

Find the steady-state currents $i_1(t)$ and $i_2(t)$.

$$i_1(t) = A_1$$

$$i_2(t) = A_2 \cos(1000t + B_2) \quad \text{with } -180^\circ < B_2 \leq 180^\circ$$

$$A_0 : 2 \text{ A}$$

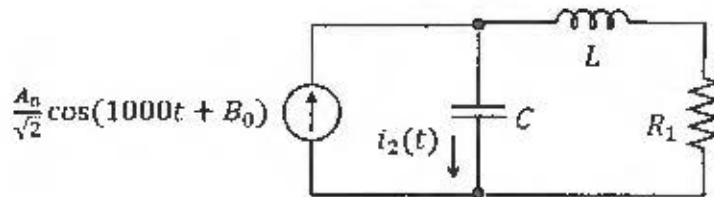
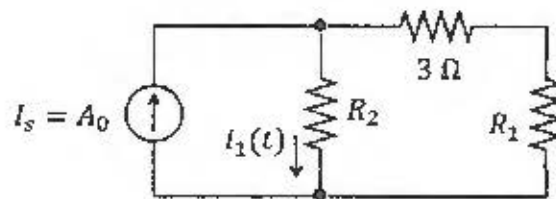
$$B_0 : 20 \text{ degrees}$$

$$C : 250 \text{ uF}$$

$$L : 4 \text{ mH}$$

$$R_1 : 4 \text{ ohm}$$

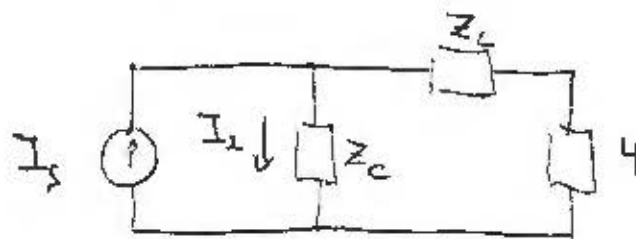
$$R_2 : 3 \text{ ohm}$$



① CURRENT DIVIDER. $I_1 = 2 \cdot \frac{3+4}{3+4+3} = \frac{14}{10}$

$$A_1 = 1.4 \text{ A}$$

②



$$I_s = \frac{2}{\sqrt{2}} \cdot e^{j20^\circ}$$

$$Z_L = j\omega L = j 1000 \cdot 4 \cdot 10^{-3} = 4j$$

$$Z_C = \frac{1}{j\omega C} = \frac{1}{j 1000 \cdot 250 \cdot 10^{-6}} = -4j$$

$$I_2 = I_s \cdot \frac{4j+4}{4j+4-4j} = I_s \cdot \frac{4(1+j)}{4} = \frac{2}{\sqrt{2}} e^{j20^\circ} \sqrt{2} e^{j45^\circ}$$

$$I_2 = 2 e^{j65^\circ}$$

$$i_2(t) = 2 \cos(1000t + 65^\circ)$$

$$A_2 = 2 \text{ A}$$

$$B_2 = 65^\circ$$