vestibular estadual 2004

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PADRÃO DE RESPOSTAS

(valor de cada questão = 2,0 pontos)

Questão	Resposta
1	A) $F = P \times A$ $F = (1{,}010 - 0{,}998) \times 10^5 \times (0{,}4 \times 10^{-2})^2 \times \pi$ $F =$ **0,06 N**
	B) $\lambda = 4 \times 2{,}8 = 11{,}2$ cm $f = \dfrac{340}{11{,}2 \times 10^{-2}}$ $f =$ **3.036 Hz**
2	A) $\Delta Q = 580 \times 0{,}5 =$ **290 kcal**
	B) $E = mhg$ $E = 500 \times 4{,}2 \times 10^3 = 80 \times 10 \times h$ $h =$ **2.625 m**
3	A) $P = \dfrac{\Delta E}{\Delta t}$ $\Delta E = \text{Pressão} \times \Delta V$ $\dfrac{\Delta V}{\Delta t} = \dfrac{4{,}8}{60} = 0{,}08$ L/s $P = \text{Pressão} \times \dfrac{\Delta V}{\Delta t}$ $\text{Pressão} = \dfrac{120 + 80}{2} = 100$ mmHg $P = 3 \times (1{,}33 \times 10^4) \times (8 \times 10^{-5}) = 3 \times 1{,}06$ **P = 3,2 W**
	B) $P_{pé} = P_{coração} + P_{coluna\ de\ sangue}$ $P_{coração} = 100$ mmHg $= 10^2 \times \dfrac{13{,}6}{1{,}04}$ mm sangue $= 1.307$ mm sangue coluna de sangue $= 1.300$ mm $P_{pé} = 1.300 + 1.307 = 2.607$ mm sangue $P_{pé} = 2.607 \times \dfrac{1{,}04}{13{,}6}$ mmHg $\mathbf{P_{pé} = 199{,}3}$ **mmHg**

4	A)	$C = 3\times10^{-7}\times0,5 = 1,5\times10^{-7}$ F $Q = C\times\Delta V = 1,5\times10^{-7}\times100\times10^{-3}$ $\mathbf{Q = 1,5\times10^{-8}\ C = 15\ nC}$
	B)	$E = \frac{1}{2}CV^2$ $E = \frac{1}{2}\times1,5\times10^{-7}\times\left(100\times10^{-3}\right)^2$ $\mathbf{E = 0,75\times10^{-9}\ J}$
5	A)	$\frac{1}{F} = \frac{1}{P} + \frac{1}{0,02}$ $\frac{1}{F_{normal}} = \frac{1}{\infty} + \frac{1}{0,02} = 50$ $\frac{1}{F_{míope}} = \frac{1}{1,0} + 50 = 51$ $\frac{1}{F_{lente}} = 50 - 51 = -1 \Rightarrow$ **lente divergente de 1 grau**
	B)	$n = 1,34$ $v = \frac{c}{n}$ $\mathbf{v = 2,24\times10^5\ km/s}$
6	A)	$M\times4\times\cos\alpha = H\times14\times\cos\alpha + P\times30\times\cos\alpha$ $4M = 14H + 30P$ $M = \frac{14H + 30P}{4} \Rightarrow$ independente de α
	B)	$T\times18\times\text{sen}\,\beta = P_0\times36 + P\times72$ $\mathbf{T\,\text{sen}\,\beta = 2P_0 + 4P}$
7	A)	É igual à pressão atmosférica.
	B)	$R = \frac{\Delta P}{\Delta V/\Delta t} \Rightarrow \frac{\Delta V}{\Delta t} = \frac{200}{330} =$ **0,61 L/s**

8	A) $F = \frac{\Delta q}{\Delta t}$ $F = \frac{mv_i - mv_f}{10^{-2}} = \frac{3 \times (1-0)}{10^{-2}}$ $F = \mathbf{3 \times 10^2\ N}$
	B) $E_c = \frac{1}{2}\ mv^2$ $E_c = \frac{1}{2} \times 80 \times 1$ $E_c = \mathbf{40\ J}$
9	A) $t = 2\ (t_1 + t_2) = 2\ \left(\frac{1}{336.000} + \frac{10}{154.000}\right)$ $t = \mathbf{1{,}36 \times 10^{-4}\ s}$
	B) $t = 2\ \left(\frac{1}{336.000} + \frac{x}{154.000}\right) = 0{,}5 \times 10^{-4}$ x = 3,4 cm em relação ao emissor d = 10 – 3,4 = **6,6 cm**
10	A) $v = \frac{\Delta x}{\Delta t}$ $v = \frac{25 \times 10^{-2}}{4 \times 10^{-3}} =$ 62,5 m/s $v = 62{,}5 \times \frac{10^{-3}}{\frac{1}{60 \times 60}} = \mathbf{225\ km/h}$
	B) $\Delta t = 11 - 7 = 4$ ms $v_{23} = \frac{0{,}2}{4\ \times\ 10^{-3}}$ $v_{23} = \mathbf{50\ m/s}$