



TOSHKENT KIMYO-TEKNOLOGIYA INSTITUTI

SHAHRISABZ FILIALI

FIZIKA

Fanidan amaliyot

Qattiq jismning aylanma harakat dinamikasi



Shahrisabz-2020

Bahromova Anzura



1. 3.1 $m=0,3\text{kg}$ massali moddiy nuqtaning nuqtadan $r=20\text{ sm}$ uzoqlikdan o'tgan o'qqa nisbatan inersiya momenti J aniqlansin.

Berilgan

$m=0,3\text{ kg}$

$r=20\text{ sm}=0,2\text{ m}$

$J=?$

Yechilishi

$$J = mr^2$$

$$J = 0,012\text{ kg} \cdot \text{m}^2$$





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2. 3.7 Uzunligi $l=60$ sm va massasi $m=100$ g bo'lgan ingichka bir jinsli tayoqchaning unga tik va tayoqchaning uchlaridan biridan $a=20$ sm masofadagi nuqtasidan o'tuvchi o'qqa nisbatan inersiya momenti J aniqlansin?

Berilgan

$$l=60 \text{ sm}=0,6 \text{ m}$$

$$m=100 \text{ g}=0,1 \text{ kg}$$

$$a=20 \text{ sm}=0,2 \text{ m}$$

J - ?

Yechilishi

$$J=J_0+ma^2$$

$$J_0 = \frac{1}{12}ml^2$$

$$J = \frac{1}{12}ml^2 + m\left(\frac{l}{2} - a\right)^2$$

$$J=4 \cdot 10^{-3} \text{ kg} \cdot \text{m}^2$$





3. 3.28 Massasi $m=10$ kg va radiusi $R=20$ sm bo'lgan shar o'z markazidan o'tuvchi o'q atrofida aylanadi. Sharining aylanish tenglamasi $\varphi=A+Bt^2+Ct^3$ ko'rinishga ega, bunda $B=4$ rad/s², $C=-1$ rad/s³. Sharga ta'sir etayotgan kuch momentining o'zgarish qonuni topilsin. Vaqtning $t=2$ s onidagi kuch momenti M aniqlansin?

Berilgan

$$M = 10 \text{ kg}$$

$$R = 20 \text{ sm} = 0,2 \text{ m}$$

$$\phi = A + Bt^2 + Ct^3$$

$$B = 4 \text{ rad/s}^2$$

$$C = -1 \text{ rad/s}^3$$

$$t = 2 \text{ s}$$

$M = ?$

Yechilishi

$$M = J\varepsilon$$

$$J = \frac{2}{5} mR^2$$

$$\varepsilon = \phi'' = 2B + 6Ct = 2(B + 3Ct)$$

$$M = \frac{4}{5} mR^2(B + 3Ct)$$

$$M = -0,64 \text{ N}\cdot\text{m}$$





Topshiriq



1. $m=0,3\text{kg}$ massali moddiy nuqtaning nuqtadan $r = n$ sm uzoqlikdan o'tgan o'qqa nisbatan inersiya momenti J aniqlansin?
2. Motorning yakori $n=1500 \text{ min}^{-1}$ chastota bilan aylanmoqda. Agar motor quvvatni n V_t gacha oshira olsa, aylantiruvchi moment M aniqlansin?
3. Massasi $m=10 \text{ kg}$ va radiusi $R= n$ sm bo'lgan shar o'z markazidan o'tuvchi o'q atrofida aylanadi. Sharning aylanish tenglamasi $\varphi=A+Bt^2+Ct^3$ ko'rinishga ega, bunda $B=4 \text{ rad/s}^2$, $C=-1 \text{ rad/s}^3$. Sharga ta'sir etayotgan kuch momentining o'zgarish qonunu topilsin. Vaqtning $t=2\text{s}$ onidagi kuch momenti M aniqlansin?



Izoh: **n** sonining o'rniga har bir talaba o'zining jurnaldagi nomerini masalaga qo'yib ishlaydi.



E'tiboringiz uchun rahmat!

