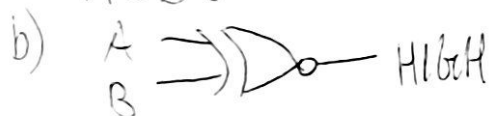
| | B | \bar{B} |
|-----------|------------|------------------|
| A | AB | $A\bar{B}$ |
| \bar{A} | $\bar{A}B$ | $\bar{A}\bar{B}$ |

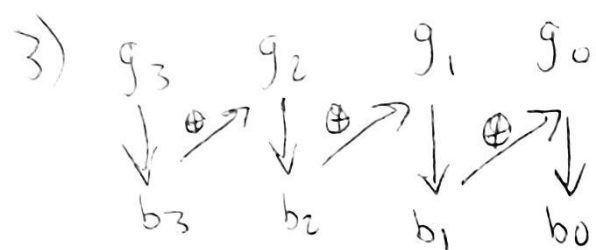
~~AB~~
 AB is the same case as $\bar{A}\bar{B}$ because ~~the~~ in both cases they have the same respective values ($A=1=B$, $\bar{A}=0=\bar{B}$)

a) $A\bar{B} = 10 \Rightarrow A > B$:



$A = B$:



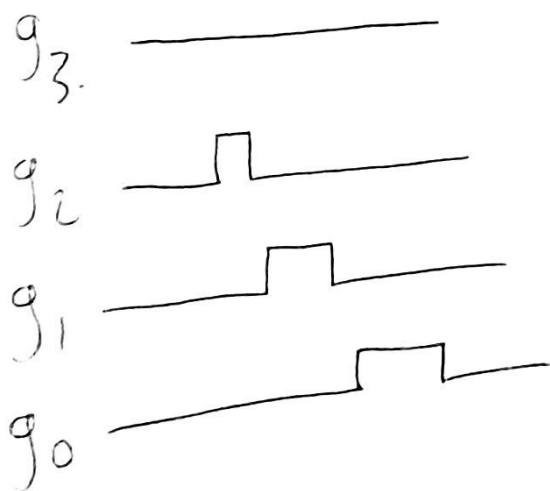
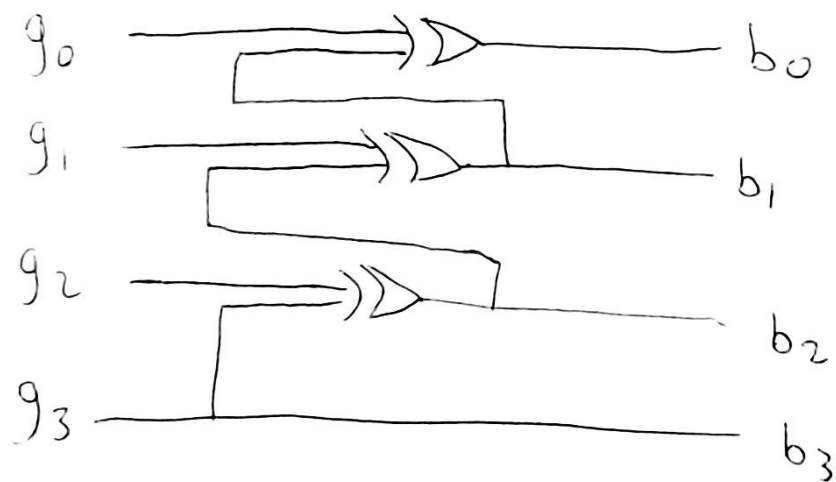


$$b_3 = g_3$$

$$b_2 = b_3 \oplus g_2$$

$$b_1 = b_2 \oplus g_1$$

$$b_0 = b_1 \oplus g_0$$



4)

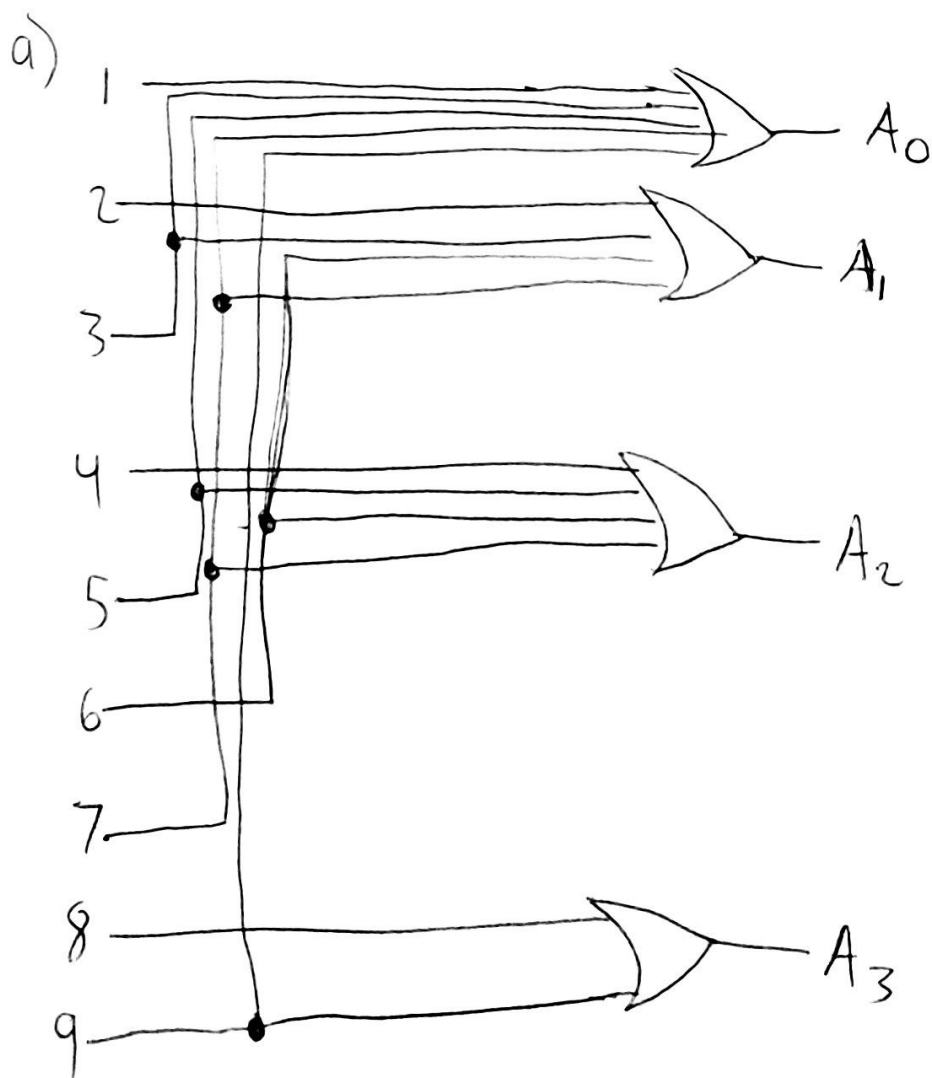
| Hex | B ₃ | B ₂ | B ₁ | B ₀ |
|-----|----------------|----------------|----------------|----------------|
| 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 0 | 1 |
| 2 | 0 | 0 | 1 | 0 |
| 3 | 0 | 0 | 1 | 1 |
| 4 | 0 | 1 | 0 | 0 |
| 5 | 0 | 1 | 0 | 1 |
| 6 | 0 | 1 | 1 | 0 |
| 7 | 0 | 1 | 1 | 1 |
| 8 | 1 | 0 | 0 | 0 |
| 9 | 1 | 0 | 0 | 1 |

$$B_3 = 9 + 8$$

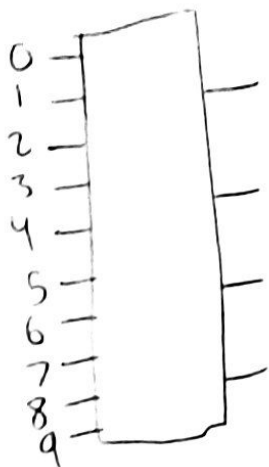
$$B_1 = 2 + 3 + 6 + 7$$

$$B_2 = 4 + 5 + 6 + 7$$

$$B_0 = 1 + 3 + 5 + 7 + 9$$

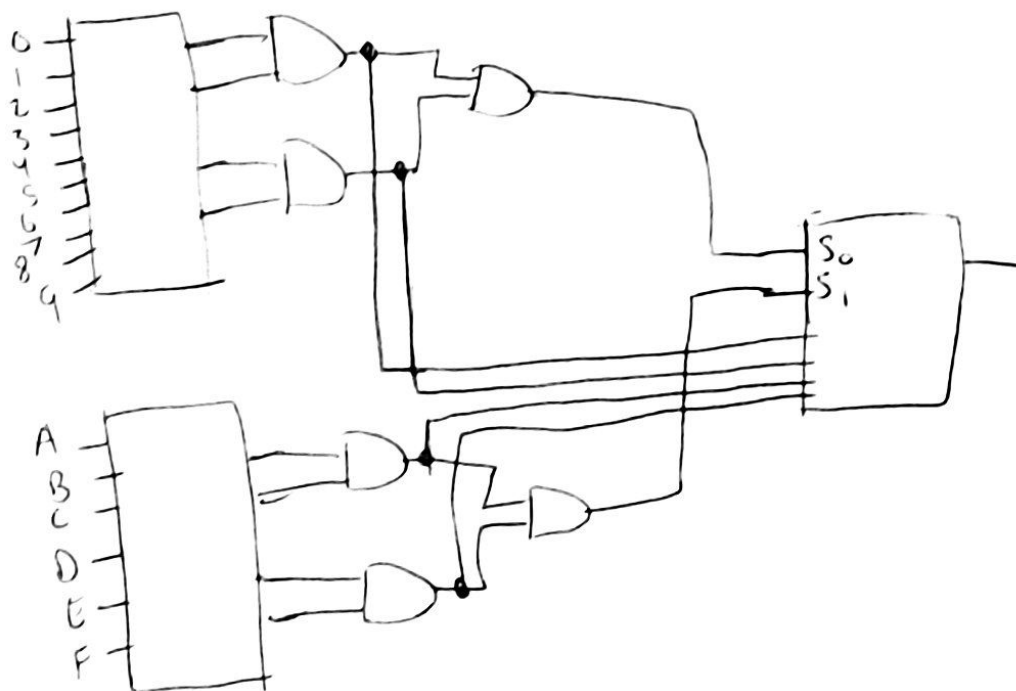


4)

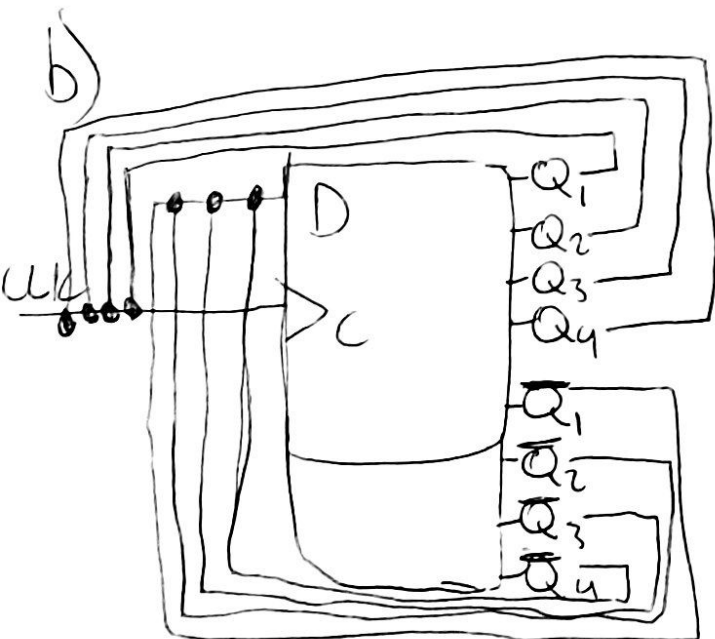
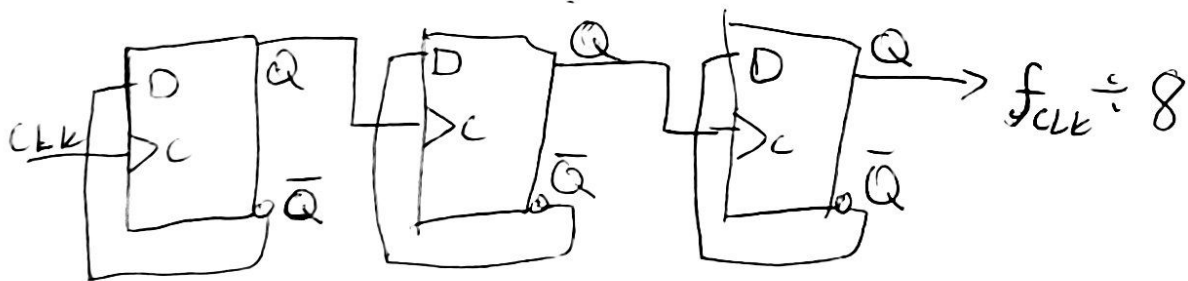
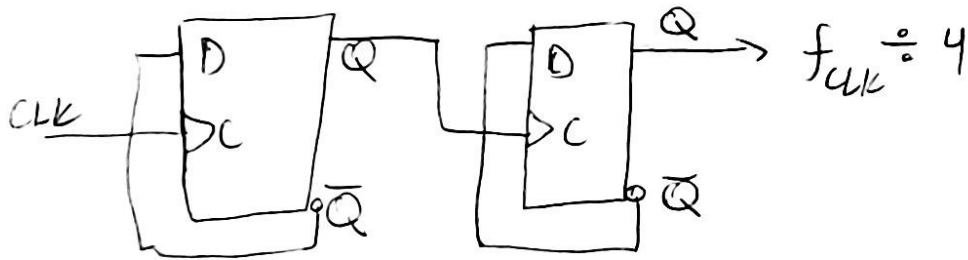
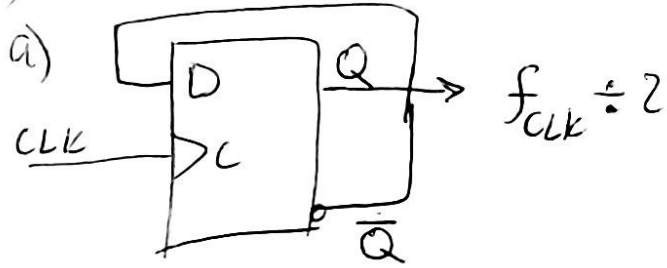


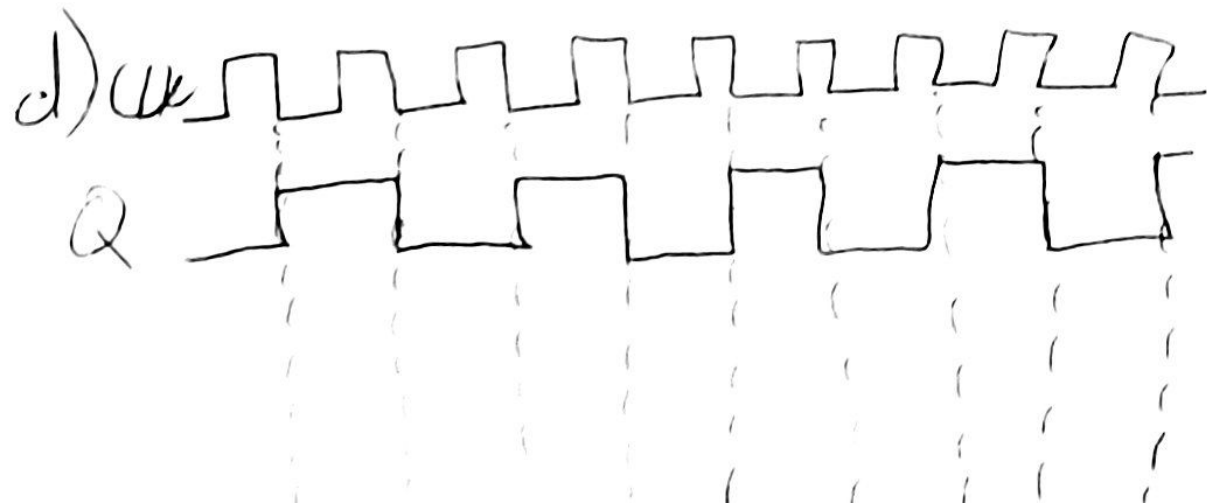
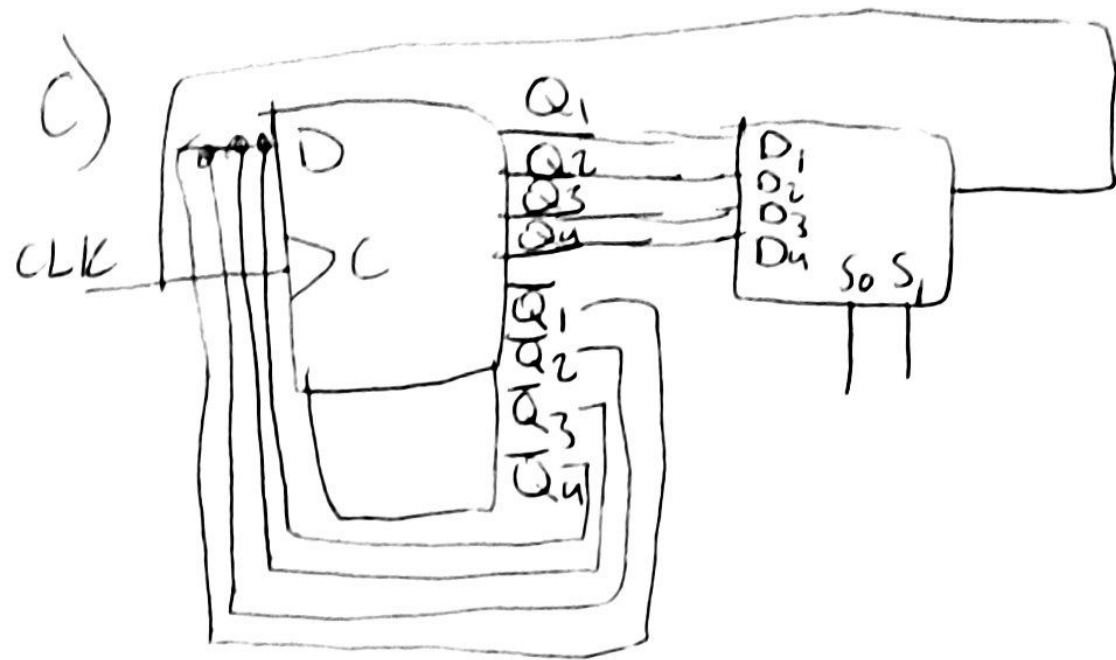
b)

c)



5)

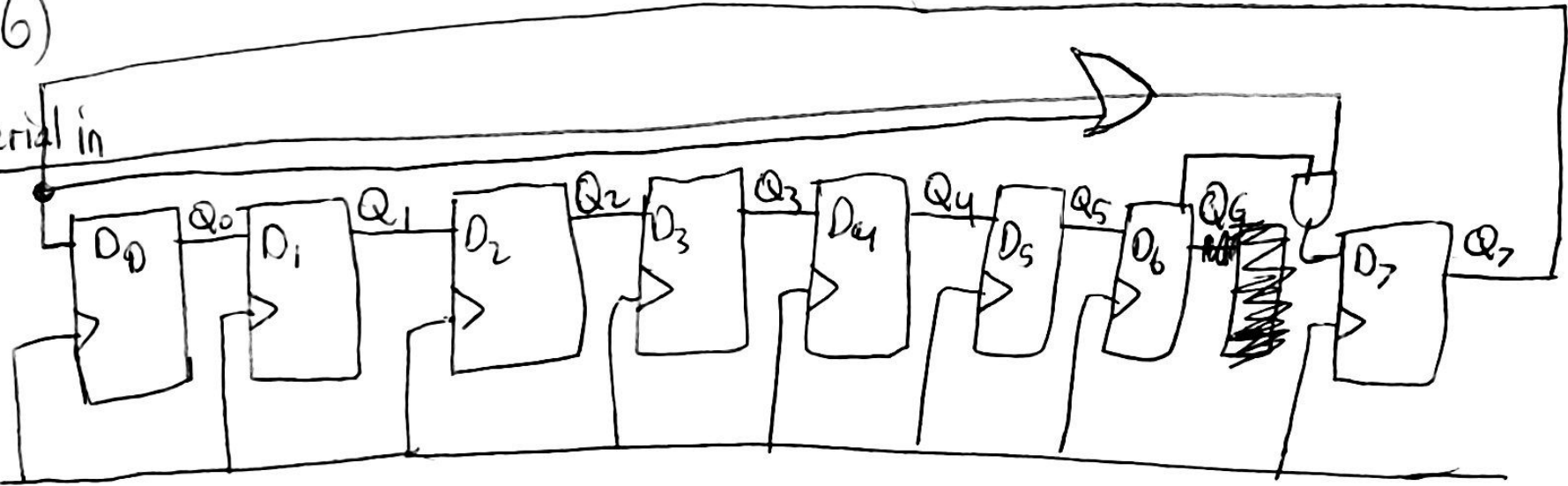




6)

Serial in

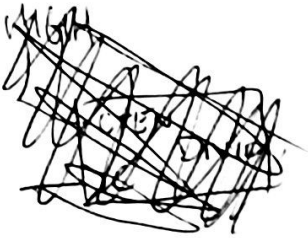
clk



7)

$$100\text{ns} = 0.01\text{GHz}$$

if the counter divides by 10 then final frequency will be $0.001\text{GHz} = 1000\text{ns}$, so initial CLK speed must be smaller than 100ns



$$10\text{ns} = \frac{1}{10} = 0.1\text{GHz}$$

