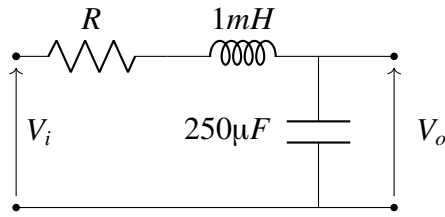


# GATE 2021 EE.20

EE23BTECH11010 - VENKATESH BANDAWAR\*

**Question:** The Bode magnitude plot for the transfer function  $\frac{V_o(s)}{V_i(s)}$  of the circuit is as shown. The value of R is \_\_\_\_\_  $\Omega$ . (GATE 2021 EE Q20)



At resonant frequency,

$$X_c = \frac{1}{\omega C} \quad (3)$$

$$= 2\Omega \quad (4)$$

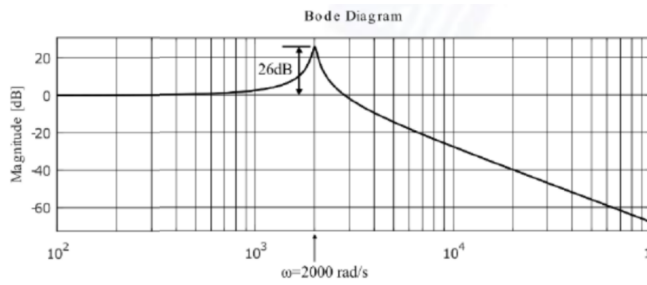
$$\frac{V_o}{V_i} = \frac{X_c}{R} \quad (5)$$

$$= \frac{2}{R} \quad (6)$$

$$|T(s)| = 20 \log \frac{V_o(s)}{V_i(s)} \quad (7)$$

$$26 = 20 \log \frac{2}{R} \quad (8)$$

$$R = 0.1\Omega \quad (9)$$



**Solution:**

Parameter	Description	Value
$C$	Capacitance	$250\mu F$
$L$	Inductor	$1mH$
$T(s)$	Transfer Function	$20 \log \frac{V_o(s)}{V_i(s)}$
$\omega_0$	Resonant frequency	

TABLE I: Given Parameters table

$$\omega_0 = \frac{1}{\sqrt{LC}} \quad (1)$$

$$= 2000 \text{ rad/sec} \quad (2)$$