

ΘΕΜΑ Β

B₁]

$$U_A = 2U_{cm}$$

$$U_r = \sqrt{U_{\gamma p}^2 + U_{cm}^2} \Rightarrow$$

$$U_r = \sqrt{\frac{U_{cm}^2}{4} + U_{cm}^2} \Rightarrow$$

$$U_r = \frac{U_{cm} \sqrt{5}}{2}$$

$$\frac{U_r}{U_A} = \frac{\frac{U_{cm} \sqrt{5}}{2}}{2U_{cm}} \Rightarrow \frac{U_r}{U_A} = \frac{\sqrt{5}}{4}$$

Σωστή απάντηση: iii

B₂]

$$\pi\% = \frac{K_1 - K_1'}{K} \cdot 100\% \Rightarrow$$

$$\pi\% = \frac{\frac{1}{2} m_1 U_1^2 - \frac{1}{2} m_1 U_1'^2}{\frac{1}{2} m_1 U_1^2} \cdot 100\% \Rightarrow$$

$$\pi\% = \frac{U_1^2 - U_1'^2}{U_1^2} \cdot 100\% = \left(1 - \frac{U_1'^2}{U_1^2}\right) \cdot 100\% \Rightarrow$$

$$\pi\% = \left[1 - \left(\frac{m_1 - m_2}{m_1 + m_2} \frac{U_1}{U_1}\right)^2\right] \cdot 100\% \Rightarrow$$

$$\pi \% = \left[1 - \left(\frac{m_1 - m_2}{m_1 + m_2} \right)^2 \right] \cdot 100 \% \Rightarrow$$

$$\pi \% = \left[1 - \frac{(m_1 - m_2)^2}{(m_1 + m_2)^2} \right] \cdot 100 \% \Rightarrow$$

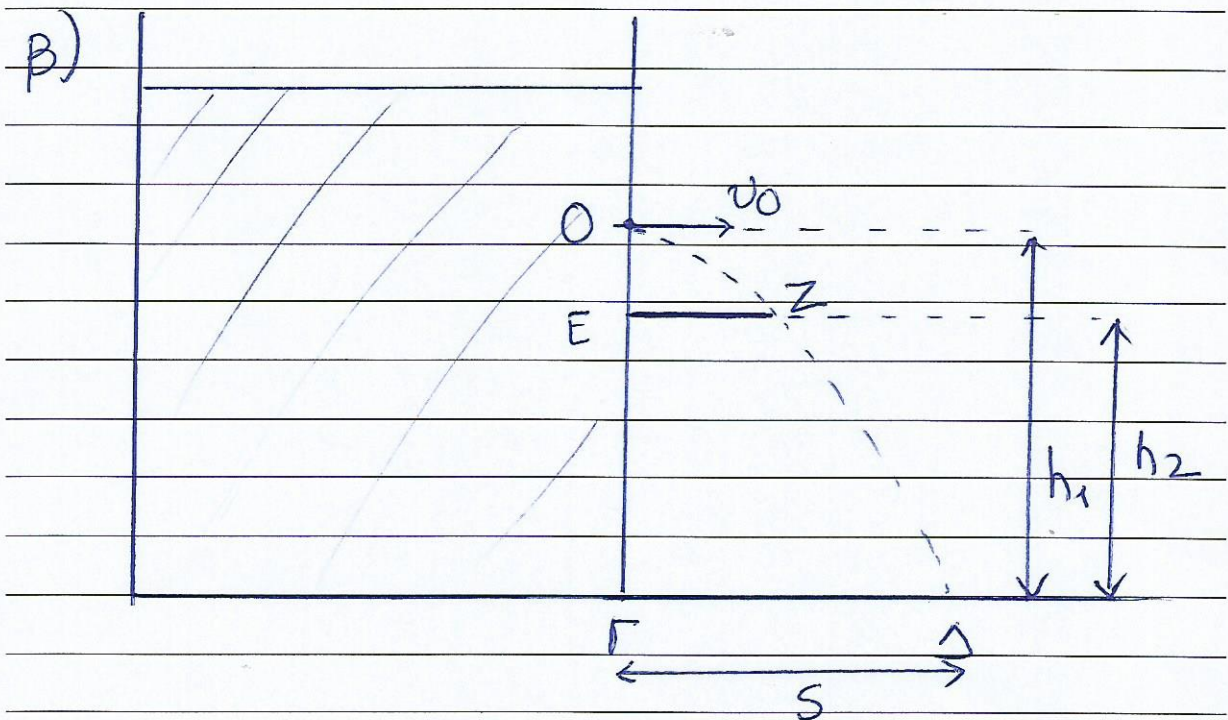
$$\pi \% = \frac{(m_1 + m_2)^2 - (m_1 - m_2)^2}{(m_1 + m_2)^2} \cdot 100 \%$$

$$\pi \% = \frac{(m_1 + m_2 + m_1 - m_2)(m_1 + m_2 - m_1 + m_2)}{(m_1 + m_2)^2} \cdot 100 \%$$

$$\pi \% = \frac{4m_1 m_2}{(m_1 + m_2)^2} \cdot 100 \%$$

Σωστή απάντηση: (ii)

B3/ α) Σωστή απάντηση η i



$$v_z = \sqrt{2g(H-h_2)}$$

$$S = 2 \cdot EZ \stackrel{s=vt}{\Rightarrow} t_{0z} = 2 \cdot t_{0z} \quad (1)$$

$$h_1 - h_2 = \frac{1}{2} g t_{0z}^2$$

$$h_1 = \frac{1}{2} g t_{0z}^2 \stackrel{(1)}{\Rightarrow} h_1 = \frac{1}{2} g \cdot 4 \cdot t_{0z}^2 \Rightarrow h_1 = 2g t_{0z}^2$$

$$\frac{h_1 - h_2}{h_1} = \frac{\frac{1}{2} g t_{0z}^2}{2g t_{0z}^2} \Rightarrow \frac{h_1 - h_2}{h_1} = \frac{1}{4} \Rightarrow$$

$$4h_1 - 4h_2 = h_1 \Rightarrow h_1 = \frac{4}{3} h_2$$

$$\Rightarrow h_1 = \frac{4}{3} \cdot \frac{21H}{32} \Rightarrow h_1 = \frac{7H}{8}$$

$$v_0 = \sqrt{2g\left(H - \frac{7H}{8}\right)} = \sqrt{2g\frac{H}{8}} \Rightarrow v_0 = \frac{\sqrt{g \cdot H}}{2}$$

$$\Pi = A \cdot v_0 \Rightarrow \Pi = \frac{A \cdot \sqrt{gH}}{2}$$