No penalty for not taking will replace a low HW or low Quiz

(a) Would you use nodal analysis or mesh analysis? Explain your answer.

(b) Does this circuit have a supermode or a supermesh? Explain.

(c) Write equations that define this circuit completely.

(d) You don’t have to solve (c) but write in matrix form (your answer in (c))

Solutions:

(a) Use mesh analysis, less equations for using mesh analysis.

(b) Supermesh contain a 1A current source.

(c) \[
\begin{align*}
\begin{cases}
1 \cdot (i_1 - i_2) + 3 \cdot (i_3 - i_2) + 1 \cdot i_2 &= 7 \\
1 \cdot (i_2 - i_3) + 2 \cdot i_2 + 3 \cdot (i_3 - i_5) &= 0 \\
i_1 - i_3 &= 7
\end{cases}
\end{align*}
\]

(b) \[
\begin{align*}
\begin{bmatrix}
1 & -4 & 4 \\
-1 & 6 & -3 \\
1 & 0 & -1
\end{bmatrix}
\begin{bmatrix}
i_1 \\
i_2 \\
i_3
\end{bmatrix}
= \begin{bmatrix}
7 \\
0 \\
1
\end{bmatrix}
\end{align*}
\]
(Could use 2x2 matrix)

\[\begin{align*}
i_1 &= 7A \\
i_2 &= 2.5A \\
i_3 &= 2A
\end{align*}\]