PADRÃO DE RESPOSTAS

(VALOR DE CADA QUESTÃO = 2 PONTOS)

Questão	Resposta
1	$\ell_{o_A} \times \ell_{o_B} = 75 \rightarrow 3\ell_{o_B} \times \ell_{o_B} = 75 \rightarrow \ell_{o_B} = 5\,\text{cm e } \ell_{o_A} = 15\,\text{cm}$ $\ell_A = \ell_B \rightarrow 15 \times (1 + \alpha_A \Delta\theta) = 5 \times (1 + \alpha_B \Delta\theta) \rightarrow 15 \times (1 + 300\alpha_A) = 5 \times (1 + 300\alpha_B)$ $15 + 4500\alpha_A = 5 + 1500\alpha_B \rightarrow 15 + 4500\dfrac{\alpha_B}{9} = 5 + 1500\alpha_B$ $10 = 1000\alpha_B \rightarrow \alpha_B = 1 \times 10^{-2}\ {}^{\circ}\text{C}^{-1}$
2	$PV = nRT$ $2,46 \times 15 = 1,5 \times 0,082 \times T \rightarrow T = 300\,\text{K}$ $\Delta\theta = 900 - 300 = 600$ $Q = mc\Delta\theta \rightarrow Q = 3 \times 2,42 \times 600 = 4356\,\text{cal}$
3	$\Delta Q = mc\Delta t$ $12\,\text{kcal} = 500\,\text{g} \times 1\dfrac{\text{cal}}{\text{g}\,{}^{\circ}\text{C}} \times (T_{max} - 0)$ Neste caso, $T_{max} - 0 = 24\ {}^{\circ}\text{C}$. Para a quantidade de calor ser maior que 12 kcal, $T_{max} > 24\ {}^{\circ}\text{C}$. Portanto, são 5 as capitais nas quais é necessário fornecer mais de 12 kcal para aquecer 500 g de água.
4	$q = Ne \rightarrow q = 1 \times 10^{19} \times 1,6 \times 10^{-19} = 1,6\,\text{C}$ $i = \dfrac{q}{t} \rightarrow i = \dfrac{1,6}{2} = 0,8\,\text{A}$ $P = U \times i$ $P = 12 \times 0,8 = 9,6\,\text{W}$
5	$E_p = mgh$ $h_1 = 5\,000\,\text{m e } h_2 = 500\,\text{m}$ $\dfrac{E_1}{E_2} = \dfrac{h_1}{h_2} = \dfrac{5\,000}{500} = 10$
6	$n = \dfrac{360}{\alpha} - 1$ $n = \dfrac{360}{4n} - 1$ $n^2 + n - 90 = 0$ $n_1 = -10 \text{ e } n_2 = 9 \rightarrow \alpha = 9 \times 4 = 36^{\circ}$

7	$P_{x_1} = m_1 \times g \times \text{sen}30 \quad P_{x_1} = 0,4 \times 10 \times 0,5 = 2,0 \text{ N}$ $P_{x_2} = m_2 \times g \times \text{sen}\beta \quad P_{x_2} = 0,6 \times 10 \times \text{sen}\beta = 6,0 \times \text{sen}\beta \text{ N}$ $P_{x_1} = P_{x_2}$ $2,0 = 6,0 \times \text{sen}\beta \quad \rightarrow \quad \text{sen}\beta = \dfrac{2,0}{6,0} = \dfrac{1}{3}$ $\beta = \text{arc sen}\dfrac{1}{3}$
8	$V_{Hg} + V_{Liq} = V_E$ $E_E = E_{Hg} + E_{Liq} \rightarrow \mu_E V_E g = \mu_{Hg} V_{Hg} g + \mu_{Liq} V_{Liq} g$ $9 \times 256 = 13,6 \times V_{Hg} + 4 \times (256 - V_{Hg})$ $V_{Hg} = 133,3 \text{ cm}^3$
9	$\overset{N}{A} = \Delta v$ $\Delta v = \Delta v_1 + \Delta v_2 + \Delta v_3$ $\Delta v_1 = 6 \times 4 = 24 \text{ cm/s} \quad \Delta v_2 = 4 \times (-3) = -12 \text{ cm/s} \quad \Delta v_3 = 6 \times 4 = 24 \text{ cm/s}$ $\Delta v = 24 + (-12) + 24 = 36 \text{ cm/s}$ $\Delta v = v - v_0 \rightarrow 36 = v - 2 \rightarrow v = 38 \text{ cm/s}$
10	$E_C = \dfrac{1}{2} mv^2$ $9 = \dfrac{1}{2} \times m \times 3^2 \rightarrow m = \dfrac{18}{9} = 2 \text{ kg}$ $Q = mv$ $Q = 2 \times 5 = 10 \text{ kg.m/s}$