

14.5 Date: $R=3\text{ cm}$ $Q=120\text{ j.E.S}$

$1C = 3 \cdot 10^9\text{ j.E.S}$

$\Phi = \frac{Q}{S}$ $S_{\text{huli}} = 4\pi r^2\text{ [m}^2\text{]}$

$\Phi = \frac{120\text{ j.E.S}}{4\pi \cdot (3 \cdot 10^{-2})^2} = \frac{120 \cdot 10^4}{4\pi \cdot 9} = 10610 \frac{\text{j.E.S}}{\text{m}^2}$

14.6

$E = \frac{Q}{R^2} = \frac{120 \cdot 10^4}{9} = 13333\overline{3}\text{ E.S}$

$100\text{ j.E.S} = xC$
 $3 \cdot 10^9\text{ j.E.S} = 1C$

$xC = \frac{100\text{ j.E.S}}{3 \cdot 10^9} \cdot 1C$

14.7

$Q=100\text{ j.E.S}$



$V_B = \frac{E_P}{q_1} = \frac{1}{q_1} \cdot \frac{k \cdot Q \cdot q_1}{r}$

$V_B = \frac{1}{4\pi \epsilon_0 \epsilon_r} \cdot \frac{3\frac{1}{3} \cdot 10^{-8}}{0,05}$

$V_B = 5994,5\text{ V}$

$100\text{ j.E.S} = 3\frac{1}{3} \cdot 10^{-8}$

$U_{BC} = V_B - V_C = 5994,5 - 1499$

$V_C = \frac{1}{4\pi \epsilon_0 \epsilon_r} \cdot \frac{3\frac{1}{3} \cdot 10^{-8}}{0,2}$

$U_{BC} = 4495,5\text{ V}$

$V_C = 1499\text{ V}$

14.8

$V = \frac{E_P}{q} = \frac{1}{q} \cdot \frac{k \cdot Q \cdot q}{r}$

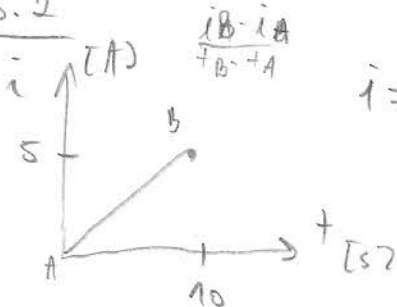
$E_P = \int_r^{\infty} \vec{F} \cdot d\vec{r}$

15.1 Date: $i=2\text{ A}$ $t=30\text{ s}$ $Q=?$

$i = \frac{dq}{dt}$ $i = \frac{Q}{t} \Rightarrow Q = i \cdot t = 2 \cdot 30 = 60\text{ C} \checkmark$

$i = \frac{dq}{dt}$

15.2



$i = \frac{5}{10} \cdot t$

$Q = \int i \cdot dt$

$i(t) = \frac{5}{10} \cdot t \text{ [}\frac{\text{A}}{\text{s}}\text{ - s]}$

$Q = 25\text{ C} \checkmark$

$Q = \int_0^{10} dq = \int_0^{10} i \cdot dt$

$Q = \int_0^{10} i \cdot dt$

$Q = \int_0^{10} \frac{5}{10} \cdot t \cdot dt$

$Q = \frac{5}{10} \cdot \left[\frac{t^2}{2} \right]_0^{10}$

$Q = \frac{5}{10} \cdot \frac{100}{2} = \frac{1}{2} \cdot 50 = 25\text{ C}$

15.3

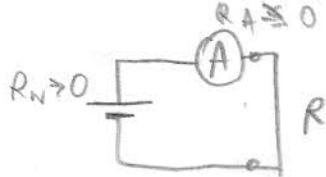
Date: $U=220\text{ V}$ $R=1930\ \Omega$

$I=?$

$i = \frac{U}{R}$

$i = \frac{220}{1930} = 0,114\text{ A} \checkmark$

15.4 Dato:



$E = 2V$ $I = 0,12A$ $R = ?$

$$I = \frac{E}{R + R_W}$$

$R_W \rightarrow 0$

$$R = \frac{E}{I} = \frac{2}{0,12} = 16,7 \Omega \quad \checkmark$$

15.5

Dato: $d = 0,2 \text{ mm}$ $l = 20 \text{ m}$ $\rho = 10 \cdot 10^{-6} \Omega \cdot \text{cm}$
 $d = 0,0002 \text{ m}$ $l = 20 \text{ m}$ $\rho = 10 \cdot 10^{-8} \Omega \cdot \text{m}$

$$R = \frac{\rho \cdot l}{S}$$

$$S = \frac{\pi d^2}{4}$$

$$S = \pi r^2 \quad r = \frac{1}{2}d$$

$$S = \pi \left(\frac{1}{2}d\right)^2$$

$$= \frac{\pi \cdot d^2}{4}$$

$$R = \frac{\rho \cdot l}{\frac{\pi \cdot d^2}{4}} \cdot 4$$

$$R = \frac{10 \cdot 10^{-8} \cdot 20}{\pi \cdot (0,0002)^2} \cdot 4 = \frac{10 \cdot 10^{-8} \cdot 80}{\pi \cdot (2 \cdot 10^{-4})^2}$$

$$R = \frac{10 \cdot 10^{-8} \cdot 80}{\pi \cdot 4 \cdot 10^{-8}} = \frac{10 \cdot 10^{-8} \cdot 20}{\pi} \cdot 10^8 = \frac{200}{\pi} = 63,66 \Omega$$

$$R = 63,66 \Omega \quad \checkmark$$

15.6

Dato: $d = 1,5 \text{ mm}$ $l = 100 \text{ m}$ $\rho = 1,692 \cdot 10^{-6} \Omega \cdot \text{cm}$
 $d = 0,0015 \text{ m}$ $l = 100 \text{ m}$ $\rho = 1,692 \cdot 10^{-8} \Omega \cdot \text{m}$

$$R = \frac{\rho \cdot l}{S} = \frac{\rho \cdot l}{\frac{\pi \cdot d^2}{4}} = 4 \cdot \frac{\rho \cdot l}{\pi \cdot d^2} = 4 \cdot \frac{\rho \cdot l}{\pi \cdot d^2} = 4 \cdot \frac{1,692 \cdot 10^{-8} \cdot 100}{\pi \cdot (0,0015)^2} =$$

$$R = 4 \cdot \frac{1,692 \cdot 10^{-8} \cdot 100}{\pi \cdot 1,5^2 \cdot 10^{-6} \cdot 2} = \frac{4 \cdot 1,692 \cdot 10^{-8} \cdot 100 \cdot 10^6}{\pi \cdot 2,25} = \frac{4 \cdot 1,692 \cdot 10^{-8} \cdot 10^8}{\pi \cdot 2,25} =$$

$$R = \frac{4 \cdot 1,692}{\pi \cdot 2,25} = 0,96 \Omega$$

$$R = 0,96 \Omega \quad \checkmark$$