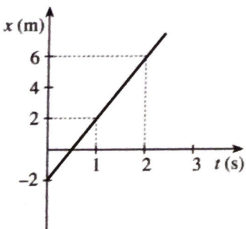


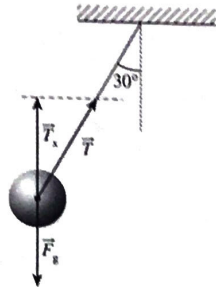
Guia de correcção

| Perg. | Resposta | Cotação | |
|-------|---|---------|-------|
| | | Parc. | Total |
| 1. a) | $T = 8 \text{ s}$ | 10 | |
| b) | $\omega = \frac{2\pi}{T}$ | 5 | |
| | $\omega = \frac{2\pi}{8} = \frac{\pi}{4} \text{ rad/s}$ | 5 | |
| | $v(t) = a \omega \text{ sen}(\omega t)$ | 5 | |
| | $v(t) = \frac{1}{3} \times \frac{\pi}{4} \text{ sen}\left(\frac{\pi}{4} t\right) \Leftrightarrow$ | 5 | |
| | $\Leftrightarrow v(t) = \frac{\pi}{12} \text{ sen}\left(\frac{\pi}{4} t\right) \text{ S.I.}$ | 5 | 35 |
| 2. a) | Riscas ou linhas. | 5 | |
| b) | $\lambda_A = 410 \text{ nm}$ | 5 | |
| c) | $\lambda_C = 490 \text{ nm} = 4,9 \times 10^{-7} \text{ m}$ | 5 | |
| | $E = \frac{hc}{\lambda} \Rightarrow$ | | |
| | $\Rightarrow E = \frac{7 \times 10^{-34} \times 3 \times 10^8}{4,9 \times 10^{-7}} \Leftrightarrow$ | 5 | |
| | $\Leftrightarrow E \approx 4,3 \times 10^{-19} \text{ J}$ | 5 | |
| d) | A. Tem menor comprimento de onda. | 5 | 30 |
| 3. a) | ${}^{139}_{57}\text{La} \rightarrow {}^{138}_{57}\text{La} + {}^1_0n$ | 10 | |
| b) | $\frac{A}{A_0} = \frac{1}{16}$ | | |
| | $\frac{A}{A_0} = \frac{1}{2^n}$ | 5 | |
| | $\frac{1}{2^4} = \frac{1}{2^n} \Rightarrow n = 4$ | 10 | |
| | $n = \frac{t}{T_{1/2}}$ | 5 | |
| | $t = 4 \times 10^{10} \text{ anos}$ | 5 | 35 |
| 4. a) | $v = \frac{x_2 - x_1}{t_2 - t_1} \Rightarrow v = \frac{6 - 2}{2 - 1} \Leftrightarrow v = 4 \text{ m/s}$ | 5 | |
| | $x(t) = x_0 + vt \Rightarrow$ | 5 | |
| | $\Rightarrow 6 = x_0 + 4 \times 2 \Leftrightarrow x_0 = -2 \text{ m}$ | 5 | |
| | Obs.: Também se pode resolver por cálculo mental. | | |
| b) | $x(t) = -2 + 4t \text{ (SI)}$ | 10 | |
| c) |  | 15 | 40 |

Guia de correcção

| Perg. | Resposta | Cotação | |
|-------|----------|---------|-------|
| | | Parc. | Total |

5. a)



10

b) $F_g = T_x \Rightarrow$

5

$\Rightarrow m g = T \cos 30^\circ \Rightarrow$

10

$\Rightarrow T = \frac{100 \times 10}{\frac{\sqrt{3}}{2}} \Leftrightarrow$

5

$\Leftrightarrow T = 1154,7 \text{ N}$

5

35

6. $k = 200 \text{ N/m}$

$m = 2 \text{ kg}$

$v = 1 \text{ m/s}$

$h = 0,15 \text{ m}$

$E_{\text{pot}} = E_{\text{pg}} + E_c \Rightarrow$

5

$\Rightarrow \frac{1}{2} k x^2 = m g h + \frac{1}{2} m v^2 \Rightarrow$

5

$\Rightarrow \frac{1}{2} \times 200 \times x^2 = 2 \times 10 \times 0,15 + \frac{1}{2} \times 2 \times 1^2 \Leftrightarrow$

5

$\Leftrightarrow 100 x^2 = 3 + 1 \Leftrightarrow$

$\Leftrightarrow x = \sqrt{\frac{4}{100}} \Leftrightarrow$

5

$\Leftrightarrow x = 0,02 \text{ m}$

5

25

