Chapter 6- Momentum

Exercises

Exercise 1

Which one has more momentum, a 1 –ton car moving at 100 km/h or a 2-ton truck moving at 500 km/h?

Exercise 2

Does a moving object have impulse?

Exercise 3

- Does a moving object have momentum?

Exercise 4

- If an object with mass of 6 kg moves with a velocity of 10 m/s, what is its momentum?

Exercise 5

- A student pushes a crate by applying 10N force over 5 minutes. What is the impulse experience by the crate?

Exercise 6

- For the same force which cannon imparts a greater impulse to a cannonball – a long cannon or a short one?

Exercise 7

- A 1500 kg car moving at 25 m/s collides with a second car. After the collision, velocity of the 1st car is -5 m/s. What is the impulse experienced by the car?

Exercise 8

A karate expert imparts a large impulse to a stack of bricks in a short time and produces a considerable force. How does the force that he exerts on the bricks compare with the force exerted on his hands?

Exercise 9

Newton's 2nd law states that, if no net force is exerted on a system, no acceleration occurs.

Does it follow that no change in momentum occurs?

Exercise 10

Newton's 3rd law states that the force a cannon exerts on a cannonball is equal and opposite to the force the cannonball exerts on the cannon.

Does it follow that the impulse the cannon exerts on the cannonball is equal and opposite to the impulse the cannonball exerts on the cannon?

Exercise 11

A cart a with mass of 0.5 kg glides on an air track and bumps into, and sticks to , a stationary cart that has a mass of 1.5 kg. If the speed of the gliding cart before impact is V_{before} , how fast will the coupled carts glide after the collision?

Exercise 12

- Consider a fish that swims toward and swallows a smaller fish at rest. The large fish has a mass of 5kg and swims 1 m/s toward 1 kg smaller fish. What is the velocity of the larger fish immediately after lunch? Neglect the effects of water resistance.

Exercise 13

A large fish with a mass of 5kg, swims 1 m/s toward 1 kg smaller fish who swims at 4 m/s toward the larger fish. What is the velocity of the larger fish immediately after swallowing the smaller fish? Neglect the effects of water resistance.

Exercise 14

Ranking # 1 in Chapter 6.

Exercise 15

Ranking # 2 part (a) in Chapter 6.

Exercise 16

Ranking # 3 in Chapter 6.