

ΦΥΣΙΚΗ Α' ΛΥΚΕΙΟΥ
ΕΝΔΕΙΚΤΙΚΕΣ ΑΠΑΝΤΗΣΕΙΣ 19/02/2017

ΘΕΜΑ Α

A1. α A2. γ A3. δ A4. δ A5. α) Λ β) Λ γ) Σ δ) Λ ε) Σ

ΘΕΜΑ Β

B1.

i. Σωστό το **β**.

$$y = \frac{1}{2}gt^2 \Leftrightarrow y = \frac{1}{2} \cdot 10 \cdot 2^2 \Leftrightarrow y = 20m$$

$$d = H - y = 100 - 20 = 80m$$

ii. Σωστό το **γ**.

$$t_{ολ} = \sqrt{\frac{2H}{g}} = \sqrt{\frac{2 \cdot 100}{10}} = \sqrt{20} = 2\sqrt{5}sec$$

B2. Σωστό το **γ**.

$$F = m_A a_A = 2ma_A \quad (1)$$

$$F = m_B a_B = 3ma_B \quad (2)$$

Από (1) και (2) έχουμε:

$$\frac{F}{F} = \frac{2ma_A}{3ma_B} \Leftrightarrow 1 = \frac{2a_A}{3a_B} \Leftrightarrow \frac{a_A}{a_B} = \frac{3}{2}$$

B3. Σωστό το **δ**.

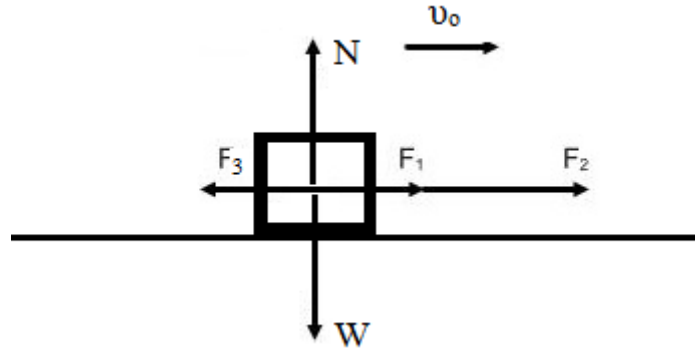
$$\Sigma F_x = F_1 + F_2 - F_3 = 3 + 4 - 4 = 3N \quad (\text{προς τα δεξιά})$$

$$\Sigma F_y = F_4 - F_5 = 6 - 2 = 4N \quad (\text{προς τα πάνω})$$

$$\Sigma F = \sqrt{\Sigma F_x^2 + \Sigma F_y^2} = \sqrt{3^2 + 4^2} = \sqrt{25} = 5N$$

ΘΕΜΑ Γ

Γ1.



Γ2.

$$\Sigma F_y = 0 \Leftrightarrow N - W = 0 \Leftrightarrow N = mg \Leftrightarrow N = 4 \cdot 10 = 40\text{N}$$

Γ3.

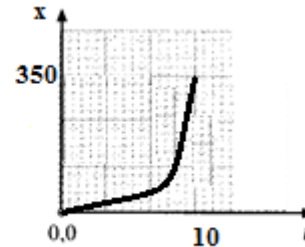
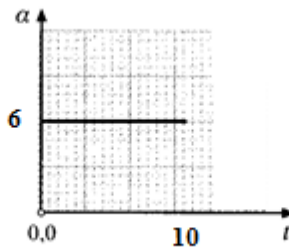
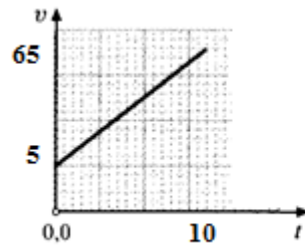
$$\Sigma F_x = ma \Leftrightarrow F_1 + F_2 - F_3 = ma \Leftrightarrow 10 + 20 - 6 = 4a \Leftrightarrow 24 = 4a \Leftrightarrow a = 6\text{m/s}^2$$

Γ4.

$$v = v_0 + at = 5 + 6 \cdot 10 = 5 + 60 = 65\text{m/s}$$

$$\Delta x = v_0 t + \frac{1}{2} at^2 = 5 \cdot 10 + \frac{1}{2} 6 \cdot 100 = 50 + 300 = 350\text{m}$$

Γ5.



ΘΕΜΑ Δ

Δ1.

$$F_x = F \sin \varphi = 10 \cdot 0,6 = 6N$$

$$F_y = F \eta \mu \varphi = 10 \cdot 0,8 = 8N$$

$$\Sigma F_x = ma_1 \Leftrightarrow F_x = ma_1 \Leftrightarrow 6 = 2a_1 \Leftrightarrow a_1 = 3m/s^2$$

Δ2.

$$s_{1,(OA)} = \frac{1}{2} a_1 t_1^2 \Leftrightarrow 54 = \frac{1}{2} 3t_1^2 \Leftrightarrow t_1^2 = 36 \Leftrightarrow t_1 = 6sec$$

$$v_A = a_1 t_1 = 3 \cdot 6 = 18m/s$$

Δ3.

$$\Sigma F_y = 0 \Leftrightarrow N - W = 0 \Leftrightarrow N = mg = 20N$$

$$T = \mu N = 0,2 \cdot 20 = 4N$$

$$A = \sqrt{N^2 + T^2} = \sqrt{400 + 16} = \sqrt{416}N$$

Δ4.

$$\Sigma F_x = ma_2 \Leftrightarrow T = ma_2 \Leftrightarrow 4 = 2a_2 \Leftrightarrow a_2 = 2m/s^2$$

Δ5.

$$v = v_0 - a_2 t_2 \Rightarrow 0 = 18 - 2t_2 \Rightarrow t_2 = 9s$$

$$t_{ολ} = t_1 + t_2 \Leftrightarrow t_{ολ} = 6 + 9 \Leftrightarrow t_2 = 15sec$$

$$s_{2,(AB)} = v_A t_2 - \frac{1}{2} a_2 t_2^2 = 18 \cdot 9 - \frac{1}{2} 2 \cdot 81 = 72 + 8 = 81m$$

$$s_{ολ} = s_1 + s_2 = 54 + 81 = 135m$$

Τις απαντήσεις επιμελήθηκαν οι καθηγητές:

ΚΑΤΣΙΓΙΑΝΝΗΣ ΔΗΜΗΤΡΗΣ

ΚΟΤΣΙΑΡΗΣ ΒΑΛΕΝΤΙΝΟΣ

ΜΑΝΤΑΡΗΣ ΒΑΣΙΛΗΣ

ΝΤΖΙΜΠΑΣ ΝΙΚΟΣ