PADRÃO DE RESPOSTAS

(valor de cada questão = 2,0 pontos)

Questão	Resposta
1	$V_g = V_{0_g} \times (1 + \gamma_g \Delta T)$ $V_g = \left(1 + 9 \times 10^{-4} \times 25\right) \times V_{0_g} = 1{,}0225 \times V_{0_g}$ $V_T = V_{T_0} \times \left(1 + \gamma_T \Delta T\right)$ $V_T = \left(1 + 1 \times 10^{-5} \times 25\right) \times V_{0_T} = 1{,}00025 \times V_{0_T}$ $V_{0_g} = f \times V_{0_T}$ $V_g = 1{,}0225 \times f \times V_{0_T}$ $\frac{1{,}0225 \times f}{1{,}00025} = 1$ $f =$ **97,8%**
2	$\frac{PV}{T} = \frac{P_0 V_0}{T_0}$ $T = T_0 + 25$ $V = V_0$ $T_0 = 273 + 15 = 288\,K$ $\frac{P - P_0}{P_0} = \frac{\Delta P}{P_0} = \frac{T}{T_0} - 1$ $\frac{\Delta P}{P_0} \times 100 = \left(\frac{313}{288} - 1\right) \times 100 =$ **8,7%**
3	$Q_{bateria} = 50\,Ah = 50 \times 60 \times 60\,C = 180.000\,C$ $I_{lâmpadas} = \frac{2 \times 10\ W}{12\ V} = \frac{20}{12}\ A$ $Q_{lâmpadas} = 5 \times 60 \times 60 \times \frac{20}{12}\ C$ $\frac{Q_{lâmpadas}}{Q_{bateria}} \times 100 = \frac{18.000}{180.000} \times \frac{20}{12} \times 100 =$ **16,7%**

4	$\left\|fem\right\|_{espira} = \frac{\Delta\Phi}{\Delta t}$ $\Delta\Phi = A \times \Delta B$ $\left\|fem\right\|_{espira} = \frac{A \times \Delta B}{\Delta t} = \pi \times R^2 \times 10^3 = 0{,}4 \times \pi$ $\left\|fem\right\| = 30.000 \times 0{,}4 \times \pi =$ **37,7 kV**
5	$a = \frac{\Delta v}{\Delta t} = \frac{20}{5 \times 3{,}6} = \frac{4}{3{,}6} = 1{,}11\ m/s^2$ $F = m \times a$ $m_g = \mu_g \times vol = \mu_g \times C \times L \times H$ $m_g = 0{,}8 \times 50 \times 50 \times 20 = 40.000\ g = 40\ kg$ $P = \frac{F}{A}$ $P = \frac{40 \times 1{,}11}{0{,}5 \times 0{,}2} =$ **444,4 Pa**
6	$v = \frac{D}{\Delta t} - v_{caminhão}$ $D = 2d$ $v = \frac{2d}{\Delta t} - v_{caminhão}$ $v = 2 \times v_{carro} - v_{caminhão}$ $v = 2 \times 60 - 45 =$ **75 km/h**
7	0 a 100 km/h em 10 segundos $v = 100\ km/h = \frac{100}{3{,}6}\ m/s$ $v = \omega R$ $\omega = \frac{100}{3{,}6 \times 0{,}5} = 55{,}6\ rad/s$ $\alpha = \frac{\omega}{\Delta t} = \frac{55{,}55}{10} =$ **5,6 rad/s²**

8	$v_f = 100\,km/h = \frac{100}{3,6} m/s$ $P = \frac{W}{\Delta t}$ $W = \Delta E_C = \frac{1}{2} \times (m+M)\, v_f^2$ $P = \frac{1}{2} \times \frac{(1.080) \times 10^4}{10 \times 3,6^2} = 41.667\ W$ $P_{HP} = \frac{41.667}{746} = \mathbf{55,85\ \ HP}$
9	$N - P = F_{cent} = \frac{mv^2}{R}$ $F_{cent} = 1,08 \times 10^3 \times \frac{v^2}{R}$ $v = \frac{40 \times 10^3}{60 \times 60}$ m/s $F_{cent} = 1,08 \times 10^3 \times \frac{(4 \times 10^2)^2}{20 \times 36^2}$ $N = 1,08 \times 10^3 \times 10 + 1,08 \times 10^3 \times \frac{(4 \times 10^2)^2}{20 \times 36^2} = \mathbf{17,5 \times 10^3\ N}$
10	$P = E$ $P = n \times \mu_m \times V \times g + (m+M) \times g$ $E = \mu_a \times n \times 0,9 \times V \times g$ $n = \frac{m+M}{(0,9 \times \mu_a - \mu_m) \times V} = \mathbf{108}$