

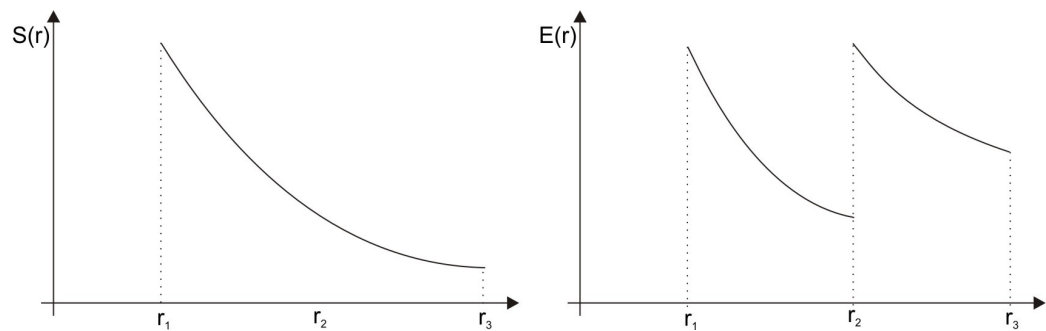
Lösungen

Aufgabe 1:

- 1.1. $R_5 = 5 \text{ k}\Omega$
- 1.2. $U_q = 2,5 \text{ V}$
- 1.3. $R_{\text{therm}} \leq 400 \text{ }^\circ\text{C/W}$

Aufgabe 2:

- 2.1. $I = 1 \text{ mA}$
- 2.2. $S(r_1) = 1,6 \text{ } \mu\text{A/cm}^2$ $E(r_1) = 160 \text{ V/cm}$
 $S(r_2) = 0,8 \text{ } \mu\text{A/cm}^2$ $E(r_2) = 80 \text{ V/cm (Schicht 1)}$
 $S(r_3) = 0,53 \text{ } \mu\text{A/cm}^2$ $E(r_2) = 160 \text{ V/cm (Schicht 2)}$
 $E(r_3) = 106,7 \text{ V/cm}$

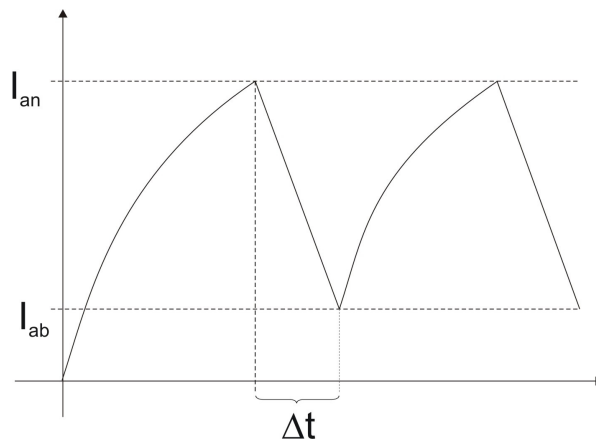


- 2.3. Schicht 2: $\varphi = -\int_{r_3}^r E_2 dr$
 Schicht 1: $\varphi = -\int_{r_3}^{r_2} E_2 dr - \int_{r_2}^r E_1 dr$
- 2.4. $r = 1,29 \text{ cm}$

Aufgabe 3:

- 3.1. $\mu_{\text{reff,an}} = 464$ $\mu_{\text{reff,ab}} = 102,3$
- 3.2. $I_{\text{an}} = 193 \text{ mA}$ $I_{\text{ab}} = 42,6 \text{ mA}$
- 3.3.1. $L_{\text{an}} = 0,625 \text{ H}$

3.3.2.

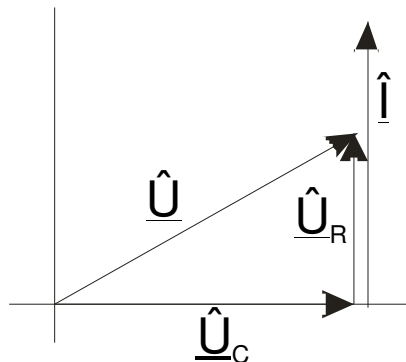


3.3.3. $\Delta t = 0,13 \text{ s}$

Aufgabe 4:

4.1. $R = 91,9 \, \Omega$

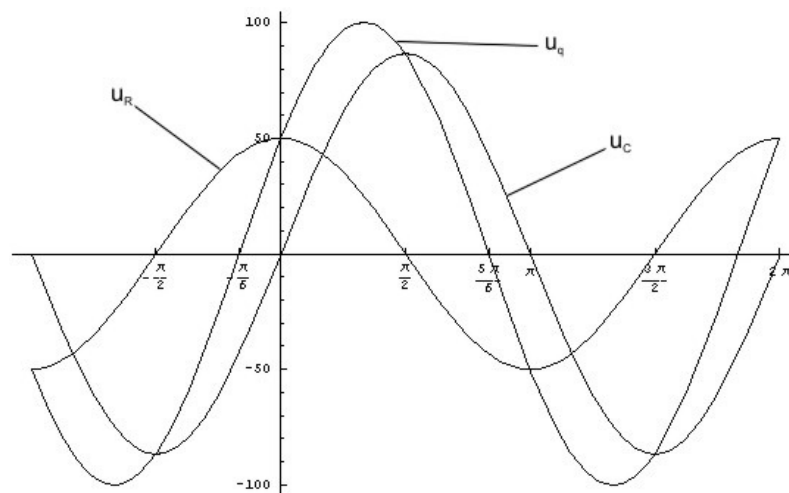
4.2. $\hat{I} = 0,54 \text{ A} \cdot e^{j90^\circ}$ $\hat{U}_R = 50 \text{ V} \cdot e^{-j90^\circ}$ $\hat{U}_C = 86,6 \text{ V} \cdot e^{j0^\circ}$



$$u_q(t) = 100 \text{ V} \cdot \sin(\omega t + 30^\circ)$$

$$u_R(t) = 50 \text{ V} \cdot \sin(\omega t + 90^\circ)$$

$$u_C(t) = 86,6 \text{ V} \cdot \sin(\omega t)$$



4.3. $L = 283,94 \text{ mH}$

4.4.

