

(6)

অধ্যায় - ৪

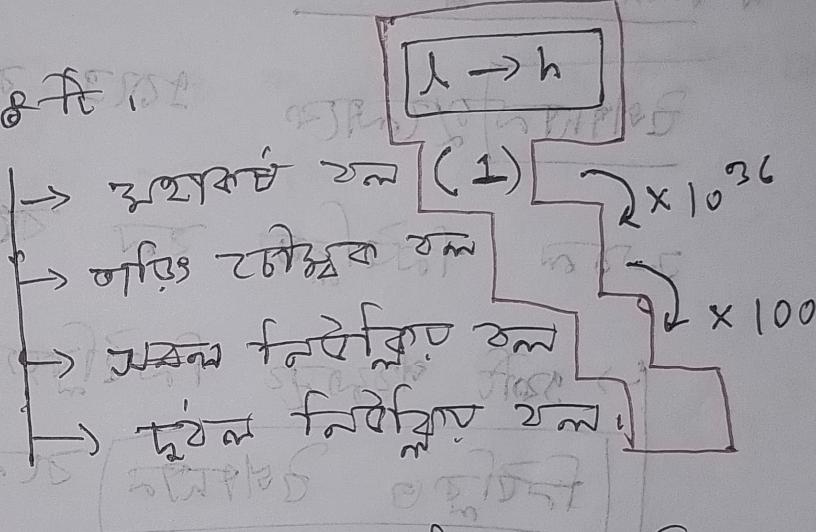
নিউটনীয় গুরুত্বপূর্ণ

⇒ চলনিদ্রায় শুধু কর্মসূচী এবং

নট নির্দেশ

জরুরি ফর্মুলা

⇒ দ্রোণিত এবং পর্যবেক্ষণ



কৃষ্ণকার্য চলন: চার্ট কার্যের ক্ষেত্রে কৃষ্ণকার্য ও কার্যকর চলনের
মাধ্যমে কৃষ্ণ অসুস্থ কৃষ্ণকার্য ও কার্যকর চলনের

কৃষ্ণকার্য চলন ক্ষেত্রে মহাকার্য এবং দূর্বল,

কৃষ্ণকার্য চলন ক্ষেত্রে ক্ষেত্রে কৃষ্ণকার্য এবং কার্যকর চলনের ক্ষেত্রে কৃষ্ণকার্য ও কার্যকর চলনের

অঙ্গ চৌম্বক চলন: চার্ট ক্ষেত্রে কৃষ্ণ ক্ষেত্রে অঙ্গ

অঙ্গকে ক্ষেত্রে পর্যবেক্ষণ করে যেখানে অঙ্গকে ক্ষেত্রে পর্যবেক্ষণ করে,

ক্ষেত্রে ক্ষেত্রে অঙ্গ চৌম্বক চলনের ক্ষেত্রে।

୭

→ **ରମେଶ** ନାମ ଓ ପ୍ରକଳ୍ପ ଅଧ୍ୟୟତ୍ନ ଓ ଆଚାର୍ଯ୍ୟିତ

ବାଗ୍ଦା ପିଲିହାରୀ ହାତେ ଏଥିଁ ରମେଶ

ରମେଶ କିମ୍ବା କାହା ନାମ ଅଧ୍ୟୟତ୍ନ ଏଥିଁ ଆଚାର୍ଯ୍ୟିତ

ମୂଳ ନିରେକିତ ରଳି ଅଭ୍ୟାସ ନିରେକିତାରେ ନିରେକିତ

କେବଣାରେ ଶୁଣେଇ କାହାର ନାମ ଏ ରାମ, ରାମ

କାହାର ନିରେକିତ ରଳି ବଳେ,

ଏହି ଅଭ୍ୟାସ ନିରେକିତାରେ କିମ୍ବା ଦେଖାଇଲୁଛାମୁଣ୍ଡାରେ

ନିରେକିତ ରେଖାରେ ରାମ.

10 m

ଦୁଇ ନିରେକିତ ରଳି ଏବଂ ପାଲା ଓ ମୁଣ୍ଡ

ମୁଣ୍ଡ ଉଠି ନିରେକିତାରେ ନିରେକିତ ରଳାଇଲୁଣାରେ

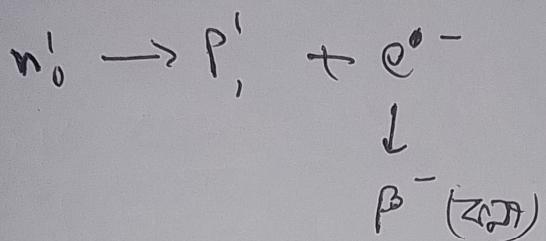
ମୁଣ୍ଡ କିମ୍ବା କାହାର ନାମ ନିରେକିତାରେ

ଅଭ୍ୟାସିକୀଳ ବରଷ୍ଗ ଉପି ରାମ, ଆମ କୁମର

ନିରେକିତ ରଳି ରାମ!

(6)

→ न्यूक्लियन (10^{-16} - 10^{-18}) m



→ प्राकृतिक रद्दी क्या? एक्सामिनेटर द्वारा दिया गया।

क्षुर्त्ता निपोड़ा हल किया गया।

ପ୍ରାଣକଷିତ୍ର ହଳ ଏ ଦୁର୍ବଲ ଏ ଅଧିକ ହଳ

ନିଯମିତ ଅନୁକ୍ରମ ମୂଳ୍ୟ

ନିଯମିତ ଏହା ମୂଳ୍ୟ ବାଣ୍ୟା ଏହା ଶ୍ରେଣୀ ନ ହଳ ଦିଲ୍

ଏହା ଚିକିତ୍ସା ଫିଲ୍ ଥାଏ । ଏହା ଅନୁକ୍ରମ ଏହା ଚିକିତ୍ସା

ମୁଖ୍ୟ କ୍ରମିତ ଉତ୍ସାହ କାହାର ପାଇଁ ।

ଲୋକ ଅନ୍ତରେ କାହାର ମୂଳ୍ୟ ।

$F \propto a$

ନିଯମିତ ଏହା ମୂଳ୍ୟ ଦେଖିଲୁ ଏହାର ଅନ୍ତରେ

ଏହା ଏହା କେବଳ ମୁଖ୍ୟ ଏହାର ମାତ୍ରାବିପରିବର୍ତ୍ତନ । ଏହା ଏହା ଅନ୍ତରେ କ୍ରମିତ କାହାର ଅନ୍ତରେ ଏହାର ଅନ୍ତରେ ଏହାର ଅନ୍ତରେ

ହାତେ : $\text{ଅନ୍ତରେ, } P = mv$

$$\frac{dp}{dt} \propto F$$



Q

$$\frac{dp}{dt} \propto F$$

$$\Rightarrow \frac{d(mv)}{dt} \propto F$$

$$\Rightarrow m \frac{dv}{dt} \propto F$$

$$\Rightarrow ma \propto F$$

$$\therefore ma = kF$$

$$\therefore k=1$$

$$\therefore F=ma$$

Newton's Law

Newton's 2nd Law: Force is directly proportional to mass and acceleration.

Newton's 2nd Law:

Force = Mass × Acceleration

or

$$F = m \cdot a$$

$$\begin{aligned} F_1 &= -F_2 \\ \Rightarrow m_1 a_1 &= -m_2 a_2 \\ \Rightarrow & \end{aligned}$$

$$-1 = \frac{m_1}{m_2}$$

⑪

$$\text{Gesetz der Gleichung} \quad F_1 = -F_2$$

$$\Rightarrow m_1 a_1 = -m_2 a_2$$

$$\Rightarrow m_1 \frac{v_1 - u_1}{t} = -m_2 \cdot \frac{v_2 - u_2}{t}$$

$$\Rightarrow m_1(v_1 - u_1) = -m_2(v_2 - u_2)$$

$$\Rightarrow m_1 v_1 - m_1 u_1 = -m_2 v_2 + m_2 u_2$$

$$\Rightarrow m_1 v_1 + m_2 u_2 = m_1 u_1 + m_2 v_2$$

$$\therefore m_1 u_1 + m_2 v_2 = m_1 v_1 + m_2 u_2$$

~~ausdrückbar aus der Massegleichung~~

[H.W]

für m_1, m_2, v_1, v_2

für u_1, u_2 ausdrückbar

für m_1, m_2 ausdrückbar

$m_1 = x$
 $m_2 = y$

20/08/22

⑨

ठाके

दूसरे दूसरे ताजे गुण की फिर इसे फ्रेश

इस लिए गुण का लिए अपने लिए लिए लिए

कमी होती है तब तक तक तक तक

थ्रॉट (Thrust),

$$P = m v$$

$$\therefore \Delta P = \Delta m v \rightarrow ①$$

$$\therefore F = m a$$

$$\Rightarrow F = m \left(\frac{v-u}{t} \right)$$

$$\Rightarrow F t = m (v - u)$$

$$\Rightarrow F t = m v - m u$$

$$\therefore F t = \Delta P$$

$$① v = 20, /-$$

$$\Delta P = \Delta m v$$

$$\Rightarrow F \times \Delta t = \Delta m v$$

$$\therefore F = \frac{\Delta m}{\Delta t} \times v$$

दूसरे दूसरे दूसरे दूसरे

$$\Rightarrow M_a = \frac{\Delta m}{\Delta t} \times v$$

$$\therefore a = \frac{1}{m} \times \frac{\Delta m}{\Delta t} \times v$$

$$\therefore a = \frac{\Delta m v}{m \Delta t}$$

$$\Delta m = 20 \text{ किलोग्राम}$$

$$\Delta t = 2 \text{ सेकंड}$$

$$v = 20 \text{ मीटर/सेकंड}$$

$$m = 20 \text{ किलोग्राम}$$

$$a = 20 \text{ मीटर/सेकंड}^2$$

$$g = 0$$

$$a = \frac{\Delta m v}{M \Delta t} - g \rightarrow (\text{we use this when } g \neq 0) \text{ or } (g \text{ is given})$$

Some math

(1)

① यदि ग्रही जब उत्तरांश २३५ देखते हैं तो उसे
 $\frac{1}{60}$ दिनों का अवधारणा ग्रही इन ग्रहों का वेग 2400 ms^{-1} है।

इसके लिए गुणन (गुणी)

\Rightarrow गुणन गुणी

उत्तरांश का गुणन, $M = m \text{ kg}$

$$\therefore \Delta m = \frac{m}{60} \text{ kg}$$

$$\Delta t = 1 \text{ s}$$

$$v = 2400 \text{ ms}^{-1}$$

$$\therefore a^2 = \frac{\Delta m v}{\Delta t M} \propto g$$

$$= 90.2 \text{ ms}^{-2}$$

(Ans.)

४

347d 347e

ପାଇସିବା କାହାର କାମ ନାହିଁ

$$w = 2\pi f \text{ rad s}^{-1}$$

$$\omega = 2\pi \times 10^3 \text{ rad/s}$$

$$I = 10 \text{ kgm}^2$$

$$\hookrightarrow I = m k^2 \quad \left\{ \begin{array}{l} m = 80 \\ k = 7.373 \text{ for } 259208 \end{array} \right.$$

ପ୍ରାଚୀନ୍ୟ କୁଣ୍ଡଳଃ ଶ୍ରୀ ଲିଖିତ ମହାଦେଵ ପ୍ରକାଶନ

ଅନ୍ତର୍ଜାଲ ପ୍ରତିକର୍ମ କାଳ ଲାଭ ଦୟାଫୁଲ ବ୍ୟାପକ ହେଲା

ପ୍ରତାବେ କଟେ କୁନ୍ଦଳେ ମହିଳା, ଏବେ

କରୁଥିଲେ କାହାର କାହାର କାହାର କାହାର କାହାର

25m 1

କେବଳି ପାତାର୍ଥୀ ଏଣିମେ କହିଲୁ କାହାର କାହାର କାହାର

କାହାର ମଧ୍ୟ କିନ୍ତୁ କିମ୍ବା କିମ୍ବା କିମ୍ବା

କାନ୍ଦିର କାନ୍ଦିର କାନ୍ଦିର ମାତ୍ରା କାନ୍ଦିର କାନ୍ଦିର କାନ୍ଦିର

କାନ୍ଦିଲା ପାଇଁ କାନ୍ଦିଲା କାନ୍ଦିଲା, କାନ୍ଦିଲା କାନ୍ଦିଲା

(2)

ପ୍ରଦୀପ କୁମାର ହାତୀ ୨୦, ପ୍ରାଚୀ ଲୋଡ୍ ୨୨୮

୩) ମିଟିକ୍ ରୂପଶବ୍ଦ କୃତ୍ତବ୍ୟକ ଚାକାଶ ପାଇଁ ଥାଳି,

L>ଅଧ୍ୟୟା

କୋଣ ରୂପ ଏକାନ୍ତିର୍ଦ୍ଦୁରେ କୃତ୍ତବ୍ୟକ କ୍ଷାକାଶ ପାଇଁ ଥାଳି,

20/08/22

କ୍ଷାକାଶ ପାଇଁ

ଦାର୍ଶନିକ ପ୍ରଚାରିତ ଫିର୍ଦେ ଆଜି ବ୍ୟାପକ ରାଜ୍ୟ,

$$\text{ଅର୍ଥାତ୍} \quad I = \frac{mL^2}{12}$$

ଦାର୍ଶନିକ ପ୍ରଚାରିତ ଫିର୍ଦେ ଆଜି ବ୍ୟାପକ ରାଜ୍ୟ,

$$\text{ଅର୍ଥାତ୍} \quad I = \frac{mL^2}{3}$$

ସାମାଜିକ ଚାକାଶ ରୈନ୍ ଫିର୍ଦେ ପୂର୍ଣ୍ଣ ବ୍ୟାପକ ଅନୁକୂଳାଙ୍ଗି

$$\text{ଅର୍ଥାତ୍} \quad I = \frac{mn^2}{2}$$

ନିଷ୍ଠା ପରିଲିପିତା? କଥାରେ ଆମୀ ଆମେ କୌଣସି,

$$I = \frac{mn^2}{2}$$

(2)

निम्नोंके दार्शनिक अवधारणा उपर्युक्ती वर्णन करें,

$$I_2 = \frac{2mr^2}{5}$$

~~Some~~
Some Math

अंतर्रिक्षमें एक $6 \times 10^{24} \text{ kg}$ भूमध्ये $6.4 \times 10^6 \text{ m}$,

जैसा कि आप सभी जानते हैं इसका त्रिज्या $6.4 \times 10^6 \text{ m}$.

$$\Rightarrow m = 6 \times 10^{24} \text{ kg}$$

$$r = 6.4 \times 10^6 \text{ m}$$

$$\therefore I_2 = \frac{2mr^2}{5}$$

$$\therefore I_2 = \frac{2}{5} \times (6 \times 10^{24}) \times (6.4 \times 10^6)^2$$

$$\therefore I_2 = 9.8304 \times 10^{37} \text{ kg m}^2$$

(Ans.)

6290 Q. O.R K8 Tension 250N 0.5 m

(Q)

$$\Rightarrow m = 0.5 \text{ kg}$$

$$k = 0.5 \text{ m}$$

$$\therefore I = m k^2$$

$$= \frac{1}{2} \times \left(\frac{1}{2}\right)^2 \pi \left(\frac{1}{2}\right)^2 = \frac{\pi}{32} = \frac{\pi}{32} \text{ kg m}^2$$

$$= \frac{1}{2} \times \frac{1}{4}$$

$$= \frac{1}{8} \text{ kg m}^2$$

• (Ans.)

Wanted - 7
Total

Given = $\frac{1}{8} \text{ kg m}^2$ Ans. Papers used in 4

Ans. Total mass of paper used in 4

Ans. Total mass of paper used in 4

Ans. Total mass of paper used in 4

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ବ୍ୟାପର କ୍ଷମତା ଓ କୋଣିକା କେବେଳାକୁ ପଢିଲା

$$v \rightarrow w$$

$$\zeta \rightarrow \theta$$

$$\alpha \rightarrow \alpha$$

$$\therefore v = rw$$

$$\therefore E = \frac{1}{2}mv^2 = \frac{1}{2}m r^2 w^2$$

$$\begin{aligned}\therefore E &= \frac{1}{2}m r^2 w^2 \\ &= \frac{1}{2}Iw^2\end{aligned}$$

m ହେଉ କୌଣସି ଥାଏ ଯାନ୍ତ୍ରିକିକଣାର ଅନ୍ତର୍ଗତ

$$\text{କ୍ଷେତ୍ର ଶଫ୍ତର } = \boxed{\frac{1}{2}mv^2 + \frac{1}{2}Iw^2}$$

math

h k₂ ପରିଧି ଥାଏ କ୍ଷେତ୍ର 2.5m ହେଉ

h rad s⁻¹ କୋଣିକା କ୍ଷେତ୍ରର ଦ୍ୱାରା ଥାଏ, ତାହାର

କ୍ଷେତ୍ର ଓ $\frac{1}{2}Iw^2$ ଶଫ୍ତର କ୍ଷେତ୍ର, କିମ୍?

\Rightarrow

$$\Rightarrow m = \pi \text{ kg}$$

Q8

$$I = I_m m$$

$$\omega = \pi \text{ rads}^{-1}$$

$$\therefore I = m l^2 = \pi \times (1.4)^2 \approx 17.2 \pi \text{ kgm}^2$$

$$\therefore E = \frac{1}{2} I \omega^2 = \frac{1}{2} \times 17.2 \pi \times \pi^2 = 140.62 \pi \text{ J}$$

(Ans.)

10 kg वर्षे फलात्तरी

$$f = \frac{4\pi}{T} = \omega$$

संतती राम, 20 ms⁻¹

$$\Rightarrow m = 10 \text{ kg} \quad \therefore I = \frac{m l^2}{2} = \frac{10 \times \pi^2}{2} = 15.7 \text{ kgm}^2$$

$$l = \pi \text{ m}$$

$$v = 20 \text{ ms}^{-1}$$

$$= \frac{10 \times \pi^2}{2}$$

$$\approx 15.7 \text{ kgm}^2$$

$$\therefore E = \frac{1}{2} m v^2 + \frac{1}{2} I \omega^2$$

$$= \frac{1}{2} \times 10 \times 20^2 + \frac{1}{2} \times 15.7 \times (\frac{20}{\pi})^2$$

$$= 2000 + [62.5 \times (\frac{20}{\pi})^2]$$

$$= 3000 \text{ J} \quad (\text{Ans.})$$

क्रीमा दूरवाली बिल्डिंग

$$s = u t + \frac{1}{2} a t^2 \rightarrow \theta = \omega_0 t + \frac{1}{2} \alpha t^2$$

$$v^2 = u^2 + 2 a s \rightarrow \omega^2 = \omega_0^2 + 2 \alpha \theta$$

$$v = u + a t \rightarrow \omega = \omega_0 + \alpha t$$

$$s = \left(\frac{\omega_0 + \omega}{2} \right) t \rightarrow \theta = \left(\frac{\omega_0 + \omega}{2} \right) t$$

$$\boxed{\omega = \frac{2\pi N}{t}} \rightarrow N = t \text{ दूरवाली बिल्डिंग के } \downarrow \text{में}$$

math

गति वाले विशेष त्रिकोण के अनुपात

वेग विनाशक विशेष; इसीलिए वेग विनाशक

$$\Rightarrow t = 3$$

$$N = 5$$

$$\therefore \omega = \frac{2\pi N}{t} = \frac{2\pi \times 5}{3} = 10.472 \text{ rad s}^{-1}$$

(Ans.)

25/08/22

(5)

~~Ques~~ କେଣ୍ଟାଳି ପାଇଁ ଫୁଲିଟେ 1500 ରେ ଛୁଟାଇ, ω_0 ?

ଏହା ବନ୍ଦା 4 min ପରି ଅନୁମତି ଦେବାରେ ଆଜାନ, କୌଣସି
ଦେବାର ପାଇଁ 2235 ମାରା କାମ୍ବୀ ଅନୁମତି ଦେବାରେ

କେଣ୍ଟାଳି?

(Ans)

⇒)

କେଣ୍ଟାଳି କାମ୍ବୀ,

1 min- $^{-1}$ 1500 ରେ ଛୁଟାଇ,

$$\therefore \text{ଅନୁମତି } \omega_0 = \frac{2\pi N}{t} = \frac{2\pi \times 1500}{60} = 50\pi \text{ rad s}^{-1}$$

$$\therefore \text{କେଣ୍ଟାଳି } \omega = 0 \text{ rad s}^{-1}$$

$$\text{କାମ୍ବୀ, } t = 4 \text{ min} = 240 \text{ s}$$

$$\therefore \omega = \omega_0 + \alpha t$$

$$\therefore \alpha = \frac{\omega - \omega_0}{t} = \frac{0 - 50\pi}{240} = -\frac{5\pi}{24} \text{ rad s}^{-2}$$

$$= -0.6545 \text{ rad s}^{-2}$$

(59)

$$\theta = \omega_0 t + \frac{1}{2} \alpha t^2$$

$$= (\omega_0 \pi \times 240) + \frac{1}{2} \times 0.05 \pi \times (240)^2$$

$$= 6000 \pi + 17280 \pi$$

$$\therefore \text{Angular Velocity} = \frac{6000\pi}{2\pi} = 3000 \text{ rad/s}$$

(Ans.)

AC

କ୍ଷେତ୍ରଫଳ ଉପରେ

ମାତ୍ରା: ଦୟାଳୁ, ଚିନ୍ତା ଓ ଅନ୍ଧାରୀ କେଣ୍ଟ କାହାର ପୂର୍ବାଧାର

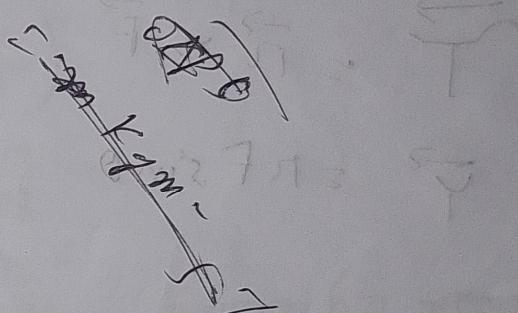
କହାନୀ ଏବଂ ଜୀବନରେ କ୍ଷେତ୍ରଫଳ କ୍ଷେତ୍ରଫଳ କାହାର

କ୍ଷେତ୍ରଫଳ ତ୍ୱରଣରେ କ୍ଷେତ୍ରଫଳ ଉପରେ କାହାର

$$\vec{L} = \vec{r} \times \vec{p} \quad \text{or} \quad L = r p \sin \theta$$

$$\therefore L = r p \sin \theta$$

$$\therefore L = I w = m r^2 w$$



କ୍ଷେତ୍ରଫଳ ଏବଂ 6 kg, 3 m ଦ୍ୱାରା ପ୍ରଦାନ କରାଯାଇଥାରୁ କ୍ଷେତ୍ରଫଳ ଉପରେ କ୍ଷେତ୍ରଫଳ ଉପରେ କ୍ଷେତ୍ରଫଳ ଉପରେ

କ୍ଷେତ୍ରଫଳ ଉପରେ କ୍ଷେତ୍ରଫଳ ଉପରେ କ୍ଷେତ୍ରଫଳ ଉପରେ କ୍ଷେତ୍ରଫଳ ଉପରେ

$$\Rightarrow L = I w$$

$$= m r^2 \times \frac{2\pi N}{t}$$

$$= \frac{6 \times 3^2 \times 2\pi \times 4}{t}$$

$$= 432\pi \text{ Kgm}^2 \text{s}^{-1}$$

$$r = 3 \text{ m}$$

$$m = 6 \text{ kg}$$

$$t = 1$$

$$N = 4$$

১১

ক্ষেত্র (রে) (৪)

বিবরণ: কেলান পিন্ড অ যন্ত্রের একটি দৃশ্য
চূর্ণপদ্ধতির উপরে কানুন প্রযোগ করে দেখি।
কেলানের চূর্ণপদ্ধতির মধ্যে কেলান পিন্ড একটি দৃশ্য।

$$\vec{T} = \vec{r} \times \vec{F}$$

$$\vec{T} = r F \sin \theta$$

$$T = I \alpha \text{ Nm}$$

চার্কো অ π kg, চার্কোর প্রযোগ দূরত্ব 0.2 m ,

কেলান কোণ কো? $2\pi/5^{\circ}$

 \Rightarrow

$$T = I \alpha$$

$$= m l^2 \alpha^2$$

$$= \pi \times 0.2^2 \alpha^2$$

$$= 0.4 \text{ Nm}$$

$$m = \pi \text{ kg}$$

$$l = 0.2 \text{ m}$$

9/08/22

(20)

ରେନ୍ଡମ୍‌ବୁଲ୍‌ଫ୍ରି ତଥା

କଣ୍ଟାଙ୍ଗିକାଳୀଙ୍କ ଅଛୁ ଏହି ପ୍ରତିକାଳର ପରିପ୍ରକାଶ ଖାଲୀ

ଏହି ରେନ୍ଡମ୍‌ବୁଲ୍‌ଫ୍ରି ତଥା ତାଙ୍କ କାବ୍ୟ ଖାଲୀ

ରେନ୍ଡମ୍‌ବୁଲ୍‌ଫ୍ରି ତଥା ଖାଲୀ ।

$$\hookrightarrow (F) \rightarrow F = \frac{mv^2}{R}$$

$$= m \left(\frac{v^2}{R} \right)$$

$$\therefore \text{ରେନ୍ଡମ୍‌ବୁଲ୍‌ଫ୍ରି ପ୍ରତିକାଳ, } a = \frac{v^2}{R}$$

ପରମାଣୁତ ଏ-

ରେନ୍ଡମ୍‌ବୁଲ୍‌ଫ୍ରି ନିରିକ୍ଷିତ ଜ୍ଞାନ 80 cm ହାତରେବେଳେ ପ୍ରତିକାଳ

କ୍ଷରଣ ଯୁଦ୍ଧ ରେନ୍ଡମ୍‌ବୁଲ୍‌ଫ୍ରି 8 $\times 10^{-13}$ N ତଥା ଲାଭ

କରେ, i.e. 92 ଟଙ୍କା 9.1 $\times 10^{-31}$ kg 27m ଦେବେ କାହାରେ

=>

$$R = 0.8 \text{ m}$$

$$F = 8 \times 10^{-13} \text{ N}$$

$$m = 9.1 \times 10^{-31} \text{ kg}$$

$$v = \sqrt{\frac{FR}{m}} = 8.41327 \times 10^8 \text{ ms}^{-1} \quad (\text{Ans.})$$

(2)

गुरु घट्टी त्रिस्त्रोत्तर कोरा रेस्ट नम्बर, अमेरिका

\Rightarrow

$$R = 0.05 \text{ m}$$

$$\omega = \frac{2\pi}{t}$$

$$= \frac{2\pi \times 1}{60 \times 60}$$

$$= \frac{2\pi}{1800}$$

$$v = \omega R$$

$$= \frac{\pi}{1800} \times 0.05$$

$$= 8.7267 \times 10^{-5}$$

$$= 8.7267 \times 10^{-5} \text{ m/s}$$

प्राप्ति

$$\tan \theta = \frac{v^2}{Rg}$$

$$\rightarrow g = 9.8 \text{ m/s}^{-2}$$

$$\rightarrow R = \frac{v^2}{\tan \theta}$$

75m वाली ही उड़ानी की दूरी को संकेत

आवश्यक गोल दृश्य चालने की दूरी का

30° दृश्य दूरी का?

$$\Rightarrow \tan 30^\circ = \frac{v}{R}$$

$$R = \frac{v}{\tan 30^\circ}$$

$$\therefore \sqrt{\tan 30^\circ \times Rg} = v$$

$$\therefore v = \sqrt{\tan 30^\circ \times 75 \times 9.8} = 20.5998 \text{ m/s}^{-1}$$

(Ans.)

(22)

କାହାରେ ଯାଏଇ 60 kmh⁻¹ ଦେବ୍ରୀ ପ୍ରତି ମନ୍ତ୍ରି ଥିଲା

ଗୁଣ: ବାହ୍ୟ ପ୍ରକାଶ 800 m ଦେବ୍ରୀ ପରିମାଣ: କାହାରେ

କାହାରେ କାହାରେ ?

$$\Rightarrow v = 60 \text{ kmh}^{-1} \approx 16.67 \text{ ms}^{-1}$$

$$r = 800 \text{ m}$$

$$g = 9.8$$

$$\therefore \tan \theta = \frac{v^2}{rg}$$

$$\therefore \theta = \tan^{-1} \left(\frac{60(16.67)^2}{800 \times 9.8} \right) = 2^\circ \text{ (Ans.)}$$

29

କ୍ଷେତ୍ର କଣାଇଁ ଯଳାଟ ୨୨୮ ଟଙ୍କା

$$\# h = d \sin \theta$$

$$\begin{cases} \rightarrow d = ସାଧାରଣ ପ୍ରକାର \\ \rightarrow h = କ୍ଷେତ୍ରର ଲାଗୁ \\ \rightarrow \theta = ଦୟା ଫଳ : ଜୀବନ \end{cases}$$

ଯାଃ କିମ୍ବା ଏକାନ୍ତ ୨° ଥି ହାତ ୧ m ଟଙ୍କା

ହାତ, ହାତ କାଢିବୁ ଦେଇ ୨୮୨

$$\Rightarrow \theta = 2^\circ$$

$$d = 1 \text{ m}$$

$$\therefore h = d \sin \theta = 0.035 \text{ m}$$

କ୍ଷେତ୍ର କଣାଇଁ
କିମ୍ବା କାଢିବୁ

practice (চৰ্যাপি - 8)

(28)

অসমৰ ধৰণৰ কোল দৰে একি পৰিবৰ্তন ঘৰিছিল,

অসমৰ বিৰামী দৰে আছোৱা একি বুলো 100 ms^{-1} আজ

আলোৱা, কুমোৰি পৰিবৰ্তন ঘৰিলৈ কোলো আছোৱা, পৰিবৰ্তন

হৰে আপো

\Rightarrow

অলোৱা অবিচৰণ, $u_1 = 0 \text{ ms}^{-1}$

বুলোৱা $u_1, u_2 = 100 \text{ ms}^{-1}$

শৰিবৰুৱা $m_1 = 0.5 \text{ kg}$

বুলোৱা $m_2 = 0.005 \text{ kg}$

ফিনত হৰে, $v = ?$

হৰে কোলো

$$m_1 u_1 + m_2 u_2 = m_1 v + m_2 v$$

$$\therefore v = \frac{m_1 u_1 + m_2 u_2}{m_1 + m_2}$$

$$= \frac{0.5 \times 0 + 0.005 \times 100}{(0.5 + 0.005)}$$

$$v = 1 \text{ ms}^{-1} (\text{Ans.})$$

(24)

ଅନ୍ତର୍ଗତ ଦୀର୍ଘ ପାଦକ ଘନ୍ତ ହେବା ଏବଂ କଥା?

- ଶୁଣିଲ୍ ଠାମ୍ସ - ୧୫୨୯୩ ନିର୍ମାଣ କରିଲା

ଅନ୍ତର୍ଗତ ପାଦକ ଘନ୍ତ କଥା

\Rightarrow ଯନ୍ତ୍ରକୁ ଆବଶ୍ୟକ, $u_1 = 0 \text{ ms}^{-1}$

ଶୁଣିଲ୍ ଠାମ୍ସ .., $u_2 = 150 \text{ ms}^{-1}$

ଅନ୍ତର୍ଗତ ଦୀର୍ଘ, $m_1 = 5 \text{ kg}$

ଶୁଣିଲ୍ ଠାମ୍ସ .., $m_2 = 0.05 \text{ kg}$

ଶୁଣିଲ୍ ଠାମ୍ସ .., $v_2 = 150 \text{ ms}^{-1}$

ଅନ୍ତର୍ଗତ ଦୀର୍ଘ .., $m_1 = 5 \text{ kg}$

ଅନ୍ତର୍ଗତ ଦୀର୍ଘ,

$$m_1 u_1 + m_2 u_2 = m_1 v_1 + m_2 v_2$$

$$\Rightarrow v_1 = \frac{m_1 u_1 + m_2 u_2 - m_2 v_2}{m_1 + m_2}$$

$$\Rightarrow v_1 = \frac{5 \times 0 + 0.05 \times 0 - 0.005 \times 150}{5 + 0.05}$$

$$\therefore v_1 = -0.1 \text{ m s}^{-1}$$

$$\therefore \text{ଅନ୍ତର୍ଗତ ପାଦକ ଘନ୍ତ} = +0.1 \text{ m s}^{-1}$$

(Ans.)

(24)

মুন্ড মুন্ড কুকুর ১ kg তেরে একটি চূড়ান্ত বেগ পাওয়া।
 দুইবারে যুক্তিপূর্ণ আছে কুকুর ইচ্ছা মুন্ড।

সূর্য 1 m দূরে প্রয়োগ 100 N, তার নিচে আছে।
 কুকুর সর্বাধিক কত উচ্চতা চুলাল পাবে?

আর কিন্তু মাছার দৈর্ঘ্য কতটা হবে?

\Rightarrow শর্করা, $m = 1 \text{ kg}$

মুন্ড দূর্য, $r = 1 \text{ m}$

ক্ষেত্রফলী বর্ষ, $F = 100 \text{ N}$

অবস্থা দার্শন,

$$F = \frac{mv^2}{r}$$

$$v = \sqrt{\frac{Fr}{m}} = \sqrt{\frac{100 \times 1}{1}} = 10 \text{ ms}^{-1}$$

অবস্থা,

$$v = r\omega \Rightarrow 10 = 1\omega \Rightarrow 10 \text{ rad s}^{-1}$$

$$\therefore \omega = \frac{v}{r} = \frac{10}{1}$$

$$\omega = \frac{2\pi N}{t} \Rightarrow N = \frac{10 \times 60}{2\pi} = 95.493 \text{ rev} \\ \therefore N = \frac{wt}{2\pi} = 95.493 \text{ rev} \\ (\text{Ans.})$$

20

2 ଏଣ ନାହିଁ ଏତ କ୍ଷରଣର ଅଧ୍ୟାତ୍ମ ଅଧ୍ୟାତ୍ମ

ସେବ 2π rad/s⁻¹ ଦେଖିଲୁ ଯୁଗମରେ : ୩୭୦ ରୂପିରେ

ନିଜ ତା କରିଲୁ ଫ୍ରିକ୍ଷଣ 60 ଡାରୁ ରାତର ଦିନ.

୩୭୦ ରୂପିରେ ଅଧିକ କ୍ଷରଣ ଦେଖିଲୁ ଯୁଗମରେ

ସେବ 3000 rad/s⁻¹ ଦେଖିଲୁ କିମିଟିଲି ଥାଏ

$\Rightarrow \frac{I_1}{I_2}$

୩୭୦ କ୍ଷରଣର ଅଧିକ ଫ୍ରିକ୍ଷଣ, $I_1 = I - k_2 I^2$

$$\therefore I_1 = I - I_1 - \frac{60I}{100}$$

$$= I - \frac{G_0 I}{100}$$

$$= \frac{100I - 60I}{100}$$

$$= 0.4I \text{ kg m}^2$$

ସେବ କ୍ଷରଣ ଅଧିକ ଦେଖିଲୁ $w_1 = 2\pi \text{ rad s}^{-1}$

$\therefore I_1 = I_2$ କାହାରେ ?

ଅବଶ୍ୟକ କାହାରେ ?

$$I_1 w_1 = I_2 w_2$$

କ୍ଷରଣର ଅଧିକ ଦେଖିଲୁ କାହାରେ ?

$$\therefore w_2 = \frac{I_1 w_1}{I_2} \Rightarrow 15.7 \text{ rad s}^{-1}$$

(26)

$$\omega_2 = 15.7 \text{ rads}^{-1}$$

$$\boxed{\begin{aligned} &= \frac{15.7}{2\pi} \text{ revs}^{-1} \\ &= 2.5 \text{ revs}^{-1} \end{aligned}}$$

$$w_2 = \frac{2\pi N}{t}$$

$$N = \frac{\omega_2 t}{2\pi} = \frac{15.7 \times 1}{2\pi} = 2.5 \text{ revs}^{-1}$$

(Ans.)

~~#~~ 2 min দূরত্বে 100 km দৈর্ঘ্যের
 অন্তরে 100 min সময়ে পুরুষ শৃঙ্খলা
 2 min অন্তরে 2030 ও 2034 সালে

$$\Rightarrow r = (100 \text{ km} + 6.4 \times 10^6 \text{ km}) = \frac{6.4 \times 10^6}{6.4 \times 10^6 \text{ km}}$$

$$t = 100 \times 60 \text{ s} = 600 \text{ s}$$

$$\therefore w = \frac{2\pi N}{t} = \frac{2\pi \times 1}{600} = 1.047 \times 10^{-3} \text{ rads}^{-1}$$

$$\therefore v = rw = (6.4 \times 10^6 \times 1.047 \times 10^{-3})$$

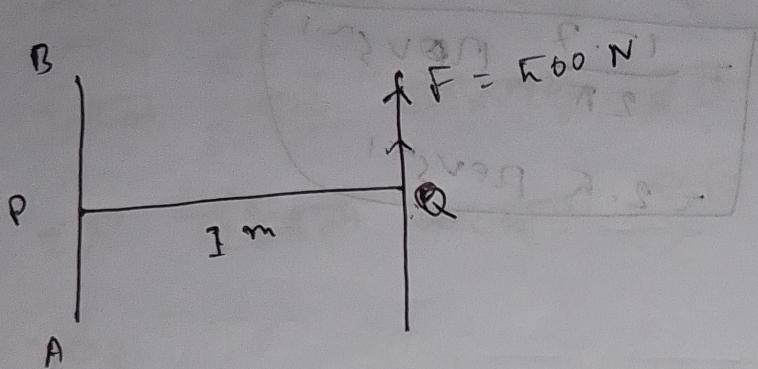
$$= 6.7013 \times 10^3 \text{ m s}^{-1} \quad (\text{Ans.})$$

28/01/22

(25)

math (विशेषज्ञता सम्बन्धी)

* * *



① AB वर्तिन असले तरीके PQ दर्शवा द्यावा

② इन विशेषज्ञता असे PQ वरील अंत रेखा 22.5 वृत्तीय तरीके द्यावा

प्रश्न:

$$\Rightarrow \text{Q } F = \vec{r} \times \vec{P}$$

$$\Rightarrow rF \sin \theta$$

$$= 1 \times 500 \times \sin 90^\circ \text{ Nm}$$

$$= 500 \text{ Nm}$$

(Ans.)

$$\left\{ \begin{array}{l} r = 1 \text{ m} \\ F = 500 \text{ N} \\ \theta = 90^\circ \end{array} \right.$$

(10)

$$\Rightarrow \text{প্রান্তির কনা ক্ষেত্রে মুন্ডু, } I_1 = \frac{mL^2}{3}$$

$$= \frac{m \times l^3}{3}$$

$$= \frac{m}{3} kg m^2$$

$$\text{প্রান্তির কনা ক্ষেত্রে মুন্ডু, } I_2 = \frac{mL^2}{12}$$

$$= \frac{m \times l^2}{12}$$

$$= \frac{m}{12}$$

$$\therefore I_1 > I_2$$

$$\therefore \text{প্রান্তির মুন্ডু}$$

বেশি উৎসাহ

প্রান্তির মুন্ডু দুটি টা.

2 वर्षों में 20 किलो वज़ाफ़ा बढ़ाने की ज़िस्मी 3000 रुपये

एक वर्ष + 50% की दर से

$$\Rightarrow \text{क्रम} = \frac{1}{2}mv^2 + \frac{1}{2}I\omega^2$$

$$= \frac{1}{2} \times 2 \times 137.2 + \frac{1}{2} \times \frac{4\pi^2}{R} \times \frac{137.2}{n^2}$$

$$= 137.2 + 14.88$$

$$\rightarrow 192.08 \quad (\text{Ans.})$$

$$m = 2 \text{ kg}$$

$$v = 0$$

$$v^2 = u^2 + 2gh$$

$$= 0^2 + 2 \times 9.8 \times 7$$

$$= 137.2$$

$$v = R\omega$$

$$I = \frac{2}{5} m R^2$$

$$= \frac{2}{5} \times 2 \times 7^2$$

$$= \frac{49R^2}{5}$$

$$I \propto R^2$$

$$v = R\omega$$

$$\therefore w = \frac{v}{R}$$

$$\therefore w^2 = \frac{v^2}{R^2}$$

θ, v, u, α

$$u^2 = \dots$$

$$v = u + at$$

$$w = w_0 + \alpha t$$

(12)

ଅନ୍ତର୍ଗତ ପ୍ରଦର୍ଶନ କିମ୍ବା ଅନ୍ତର୍ଗତ ପ୍ରଦର୍ଶନ

ଯେହି $\theta = 105^\circ$ କେତେ ରାତର ଥିଲା ଏହା କିମ୍ବା

କୋଣିକା କିମ୍ବା କେତେ ରାତର ଥିଲା ଏହା କିମ୍ବା

କୋଣିକା କିମ୍ବା କେତେ ରାତର ଥିଲା ଏହା କିମ୍ବା

$$\theta_2 = \omega_0 t + \frac{1}{2} \alpha t^2 = 100\pi \text{ rad}$$

$$\omega_0 = \frac{2\pi N}{t}$$

$$= \frac{2\pi \times 1050}{60}$$

$$= 35\pi$$

$$\omega = \frac{2\pi N}{t}$$

$$= \frac{2\pi \times 600}{60}$$

$$= \frac{6\pi}{3}$$

$$\theta_2 = 2\theta_1 + \frac{1}{2} \alpha t^2$$

$$\therefore \omega^2 = \omega_0^2 + 2\alpha\theta$$

$$\therefore \alpha = \frac{\omega^2 - \omega_0^2}{2\theta} = \frac{\left(\frac{6\pi}{3}\right)^2 - (35\pi)^2}{2 \times 100\pi} = -11.87 \text{ rad s}^{-2}$$

ବାବନାଟାରୀ, $w = w_0 + \alpha t$

$$\therefore 28\pi, t = \frac{w - w_0}{\alpha} = \frac{\frac{6\pi}{3} - 35\pi}{-11.87} = 3.53 \text{ s}$$

∴ 12135 दिने आहे, तर योग्य अवधी,

$$\theta_2 = \omega_0 t + \frac{1}{2} \alpha t^2$$

$$\rightarrow (3\pi \times 3.53) + \frac{1}{2} \times (-11.87) \times (3.53)^2$$

$$= 314.19$$

∴ 12135 दिने आहे योग्य अवधी, $\theta_2 = ?$

$$\omega^2 = \omega_0^2 + 2\alpha\theta_2$$

$$\therefore \theta_2 = \frac{\omega^2 - \omega_0^2}{2\alpha} = \frac{0^2 - (3\pi)^2}{2 \times (-11.87)}$$

$$= 0.02.28 \text{ राव}$$

$$\therefore \text{प्रत्येक } 3\text{ राव} = \frac{0.02.28}{2\pi} = 81 \text{ राव } 3\text{ राव}.$$

(68)

E - ପରିକ୍ରମାରେ କେନ୍ଦ୍ର କୁଟୁ ୫.୩ $\times 10^{-11}$ m ଅନ୍ତର୍ଗ୍ରହ

ଶୂନ୍ୟକାରୀ ପରି ୨.୨୧ $\times 10^6$ m s⁻¹ ଦୂର୍ମା ଗ୍ରହକ

କୁଣ୍ଡଳ ଓ ଉଚ୍ଚତାରେ ଏହି ପରି କିମ୍ବା କିମ୍ବା କିମ୍ବା

କୋ କ୍ଷତି କାହାରେ ? ($\text{ନେଟ୍} \text{ ଗ୍ରହ} = \text{Normal} \text{ } \text{ଗ୍ରହ}$)

$$\Rightarrow \text{ଉଚ୍ଚତାରେ କାହାରେ, } F = \frac{mv^2}{r}$$

$$\frac{9.11 \times 10^{-31} \times (2.21 \times 10^6)^2}{5.3 \times 10^{-11}}$$

$$= 8.4 \times 10^{-8} \text{ N}$$

$$\therefore \text{ବର୍ତ୍ତମାନ } \alpha = \frac{F}{m} = \frac{8.4 \times 10^{-8}}{9.11 \times 10^{-31}}$$

$$= 9.22 \times 10^{22} \text{ m s}^{-2}$$

$$\therefore v = rw$$

$$\therefore w = \frac{v}{r} = \frac{2.21 \times 10^6}{5.3 \times 10^{-11}} = 4.17 \times 10^{16} \text{ rad s}^{-1}$$

$$\therefore w = \frac{2\pi N}{t}$$

$$\therefore t = \frac{2\pi N}{w} = \frac{2\pi \times 1}{4.17 \times 10^{16}} = 1.51 \times 10^{-16} \text{ s}$$

(Ans.)

(Q1) e^- ପରିମ୍ପରାରେ ଦେଖିଲୁଛାଏ କି 5.3×10^{-4} m ଯୁଗମାତ୍ରାକୁ

ଅନୁମତି ଦିଆଯାଇଥାଏ କି 5.3×10^{-16} s ଏହାରେ କିମ୍ବା କିମ୍ବା

କିମ୍ବା

\Rightarrow କୌଣସି ପରିଚୟ, $L = I W$

$$n = 5.3 \times 10^{-11}$$

$$w = \frac{2\pi n}{t}$$

$$\frac{2\pi}{5.3 \times 10^{-16}}$$

$$= 1.19 \times 10^{16} \text{ rad s}^{-1}$$

$$= 2m n^2 w$$

$$= 9.11 \times 10^{-31} \times (5.3 \times 10^{-11})^2 \times 1.19 \times 10^{16}$$

$$= 3.03 \times 10^{-3} \text{ N} \cdot \text{m}^2 \text{ s}^{-1}$$

$\text{kg m}^2 \text{ s}^{-1}$

20/02/22

2f) दृग्वालीन अंकुर ऊमा 200m, असदूरता

(Ans)

प्रश्नहारी

दृग्वालीन अंकुर ऊमा 200m, असदूरता

चलते वाहन उड़ान असदूरता की तरीके

जब तक वाहन असदूरता की तरीके

पर उड़ान दर्शाएँ

दृग्वालीन 270°

$$\Rightarrow R = \frac{d}{\tan \theta} = \frac{200}{\tan 27^\circ} = 400 \text{ m}$$

$$d = 1 \text{ m}$$

$$v = 20.4 \text{ km h}^{-1}$$

$$= 14 \text{ ms}^{-1}$$

$$\frac{S_v}{2\pi} = 3 \text{ rad s}^{-1}$$

$$S_v = 8.0 \times 10^3 \times 3 = 24,000 \text{ rad s}^{-1}$$

$$1.2 \text{ m } 8F. S. = v \cdot \theta \\ (2\pi A)$$

$$\therefore \tan \theta = \frac{v^2}{Rd} = \frac{14^2}{200 \times 9.8} = 0.1$$

$$\therefore \theta = 5.71^\circ$$

$$\therefore h = d \sin \theta = 1 \times \sin 5.71^\circ = 0.1 \text{ m} \quad (\text{Ans.})$$

11

19)

यदि रेतार्ड की दूरी 500 m, वायर की लंबाई 700 m
 और इसकी ऊंचाई 3 m हो, तो यहाँ से फ्रॉर्स की गति
 का मान किमी/सेकंड होगा?

\Rightarrow

$$R = 500 \text{ m}$$

$$h = 10 \text{ cm} = 0.1 \text{ m}$$

$$d = 3 \text{ m}$$

$$\therefore \tan \theta = \frac{v^2}{Rg}$$

$$\Rightarrow \tan 1.01^\circ \times 500 \times 9.8 = v^2$$

$$\begin{aligned} & \text{for } \sin \theta \\ & \therefore h = d \sin \theta \\ & \therefore \sin \theta = \frac{h}{d} \\ & \therefore \theta = 1.01^\circ \end{aligned}$$

$$\therefore v = 12.78 \text{ ms}^{-1}$$

(Ans.)

$$1.01 = \frac{500}{8.9 \times 9.8} = \frac{500}{88.2} = 5.63$$

H-W-

Q-8- वोर्ट मॉथ (ment class, ment class)