

Physics 1214, Homework #7: solutions

Answers to multiple choice questions: M1: (a) C, (b) B; M2: A, C; M3: (a) B, (b) A.

P1: (a) 9 rad, 6 rad/s, 2 rad/s²; (b) 5 rad, 2 rad/s, 0.

$$\text{P2: } \alpha = \frac{2(\omega_f t - \Delta\theta)}{t^2} = 2.97 \text{ rad}$$

$$\text{P3: } I = 8m \left(\frac{a}{\sqrt{2}} \right)^2 = 4 \times 10^{-4} \text{ kg} \cdot \text{m}^2$$

P4: $I_{\text{cam}} = I_1 - I_2$, where

$$I_1 = \frac{1}{2}m_1(2r)^2 + m_1r^2, \quad m_1 = \frac{4}{3}m$$

$$I_2 = \frac{1}{2}m_2r^2, \quad m_2 = \frac{1}{3}m$$

$$I_{\text{shaft}} = \frac{1}{2}Mr^2$$

$$\frac{m}{M} = \frac{3}{23}$$