Unit 8 - Week 7

Course outline

How does an NPTEL online course work?

Week 1

Week 2

Week 3

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Week 6

Week 7

- 7.1 Center of Percussion - Example
- 7.2 Impulse/Momentum - Example 1
- 7.3 Impulse/Momentum - Example 2
- 7.4 Impulse/Momentum - Example 3
- 7.5 Impulse/Momentum - Example 4
- Quiz : Assignment 7
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- Engineering Mechanics - Statics and Dynamics: Week 7 Feedback Form
- Assignment 7 solutions

Week 8

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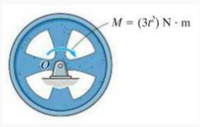
Assignment 7

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2020-03-18, 23:59 IST.

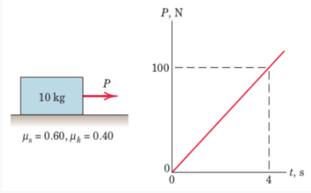
1) The 60 Kg wheel has a radius of gyration about its centre O of $k_O = 300$ mm. If it is subjected to a couple moment of $M = (3t^2)$ N.m, where t is in seconds,
the angular velocity (in rad/s) of the wheel when $t = 4$, starting from rest is . . . . . .



No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 11,13

1 point

2) The force P, which is applied to the 10 kg block initially at rest, varies linearly with time as indicated in below Figure . If the coefficients of static and kinetic friction
between the block and the horizontal surface are 0.60 and 0.40, respectively then the velocity (in m/s) of the block when $t = 4$ seconds is . . . . . .



No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 6,7

1 point

3) A particle is located by its position vector \textbf{r} with respect to a convenient origin O of fixed coordinates XYZ. The velocity of the particle is $\mathbf{v} = \dot{\mathbf{r}}$, *1 point*
and its linear momentum is $\mathbf{G} = m\mathbf{v}$. The quantity $\mathbf{r} \times \mathbf{G}$ is known as

- Torque
- Angular momentum
- Moment of force
- None of the above

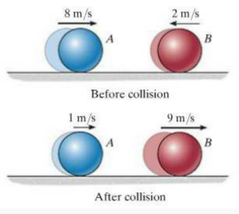
No, the answer is incorrect.
Score: 0
Accepted Answers:
Angular momentum

4) Which of the following quantities is conserved during an elastic collision *1 point*

- Speed alone
- Momentum alone
- Kinetic energy alone
- Both momentum and Kinetic energy

No, the answer is incorrect.
Score: 0
Accepted Answers:
Both momentum and Kinetic energy

5) Determine the coefficient of restitution e between ball A and ball B. The velocities of A and B before and after the collision are shown in Figure .



No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 0.75,0.85

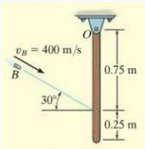
1 point

6) If the resultant moment about a fixed point O of all forces acting on a particle is zero during an interval of time then the angular momentum $\mathbf{H}_O$ of the *1 point*
particle about that point remain constant. The above statement is

- True
- False
- Cannot be said
- None of the above

No, the answer is incorrect.
Score: 0
Accepted Answers:
True

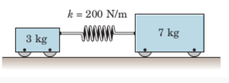
7) The 5-Kg slender rod shown in Figure is pinned at O and is initially at rest. If a 0.004-Kg bullet is fired into the rod with a velocity of 400 m/s then the angular velocity (rad/s) of the rod just after the bullet becomes embedded in it is . . . . . .



No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 0,1

1 point

8) The spring of modulus $k = 200$ N/m is compressed a distance of 300 mm and suddenly released with the system at rest (see below Figure). Determine the absolute velocity (in m/s) of the 3-Kg mass when the spring is unstretched. (Neglect friction)



No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 1.8,2.2

1 point