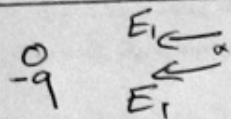


حل مسائل في ترميز الألكترونات، والبطون

سؤال ١

$$F = k \frac{q_1 q_2}{r^2} \quad \left. \begin{array}{l} \\ q_1 = q_2 \end{array} \right\} \Rightarrow q^2 = \frac{F r^2}{k} \Rightarrow q = \sqrt{\frac{F}{k}} r$$

$$q = \sqrt{\frac{3.7 \times 10^{-9}}{9 \times 10^9}} \times 5 \times 10^{-10} = \underline{3.2 \times 10^{-19} \text{ C}}$$



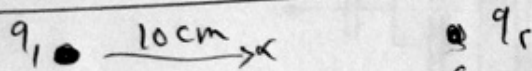
$+q$

سؤال ٢

$$E_1 = k \frac{q}{r^2} = 9.0 \times 10^9 \frac{2.0 \times 10^{-7}}{(15 \times 10^{-2})^2} = 8.0 \times 10^4 \frac{\text{N}}{\text{C}}$$

$$E_r = E_1 = 8.0 \times 10^4 \frac{\text{N}}{\text{C}}$$

$$E_y = E_1 + E_r = \underline{16.0 \times 10^4 \frac{\text{N}}{\text{C}}}$$



سؤال ٣

$$V_1 = k \frac{q_1}{r} = 9 \times 10^9 \frac{5 \times 10^{-6}}{0.1} = 4.5 \times 10^5 \text{ V}$$

$$V_2 = k \frac{q_2}{r} = 9 \times 10^9 \frac{[-6 \times 10^{-6}]}{0.1} = -5.4 \times 10^5 \text{ V}$$

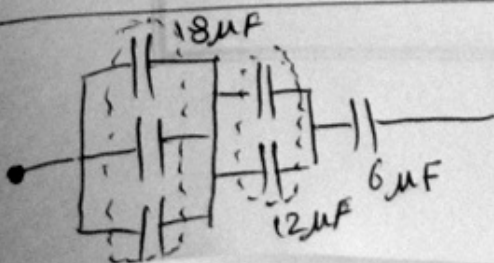
$$V = V_1 + V_2 = 4.5 \times 10^5 - 5.4 \times 10^5 = \underline{-9.0 \times 10^4 \text{ V}}$$

$$C = \kappa \epsilon_0 \frac{A}{d}$$

سؤال ٤

$$C = 3.5 \times 8.85 \times 10^{-12} \frac{1}{0.1 \times 10^{-3}} = 30.9 \times 10^{-8} \text{ F} = \underline{0.3 \mu\text{F}}$$

$$C = \frac{q}{V} \Rightarrow q = CV = 0.3 \mu\text{F} \times 12 = \underline{3.6 \mu\text{C}}$$



$$\frac{1}{C_T} = \frac{1}{6} + \frac{1}{12} + \frac{1}{18}$$

$$\frac{1}{C_T} = \frac{6+3+2}{36} = \frac{11}{36} \Rightarrow C_T = \underline{\underline{\frac{36}{11} \mu\text{F} = 3.27 \mu\text{F}}}}$$

سؤال ٥