4983 pdf (ΑΠΑΝΤΗΣΗ)

ΘΕΜΑ Β

B_1) A) γ)

B) $a = \frac{\Sigma F}{m}$, $a' = \frac{\Sigma F}{2m}$ $\Big\} \Rightarrow a' = \frac{a}{2}$

B_2) A) β)

B) $E_{max} = K_\Gamma + U_\Gamma \Rightarrow mgH = K_\Gamma + mg\frac{H}{2}$

$K_\Gamma = mg\frac{H}{2} = U_\Gamma$

ΘΕΜΑ Δ

Δ1) $a_1 = \frac{\Delta v_1}{\Delta t} = \frac{60}{15} = 4\,m/s^2$

$\Sigma F_1 = m_1 a_1 = 40 \cdot 4 = 160\,N$

Δ2) (Σ_2): $\Delta K_2 = 0$ (Θ.Κ.)

(Σ_1): $\Delta K_1 = \frac{1}{2} m_1 (v_{\tau\Delta}^2 - v_1^2)$ $\xrightarrow[v_1 = 40\,m/s]{v_{\tau\Delta} = 60\,m/s}$

$\Delta K_1 = \frac{1}{2} \cdot 40 \cdot 2000 = 40.000\,J$

Δ3) Τη στιγμή t_1 ισχύει $v_1 = v_2 \Rightarrow a_1 t_1 = v_2 \Rightarrow$

$t_1 = 10\,s$

$\Delta S = S_2 - S_1 = 400 - 200 = 200\,m$

Δ4) Έστω συμβαίνει συνάντηση τη στιγμή t τότε ισχύει $x_1 = x_2 \Rightarrow 40t = \frac{t + (t-15)}{2} \cdot 60$

$40t = (2t - 15) \cdot 30 \Rightarrow 2t = 45 \Rightarrow t = 22{,}5\,s$