ZUR VERÖFFENTLICHUNG

Lösungen

Aufgabe 1:

1.1. $k_1 = 0{,}72$ $k_2 = 0{,}28$

1.2. $\varphi_1 = 5{,}56\ V$ $\varphi_2 = 8{,}77\ V$ $\varphi_3 = 20\ V$

1.3. $I = 8{,}88\ mA$
$P = 7{,}51\ mW$

Aufgabe 2:

2.1. $D(r) = 259{,}3\,\frac{nAs}{m^2} \cdot \frac{1}{\left(\frac{r}{m}\right)}$ $E(r) = 29{,}28 \cdot \frac{1}{\varepsilon_r}\,\frac{kV}{m} \cdot \frac{1}{\left(\frac{r}{m}\right)}$

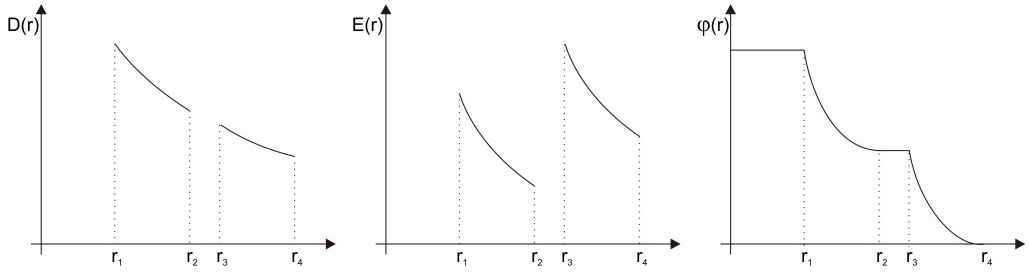
$r_3 \le r \le r_4$ $\varphi(r) = 14{,}64kV \cdot \ln\left(\frac{r_4}{r}\right)$

$r_2 \le r \le r_3$ $\varphi(r) = \varphi(r_3) = 4{,}93kV$

$r_1 \le r \le r_2$ $\varphi(r) = 4{,}93kV + 7{,}32kV \cdot \ln\left(\frac{r_2}{r}\right)$

$r \le r_1$ $\varphi(r) = U = 10kV$

	$\frac{D}{nAs/m^2}$	$\frac{E}{kV/m}$	$\frac{\varphi}{kV}$
r_2	$6{,}48 \cdot 10^4$	1830	4,93
r_3	$5{,}18 \cdot 10^4$	2928	4,93

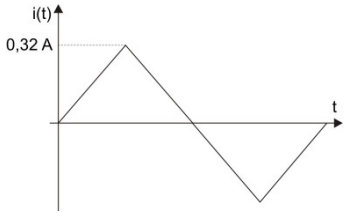


2.2. $U_{p2} = 2{,}1\ kV$

Aufgabe 3:

3.1. f = 62,5 Hz

3.2. $\hat{i}$ = 0,32 A



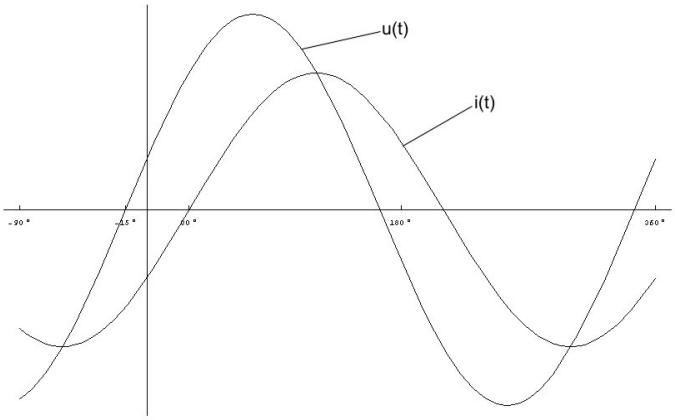
3.3. $\hat{i}$ = 1,12 A

3.4. $\hat{i}$ = 2,88 A

Aufgabe 4:

4.1.

4.2.

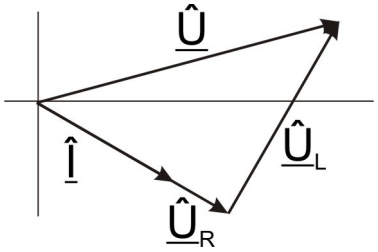


Reihenschaltung:

$\underline{\hat{I}} = 0{,}5A \cdot e^{-j30°}$

$\underline{\hat{U}}_R = 49{,}5V \cdot e^{-j30°}$

$\underline{\hat{U}}_L = 49{,}5V \cdot e^{j60°}$

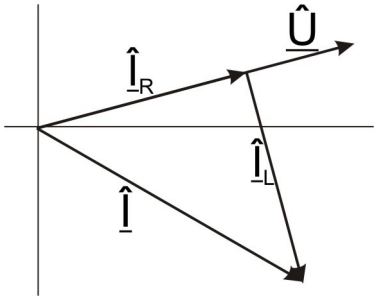


Parallelschaltung:

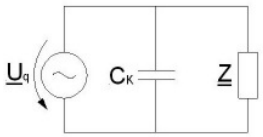
$\underline{\hat{U}} = 70V \cdot e^{j15°}$

$\underline{\hat{I}}_R = 353{,}6mA \cdot e^{j15°}$

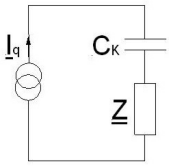
$\underline{\hat{I}}_L = 353{,}6mA \cdot e^{-j75°}$



4.3.1. $C_K = 4{,}02\ \mu F$



4.3.2. $C_K = 8{,}04\ \mu F$



4.4.