



# ИСПИТ ИЗ ОСНОВА ЕЛЕКТРОТЕХНИКЕ 1

07. 02. 2014. - Рјешења

1.

$$A = Q_p (U_{AC} + U_{CD} + U_{DB}) = Q_p [(V_A - V_C) + (V_C - V_D) + (V_D - V_B)] = Q_p (V_A - V_B) = 52,7 \text{ nJ},$$

2.

a) За  $r < r_0$ :

$$D_1 = 0, \quad E_1 = 0, \quad P_1 = 0,$$

За  $r > r_0$ :

$$\vec{D}_2 = \frac{Q}{4r^2\pi} \vec{r}_{012}, \quad \vec{E}_2 = \frac{Q}{4r^2\epsilon_0\epsilon_r\pi} \vec{r}_{012}, \quad \vec{P}_2 = \frac{Q}{4r^2\pi} \cdot \frac{\epsilon_r - 1}{\epsilon_r} \vec{r}_{012}.$$

б)  $Q_p - 80 \text{ nC}$ .

$$\sigma_p - 2,54 \frac{\text{nC}}{\text{m}^2},$$

в)  $\sigma = 3,18 \frac{\text{nC}}{\text{m}^2}$ .

3.

$$Q_1 = 200 \text{ nC}, \quad Q_2 = -400 \text{ nC}.$$

4.

$$R_6 = 90 \Omega.$$

5.

$$E_T = -60 \text{ V}, \quad R_T = 10 \Omega.$$

6.

$$U_{C1} = -14,08 \text{ V}, \quad U_{C2} = -17,92 \text{ V}.$$

$$W_{C1} = 2,18 \mu\text{J}, \quad W_{C2} = 4,34 \mu\text{J}.$$