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1. $V_c(t) = 20 \cos(2\pi . 10^8 t)$ $\beta = 2,4$

$V_s(t) = 2 \cos(\pi . 10^4 t)$

a. $f_c = 10^8$ Hz

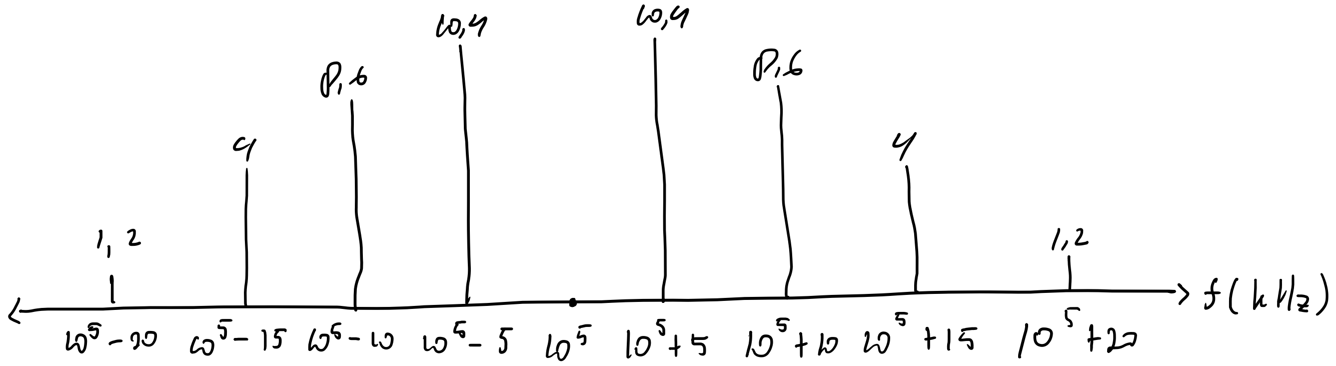
$f_m = 5 \times 10^3$ Hz

$\beta = \frac{\Delta f}{f_m} \rightarrow \Delta f = \beta . f_m = 2,4 . 5 \times 10^3 = 12$ kHz

$BW = 2(\Delta f + f_m) = 2(12\text{ kHz} + 5\text{ kHz}) = 34$ kHz

$P = \frac{A_c^2}{2R} = \frac{20^2}{2R} = 200\ W/\Omega$

b.



2. $V_c(t) = 20 \cos(2\pi 10^8 t)$ $\beta = 2,4$

$V_s(t) = 2 \cos(\pi . 10^4 t)$

$V_s'(t) = 4 \cos(24\pi 10^3 t) \rightarrow f_m' = 12$ kHz

a. $k_f = \frac{\beta . f_m}{A_m} = \frac{2,4 . 5 \times 10^3}{2} = 6$ kHz/V

$\beta = \frac{\Delta f}{f_m} \rightarrow \Delta f = \beta . f_m$

$\Delta f' = \beta' . f_m'$

$\Delta f' = \frac{A_m' . k_f}{\cancel{f_m'}} . \cancel{f_m'} = A_m' . k_f = 4 . 6 = 24$ kHz

$$\beta' = \frac{A_m' \cdot k_f}{f_m'} = \frac{\Delta f'}{f_m'} = \frac{24}{12} = 2$$

b. $BW_c = 2(\Delta f' + f_m') = 2(24\,kHz + 12\,kHz) = 72\,kHz$

$$P = \frac{A_c^2}{2R} = \frac{20^2}{2R} = 200\,W/\Omega$$