

Solutions

Chapter 8

8.1 $T=15.71\text{mS}$

8.3 $v(t)$ leads $i(t)$ by 140 degrees

8.5 $v_1(t)$ leads $i_1(t)$ by -45 degrees, $v_1(t)$ leads $i_2(t)$ by 160 degrees

Chapter 9

9.3 $P = 0 \text{ W}$

9.5 $P = 336.11 \text{ W}$, $i_2(t) = 5.64 \cos(100t + 41.18^\circ) \text{ A}$

9.6 $P = 149.99 \text{ W}$

9.7 $P_{ig} = 9.98\text{W}$, $P_{120\Omega} = 7.48\text{W}$, $P_{40\Omega} = 2.49\text{W}$, $P_L=0\text{W}$, $P_C = 0\text{W}$

9.9 $P_{is} = 27.49\text{W}$, $P_{2\Omega} = 10.56\text{W}$, $P_{2\Omega\#2} = 16.97\text{W}$

9.11 $P_{is} = 8.66\text{W}$, $P_{Vs} = 41.35\text{W}$,

9.44 $V_{rms} = 4.47\text{V}$

9.45 $I_{rms} = 2.35\text{A}$

9.47 $I_{rms} = 6.46\text{A}$

9.48 $I_{rms} = 1.53\text{A}$

9.49 $V_{rms} = 3.87\text{V}$

9.51 $I_{rms} = 0.94\text{A}$

Chapter 1

1.1 $Q = 72 \text{ C}$

1.3 $Q = 1.5 \text{ C}$

1.5 $Q = 135 \text{ C}$

1.7 $Q = 43.2 \text{ KC}$

1.9 $i(t) = 2\text{A}$ $0 \leq t \leq 0.5\text{s}$

1.11 $W = 622.04 \text{ mJ}$

- 1.13 $W = 5.99 \text{ J}$
- 1.15 (a) $Q(4.5) = 0 \text{ C}$, (b) $P(5.5) = 12 \text{ W}$, (c) $W = 12 \text{ J}$
- 1.19 (a) $I = 4 \text{ A}$, (b) $P = -24 \text{ W}$
- 1.21 $P_1 = 8 \text{ W}$, $P_2 = 32 \text{ W}$
- 1.23 (a) $P_2 = 18 \text{ W}$ absorbed, (b) $P_1 = 12 \text{ W}$ absorbed
- 1.25 $P_2 = 48 \text{ W}$ absorbed
- 1.27 $P_2 = 7 \text{ W}$ absorbed, $I_s = 3.5 \text{ A}$
- 1.31 (a) $P_{2A} = 40 \text{ W}$ supplied, $P_1 = 12 \text{ W}$ absorbed, $P_{14V} = 28 \text{ W}$ absorbed, (b) $P_{4A} = 64 \text{ W}$ supplied, $P_1 = 32 \text{ W}$ absorbed, $P_{2ix} = 32 \text{ W}$ absorbed
- 1.37 $P_{10V} = 30 \text{ W}$ absorbed, $P_{6V} = 18 \text{ W}$ absorbed, $P_{9A} = 144 \text{ W}$ supplied, $V_s = 8 \text{ V}$, $P_{V_s} = 48 \text{ W}$ absorbed, $P_{8V} = 48 \text{ W}$ absorbed

Chapter 2

- 2.1 $P_{12\Omega} = 6.75 \text{ W}$
- 2.3 $P_R = 48 \text{ W}$
- 2.5 $R_x = 5 \text{ K}\Omega$
- 2.7 $P_{\text{Lamp}} = 9 \text{ W}$
- 2.11 $I_2 = 10 \text{ mA}$, $I_1 = 10 \text{ mA}$
- 2.13 $I_1 = 12 \text{ mA}$, $I_2 = 6 \text{ mA}$
- 2.15 $I_x = 2 \text{ mA}$
- 2.17 $I_0 = 3 \text{ mA}$, $I_1 = -2 \text{ mA}$
- 2.19 $V_{BD} = 8 \text{ V}$
- 2.21 $V_{FB} = -8 \text{ V}$, $V_{EC} = -6 \text{ V}$
- 2.29 $V_{BD} = 6 \text{ V}$
- 2.31 $V_{AB} = -4 \text{ V}$
- 2.33 $P_{12V} = 4 \text{ mW}$, $P_{6V} = -2 \text{ mW}$
- 2.39 $I_0 = 6 \text{ mA}$

- 2.41 $V_1 = 1.18 \text{ V}$, $P_{4\text{ma}} = 4.72 \text{ mW}$, $P_{2\text{ma}} = -2.36 \text{ mW}$
- 2.43 $I_0 = 4.5 \text{ mA}$
- 2.49 $R_{AB} = 3 \text{ K}\Omega$
- 2.51 $R_{AB} = 3 \text{ K}\Omega$
- 2.55 $R_{EQ} = 7.2 \Omega$
- 2.57 1) $R_{EQ} = 3.61 \Omega$, 2) $R_{EQ} = 3.11 \Omega$, 3) $R_{EQ} = 4.5 \Omega$, 4) $R_{EQ} = 26.5 \Omega$, 5) $R_{EQ} = 16.5 \Omega$, 6) $R_{EQ} = 14.5 \Omega$
7) $R_{EQ} = 10 \Omega$, 8) $R_{EQ} = 12 \Omega$, 9) $R_{EQ} = 13.61 \Omega$, 10) $R_{EQ} = 15.11 \Omega$
- 2.59 a) $R_{MIN} = 950 \Omega$, $R_{MAX} = 1050 \Omega$, b) $R_{MIN} = 460.6 \Omega$, $R_{MAX} = 479.4 \Omega$, c) $R_{MIN} = 19.8 \text{ K}\Omega$,
 $R_{MAX} = 24.2 \text{ K}\Omega$,
- 2.63 $V_{AB} = 6 \text{ V}$, $V_{DC} = -8 \text{ V}$
- 2.65 $I_0 = 6 \text{ mA}$
- 2.67 $I_2 = 1 \text{ A}$, $I_1 = 1 \text{ A}$, $I_3 = 0.5 \text{ A}$, $I_4 = 0.5 \text{ A}$, $V_1 = 5 \text{ V}$
- 2.69 $I_2 = 6/5 \text{ A}$, $I_1 = 4/5 \text{ A}$, $I_4 = 3/5 \text{ A}$, $V_{AB} = -6 \text{ V}$
- 2.71 $V_1 = -7.2 \text{ V}$
- 2.75 $V_S = 9.5 \text{ V}$
- 2.77 $V_S = 30 \text{ V}$
- 2.79 $I_S = 3 \text{ A}$
- 2.81 $I_S = 2 \text{ mA}$
- 2.83 $V_S = 36 \text{ V}$
- 2.85 $I_X = 13.75 \text{ A}$, $V_X = 42.5 \text{ V}$
- 2.87 $I_A = -26 \text{ mA}$
- 2.89 $I_A = 42 \text{ mA}$
- 2.91 $V_X = 18 \text{ V}$
- 2.93 $R_B = 2 \text{ K}\Omega$, $V_A = -10 \text{ V}$
- 2.97 $I_0 = 1.29 \text{ A}$

$$2.99 \quad V_o = 3.42 \text{ V}$$