Practice Question Set For GCSE
Subject : Physics
Paper-2 Topic: GCSE Triple Science_Forces (High Demand Questions)

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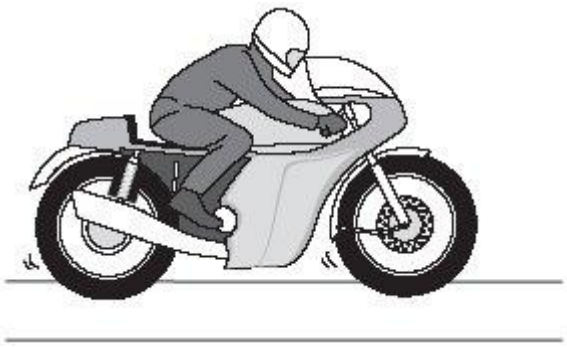
Name of the Student:_____
Max. Marks : 27 Marks **Time : 27 Minutes**

Q1.

The diagram shows a motorbike of mass 300 kg being ridden along a straight road.



The rider sees a traffic queue ahead. He applies the brakes and reduces the speed of the motorbike from 18 m/s to 3 m/s.

(a) Calculate the kinetic energy lost by the motorbike.

Show clearly how you work out your answer.

_____

_____

_____

_____

Kinetic energy lost = _____ J

(2)

(b) (i) How much work is done on the motorbike by the braking force?

_____

(1)

(ii) What happens to the kinetic energy lost by the motorbike?

_____

(1)

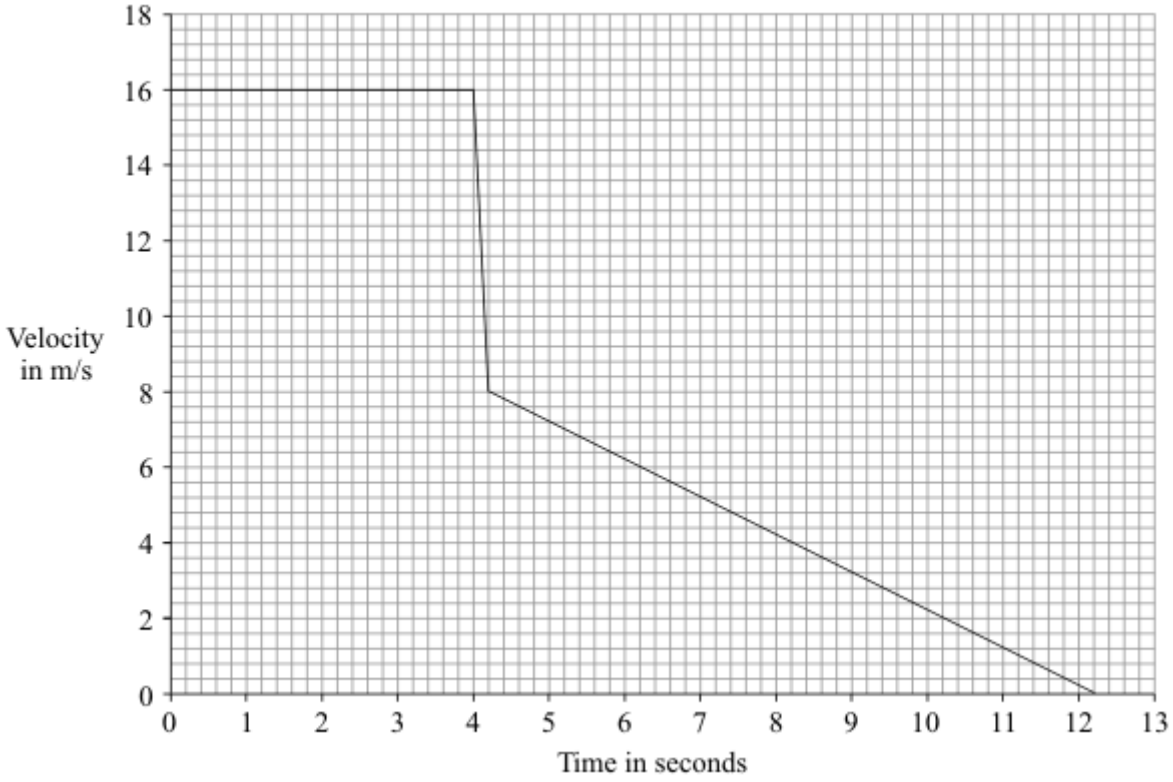
(Total 4 marks)

Q2.

In an experiment at an accident research laboratory, a car driven by remote control was crashed into

the back of an identical stationary car. On impact the two cars joined together and moved in a straight line.

(a) The graph shows how the velocity of the remote-controlled car changed during the experiment.



(i) How is the *velocity* of a car different from the speed of a car?

_____

(1)

(ii) Use the graph to calculate the distance travelled by the remote-controlled car before the collision.

Show clearly how you work out your answer.

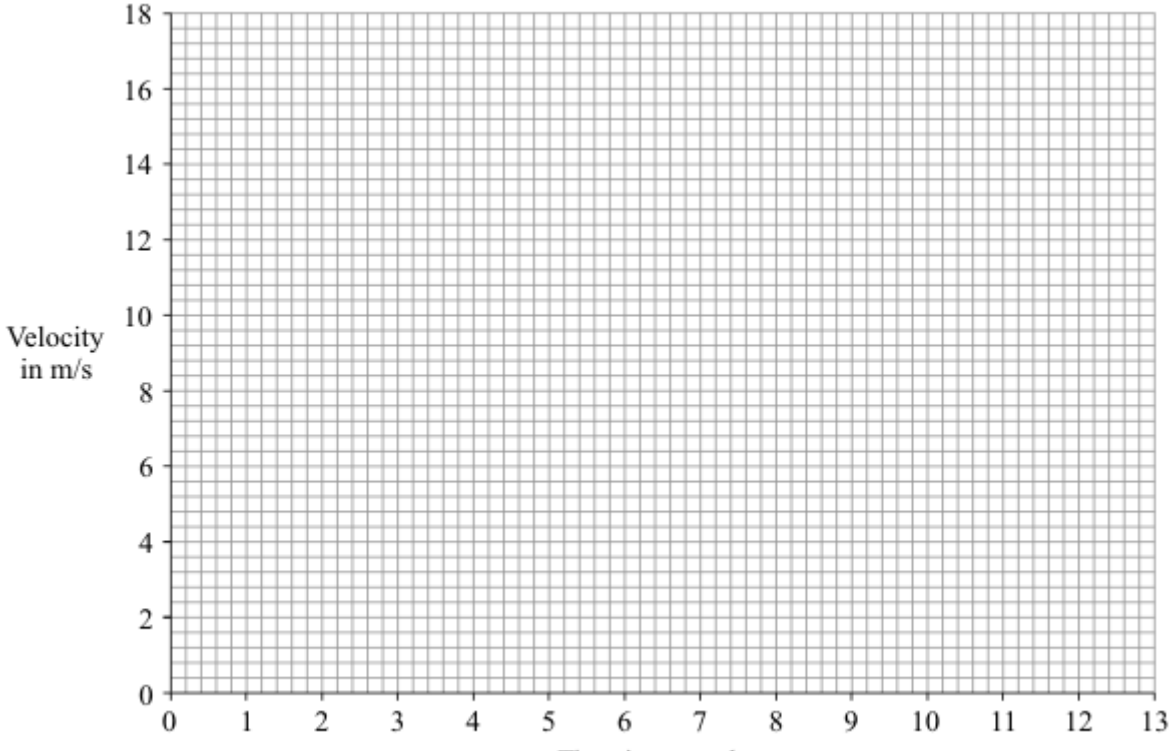
_____

_____

Distance = _____ m

(2)

(iii) Draw, on the grid below, a graph to show how the velocity of the second car changed during the experiment.



(2)

(iv) The total momentum of the two cars was not conserved.

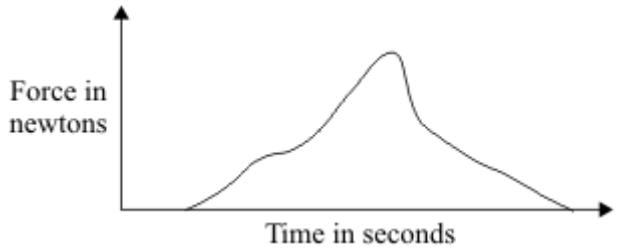
What does this statement mean?

_____

_____

(1)

(b) The graph line shows how the force from a seat belt on a car driver changes during a collision.



Scientists at the accident research laboratory want to develop a seat belt that produces a constant force throughout a collision.

Use the idea of momentum to explain why this type of seat belt would be better for a car driver.

_____

_____

_____

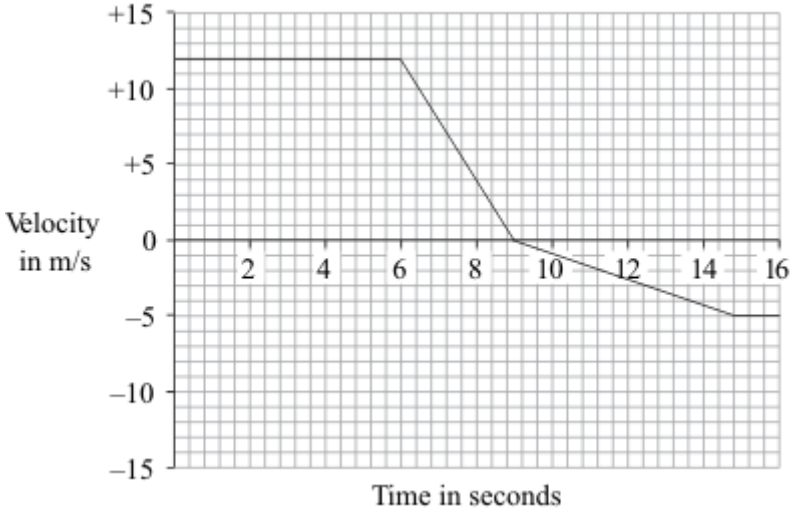
_____

(2)

(Total 8 marks)

Q3.

A car is driven along a straight road. The graph shows how the velocity of the car changes during part of the journey.



(a) Use the graph to calculate the deceleration of the car between 6 and 9 seconds.

Show clearly how you work out your answer and give the unit.

_____

_____

_____

Deceleration = _____

(3)

(b) At what time did the car change direction?

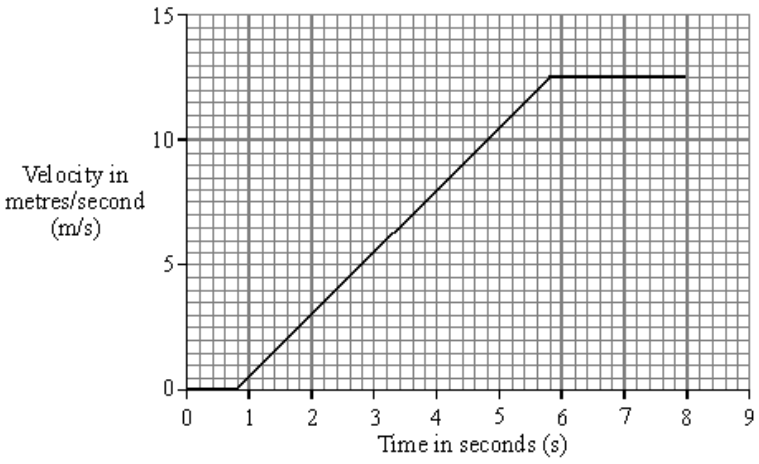
_____ seconds

(1)

(Total 4 marks)

Q4.

A car travelling along a straight road has to stop and wait at red traffic lights. The graph shows how the velocity of the car changes after the traffic lights turn green.



(a) Between the traffic lights changing to green and the car starting to move there is a time delay. This is called the reaction time. Write down **one** factor that could affect the driver's reaction time.

_____

(1)

(b) Calculate the distance the car travels while accelerating. Show clearly how you work out your answer.

_____

_____

Distance = _____metres

(3)

(c) Calculate the acceleration of the car. Show clearly how you work out your final answer and give the units.

_____

_____

_____

Acceleration = _____

(4)

(d) The mass of the car is 900 kg.

(i) Write down the equation that links acceleration, force and mass.

_____

(1)

(ii) Calculate the force used to accelerate the car. Show clearly how you work out your final answer.

_____

_____

Force = _____ newtons

(2)

(Total 11 marks)