

## Exercice 2

$$1) \text{ BP } \left\{ N \text{ tel que } I_{\text{eff}} \geq \frac{I_0}{\sqrt{2}} \right\}$$

$$2) Z_0 = \frac{U_{\text{eff}}}{I_0} = R + r \Rightarrow R = \frac{U_{\text{eff}}}{I_0} - r$$

$$\text{AN } R = \frac{5}{1,9 \cdot 10^{-2}} - 5 = 258,15 \Omega$$

$$3) N_0 = f_0 = \frac{1}{2\pi\sqrt{LC}} \Leftrightarrow L = \frac{1}{4\pi^2 f_0^2 C}$$

$$\text{et } Q = \frac{f_0}{\Delta f} \Rightarrow f_0 = Q \Delta f$$

$$\Rightarrow L = \frac{1}{4\pi^2 Q^2 \Delta f^2 C} = \frac{1}{4 \times 10 \times 49 \times (15)^2 \cdot 310^{-6}} \\ = 0,75 \text{ H}$$

$$4) Z = \frac{U_{\text{eff}}}{I_{\text{eff}}} = \frac{U_{\text{eff}}}{I_0/\sqrt{2}} = \sqrt{2} \cdot \frac{U_{\text{eff}}}{I_0}$$

$$= \sqrt{2} \cdot Z_0 = (R+r)\sqrt{2} = 372,15 \Omega$$

### Exercice 3

1) le phénomène de la résonance

$$2) Z_0 = R + r = \frac{U_{eff}}{I_0} = \frac{30}{63,9 \cdot 10^{-3}}$$

$$r = \frac{30}{63,9 \cdot 10^{-3}} - R = \frac{30}{63,9 \cdot 10^{-3}} - 460$$
$$= 9,48 \Omega$$

$$3) L = \frac{1}{4\pi^2 N_0^2 C} = \frac{1}{4 \times 10 \times (470)^2 \times 5 \cdot 10^{-5}}$$

$$= 0,0226 \text{ H}$$

$$= 22,6 \text{ mH}$$

$$4) Q = \frac{N_0}{\Delta N} = \frac{470}{440 - 420} = 23,5$$

