HOMEWORK SET 11

Issued: November 15, 2004 Due: November 22, 2004

Problem 1. Do Problem 4.30 on page 194 of textbook.

Problem 2. Do Problem 4.31 on page 194.

Problem 3. Do Problem 4.32 on page 194.

Problem 4. Do Problem 4.35 on page 195.

Problem 5. Do Problem 4.47 on page 196.

Problem 6. Do Problem 4.55 On page 197.

Problem 7. Do Problem 4.58 on page 197.

4.30 If the current through and the voltage across a component in an electric circuit are

$$i(t) = 17\cos(\omega t - \pi/12)\ \text{mA}$$

$$v(t) = 3.5\cos(\omega t + 1.309)\ \text{V}$$

where $\omega = 628.3$ rad/s, determine

a. Whether the component is a resistor, capacitor, or inductor.

b. The value of the component in ohms, farads, or henrys.

4.31 Describe the sinusoidal waveform shown in Figure P4.31, using time-dependent and phasor notation.

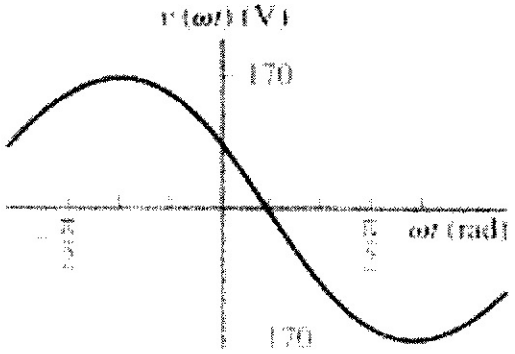


Figure P4.31

4.32 Describe the sinusoidal waveform shown in Figure P4.32, using time-dependent and phasor notation.

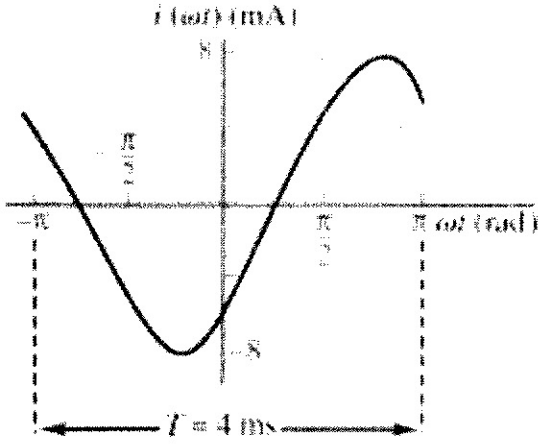


Figure P4.32

4.35 Determine the equivalent impedance in the circuit shown in Figure P4.35:

$$v_s(t) = 7\cos\left(3{,}000t + \frac{\pi}{6}\right) \quad \text{V}$$

$$R_1 = 2.3\ \text{k}\Omega \qquad R_2 = 1.1\ \text{k}\Omega$$

$$L = 190\ \text{mH} \qquad C = 55\ \text{nF}$$

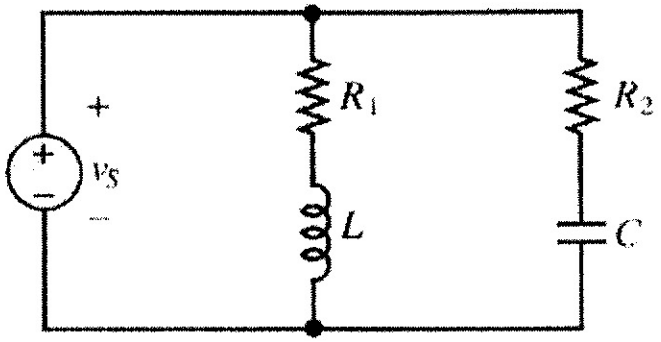


Figure P4.35

4.47 With reference to Problem 4.44, find the value of ω for which the current through the resistor is maximum.

4.44 Using phasor techniques, solve for the voltage v in the circuit shown in Figure P4.44.

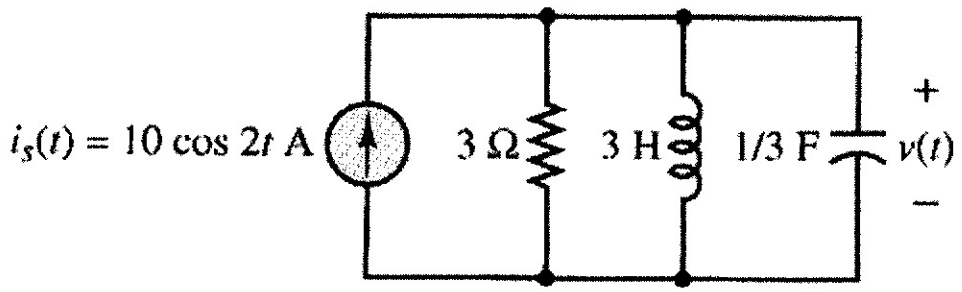


Figure P4.44

4.55 Find the Thévenin equivalent of the circuit shown in Figure P4.55 as seen by the load resistor.

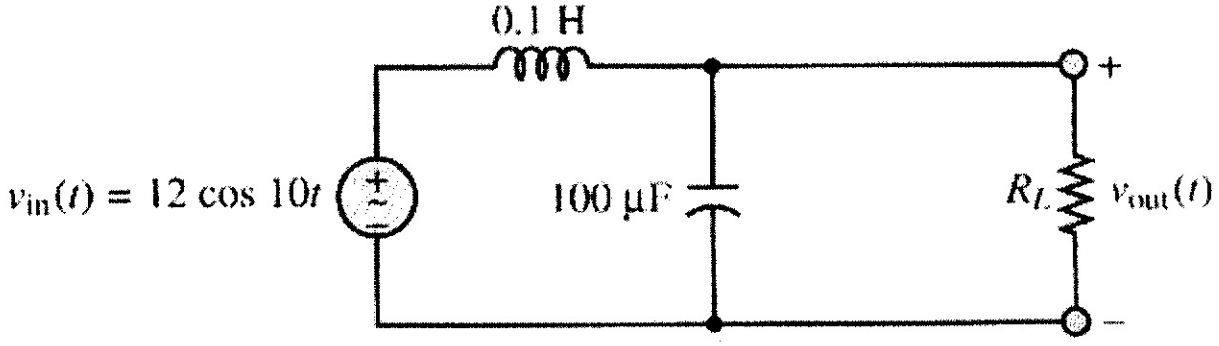
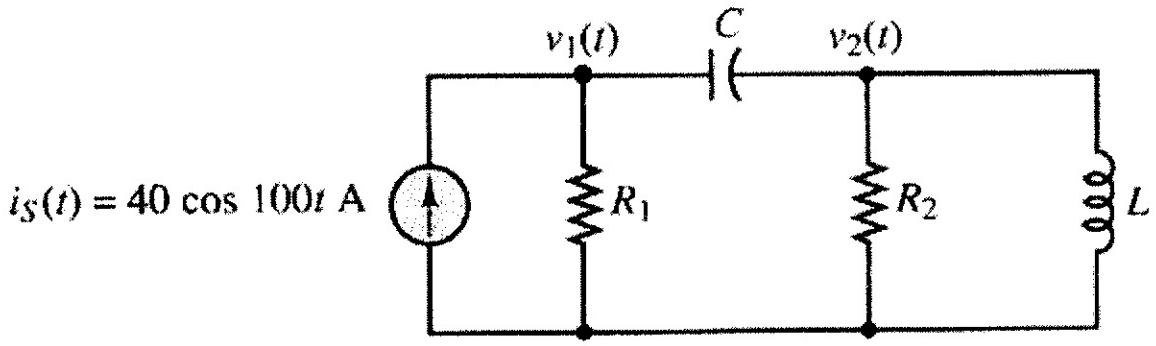


Figure P4.55

4.58 Using node voltage methods, determine the voltages $v_1(t)$ and $v_2(t)$ in the circuit shown in Figure P4.58.



$R_1 = 40\ \Omega$
$R_2 = 10\ \Omega$
$C = 500\ \mu\text{F}$
$L = 0.2$ H

Figure P4.58