Momentum – 2021 IGCSE 0625

1. Nov/2021/QPaper_21/No.7

What is the relationship between the impulse acting on an object and the change in momentum of the object?

A impulse = change in momentum

B impulse = change in momentum × time

C $\text{impulse} = \frac{\text{change in momentum}}{\text{time}}$

D $\text{impulse} = \frac{\text{change in momentum}}{\text{mass}}$

2. Nov/2021/QPaper_22/No.7

A rocket is launched upwards from the surface of the Moon.

Hot gases are ejected downwards over a very short period of time.

Which statement is **not** correct?

A The rocket experiences a downward force.

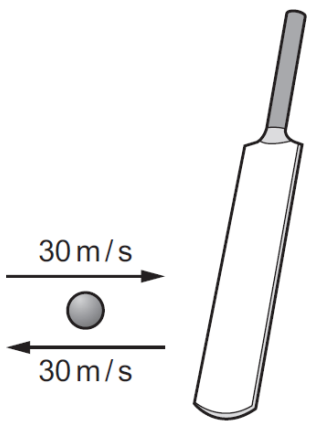
B The rocket experiences an upward force.

C The total momentum of the hot gases is equal to the momentum of the rocket.

D The total momentum of the hot gases and rocket when the hot gases have been ejected is zero.

3. Nov/2021/QPaper_23/No.7

A cricket ball has a mass of 0.16 kg. The ball travels at 30 m/s. The ball is hit by a bat with a force of 10 800 N. After being hit, the ball moves off at 30 m/s in the opposite direction.



For how long was the ball in contact with the bat?

A 0.0004 s **B** 0.00089 s **C** 0.0044 s **D** 0.015 s

4. Nov/2021/QPaper_42/No.3

Fig. 3.1 shows a collision at very slow speed between two cars travelling along a straight road.

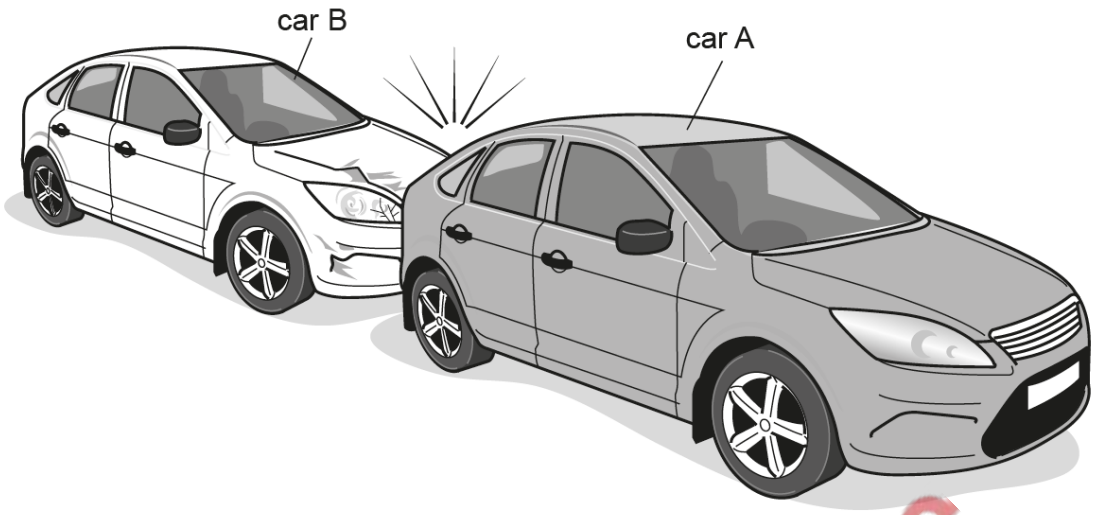


Fig. 3.1

Car B, of mass 800 kg, is moving at 2.0 m/s and collides with car A, of mass 1000 kg, which is stationary. After the collision, both cars travel in the same direction as the initial direction of car B.

(a) After the collision, car A moves at 1.3 m/s.

Show that the speed of car B after the collision is approximately 0.4 m/s.

[3]

(b) **(i)** Calculate the impulse exerted by car A on car B.

impulse = ... [2]

(ii) State the impulse exerted by car B on car A.

impulse = ... [1]

[Total: 6]