

M. Masrym Abdillah P.
1101191095
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1. $BW_{3dB} = 20,4 - 20 = 400 \text{ kHz}$
 $BW_{24dB} = 1 \text{ MHz}$

$$\omega_1 = 400 \text{ kHz}$$

$$\omega_2 = 1 \text{ MHz}$$

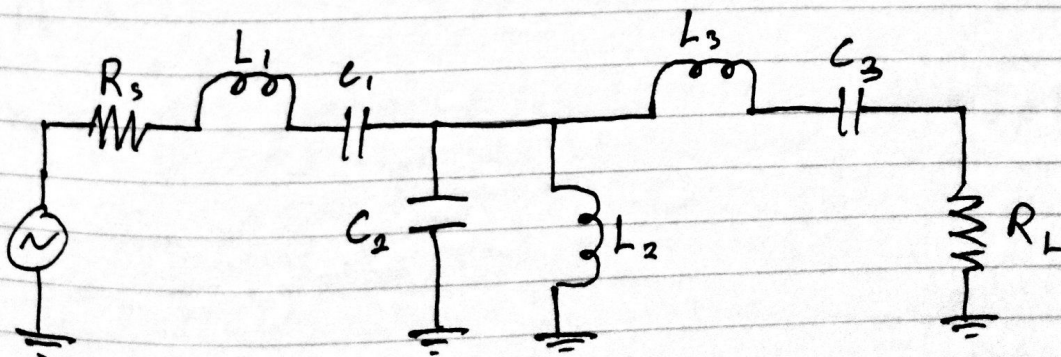
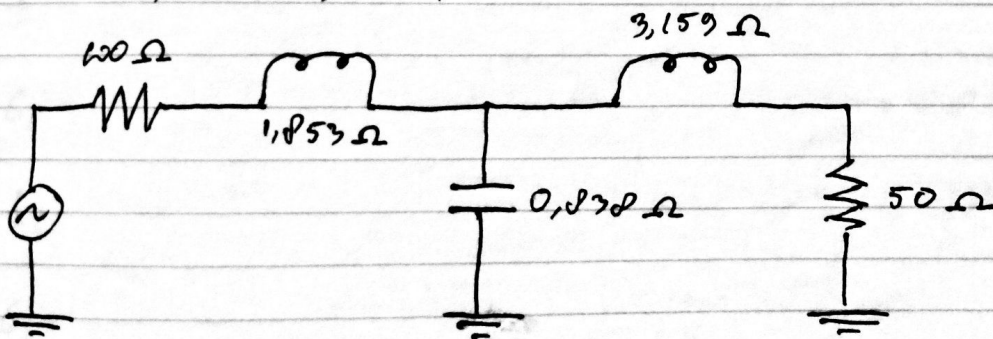
$$\omega_c = \frac{\omega_1}{\omega_2} = \frac{400 \text{ kHz}}{400 \text{ kHz}} = 1 \text{ rad/s}$$

$$\omega_s = \frac{\omega_2}{\omega_1} = \frac{1000 \text{ kHz}}{400 \text{ kHz}} = 2,5 \text{ rad/s}$$

a. Dengan melihat tabel didapat: $n = 3$

b. $\frac{R_s}{R_L} = \frac{100}{50} = 2$ atau $\frac{R_L}{R_s} = \frac{50}{100} = 0,5$

$$n = 3 ; R_L / R_s = 0,5$$



$$R_s = 100 \Omega$$

$$R_L = 50 \Omega$$

$$L_1 = C_1 = 1,853 \Omega$$

$$C_2 = L_2 = 0,838 \Omega$$

$$L_3 = C_3 = 3,159 \Omega$$

} Nilai
Terormalisasi

M. Hasyim Abdillah P.
110491095
TT-43-11

d. Ambil $Q \geq 10$

$$f_{CB} = 20 \text{ MHz}$$

$$f_{CA} = 20,4 \text{ MHz}$$

$$\begin{aligned} f_0 &= 0,5 (f_{CA} + f_{CB}) \\ &= 0,5 (20,4 \text{ MHz} + 20 \text{ MHz}) \\ &= 20,2 \text{ MHz} \end{aligned}$$

e. $L_{1n} = C_{1n} = 1,853 \Omega$

$$L_{2n} = C_{2n} = 0,838 \Omega$$

$$L_{3n} = C_{3n} = 3,159 \Omega$$

$$R = 100 \Omega$$

$$f_0 = 20,2 \times 10^6 \text{ Hz}$$

$$BW_{3dB} = 400 \text{ kHz} = 4 \times 10^5 \text{ Hz}$$

Denormalisasi: $L_{1n}, C_{1n}, L_{2n}, C_{2n}, L_{3n}, C_{3n}$:

$$L_1 = \frac{R \cdot L_{1n}}{2\pi \cdot BW} = \frac{100 \cdot 1,853}{2\pi \cdot 4 \times 10^5} = 73,7 \mu\text{H}$$

$$C_1 = \frac{BW}{2\pi \cdot f_0^2 \cdot C_{1n} \cdot R} = \frac{4 \times 10^5}{2\pi \cdot (20,2 \times 10^6)^2 \cdot 1,853 \cdot 100} = 0,84 \text{ pF}$$

$$L_2 = \frac{R \cdot BW}{2\pi \cdot f_0^2 \cdot L_{2n}} = \frac{100 \cdot 4 \times 10^5}{2\pi \cdot (20,2 \times 10^6)^2 \cdot 0,838} = 18,6 \text{ nH}$$

$$C_2 = \frac{C_{2n}}{2\pi \cdot R \cdot BW} = \frac{0,838}{2\pi \cdot 100 \cdot 4 \times 10^5} = 3,33 \text{ nF}$$

$$L_3 = \frac{R \cdot L_{3n}}{2\pi \cdot BW} = \frac{100 \cdot 3,159}{2\pi \cdot 4 \times 10^5} = 125,7 \mu\text{H}$$

$$C_3 = \frac{BW}{2\pi \cdot f_0^2 \cdot C_{3n} \cdot R} = \frac{4 \times 10^5}{2\pi \cdot (20,2 \times 10^6)^2 \cdot 3,159 \cdot 100} = 0,49 \text{ pF}$$

