

SOLUCIONES-TEMA 6- ROTACIÓN DEL SÓLIDO RÍGIDO

- 6.1. completar
- 6.2. c) $\Delta t = 291 \text{ s} = 4 \text{ min } 51 \text{ s}$
- 6.3. b) aprox. 15,9 min
- 6.4. $I_x = 28 \text{ Kg} \cdot \text{m}^2 = I_y$; $I_z = 56 \text{ kg} \cdot \text{m}^2$
- 6.5. $I_x = 3ML^2/4$, $I_y = ML^2/2$; $I_z = 5ML^2/4$
- 6.6. a) MR^2 ; b) y c) $MR^2/2$.
- 6.7. a) $ML^2/3$, $ML^2/12$; b) $M(a^2 + b^2)/12$, $M(a^2 + b^2)/3$ c) $MR^2/2$, d) $2MR^2/5$
- 6.8. $\Delta I/I = ((\cos \lambda_2)^2 - (\cos \lambda_1)^2) / ((2M_T/5m) + (\cos \lambda_1)^2)$
- 6.9. completar
- 6.10. completar
- 6.11. a) $\alpha = 1,96 \text{ rad/s}^2$; b) $\alpha = 1,78 \text{ rad/s}^2$; c) $\alpha = 13,07 \text{ rad/s}^2$
- 6.12. a) $a = (m_2 - m_1)g / (m_2 + m_1 + m/2) = 0,0947 \text{ m/s}$
 b) $T_1 = m_1(a + g) = 4,947 \text{ N}$, $T_2 = T_1 + ma/2 = 4,949 \text{ N}$ $\Delta T = 0,002 \text{ N}$ c) $a = 0,0970 \text{ m/s}$, $T_2 = T_1 = 4,948 \text{ N}$, $\Delta T = 0$
- 6.13. completar
- 6.14. a) $a = \frac{2m_2 g \sin \theta}{2m_2 + m_1}$; b) $T = \frac{m_1 m_2 g \sin \theta}{2m_2 + m_1}$ c) $v = \sqrt{\frac{4m_2 gh}{2m_2 + m_1}}$
- 6.15. e) $\omega = 5,4 \text{ rad/s}$.
- 6.16. completar
- 6.17. $E = 0,22 \text{ kJ}$
- 6.18. b) $E = \frac{1}{2} \left(\frac{7}{3} + \frac{R^2}{L^2} \right) m_v v^2 = 0,15 \text{ J}$.
- 6.19. a) $s_f = 12v_0^2 / 49\mu_{kg}$ $t_1 = 2v_0 / 7\mu_{kg}$ $v_1 = 5v_0 / 7$ b) $K_f / K_i = 5/7$
- 6.20. d) $v_{esfera} = 3,7 \text{ m/s}$, $v_{cil} = 3,6 \text{ m/s}$, $v_{ani} = 3,1 \text{ m/s}$.
- 6.21. completar
- 6.22. completar
- 6.23. a) $4mvd\vec{k}$; b) $\vec{0}$; c) $-2mvd\vec{k}$
- 6.24. a) $\vec{L}_0 = \vec{0}$; b) $\vec{L}_1 = -(mv_0^3 \cos \theta \sin^2 \theta / 2g)\vec{k}$; d) el momento de la fuerza gravitatoria. c) $\vec{L}_2 = -(2mv_0^3 \cos \theta \sin^2 \theta / g)\vec{k}$
- 6.25. $\omega = \frac{-m}{\left(\frac{M}{2} + m\right)} \frac{\omega_0}{R}$; $\omega = -0,017 \text{ rad/s}$
- 6.26. a) $\omega = \frac{I_1}{I_1 + I_2} \omega_0$; b) $\frac{\Delta E_c}{E_{ci}} = -\frac{I_2}{I_1 + I_2}$
- 6.27. completar
- 6.28. a) $v_{\min} = \frac{1}{m} \sqrt{2\left(\frac{M}{3} + m\right)(2m + M)gL}$; $v_{\min} = 31,43 \text{ m/s}$; $\Delta E = -8,82 \text{ J}$.
- 6.29. a) $h = 3R$; b) $\Delta E = -mgR$; c) $\omega(\theta) = \left[\frac{g}{R}(1 + \sin \theta) \right]^{1/2}$.
- 6.30. Completar
- 6.31. $\Delta t = 2r\omega_0 / 7\mu g$; $v(\Delta t) = 2r\omega_0 / 7$
- 6.32. $\omega = 3v_0 b / 2(a^2 + b^2)$
- 6.33. Completar
- 6.34. Completar
- 6.35. Completar
- 6.36. a) $y_{CM} = 7L/12$; $I = (5/12)ML^2$; b) $\omega = 2,33 \text{ rad/s}$; c) $\theta = 37^\circ$.
- 6.37. $s_2 = \frac{1}{g \sin \theta} (v_0 + \mu g s_1)$; $v_0 = \frac{2L\omega}{1 + \frac{3m}{M}} = \frac{2\sqrt{3gL}}{1 + \frac{3m}{M}}$ $s_2 = 6,8 \text{ m}$
- 6.38. Completar

