Problem 1

For the following circuit, find:
(a) $i(0^-)$ and $v(0^+)$,
(b) $\frac{dv(0^+)}{dt}$,
(c) $i(\infty)$ and $v(\infty)$.

Problem 2

The current in an RLC circuit is described by
$$\frac{d^2i}{dt^2} + 10 \frac{di}{dt} + 25i = 0$$
If $i(0) = 3A$ and $di(0)/dt = 1A/s$, find $i(t)$ for $t>0$

Problem 3

A branch voltage in an RLC circuit is described by
$$\frac{d^2v}{dt^2} + 4 \frac{dv}{dt} + 8v = 48$$
If the initial conditions are $v(0) = 4V$, $dv(0)/dt = -20V/s$, find $v(t)$. 
Problem 4

In the following circuit, the switch instantaneously moves from position A to B at t=0. Find v(t) for all $t \geq 0$.

$$v(1)=5.546\, \text{V}$$

Problem 5

The switch in the following circuit has been closed for a long time but is opened at t=0. Determine i(t) for $t>0$.

$$i(1)=0.133\, \text{A}$$
Problem 6

Calculate \( v(t) \) for \( t>0 \) in the following circuit.

\[ (v(1)=6.622V) \]

\[ 40\text{V} \]

\[ \begin{array}{c}
36\Omega \\
60\Omega
\end{array} \]

\[ 15\Omega \]

\[ 6\Omega \]

\[ 3\text{H} \]

\[ 25\Omega \]

\[ 3\text{H} \]

\[ \frac{1}{27}\text{F} \]

Problem 7

For the following circuit, find \( v(t) \) for \( t>0 \).

\[ (v(1)=65.107V) \]

\[ 4\text{V} \]

\[ 4\text{A} \]

\[ 1\text{H} \]

\[ 0.04\text{F} \]

\[ 4\Omega \]

\[ 2\Omega \]

\[ 60u(t)\text{V} \]
Problem 8

Find $v(t)$ for $t>0$ in the following circuit.

$\begin{align*}
\text{Problem 8} \\
\text{Find } v(t) \text{ for } t>0 \text{ in the following circuit.}
\end{align*}$

Problem 9

Obtain $v(t)$ and $i(t)$ for $t>0$ in the following circuit.

$\begin{align*}
\text{Problem 9} \\
\text{Obtain } v(t) \text{ and } i(t) \text{ for } t>0 \text{ in the following circuit.}
\end{align*}$
Problem 10

The switch in the following circuit is moved from position a to b at t=0. Determine i(t) for t>0.

\[ \text{(i(1)=-0.0283A)} \]

Problem 11

Given the network in the following circuit, find v(t) for t>0.

\[ \text{(v(1)≈18.486V)} \]