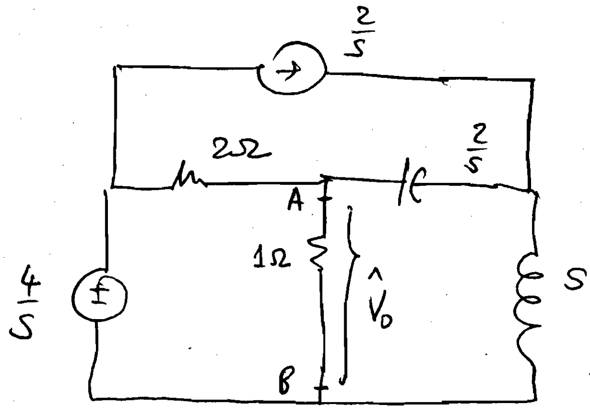
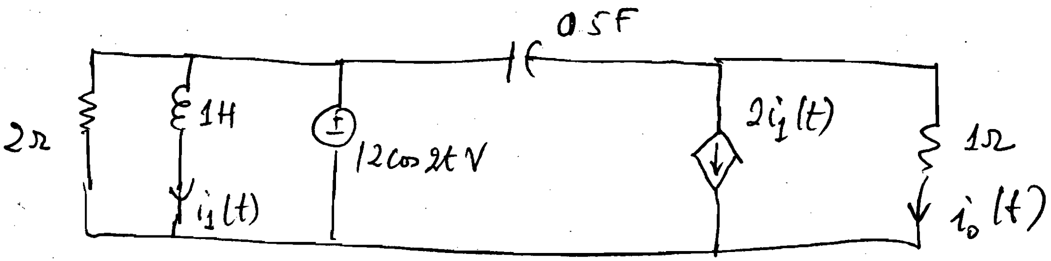
13.26 :



Find $\hat{V}_o$ then find $v_o(t)$

13.62 :



Find $\hat{I}_o$, then $i_o(t)$

$$V_O = \frac{V_{OC}(1)}{1+Z_{TH}} = \frac{8S+8/S}{S^2+2S+2+2S^2+4}$$

$$V_O = \frac{(8/3)(S^2+1)}{S(S^2+(2/3)S+2)}$$

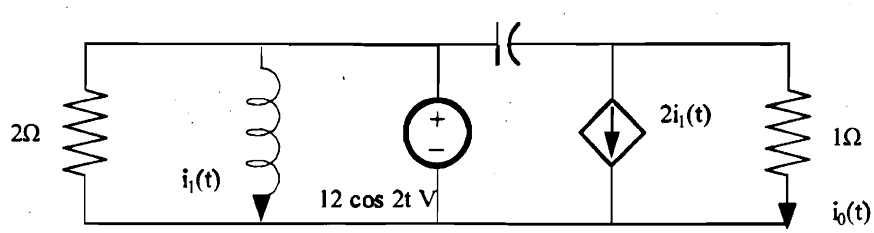
$$A = 4/3$$

$$K\underline{|\theta} = 1.273\underline{|10.05^0}$$

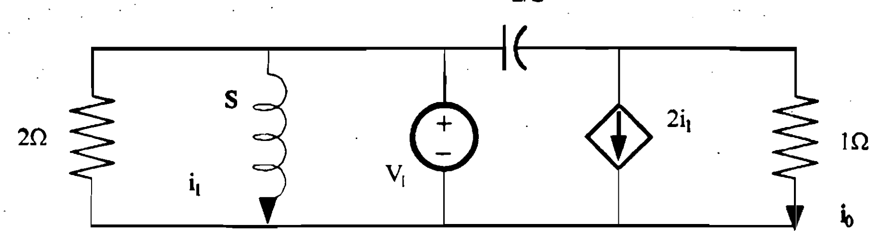
$$V_O(t) = (\frac{4}{3} + 2.546e^{-t/3}COS(\sqrt{17t}+10.05^0))V$$

Problem 13.62

Find the steady state response Io(t) for the network shown the fig.



Suggested Solution



KCL

$$\frac{V_0}{1} + 2I_1 + (V_0 - V_I)\frac{s}{2} = 0$$

$$I_0 = V_0/1, I_1 = V_I/s$$

$$I_0 + \frac{2V_I}{s} + I_0(\frac{s}{2}) - V_I(\frac{s}{2}) = 0$$

or

$$I_0(1+\frac{s}{2}) = V_I(\frac{s}{2}-\frac{2}{s}) = V_I(\frac{s^2-4}{2s})$$

$$I_0(\frac{s+2}{2}) = V_I(\frac{s^2-4}{2s})$$

Finally

$$\frac{I_0}{V_I} = \frac{s-2}{s}$$

at steady state s=j2

$V_i(t) = 12\cos(2t)$

$$\left.\frac{I_0}{V_I}\right|_2 = \frac{j2-2}{j2} = \sqrt{2}\angle 45^o$$

and

$$I_0 = |V_I|\sqrt{2}\angle 45^o = 12\sqrt{2}\angle 45^o$$

$$I_0 = 12\sqrt{2}\cos(2t + \angle 45^o)A$$