Dynamics

1 Multiple Choice 1 point

An object experiences rectilinear acceleration a(t) = 10 – 2t. How far does it travel in 6 seconds if its initial velocity is 10 m/s?

- 168 m
- 142 m
- 182 m
- 126 m

2 Multiple Choice 1 point

A wheel is rotating at 4000 rpm. If it experiences a deceleration of 20 rad/s^2, through how many revolutions will it rotate before it stops?

- 4400
- 2100
- 700
- 320

3 Multiple Choice 1 point

A small rotating robotic arm weighs 6.5 N and has a mass radius of gyration of 5.0 cm. The mass moment of inertia (kg*cm^2) is most nearly:

- 162.5
- 13.0
- 16.6
- 10.6

4 Multiple Choice 1 point

A boat accelerates at a constant rate of 15 ft/sec^2. The boat travels 150 ft while its speed changes to 75 ft/sec. The initial velocity (ft/sec) was most nearly:

- 58.0
- 67.0
- 11.0
- 33.5

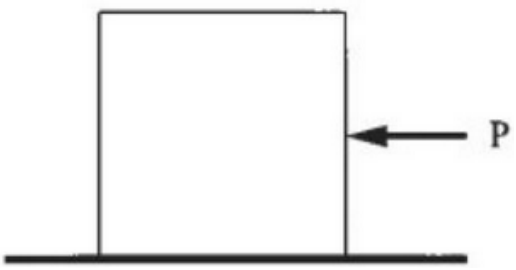
5 Multiple Choice 1 point

During impact of two objects, which of the following is true?

- Energy is never conserved.
- Momentum is always conserved.
- Energy is always conserved.
- Momentum is never conserved.

6 Multiple Choice 1 point

A 7.5-kg block is sliding along a friction-less surface and is acted on by a constant force **P** of 25 N.

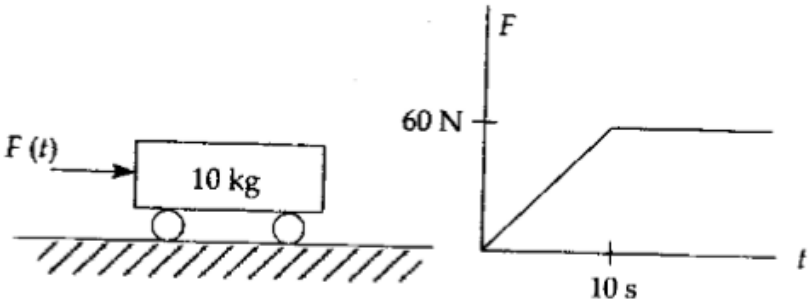


The time (seconds) when the block is moving at 16 m/s is most nearly:

- 3.33
- 4.80
- 53.33
- 4.50

7 Multiple Choice 1 point

The force F(t) acts on the mass shown. What is its velocity after 20 *s* if it starts from rest?



- 60 m/s
- 80 m/s
- 70 m/s
- 90 m/s

8 Multiple Choice 1 point

A wheel begins to rotate about an axis through its center with constant angular acceleration $\alpha = 3\ \frac{rad}{sec}$ starting from rest? The number of revolutions it completes until it achieves an angular velocity of100 rpm is most nearly:

- 2.91
- 4.27
- 18.3
- 10.5