Practice Question Set For GCSE
Subject : Physics
Paper-1 Topic : 2_Motion and Forces

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Name of the Student:_____
Max. Marks : 18 Marks **Time : 18 Minutes**

Q1.

Figure 9 shows two trolleys, **P** and **Q**, moving at the same speed, v, directly towards each other.

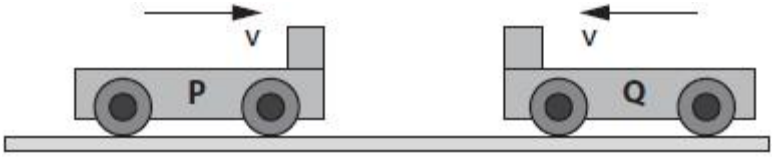

Figure 9

The trolleys have the same mass.

When the trolleys collide, they stick together and stop.

Explain how momentum and energy are both conserved in this collision.

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(Total for question = 6 marks)

Q2.

Figure 9 is a diagram showing a rocket that is sent into space to try and change the path of a small asteroid.

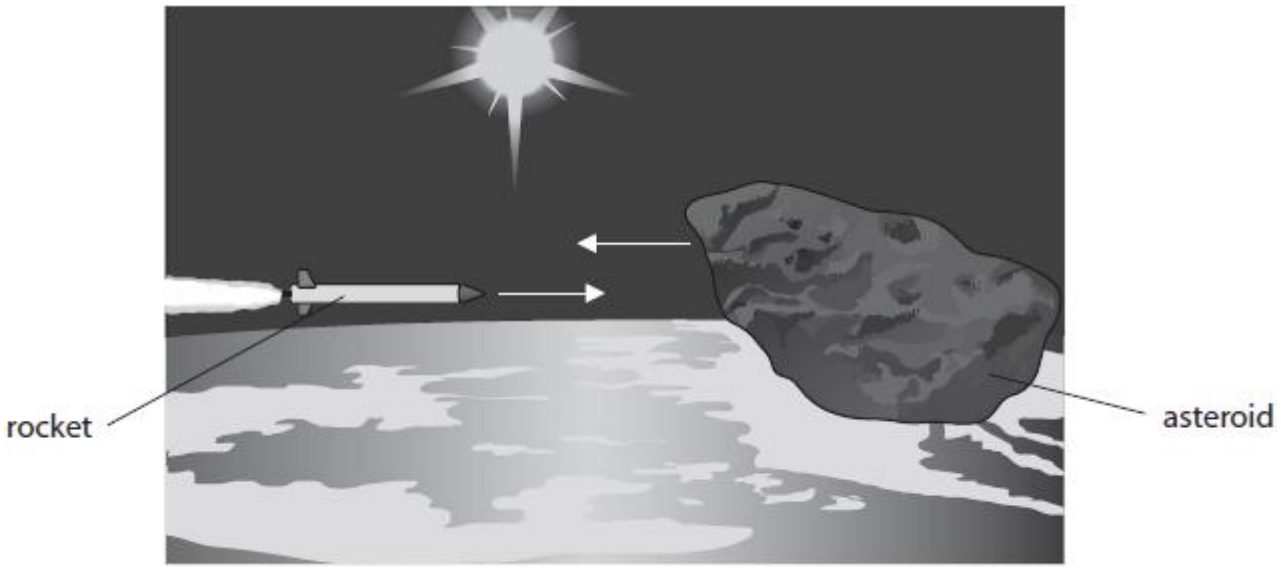

Figure 9

Newton's third law, when applied to the collision of the rocket and the asteroid as shown in Figure 9, can be stated as follows:

The force exerted by the rocket on the asteroid is equal and opposite to the force exerted by the asteroid on the rocket.

Explain how this statement links to the conservation of momentum in the collision.

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(Total for question = 4 marks)

Q3.

A car collides with a barrier on a road.

The time of the collision is very short.

Explain **one** factor, other than the time of the collision, that would affect the force on the car in the collision.

Your explanation should refer to an equation in the Equation Booklet.

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(Total for question = 2 marks)

Q4.

Shot-put is an Olympic event.
The shot is a heavy ball.
An athlete throws the shot as far as possible.

A sports scientist analyses an athlete's throw to help improve performance.

The scientist examines the images to find ways of increasing the momentum of the shot when it leaves the athlete's hand without the athlete using any extra force.

The scientist advises the athlete to

lean further down at the start
and make his arm straight before he releases the shot.

Explain the scientific principles behind this advice.

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(Total for question = 3 marks)

Q5.

Figure 8 shows a rocket soon after it takes off from the ground.

(Source: © Alones/Shutterstock)

Figure 8

The force that the rocket engines produce remains constant during the first few seconds after take-off.

Explain what happens to the acceleration during the first few seconds.

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(Total for question = 3 marks)