

RESPOSTAS ESPERADAS – FÍSICA

QUESTÃO 1

a)

$$v_m = \frac{\Delta s}{\Delta t} = \frac{1,2 \times 10^6 \text{ m}}{800 \text{ s}} = 1500 \text{ m/s}$$

b)

$$a_R = \frac{2\Delta s}{t^2} = \frac{2 \times 32000 \text{ m}}{(80 \text{ s})^2} = 10 \text{ m/s}^2$$

QUESTÃO 2

a)

$$v_m = \frac{\Delta s}{\Delta t} = \frac{10\sqrt{4^2 + 3^2} \text{ } \mu\text{m}}{10 \times 30 \text{ s}} = \frac{50 \text{ } \mu\text{m}}{300 \text{ s}} = 0,17 \text{ } \mu\text{m/s}$$

b)

$$D = \frac{kT}{r} = \frac{3 \times 10^{-18} \times 300}{3 \times 10^{-6}} = 3 \times 10^{-10} \text{ m}^2/\text{s}$$

$$l = \sqrt{2 D t} = \sqrt{2 \times (3 \times 10^{-10}) \times (10 \times 60)} = 6 \times 10^{-4} \text{ m}$$

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QUESTÃO 3

a)

$$E_p = mgh = 60 \times 10 \times 10 = 6 \times 10^3 \text{ J}$$

b)

$$m_{\text{piloto}} g \Delta t = m_{\text{água}} (v_f - v_i)$$

$$(v_f - v_i) = \frac{m_{\text{piloto}} g}{m_{\text{água}} / \Delta t} = \frac{60 \text{ kg} \times 10 \text{ m/s}^2}{30 \text{ l/s} \times 1 \text{ kg/l}} = 20 \text{ m/s}$$

QUESTÃO 4

a)

$$\begin{aligned} \frac{n}{V} &= \frac{P}{RT} = \frac{3,2 \times 10^{-8}}{8 \times 300} = \frac{3,2 \times 10^{-8}}{8 \times 300} = \\ &= 1,3 \times 10^{-11} \text{ mol/m}^3 \left(\times 6 \times 10^{23} \text{ partículas/mol} \right) = 8 \times 10^{12} \text{ partículas/m}^3 \end{aligned}$$

b)

$$P_{\text{nave}} = 10^5 - 0 = 10^5 \text{ Pa}$$

$$P_{\text{sub}} = \rho gh + P_0 - 10^5 = 1000 \times 10 \times 100 + 10^5 - 10^5 \text{ Pa} = 10 \times 10^5 \text{ Pa}$$

$$\frac{P_{\text{sub}}}{P_{\text{nave}}} = \frac{10 \times 10^5}{10^5} = 10$$

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QUESTÃO 5

a)

$$\left(\frac{\tau_{aço}}{\tau_{Al}} \right) = \left(\frac{V_{trem} d_{aço} al}{V_{trem} d_{Al} al} \right) = \left(\frac{d_{aço}}{d_{Al}} \right) = \left(\frac{7,9}{2,7} \right) = 2,926$$

b)

$$I = \frac{P}{4\pi R^2} = \frac{1,2 \times 10^{-3}}{4 \times 3 \times 10^2} = 10^{-6} \text{ W/m}^2$$

$$S = 10 \text{ dB} \log \frac{I}{I_0} = 10 \text{ dB} \log \frac{10^{-6}}{10^{-12}} = 60 \text{ dB}$$

QUESTÃO 6

a)

$$C(0,4 \text{ V}) = 20 \text{ mAh/g}$$

$$i_m = \frac{Cm}{t} = \frac{20 \text{ mAh/g} \cdot 5,0 \text{ g}}{4 \text{ h}} = 25 \text{ mA}$$

b)

$$U(10 \text{ mAh/g}) = 0,2 \text{ V}$$

$$P = Ui = 0,2 \text{ V} \times 2 \text{ mA} = 0,4 \text{ mW}$$