Homework Quiz # 5 - Solution

a) \[ D = A'Q' + BQ \]

\[
\begin{array}{cccc|c}
A & B & Q0 & Qn & D \\
0 & 0 & 0 & 0 & 1 \ \\
0 & 0 & 1 & 0 & 0 \ \\
0 & 1 & 0 & 1 & 1 \ \\
0 & 1 & 1 & 1 & 1 \ \\
1 & 0 & 0 & 0 & 0 \ \\
1 & 0 & 1 & 0 & 0 \ \\
1 & 1 & 0 & 0 & 0 \ \\
1 & 1 & 1 & 1 & 1 \\
\end{array}
\]

\[
\begin{array}{cccc}
A & Q' & B & Q \\
& & & \\
& & & \\
& & & \\
& & & \\
& & & \\
& & & \\
& & & \\
& & & \\
& & & \\
\end{array}
\]

b) \[ T = A'Q' + B'Q \]

\[
\begin{array}{cccc|c}
A & B & Q0 & Qn & T \\
0 & 0 & 0 & 0 & 1 \ \\
0 & 0 & 1 & 0 & 1 \ \\
0 & 1 & 0 & 1 & 1 \ \\
0 & 1 & 1 & 1 & 0 \ \\
1 & 0 & 0 & 0 & 0 \ \\
1 & 0 & 1 & 0 & 1 \ \\
1 & 1 & 0 & 0 & 0 \ \\
1 & 1 & 1 & 1 & 0 \\
\end{array}
\]

\[
\begin{array}{cccc}
A & Q' & B & Q \\
& & & \\
& & & \\
& & & \\
& & & \\
& & & \\
& & & \\
& & & \\
& & & \\
\end{array}
\]

\[
\begin{array}{cccc}
AB & D \\
Q & 00 & 01 & 11 & 10 \\
0 & 1 & 1 & 0 & 0 \\
1 & 0 & 1 & 1 & 0 \\
\end{array}
\]

\[
\begin{array}{cccc}
AB & T \\
Q & 00 & 01 & 11 & 10 \\
0 & 1 & 1 & 0 & 0 \\
1 & 1 & 0 & 0 & 1 \\
\end{array}
\]