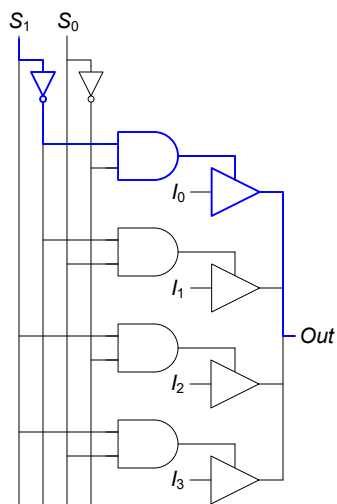


$$\begin{aligned}
 t_{pd_sy} &= t_{pINV} + t_{pAND3} + t_{pOR4} \\
 &= 30 \text{ ps} + 80 \text{ ps} + 90 \text{ ps} \\
 &= \mathbf{200 \text{ ps}}
 \end{aligned}$$

$$\begin{aligned}
 t_{pd_dy} &= t_{pAND3} + t_{pOR4} \\
 &= \mathbf{170 \text{ ps}}
 \end{aligned}$$

(a)



$$\begin{aligned}
 t_{pd_sy} &= t_{pINV} + t_{pAND2} + t_{pTRI_SY} \\
 &= 30 \text{ ps} + 60 \text{ ps} + 35 \text{ ps} \\
 &= \mathbf{125 \text{ ps}}
 \end{aligned}$$

$$\begin{aligned}
 t_{pd_dy} &= t_{pTRI_AY} \\
 &= \mathbf{50 \text{ ps}}
 \end{aligned}$$

(b)