

9.1.1

$$a) \omega_0 \cdot L = \frac{1}{\omega_0 \cdot C}$$

$$C = \frac{1}{\omega_0^2 \cdot L} = \frac{1}{(2 \cdot \pi \cdot 50 \text{ Hz})^2 \cdot 47,7 \cdot 10^{-3} \text{ H}} = \underline{\underline{212,4 \cdot 10^{-6} \text{ F} = 212,4 \mu\text{F}}}$$

$$b) X_L = 2 \cdot \pi \cdot f \cdot L = 2 \cdot \pi \cdot 50 \text{ Hz} \cdot 47,7 \cdot 10^{-3} \text{ H} = \underline{\underline{15,0 \Omega}}$$

$$X_C = \frac{1}{2 \cdot \pi \cdot f \cdot C} = \frac{1}{2 \cdot \pi \cdot 50 \text{ Hz} \cdot 212,4 \cdot 10^{-6} \text{ F}} = \underline{\underline{15,0 \Omega}}$$

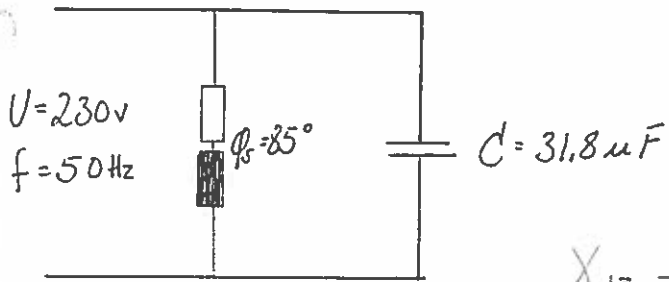
$$c) \bar{I}_0 = \frac{U}{R + jX_L - jX_C} = \frac{230 \text{ V}}{2 \Omega + j15 \Omega - j15 \Omega} = \underline{\underline{115 \text{ A}}}$$

$$I_1 = I_2 = \frac{\sqrt{2}}{2} \cdot \bar{I}_0 = \frac{\sqrt{2}}{2} \cdot 115 \text{ A} = \underline{\underline{81,3 \text{ A}}}$$

$$d) Q = \frac{X_L}{R} = \frac{15,0 \Omega}{2,0 \Omega} = \underline{\underline{7,5}}$$

$$B_0 = \frac{f_0}{Q} = \frac{50 \text{ Hz}}{7,5} = \underline{\underline{6,67 \text{ Hz}}}$$

9.1.2



$$X_C = \frac{1}{2 \cdot \pi \cdot f \cdot C} = \frac{1}{2 \cdot \pi \cdot 50\text{Hz} \cdot 31,8 \cdot 10^{-6}\text{F}} = 100\Omega$$

a)

$$\frac{1}{X_L} = \frac{1}{X_C}$$

$$X_L = X_C = \underline{\underline{100\Omega}}$$

$$\sin \phi_s = \frac{X_L}{Z_s} \Rightarrow Z_s = \frac{X_L}{\sin \phi_s} = \frac{100\Omega}{\sin 85^\circ} = \underline{\underline{100,4\Omega}}$$

$$R_s = \sqrt{Z_s^2 - X_L^2} = \sqrt{100,4\Omega^2 - 100\Omega^2} = \underline{\underline{8,95\Omega}}$$

b)

$$Q = \frac{X_L}{R} = \frac{100\Omega}{8,95\Omega} = \underline{\underline{11,2}}$$

$$B_s = \frac{f_0}{Q} = \frac{50\text{Hz}}{11,2} = \underline{\underline{4,48\text{Hz}}}$$