FÍSICA - LISTA 02 - 3º TRI

1. $E = 900\ N/C$; $d = 0,2\ m$; $V = ?$

$V = E/d \Rightarrow V = \frac{900}{0,2} \Rightarrow V = 4500\ V$

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2. $V = 180V$; $Q = 80.10^{-10}C$; $d = ?$

$V = \frac{kQ}{d} \Rightarrow 180 = \frac{9.10^9 . 8.10^{-9}}{d} \Rightarrow d = 0,4\ m$

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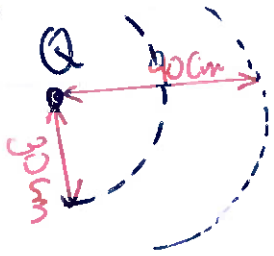
3. $Q = 100.10^{-6}C$; $d_A = 0,3m$; $d_B = 0,9cm$; $q = -2.10^{-6}$



$V = \frac{kQ}{d} \Rightarrow$

$V_A = \frac{9.10^9 . 100.10^{-6}}{3.10^{-1}} \Rightarrow V_A = 3.10^6\ V$

$V_B = \frac{9.10^9 . 100.10^{-6}}{9.10^{-2}} \Rightarrow V_B = 1.10^6\ V$

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4. I. → FALSA; A UNIDADE DE MEDIDA É COULOMB.
II → V
III → V
IV → FALSA; A UNIDADE DE ENERGIA É JOULE.
V → V

} CORRETAS II, III e V

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5. ANULADA FALTOU INFORMAÇÃO.

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6. $V_1 = 8,0V$ | $V_2 = 5,0V$
$d_1 = 0,3m$ | $d_2 = x$

$V_1 . d_1 = V_2 . d_2$

$8 . 0,3 = 5 . d_2$

$\therefore d_2 = 0,48\ m$

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7. $\Delta V = 40 - 60 \Rightarrow \Delta V = -20V$
$q = 6.10^{-6}C$

$\tau = q . \Delta V$

$\tau = 6.10^{-6}(-20) \Rightarrow$

$\tau = -120\ \mu J$

8. $q = 3.10^{-12}\,C$; $V_A = 80\,V$ e $V_B = 45\,V$

$\mathcal{E} = q\,\Delta V$

$\mathcal{E}_A = 3.10^{-12} \cdot 80 \Rightarrow \mathcal{E}_A = 240\,pJ$

$\mathcal{E}_B = 3.10^{-12} \cdot 45 \Rightarrow \mathcal{E}_B = 135\,pJ$

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9. $q = 2\,\mu C$; $\mathcal{E}_{pA} = 4\,\mu J$; $\mathcal{E}_{pB} = 8\,\mu J$

a) $V_A = \dfrac{\mathcal{E}}{q} \Rightarrow V_A = \dfrac{4.10^{-6}}{2.10^{-6}} \Rightarrow V_A = 2,0\,V$

$V_B = \dfrac{8.10^{-6}}{2.10^{-6}} \Rightarrow V_B = 4,0\,V$

b) $\mathcal{E}'_A = q\,V_A$

$\mathcal{E}'_A = 3.10^{-6} \cdot 2 \Rightarrow \mathcal{E}'_A = 6\,\mu J$

$\mathcal{E}_B = 3.10^{-6} \cdot 4 \Rightarrow \mathcal{E}_B = 12\,\mu J$

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10. $V_p = 60\,V$ $\quad q = 2.10^{-8}\,C$

$\mathcal{E}_p = q\,V_p \Rightarrow \mathcal{E} = 6.0\,2.10^{-8} \Rightarrow \mathcal{E}_p = 120\,nJ$

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11. $Q = 3\,\mu C$; $d_A = 0,3\,m$; $d_B = 0,6\,m$

a) $V_A = k\dfrac{Q}{d_A} \Rightarrow V_A = 9.10^9 \cdot \dfrac{3.10^{-6}}{3.10^{-1}} \Rightarrow V_A = 9.10^4\,V$

$V_B = \dfrac{kQ}{d_B} \Rightarrow V_B = 9.10^9 \cdot \dfrac{3.10^{-6}}{6.10^{-1}} \Rightarrow V_B = 4,5.10^4\,V$

b) $q = 1,0.10^{-6}\,C$, $\mathcal{E} = q.\Delta V$

$\Delta V = V_A - V_B \Rightarrow \Delta V = (9 - 4,5).10^4 \Rightarrow \underline{\Delta V = 4,5.10^4\,V}$

$\mathcal{E} = 1.10^{-6} \cdot 4,5.10^4 \Rightarrow \mathcal{E} = 4,5.10^{-2} \Rightarrow \mathcal{E} = 0,450\,mJ$

12. $q = 2{,}5 \cdot 10^{-8}\ C$; $\mathcal{E}_{p_2} = 5 \cdot 10^{6}\ J$; $F = 7{,}5\ N$

a) $V = \mathcal{E}/q$

$V = \frac{5 \cdot 10^{6}}{2{,}5 \cdot 10^{-8}} \Rightarrow V = 2 \cdot 10^{14}\ V$

b) $F = qE$

$E = 7{,}5 / 2{,}5 \cdot 10^{-8}$

$E = 3 \cdot 10^{8}\ N/C$

c) $\mathcal{E}_p = qV$

$\mathcal{E}_p = 1{,}5 \cdot 10^{-8} \cdot 2 \cdot 10^{14} \Rightarrow \mathcal{E}_p = 3 \cdot 10^{6}\ J$

$F = q \cdot E \Rightarrow F = 1{,}5 \cdot 10^{-8} \cdot 3 \cdot 10^{8}$

$F = 4{,}5\ N$

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13. $q = 10\ \mu C$; $\Delta V = 100\ V$

a) $\tau = q \cdot \Delta V$

$\tau = 10 \cdot 10^{-6} \cdot 10^{2} \Rightarrow \tau = 0{,}001\ J \Rightarrow \tau = 1\ mJ$

b) O TRABALHO TERIA O MESMO VALOR, POIS O TRABALHO ENTRE DOIS PONTOS DETERMINADOS EM UM CAMPO ELÉTRICO NÃO DEPENDE DA TRAJETÓRIA.

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14. $Q = 4\ \mu C$, $K = 9 \cdot 10^{9}\ N m^2/C^2$

a) $d_A = 3\ m$; $d_B = 2\ m$; $V = kQ/d$

$V_A = 9 \cdot 10^{9} \frac{4 \cdot 10^{-6}}{3} \Rightarrow V_A = 3 \cdot 10^{3}\ V$

$V_B = 9 \cdot 10^{9} \frac{4 \cdot 10^{-6}}{9} \Rightarrow V_B = 4 \cdot 10^{3}\ V$

b) $\tau = q(V_B - V_A) \Rightarrow \tau = 2 \cdot 10^{-6} \cdot (4 \cdot 10^{3} - 3 \cdot 10^{3})$

$\tau = 2 \cdot 10^{-3}\ J \Rightarrow \tau = 2\ mJ$

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15. $q = 1\ mC$; $m = 2g = 2 \cdot 10^{-3}\ kg$; $V_A = 100\ V$ e $V_B = 75\ V$

$\Delta E = \tau \Rightarrow \frac{m \cdot v^2}{2} = qV \Rightarrow v^2 = \frac{2qV}{m} \Rightarrow v = \sqrt{\frac{2q \cdot \Delta V}{m}}$

$\therefore v = \sqrt{\frac{2 \cdot 10^{-3} \cdot 25}{2 \cdot 10^{-3}}} \Rightarrow v = 5\ m/s$