3.4 This is sequential logic. If \( S \) and \( R \) are both high, the outputs don't change. If \( S \) goes low, \( Q \) goes high which makes \( Q \) go low. If \( R \) goes low, \( \overline{Q} \) goes high which makes \( \overline{Q} \) go low. If both \( S \) and \( R \) go low the latch malfunctions.

This is an active low \( \overline{S}R \) latch.

3.7 a) \underline{Combo Logic} \[
\begin{align*}
D^* &= \overline{S}K\overline{Q} + \overline{S}\overline{K} + S\overline{K}\overline{Q}
\end{align*}
\]

b) \underline{Combo Logic} \[
\begin{align*}
D^* &= \overline{S}K\overline{Q} + \overline{S}K + S\overline{K}\overline{Q}
\end{align*}
\]
3.12

3.13 \[ \text{Frequency Range} = \frac{1}{N \times T_{pd}} \text{ to } \frac{1}{N \times T_{cd}} \]

3.19 See Lecture #7 notes

I.Q 3.3 A latch updates the output whenever the enable is high. It is level driven.

A flip-flop updates the output during a rising or falling edge. It is edge driven.