# 8ZRFVYCXJNW

## 'RYDXYVT[L

0^RXYFRYDRTW 1aPFW

- ÆH õ I ï H š G
- 

# ( L

# Γ3

Τη στιγμή όπου $v = \frac{v_{o\rho}}{2} = 6m/s$

$$I' = \frac{Bvl}{R_{o\lambda}} = \frac{Bvl}{R_{\mathrm{K\Lambda}} + R_{1,\Sigma}} = \frac{6}{4} = 1,5A$$

$$\frac{dP}{dt} = \Sigma F = mg - F_L = mg - BIl = 3 - 1,5 = 1,5kg\frac{m}{s^2}$$

# Γ4

Όταν $v_{o\rho} = 12m/s \Rightarrow I_{o\rho} = \frac{Bv_{o\rho}l}{R_{\text{ΚΛ}}+R_{1,\Sigma}} = 3A$

$$V_{\text{ΚΛ}} = V_{\pi o\lambda} = I_{o\rho}R_{1,\Sigma} = 3 \cdot 2 = 6V$$

Άρα $V_{\text{MN}} = V_{\text{ΚΛ}} = 6V = V_{\Sigma} \Rightarrow$ κανονική λειτουργία

# Δ1

$$\Sigma_{\tau(\Gamma)} = 0 \Rightarrow W\frac{l}{2}\sigma\upsilon\nu\varphi + N_B\frac{l}{2}\sigma\upsilon\nu\varphi = T_1\frac{l}{2}\eta\mu\varphi \Rightarrow$$

$$N_B\sigma\upsilon\nu\varphi = T_1\eta\mu\varphi - W\sigma\upsilon\nu\varphi \Rightarrow$$

$$0,6N_B = 10,5\cdot 0,8 - 10\cdot 0,6 \Rightarrow 0,6N_B = 8,4 - 6 \Rightarrow N_B = 4N$$

# Δ2

$$I_{o\lambda} = I_\rho + I_{\sigma\varphi} = \frac{1}{12} M_\rho l^2 + m\left(\frac{l}{2}\right)^2 = \frac{1}{12}\cdot 3\cdot 4 + 1\cdot 1 = 2kg\cdot m^2$$

$$\Sigma_{\tau(\Gamma)} = I_{o\lambda}\alpha_{\gamma\omega\nu} \Rightarrow mg\frac{l}{2}\sigma\upsilon\nu\varphi = I_{o\lambda}\cdot\alpha_{\gamma\omega\nu} \Rightarrow$$

$$10\cdot 0,6 = 2\alpha_{\gamma\omega\nu} \Rightarrow \alpha_{\gamma\omega\nu} = 3rad/s^2$$

$$\frac{dL_\rho}{dt} = I_\rho\cdot\alpha_{\gamma\omega\nu} = 3kg\cdot m^2/s^2$$

# Δ3

Γωνιακή ταχύτητα $\omega$ ωριακά πριν φτάσει στο οριζόντιο δάπεδο

$$E_{o\lambda(\alpha\rho\chi)} = E_{o\lambda(\tau\varepsilon\lambda)} \Rightarrow$$
$$mgl\eta\mu\varphi + M_\rho g\frac{l}{2}\eta\mu\varphi = 0 + M_\rho g\frac{l}{2}\eta\mu\varphi + \frac{1}{2}I_{o\lambda}\omega^2 \Rightarrow$$
$$10\cdot 2\cdot 0,8 = \frac{1}{2}2\omega^2 \Rightarrow \omega = 4rad/s$$
$$|\vec{L}_{\pi\rho\iota\nu}| = I_{o\lambda}|\vec{\omega}| = 2\cdot 4 = 8kg\cdot m^2/s$$
$$|\vec{L}_{\mu\varepsilon\tau}| = I_{o\lambda}|\vec{\omega}'| = 2\cdot 2 = 4kg\cdot m^2/s$$
$$\Delta\vec{L} = \vec{L}_{\mu\varepsilon\tau} - \vec{L}_{\pi\rho\iota\nu} \Rightarrow \Delta L = 4-(-8) = 12kg\cdot m^2/s$$

# Δ4

Κύλιση χωρίς ολίσθηση

$$v_E = 0 \Rightarrow v_{cm} = \omega R \Rightarrow a_{cm} = a_{\gamma\omega\nu}$$

Μεταφορική

$$\Sigma F = F + T_{\sigma\tau} = M_T \cdot a_{cm}$$

Περιστροφική

$$\Sigma_{\tau(\mathrm{O})} = I_{\tau\rho} \cdot a_{\gamma\omega\nu} \Rightarrow F \cdot r - T_{\sigma\tau} R = \frac{1}{2} M_T R^2 \cdot a_{\gamma\omega\nu} \Rightarrow$$

$$F \frac{r}{R} - T_{\sigma\tau} = \frac{1}{2} M_T \cdot a_{cm}$$

$$F \left(1 + \frac{V}{R}\right) = \frac{3}{2} M_T \cdot a_{\gamma\omega\nu} \Rightarrow$$

$$F \left(1 + \frac{3}{4}\right) = \frac{3}{2} M_T \cdot a_{\gamma\omega\nu} \Rightarrow a_{\gamma\omega\nu} = \frac{7F}{6M_T} = 2m/s^2$$

# Δ5

$\Delta x_{cm} = \frac{1}{2} a_{cm} t_1^2 = \frac{1}{2} \cdot 2 \cdot 4 = 4m$ Μετατόπιση άκρου νήματος:

$$\Delta x_z = \Delta x_{cm} + r \cdot \Delta \varphi = \Delta x_{cm} + r \frac{\Delta x_{cm}}{R} = \Delta x_{cm} \left(1 + \frac{r}{R}\right) = \frac{7}{4} \Delta x_{cm}$$

$$W_F = F \cdot \Delta x_z \cdot \sigma\upsilon\nu 0^\circ = 12 \cdot 7 = 84J$$