14.24 Use Thévenin's theorem to find $v_o(t)$, $t > 0$, in the network in Fig. P14.24.

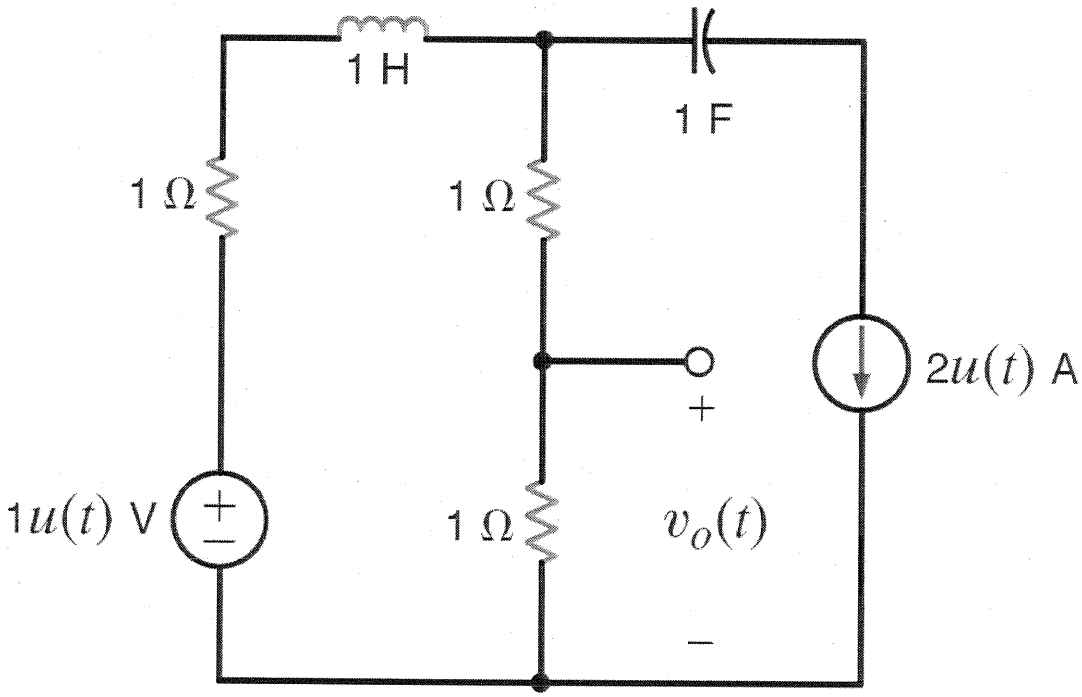
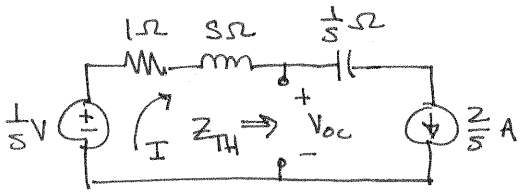


Figure P14.24

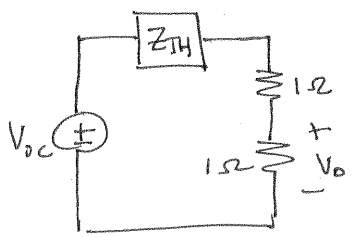
SOLUTION:



$I = \frac{2}{s}A \qquad \frac{1}{s} = (s+1)I + V_{oc}$

So, $V_{oc} = -\frac{(2s+1)}{s}$

$Z_{TH} = s + 1\Omega$



$V_o = V_{oc}\frac{(1)}{2+Z_{TH}} = -\frac{(2s+1)}{s}\cdot\frac{1}{s+3} = -\frac{(2s+1)}{s(s+3)}$

$V_o = \frac{-1/3}{s} - \frac{5/3}{s+3}$

$$\boxed{v_o(t) = \left[-\tfrac{1}{3} - \tfrac{5}{3}e^{-3t}\right]u(t)\ V}$$