**Chapter 9, Solution 31.**

A series RLC circuit has R=80 Ω, L=240 mH, and C = 5mF. If the input voltage is v(t)= 10cos(2t) V, find the current flowing through the circuit.

**Solution**

$$L = 240mH \longrightarrow j\omega L = j2x240x10^{-3} = j0.48$$

$$C = 5mF \longrightarrow \frac{1}{j\omega C} = \frac{1}{j2x5x10^{-3}} = -j100$$

$$Z = 80 + j0.48 - j100 = 80 - j99.52 =$$

$$I = \frac{V}{Z} = \frac{10 < 0^0}{80 - j99.52} = 0.0783 < 51.206^o$$

i(t) = **78.3cos(2t+51.21°) mA**