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17/ENG02/058
COMPUTER ENGINEERING
CCE 323

① $R = 100\,k\Omega$, $L = 20mH$ & $C = 5mF$

Calculate $\omega_0, \omega_1, \omega_2, Q$ & $B$

$$\omega_0 = \frac{1}{\sqrt{LC}} = \frac{1}{\sqrt{20\times10^{-3}\times5\times10^{-3}}} = 100\,rads^{-1}$$

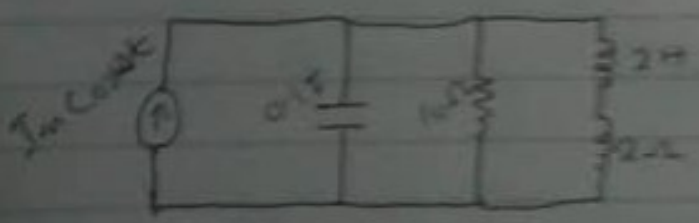
$$B = \frac{\omega_0}{Q} = \frac{1}{RC} = \frac{1}{100\times5\times10^{-3}} = 2\,rads^{-1}$$

$$Q = \frac{\omega_0}{B} = \frac{100\times10^3}{2\times10^3} = 50$$

$$\omega_1 = \omega_0 - \frac{B}{2} = 100\times10^3 - \frac{2\times10^3}{2} = 99\,krads^{-1}$$

$$\omega_2 = \omega_0 + \frac{B}{2} = 100\times10^3 + \frac{2\times10^3}{2} = 101\,krads^{-1}$$

②




Input admittance is $Y = j\omega 0.1 + \frac{1}{10} + \frac{1}{2j\omega}$

$$= 0.1 + j\omega 0.1 + \frac{2 - j\omega^2}{4\omega^2}$$

$Im(Y) = 0$

$\omega_0 = 0.1 = \frac{2\omega_0}{4 + \omega_0^2} = 0$

$\omega_0 = 2.1 \text{ rad s}^{-1}$