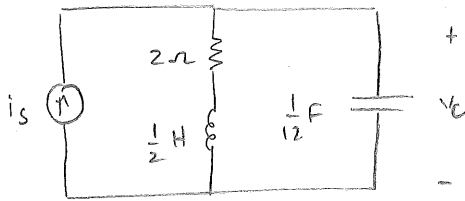


PROBLEM SET VIII

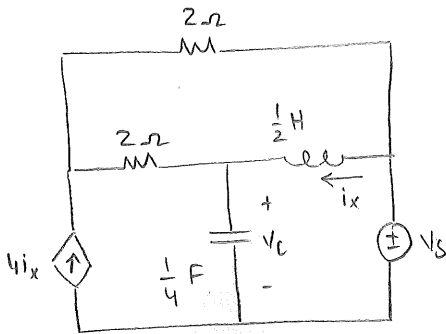
1

The circuit is in SSS. Find $v_c(t)$ for

a) $i_s(t) = 5 \cos 6t$ A

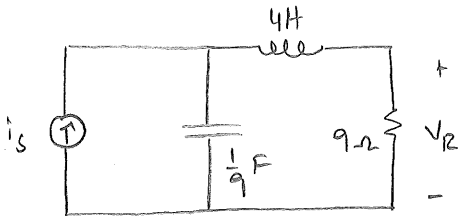
b) $i_s(t) = 5 \cos(6t + 17^\circ)$ A

2

The circuit is in SSS. Find $v_c(t)$ and $i_x(t)$.

$$v_s(t) = 10 \cos 4t$$
 V

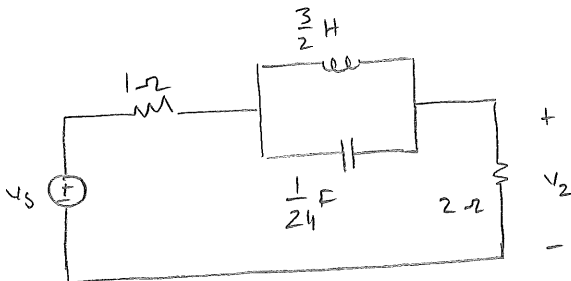
3

a) Find $i_s(t)$.

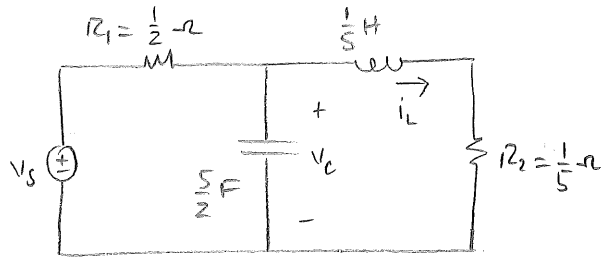
b) Find the average stored energy in the capacitor.

$$v_R(t) = 18 \cos(3t - 60^\circ)$$
 V

4

The circuit is in steady state. Find $v_2(t)$.

$$v_s(t) = 12 + 10 \cos 2t + 2 \cos(4t + 55^\circ)$$
 V

51

$$v_s(t) = 6 \cos 2t \text{ V}$$

The circuit is in SSS.

a) Find $v_c(t)$ and $i_L(t)$.

b) Find the average powers $P_{1,av}$ and $P_{2,av}$ dissipated on the resistors.

c) Find the average energies $E_{L,av}$ and $E_{C,av}$ stored in the inductor and capacitor.

KEY

1 a) $v_c(t) = 2\sqrt{65} \cos(6t - \tan^{-1} \frac{7}{4}) \text{ V}$

b) $v_c(t) = 2\sqrt{65} \cos(6t - \tan^{-1} \frac{7}{4} + 17^\circ) \text{ V}$

2 $v_c(t) = 2\sqrt{185} \cos(4t - \tan^{-1} \frac{4}{13}) \text{ V}$

$i_x(t) = 4\sqrt{5} \cos(4t + \tan^{-1} 2) \text{ A}$

3 a) $i_s(t) = 6\sqrt{2} \cos(3t + 75^\circ) \text{ A}$

b) $E_{C,av} = 25 \text{ J}$

4 $v_2(t) = 8 + 4 \cos(2t - \tan^{-1} \frac{4}{3}) \text{ V}$

5 a) $v_c(t) = 2\sqrt{2} \cos(2t - \frac{\pi}{4}) \text{ V}$, $i_L(t) = 2\sqrt{10} \cos(2t + \pi + \tan^{-1} 3) \text{ A}$

b) $P_{1,av} = 20 \text{ W}$, $P_{2,av} = 4 \text{ W}$

c) $E_{L,av} = 2 \text{ J}$, $E_{C,av} = 5 \text{ J}$