

Scalar and Vector Quantities

Question Paper

Level	GCSE (9-1)
Subject	Combined Science: Trilogy - Physics
Exam Board	AQA
Topic	6.5 Forces
Sub-Topic	Scalar and Vector Quantities
Difficulty Level	Bronze Level
Booklet	Question Paper

Time Allowed: 13 minutes

Score: /13

Percentage: /100

Grade Boundaries:

Q1.(a) The diagrams, **A**, **B** and **C**, show the horizontal forces acting on a **moving** car.

Draw a line to link each diagram to the description of the car's motion at the moment when the forces act.

Draw only **three** lines.



A

stationary



B

constant speed



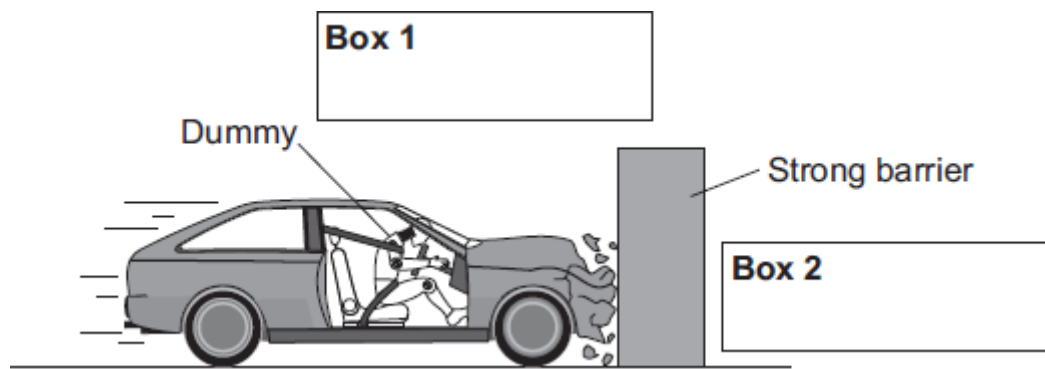
C

slowing down

accelerating forwards

(3)

- (b) The front crumple zone of a car is tested at a road traffic laboratory. This is done by using a remote control device to drive the car into a strong barrier. Electronic sensors are attached to a dummy inside the car.



- (i) Draw an arrow in **Box 1** to show the direction of the force that the car exerts on the barrier.

(1)

- (ii) Draw an arrow in **Box 2** to show the direction of the force that the barrier exerts on the car.

(1)

- (iii) Complete the following by drawing a ring around the correct line in the box.

The car exerts a force of 5000 N on the barrier. The barrier does not move.
The force

exerted by the barrier on the car will be

more than
equal to
less than

5000 N.

(1)

- (iv) Which **one** of the following gives the most likely reason for attaching electronic sensors to the dummy?

Put a tick (✓) in the box next to your answer.

To measure the speed of the car just before the impact.

☐

To measure the forces exerted on the dummy during the impact.

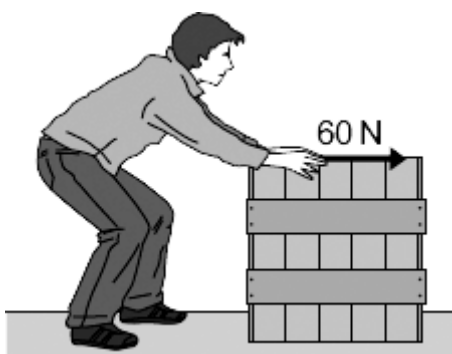
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To measure the distance the car travels during the impact.

☐

(1)
(Total 7 marks)

Q2. The diagram shows a worker using a constant force of 60 N to push a crate across the floor.



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(a) The crate moves at a constant speed in a straight line

(i) Draw an arrow on the diagram to show the direction of the friction force acting on the moving crate.

(1)

(ii) State the size of the friction force acting on the moving crate.

..... N

Give the reason for your answer.

.....

(2)

(b) Calculate the work done by the worker to push the crate 28 metres.

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

Choose the unit from the list below.

joule

newton

watt

.....

Work done =

(3)

(Total 6 marks)

