ΕΠΑΝΑΛΗΠΤΙΚΕΣ ΑΠΟΛΥΤΗΡΙΕΣ ΕΞΕΤΑΣΕΙΣ
Γ΄ ΤΑΞΗΣ ΗΜΕΡΗΣΙΟΥ ΕΝΙΑΙΟΥ ΛΥΚΕΙΟΥ
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ΑΠΑΝΤΗΣΕΙΣ ΣΤΗ ΦΥΣΙΚΗ ΘΕΤΙΚΗΣ & ΤΕΧΝΟΛΟΓΙΚΗΣ ΚΑΤΕΥΘΥΝΣΗΣ

ΘΕΜΑ 1ο

1. α
2. β
3. γ
4. γ
5. α. Λάθος **β.** Σωστό **γ.** Σωστό **δ.** Λάθος **ε.** Σωστό

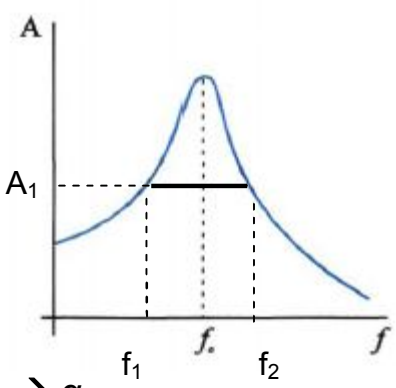
ΘΕΜΑ 2ο

1. → γ

$$\frac{U_B}{E}100\% = \frac{E - U_E}{E}100\%$$

$$\frac{U_B}{E}100\% = \frac{\frac{1}{2}\frac{Q^2}{C} - \frac{1}{2}\frac{q^2}{C}}{\frac{1}{2}\frac{Q^2}{C}}100\% \overset{q=\frac{Q}{2}}{\Longrightarrow} \frac{U_B}{E}100\% = 75\% \Rightarrow U_B = 75\%E$$

2. → γ



3. → α

Όταν $m_A = m_B$

$u'_B = u_A$ και $u'_A = 0$

Άρα $\Pi\% = \frac{K_{B_{ΤΕΛ}}}{K_{A_{ΑΡΧ}}}100\% = 100\%$

4. → β

$K_{μετ} = K_{περ} \Rightarrow$

$$\frac{1}{2}mu_{cm}^2 = \frac{1}{2}I\omega^2 \overset{u=\omega R}{\Longrightarrow} I = mR^2$$

ΘΕΜΑ 3ο

Α. Το Κ πρώτο σημείο ενίσχυσης οπότε $r_1 - r_2 = \lambda$

$$y = 2A \cdot \sigma\upsilon\nu\left(2\pi \cdot \frac{r_1 - r_2}{2\lambda}\right) \cdot \eta\mu\left[2\pi \cdot \left(\frac{t}{T} - \frac{r_1 + r_2}{2\lambda}\right)\right]$$

$$= 2A \cdot \sigma\upsilon\nu\pi \cdot \eta\mu\left[2\pi \cdot \left(\frac{t}{T} - \frac{r_1 + r_2}{2\lambda}\right)\right]$$

$$= -2A \cdot \eta\mu\left[2\pi\left(\frac{t}{T} - \frac{r_1 + r_2}{2\lambda}\right)\right]$$

$$= 2A \cdot \eta\mu\left[2\pi\left(\frac{t}{T} - \frac{r_1 + r_2}{2\lambda}\right) + \pi\right]$$

$$= 2A \cdot \eta\mu\left(2\pi\frac{t}{T} - 2\pi\frac{r_1 + r_2}{2\lambda} + \pi\right)$$

όμως $y = 0{,}2 \cdot \eta\mu\left[\frac{5\pi}{3}(t - 2)\right] = 0{,}2 \cdot \eta\mu\left(\frac{5\pi}{3}t - \frac{10\pi}{3}\right)$

Άρα $A = 0{,}1m$

$$2\pi\frac{t}{T} = \frac{5\pi t}{3} \Rightarrow T = \frac{6}{5}sec$$

$$u = \lambda f \Rightarrow \lambda = uT \Rightarrow \lambda = 0{,}6m$$

Β.
$$\left.\begin{array}{l} -2\pi\frac{r_1 + r_2}{2\lambda} + \pi = -\frac{10\pi}{3} \Rightarrow r_1 + r_2 = \frac{13\lambda}{3} \\ AB = r_1 + r_2 \end{array}\right\} \Rightarrow AB = 2{,}6m$$

Γ.
$$\left.\begin{array}{l} r_1 - r_2 = \lambda \\ r_1 + r_2 = \frac{13\lambda}{3} \end{array}\right\} \overset{(+)}{\Rightarrow} 2r_1 = \frac{16\lambda}{3} \Rightarrow r_1 = 1{,}6m$$

$$r_1 - r_2 = \lambda = 0{,}6 \Rightarrow r_2 = 1m$$

Δ.
$$\left.\begin{array}{l} r_1 - r_2 = N\lambda \\ r_1 + r_2 = AB \end{array}\right\} \overset{(+)}{\Rightarrow} 2r_1 = N\lambda + AB \Rightarrow r_1 = 0{,}3N + 1{,}3$$

$$0 < r_1 < 2{,}6 \Rightarrow 0 < 0{,}3N + 1{,}3 < 2{,}6 \Rightarrow -\frac{13}{3} < N < \frac{13}{3} \Rightarrow$$

$N = -4 , -3 , -2 , -1 , 0 , 1 , 2 , 3 , 4 \rightarrow$ 9 σημεία

ΘΕΜΑ 4ο

Α. $\sum\vec{\tau} = I\vec{\alpha}_\gamma \Rightarrow TR = \frac{1}{2}MR^2\alpha_\gamma \Rightarrow T = \frac{1}{2}MR\alpha_\gamma$

$\sum\vec{F} = m\vec{\alpha} \Rightarrow w_1 - T = m_1\alpha$

Με απόδειξη $\alpha = \alpha_\gamma R$, οπότε

$w_1 - \frac{1}{2}MR\alpha_\gamma = m_1\alpha \Rightarrow w_1 - \frac{1}{2}M\alpha = m_1\alpha \Rightarrow$

$m_1g - \frac{1}{2}M\alpha = m_1\alpha \Rightarrow \alpha = 4\frac{m}{s^2}$

Β. $\omega = \alpha_\gamma t \Rightarrow \omega = \frac{\alpha}{R}t \Rightarrow \omega = 20\ rad/sec$

$K = \frac{1}{2}I\omega^2 \Rightarrow K = \frac{1}{2}\left(\frac{1}{2}MR^2\right)\omega^2 \Rightarrow K = 12J$

Γ. Α.Δ.Ο

$\left.\begin{array}{l}\vec{p}_{\pi\rho\iota\nu} = \vec{p}_{\mu\varepsilon\tau\acute{\alpha}} \Rightarrow m_1u_1 = (m_1 + m_2)V \Rightarrow V = \dfrac{m_1u_1}{(m_1 + m_2)} \\ u_1 = \alpha t \Rightarrow u_1 = 4m/s\end{array}\right\} \Rightarrow V = 1m/s$

Π.Θ.Ι: $\sum F = 0 \Rightarrow k\Delta l_1 = m_2g \Rightarrow \Delta l_1 = 0,15m$

Ν.Θ.Ι: $\sum F = 0 \Rightarrow k\Delta l_2 = m_1g + m_2g \Rightarrow \Delta l_2 = 0,2m$

Α.Δ.Ε.Τ

$K_{\alpha\rho\chi} + U_{\alpha\rho\chi} = K_{\tau\varepsilon\lambda} + U_{\tau\varepsilon\lambda} \Rightarrow$

$\frac{1}{2}(m_1 + m_2)V^2 + \frac{1}{2}k(\Delta l_2 - \Delta l_1)^2 = \frac{1}{2}kA^2 \Rightarrow A = 0,15m$

Δ. $\left|\frac{\Delta P}{\Delta t}\right| = \left|\sum F_{\varepsilon\xi}\right| = \left|(m_1 + m_2)\alpha\right| = (m_1 + m_2)\omega^2x = kx \Rightarrow$

$\left|\frac{\Delta P}{\Delta t}\right| = 20N$