

حل التمرين 02

$$V_A - V_B = \vec{E} \cdot \vec{AB} \quad .1$$

$$U_{AB} = V_B - V_A = -\vec{E} \cdot \vec{AB} \Rightarrow U_{AB} = -E \vec{i} \cdot (x_B - x_A) \vec{i}$$

$$\Rightarrow U_{AB} = -E(x_B - x_A)$$

$$U_{AB} = -2 \cdot 10^4 \times 2 \times 10 \cdot 10^{-2} = -4000V$$

$$U_{BC} = V_C - V_B = -\vec{E} \cdot \vec{BC} \Rightarrow U_{BC} = -E \vec{i} \cdot (x_C - x_B) \vec{i}$$

$$\Rightarrow U_{BC} = -E(x_C - x_B)$$

$$U_{BC} = -2 \cdot 10^4 \times 2 \times 10 \cdot 10^{-2} = -4000V$$

$$U_{AC} = U_{AB} + U_{BC}$$

$$U_{AC} = -8000V$$

.2

$$E = \frac{U_1}{d_1} \Rightarrow d_1 = \frac{U_1}{E}$$

$$d_1 = \frac{5 \cdot 10^3}{2 \cdot 10^4} = 0,25m = 25cm$$

$$d_2 = \frac{15 \cdot 10^3}{2 \cdot 10^4} = 0,75m = 75cm$$

.3

$$\Delta E p_e = -W_{A \rightarrow B}(\vec{F}_e)$$

$$W_{A \rightarrow B}(\vec{F}_e) = q(V_A - V_B) = -qU_{AB}$$

$$\Rightarrow \Delta E p_e = qU_{AB}$$

$$= 3 \times 1,6 \cdot 10^{-19} \times -4000 = -1,9 \cdot 10^{-15} J$$

$$\Delta E p_e = -\frac{1,9 \cdot 10^{-15}}{1,6 \cdot 10^{-19}} J = 1,2 \cdot 10^4 eV$$