

Ch. 15 Prob. 38

$$R = 20 \Omega \quad L = 2.0 \text{ mH} \quad C = 4.0 \mu\text{F}$$

a) Find The resonance frequency

at resonance

$$\omega = \frac{1}{\sqrt{LC}} = \frac{1}{\sqrt{(2.0 \times 10^{-3} \text{ H})(4.0 \times 10^{-6} \text{ F})}}$$

$$= \frac{1}{\sqrt{8 \times 10^{-9} \text{ H.F}}}$$

$$= 1.118 \times 10^4 \text{ rad/s}$$

$$f = \frac{\omega}{2\pi} = \frac{1.118 \times 10^4 \text{ rad/s}}{2\pi}$$

$$f = 1,780 \text{ Hz}$$

b) What is the impedance at resonance?

At resonance $X_L = X_C$

$$\therefore Z = \sqrt{R^2 + (X_L - X_C)^2} = \sqrt{R^2 + 0} = R$$

$$Z = 20 \Omega$$

at
resonance