

Solutions

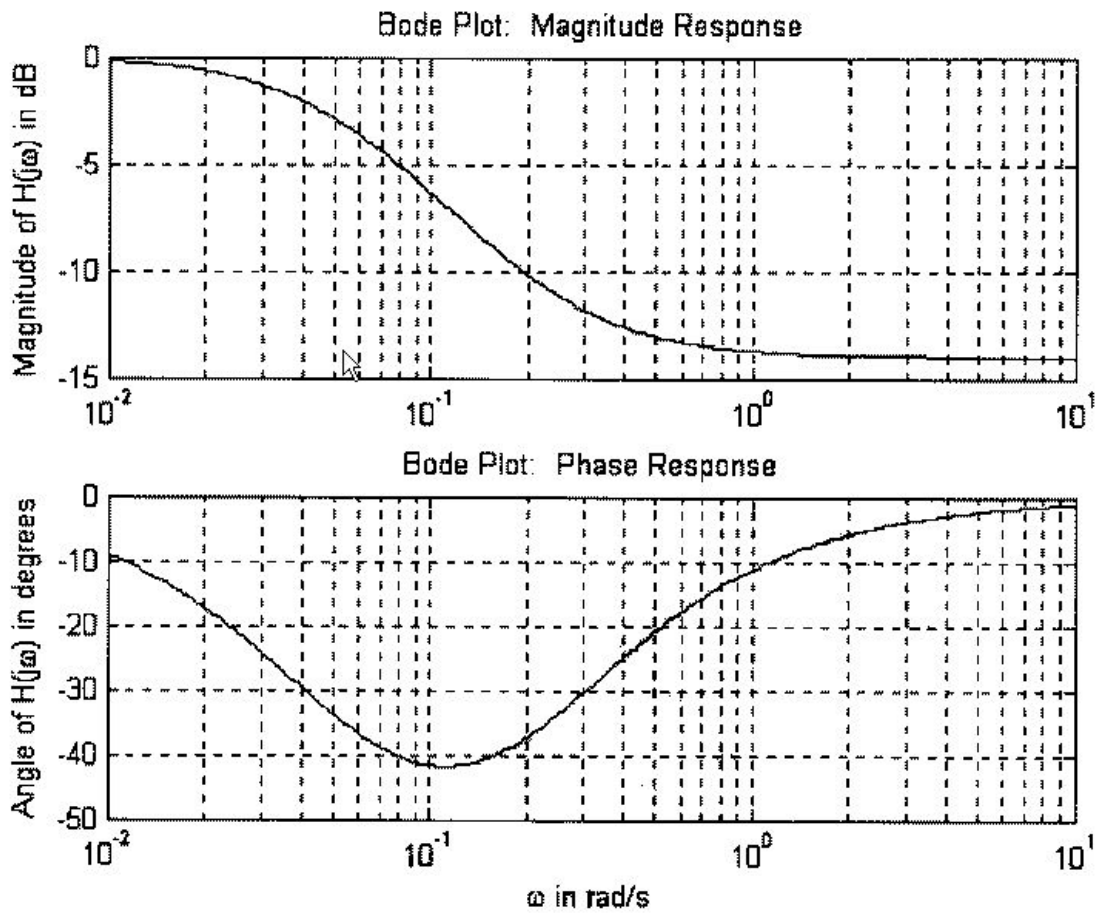
Chapter 12

12.1 $Z = R\{[s^3 + s^2/C_1R + s(C_1+C_2)/LC_1C_2 + 1/RLC_1C_2]\}/[s(s^2 + (C_1+C_2)/LC_1C_2)]$

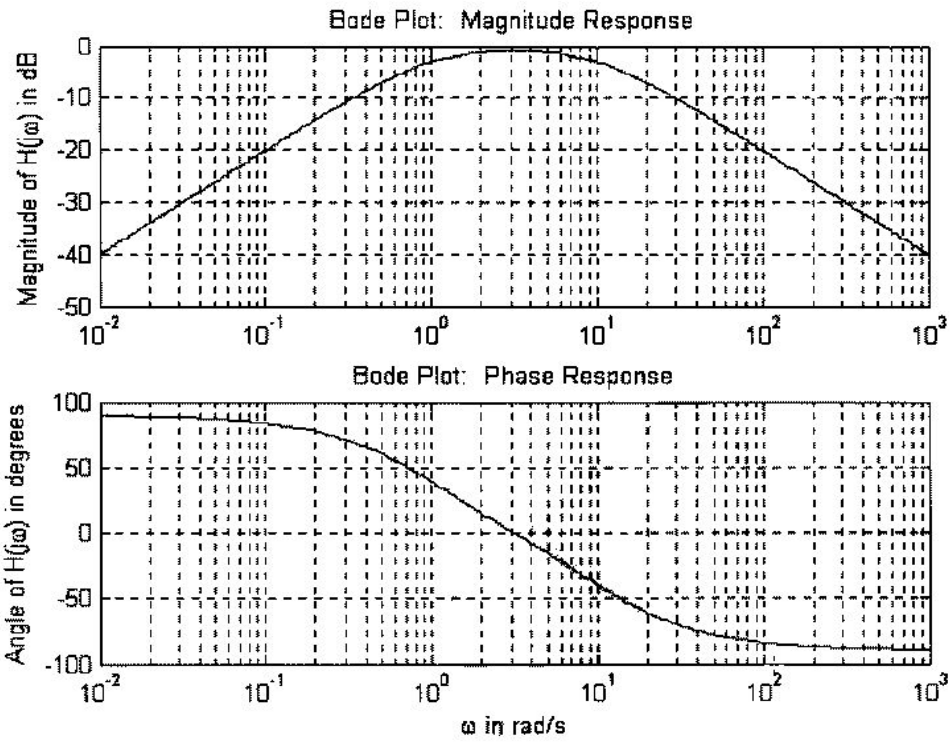
12.3 $V_o(s)/V_i(s) = [s^2+s(R_2/L + 1/R_1C)+(R_2/R_1)/LC]/[s^2+s(R_2/L+1/R_1C)+((R_1+R_2)/R_1/LC)]$

12.5 $V_o/I_s = 8s(s+1)/(2s^2+6s+1)$

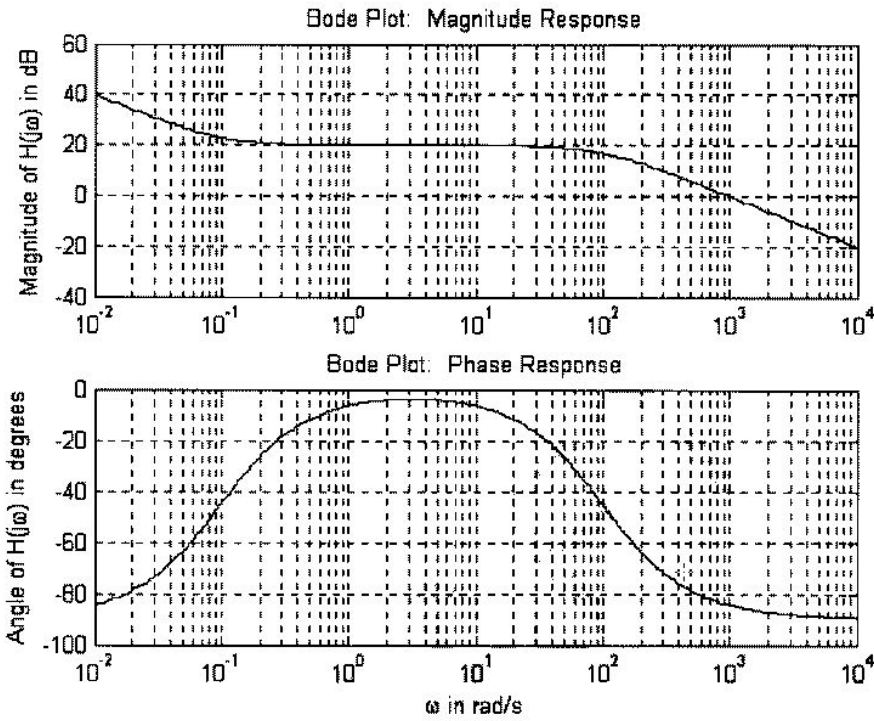
12.6



12.7



12.9



12.22 $H(j\omega) = 5.33 \times 10^4 (j\omega + 1)(j\omega + 120) / [(j\omega + 10)(j\omega + 80)^2]$

12.24 $H(j\omega) = 7.2 \times 10^5 (j\omega)(j\omega + 20) / [(j\omega + 4)(j\omega + 100)(j\omega + 600)^2]$

12.30 $C = 39 \mu\text{F}$, $I(j\omega) = 12 \angle 30^\circ \text{ A}$ @ $\omega/\omega_0 = 1$, $I(j\omega) = 0.4 \angle 118^\circ \text{ A}$ @ $\omega/\omega_0 = 1/4$, $I(j\omega) = 0.4 \angle -58^\circ \text{ A}$ @ $\omega/\omega_0 = 4$

12.31 $L = 50 \text{mH}$, $Q = 20.83$, $\text{BW} = 48.01 \text{ rad/s}$

12.35 $\omega_0 = 2000 \text{ rad/s}$, $Q = 1$, $\text{BW} = 2000 \text{ rad/s}$, $P = 720 \text{mW}$

12.51 Lowpass Filter

Chapter 3

3.1 $V_1 = 35 \text{V}$

3.3 $V_1 = -11 \text{V}$

3.5 $V_1 = 1.09 \text{V}$, $V_0 = 1.09 \text{V}$

3.7 $V_0 = 1.6 \text{V}$

3.9 $I_0 = -0.444 \text{mA}$

3.11 $V_0 = 0 \text{V}$

3.13 $V_0 = 0.27 \text{V}$

3.15 $V_0 = 3.71 \text{V}$

3.17 $V_1 = 48 \text{V}$, $V_2 = 21 \text{V}$, $V_3 = 39 \text{V}$, $P_{1A} = 39 \text{W}$

3.19 $I_0 = 2 \text{mA}$

3.21 $V_0 = -14.4 \text{V}$

3.23 $I_0 = -0.25 \text{mA}$

3.25 $V_0 = 3 \text{V}$

3.27 $V_0 = 0 \text{V}$

3.29 $V_0 = 7.2 \text{V}$

3.31 $V_0 = -7.71 \text{V}$

3.33 $V_0 = 7.565 \text{V}$

3.47 $V_0 = 2.67 \text{V}$

- 3.49 $V_0=6.68\text{V}$
3.52 $V_0=10.29\text{V}$
3.53 $V_0=0\text{V}$
3.55 $V_0=1\text{V}$
3.57 $I_0=1.67\text{mA}$
3.59 $V_0=-3.6\text{V}$
3.61 $V_0=6\text{V}$
3.63 $I_0=0\text{A}$
3.67 $V_0=6\text{V}$
3.69 $I_0=1.64\text{mA}$
3.71 $V_0=14.4\text{V}$

Chapter 7

- 7.1 $i(t) = 2e^{-3t} \text{ A}, t>0$
7.3 $v_c(t) = 2-2e^{-2.5t} \text{ V}, t>0$
7.5 $v_c(t) = 12-8e^{-t/0.6} \text{ V}, t>0$
7.7 $i_0(t) = 0.25 \text{ mA}, t>0$
7.11 $i_0(t) = 2/3 * e^{-5t} \text{ A}, t>0$
7.13 $i_0(t) = 0.375-1.125e^{-8t} \text{ A}, t>0$