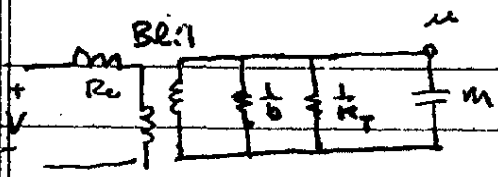
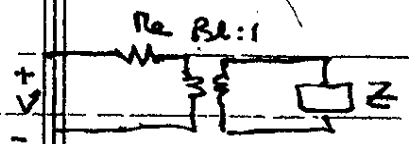


①



where $\frac{1}{k_T} = \frac{1}{k} \parallel \frac{CA}{A^2}$

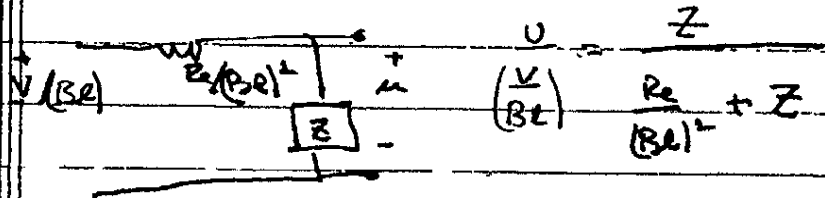


$$Z = (b + \frac{k_T}{s} + Ms)^{-1} = \left(\frac{s}{s^2 + \frac{b}{M}s + \frac{k_T}{M}} \right) \frac{1}{M}$$

$$Z = \left[\frac{s}{s^2 + \frac{\omega_0}{Q_m}s + \frac{k}{M}\omega_0^2} \right] \frac{1}{M}$$

where $\omega_0^2 = \frac{k_T}{M}$

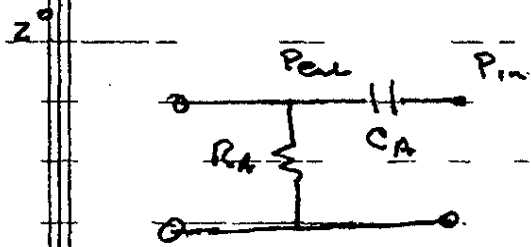
$$\frac{\omega_0}{Q_m} = \frac{b}{M}$$



$$\frac{U}{\frac{V}{Bt}} = \frac{1}{M} \frac{s}{s^2 + \left[\frac{\omega_0}{Q_m} + \frac{\omega_0}{Q_e} \right] s + \omega_0^2}$$

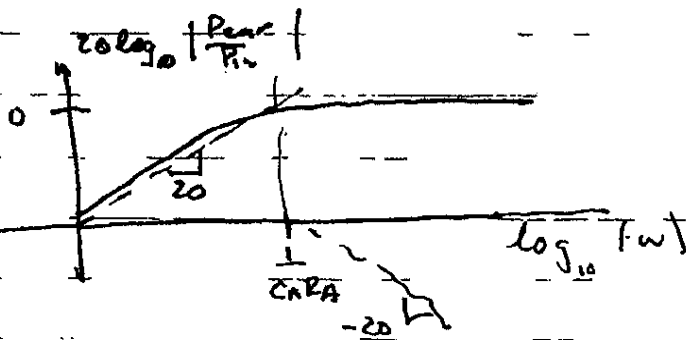
$$= \frac{\omega_0}{Q_T} \quad \text{where} \quad \frac{1}{Q_T} = \frac{1}{Q_m} + \frac{1}{Q_e}$$

$$\frac{U}{V} = \left[\frac{Bt}{R_e M} \right] \left[\frac{s}{s^2 + \frac{\omega_0}{Q_T}s + \omega_0^2} \right]$$



$$C_A = \frac{V}{\rho \omega}$$

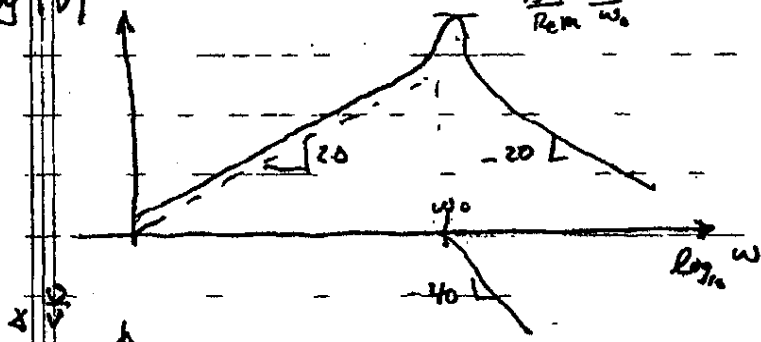
$$\frac{P_{out}}{P_{in}} = \frac{R_A}{\frac{1}{C_A s} + R_A} = \frac{R_A C_A s}{C_A R_A s + 1} = \frac{s}{s + \frac{1}{C_A R_A}}$$



$20 \log \left| \frac{U}{V} \right|$

$\frac{R_L}{R_{in}} \frac{G_T}{\omega_0}$

under high Q assumption



$\angle \frac{U}{V}$

