

ΑΠΑΝΤΗΣΕΙΣ
ΠΑΝΕΛΛΑΔΙΚΩΝ ΕΞΕΤΑΣΕΩΝ 2021

ΜΑΘΗΜΑ

ΦΥΣΙΚΗ ΠΡΟΣΑΝΑΤΟΛΙΣΜΟΥ
ΓΕΛ

ΕΠΙΜΕΛΕΙΑ ΑΠΑΝΤΗΣΕΩΝ

ΔΗΜΑΣ ΙΩΑΝΝΗΣ – ΦΙΛΙΟΣ ΧΡΗΣΤΟΣ- ΠΟΘΗΤΑΚΗΣ

ΓΕΩΡΓΙΟΣ- ΣΠΥΡΟΥ ΣΤΑΥΡΟΣ



νέο φροντιστήριο

νέο φροντιστήριο

ΘΕΜΑ Α

A1 γ

A2 δ

A3 γ

A4 β

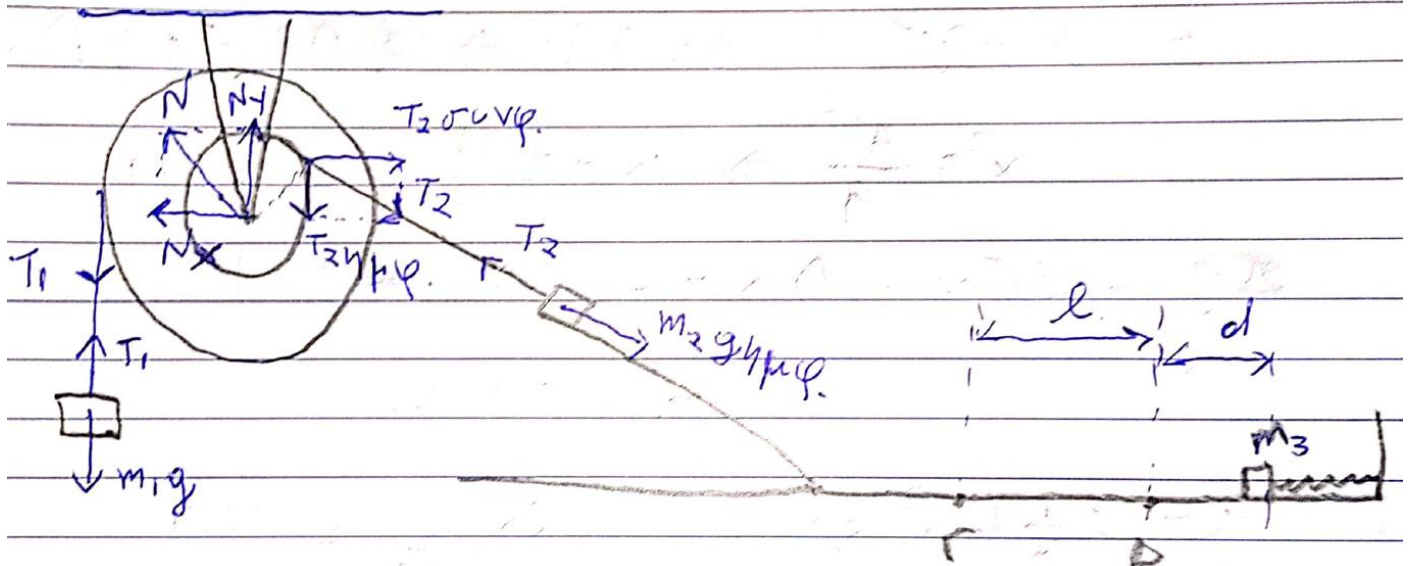
A5 ΣΩΣΤΟ , ΛΑΘΟΣ , ΣΩΣΤΟ , ΣΩΣΤΟ , ΛΑΘΟΣ



νέο φροντιστήριο

ΘΕΜΑ Δ

Δ1.



$$\text{Σώμα } m_2: \Sigma \vec{F}_x = 0 \Rightarrow T_2 = m_2 g \eta \mu \varphi = 30 \text{ N}$$

$$\text{ΤΡΟΧΑΛΙΑ: } \Sigma \tau_o = 0 \Rightarrow \tau_2 \cdot r = T_1 \cdot 2r \Rightarrow T_1 = 15 \text{ N}$$

$$\text{Σώμα } m_1: \Sigma \vec{F}_y = 0 \Rightarrow T_1 - m_1 g = 0 \Rightarrow m_1 = 1,5 \text{ kg}$$

$$\text{Τροχαλία: } \Sigma \vec{F}_x = 0 \Rightarrow N_x - T_2 \sigma \nu \nu \varphi = 0 \Rightarrow N_x = 24 \text{ N}$$

$$\Sigma \vec{F}_y = 0 \Rightarrow N_y - T_2 \eta \mu \varphi - T_1 - w = 0 \Rightarrow N_y = 18 + 15 + 15 = 48 \text{ N}$$

$$N = \sqrt{N_x^2 + N_y^2} = \sqrt{24^2 + 48^2} = 24\sqrt{5} \text{ N}$$

Δ2. $E_{\text{αρχ}} = E_{\text{τελ}}$

$$K_{\text{αρχ}} + U_{\text{αρχ}} = K_{\text{τελ}} + U_{\text{τελ}}$$

$$m_2 g h = \frac{1}{2} m_2 u_2^2 \Rightarrow u_2 = \sqrt{2gh} = 6 \frac{\text{m}}{\text{sec}}$$

$$l = u_2 t \Rightarrow t = \frac{3\pi}{30} = \frac{\pi}{10} \text{ sec}$$

$$\frac{T}{4} = \frac{\pi}{10} \Rightarrow T = \frac{2\pi}{5} \text{ sec}$$

$$\omega = \frac{2\pi}{T} \Rightarrow \omega = \frac{\frac{2\pi}{1}}{\frac{2\pi}{5}} = 5 \frac{\text{rad}}{\text{sec}}$$

$$D = K = m_3 \omega^2 \Rightarrow D = K = 5 \cdot 5^2 = 125 \frac{\text{N}}{\text{m}}$$

Δ3. $u_3 = u_{\max} = \omega \cdot A = \omega \cdot d = 1 \frac{\text{m}}{\text{sec}}$

$$u_3' = -|u_2| = -6 \frac{\text{m}}{\text{sec}}$$

$$A' = \frac{u_{\max}'}{\omega} = 1,2 \text{ m}$$

$$t = 0, \quad x = 0, \quad u < 0.$$

Άρα $\varphi_0 = \pi \text{ rad}$

$$x = 1,2 \eta \mu(5t + \pi).$$

Δ4. $K = 8U$

$$E = K + U \Rightarrow E = 9U \Rightarrow \frac{1}{2} D A'^2 = 9 \frac{1}{2} D x^2$$

$$x^2 = \frac{A'^2}{9} \Rightarrow x = \pm \frac{A'}{3} = \pm 0,4 \text{ m}.$$

$$\frac{\Delta P}{\Delta t} = \Sigma F = -Dx = -125 \cdot (-0,4) = +50 \text{ N}.$$

$$K = 8 \frac{1}{2} D x^2 \Rightarrow K = 4 \cdot 125 \cdot \frac{16}{100} = 80 \text{ J} \Rightarrow \frac{1}{2} m u^2 = 80 \Rightarrow u^2 = \frac{160}{5} = 32 = 2 \cdot 16 \Rightarrow u = 4\sqrt{2} \frac{\text{m}}{\text{sec}}$$

$$\left| \frac{\Delta K}{\Delta t} \right| = |\Sigma F \cdot u| = |-Dx \cdot u| = 50 - 4\sqrt{2} = 200\sqrt{2} \text{ W}.$$

Δ5. $t' = \frac{T}{2} = \frac{2\pi}{10} \text{ sec}.$

$$d = u_2' t' = 1 \cdot \frac{2\pi}{10} = 0,628 \text{ m}.$$