Solutions

Chapter 5

5.1 Io=2mA

5.3 Io=1.14mA

5.7 Io=-3.2mA

5.9 Vo=8V

5.11 Vo=4.125V

5.13 Io=0.4mA

5.15 Ia=-9.75mA

5.17 Vo=6V

5.19 Io=0.909mA

5.21 Io=0.27mA

5.23 Vo=6V

5.25 Vo=8V

5.27 Vo=0.21V

5.29 Io=2mA

5.31 Io=3.5mA

5.33 Io=5.2mA

5.35 Vo=1.375V

5.37 Vo=-8V

5.39 Io=1.56mA

5.41 Vab=20V

5.43 Io=1mA

5.45 Io=2.57mA

5.47 Vo=8V

5.49 Io=0.908mA

5.51 Io=1.55mA

5.77 Vo=2V

5.79 Vo=-3V

5.81 Vo=-1.05V

5.83 Io=1.5mA

5.85 Io=-0.375mA

5.87 Io=-1.4mA

5.89 Vo=2V

5.91 Io=0.267mA

5.93 Io=1mA

5.95 Io=1.6mA

5.97 Rl=2.22Kohm, Pl=3.2mW

5.99 Rl=1.5kohm, Pl=5.04mW

5.101 Rl=2.33kohm, Pl=0.429mW

Chapter 6

6.1 V=40V

6.5 i(t)=+- 9.23cos(377t) A

6.7 v(t)= 0V, t<0

100t V, 0 <= t <= t1

0.2V, t >= t1

6.9 i(t)= 24 A, 0 <= t <= 6uS

-60 A, 6us <= t <= 10uS

16 A, 10us <= t <= 16uS

0 A, t >= 16uS

6.11 i(t)= 0 A, t <= 0

1.2 A, 0 <= t <= 20s

4.8 A, 20s <= t <= 30s

1.2 A, 30s <= t <= 50s

0 A, t >= 50s

6.17 Vc(0) = 1V, Vc(1ms) = 2.5V, Vc(3ms)=5.5V, Vc(4ms)=4.5V, Vc(5ms)=3.5V

6.19 Wc(6)=169J, Ps(6)=60W

6.21 $V(t)=75.4\cos(377t)$ V, $W(t)=0.2\sin^2(377t)$ J

6.25 Vl(t)=0 V, t<0

$Vl(t)=0.1e^{-4t}(1-4t)$ V, t>0

6.35 (a) 0.9mJ, (b) 56.25uJ, (c) 0V, (d) 17.5V, (e) -40V

6.37 (a) 9mH <= L <= 11mH, (b) 1.9nH <= L <= 2.1nH, (c) 61.2uH <= L <= 74.8uH

6.41 L = 50mH

6.43 Pr=21.33W, Wc=144J

6.45 Cmin = 0.5uF, Cmax = 8uF

6.49 yes

6.51 Ct= 6uF

6.53 Ceq = 10.67uF

6.55 (a) 10uF, (b) 10uF

6.57 C=468nF

6.59 Vo=5.33V

6.61 Lab=5mH

6.63 Lt=2.4mH

6.67 L=3mH

6.69 Leq=32mH, Wtot=16mJ

Chapter 8

8.7 (a) $i(t)=3.77\cos(377t+60^{O})$ mA, $\mathbf{I} = 3.77\angle 60^{O}$ mA

(b) $i(t)=1.89\cos(377t+60^{O})$ mA, $\mathbf{I} = 1.89\angle 60^{O}$ mA

8.9 $Z=2.24\angle 63.43^{O}$ ohms

8.11 $Z=1.414\angle 45^{O}$ ohms

8.13 $Y=0.5\angle 0^{O}$ S

8.15 Z=6.69 + j5.28 ohms

8.17 $Z=7.11\angle 44.22^{O}$ ohms

8.19 C=1.4mF

8.21 L=703.6uH

8.23 C=15uF

8.25 f=71.2Hz

8.27 Z=4.1-j4.92ohms

8.29 $i(t)=0.6\cos(1000t-53.26^{O})$A

8.32 $Vo=7.3\cos(10^{5}t-2.14^{O})$V, $Vc=12.16\cos(10^{5}t-126.87^{O})$V

8.33 $Vo=12.9\cos(5t+1.85^{O})$V

8.35 $V(t)=23.49\cos(20t-104.97^{O})$V

8.43 $V=70.71\angle -45^{O}$ V

8.45 $I=6\angle -53.13^{O}$ A

8.47 $V=0.894\angle 56.57^{O}$ V

8.49 $I=2\angle 125^{O}$ A

8.55 $I_1=3\angle -45^{O}$ A

8.61 $Z=1.99\angle 83.1^{O}$ ohms

8.65 $Io=2\angle -36.87^{O}$ A

8.69 $Io=1.65\angle -56.5^{O}$ A

8.77 $V_o = 6.5\angle 157.5^{O}$ V

8.85 $V_o = 3.58\angle 153.4^{O}$ V

8.91 $V_o = 2.82\angle 8.2^{O}$ V

8.95 $I_o = 3.24\angle -177.31^{O}$ A

8.101 $V_o = 3.6\angle 153.4^{O}$ V

8.105 $V_o = 17.9\angle -26.57^{O}$ V

8.111 $I_o = 3.38\angle 150.8^{O}$ V