14.16 Use mesh analysis to find $v_o(t)$, $t > 0$, in the network in Fig. P14.16. CS

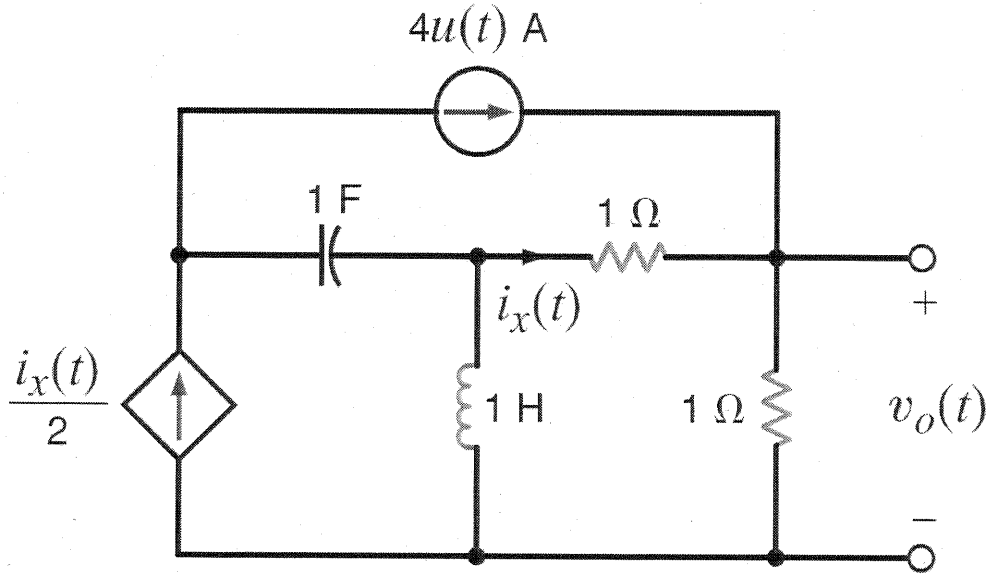
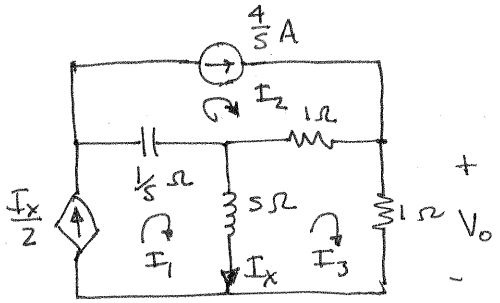


Figure P14.16

SOLUTION:



$I_1 = \frac{I_x}{2} = \frac{I_1 - I_3}{2} \Rightarrow I_1 = -I_3$

$I_2 = 4/s$

$I_3(s+2) - 5I_1 - I_2 = 0$

$V_o = (1)I_3$

$I_3(s+2) + 5I_3 = 4/s \Rightarrow I_3 = \frac{4}{s(2s+2)} = \frac{2}{s(s+1)}$

$V_o = \frac{2}{s(s+1)} = \frac{2}{s} - \frac{2}{s+1}$

$v_o(t) = [2(1-e^{-t})]u(t)$