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11/ENG04/005

ELECT/ELECT ENGINEERING

EEF322

CIRCUIT THEORY ASSIGNMENT III

$$\begin{aligned} 1a) \omega_0 &= \frac{1}{\sqrt{LC}} = \frac{1}{\sqrt{0.02 \times 5 \times 10^{-9}}} \\ &= \frac{1}{\sqrt{0.0000001}} \\ &= \frac{1}{0.0001} = 100,000 \\ &= 100 \text{ Krad/s} \end{aligned}$$

$$\begin{aligned} b) Q &= \frac{R}{\omega_0 L} = \frac{100 \times 10^3}{100 \times 10^3 \times 0.02} \\ Q &= \frac{1}{0.02} = 50 \end{aligned}$$

$$\begin{aligned} c) B &= \frac{\omega_0}{Q} = \frac{100 \times 1000}{50} = 2,000 \\ B &= 2 \text{ Krad/s} \end{aligned}$$

$$\begin{aligned} d) \omega_1 &= \omega_0 - \frac{B}{2} = 100,000 - 1,000 \\ &= 99 \text{ Krad/s} \end{aligned}$$

$$\begin{aligned} e) \omega_2 &= \omega_0 + \frac{B}{2} = 100,000 + 1,000 \\ &= 101 \text{ Krad/s} \end{aligned}$$

$$\begin{aligned} 2) \omega_0 &= \frac{1}{\sqrt{LC}} = \frac{1}{\sqrt{2 \times 0.1}} \\ &= \frac{1}{\sqrt{0.2}} = \frac{1}{0.4472} \\ \omega_0 &= 2.23 \text{ rad/s} \end{aligned}$$

$$3) \omega_0 = \frac{1}{\sqrt{0.1 \times 0.5 \times 10^{-6}}}$$

$$\omega_0 = \frac{1}{\sqrt{0.00000005}}$$

$$\omega_0 = 44721.36 \text{ rad/s}$$