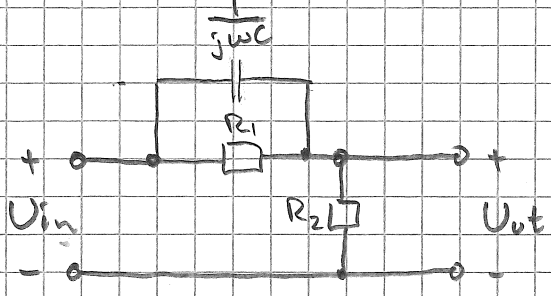
Ex 11.4 sid 218



$$Z_p = R_1 /\!/ \frac{1}{j\omega C} = \frac{R_1 \cdot \frac{1}{j\omega C}}{R_1 + \frac{1}{j\omega C}} = \frac{R_1}{1 + j\omega C R_1}$$

$$U_{ut} = \frac{R_2}{R_2 + Z_p} \cdot U_{in}$$

$$H(j\omega) = \frac{U_{ut}}{U_{in}} = \frac{R_2}{R_2 + Z_p} = \frac{R_2}{R_2 + \frac{R_1}{1 + j\omega C R_1}} = \frac{R_2(1 + j\omega C R_1)}{R_2(1 + j\omega C R_1) + R_1} =$$

$$= \frac{R_2(1 + j\omega C R_1)}{R_1 + R_2 + j\omega C R_1 R_2} = \frac{R_2(1 + j\omega C R_1)}{(R_1 + R_2)\left(1 + j\omega \frac{C R_1 R_2}{R_1 + R_2}\right)} =$$

$$= \underbrace{\overbrace{K}^{A}\left(\overbrace{1 + j\frac{\omega}{\omega_1}}^{B}\right)}_{\left(1 + j\frac{\omega}{\omega_2}\right)} \quad \text{där} \qquad \textcircled{C}$$

$$K = \frac{R_2}{R_1 + R_2} = \frac{4}{4+4} = 0{,}5 = -6\,\text{dB}$$

$$\omega_1 = \frac{1}{C R_1} = \frac{1}{100 \cdot 10^{-9} \cdot 4000} = 2500\ \text{rad/s}$$

$$\omega_2 = \frac{R_1 + R_2}{C R_1 R_2} = 5000\ \text{rad/s}$$