Label the diagram with currents and voltages. Write equations to solve for the voltage across and the current through each element. Do not solve.

\[ \begin{align*}
\text{Devices:} \\
N_8 &= 8 \times 12 \\
N_9 &= 9 \times i_c \\
N_{10} &= 10 \times i_c \\
N_{11} &= 11 \times i_{11} \\
N_6 &= 100 \times \frac{dN_6}{dt}
\end{align*} \]

\[ \begin{align*}
\text{KVL:} \\
N_8 - N_{12} - N_7 - 5 \sin(6t) &= 0 \\
N_7 - N_{10} &= 0 \\
-N_9 + 5 \sin(6t) + N_4 - N_6 &= 0 \\
-N_4 + N_{10} + 2t + 3 - N_{11} &= 0
\end{align*} \]

\[ \begin{align*}
\text{KCL: (Use any 3 nodes)} \\
(\text{A}) 12 + 15 + i_c &= 0 \\
(\text{B}) -i_5 + i_7 + i_9 &= 4e^{-t} = 0 \\
(\text{C}) -i_6 + i_{11} &= 0
\end{align*} \]

Find \( i(t) \). At \( t = 0 \) the current in the inductor is 8A downward. Simplify your answer.