Practice Question Set For GCSE
Subject : Physics
Paper-2 Topic: Forces (Low Demand Questions)

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Name of the Student:_____

Max. **Marks : 18 Marks**   **Time : 18 Minutes**

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.

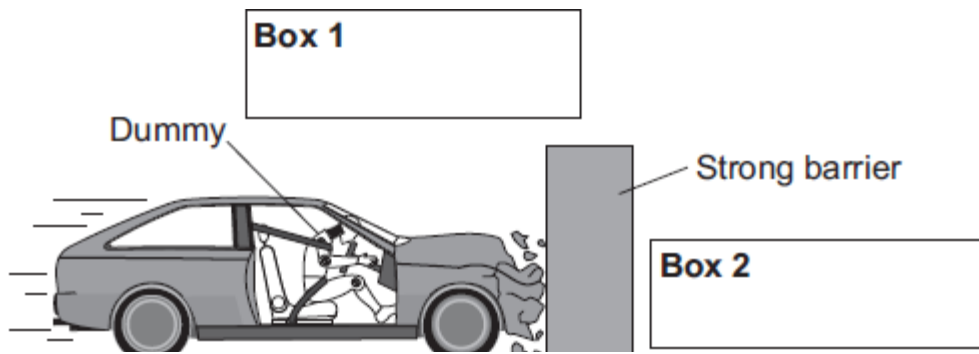Draw only **three** lines.

stationary

constant speed

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.

To measure the distance the car travels during the impact.
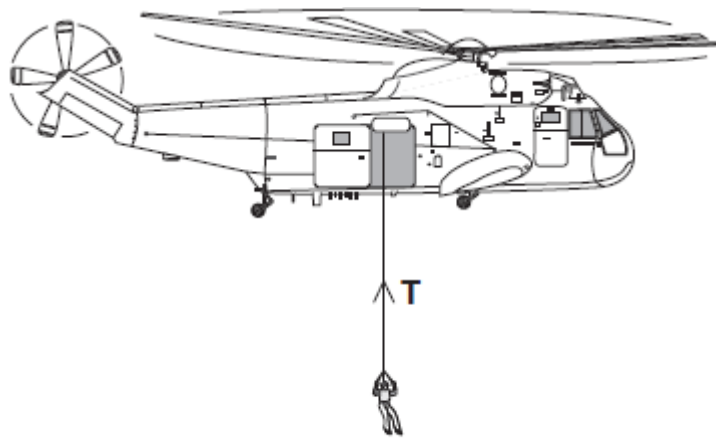
(1)

(Total 7 marks)

Q2.

The diagram shows a helicopter being used to rescue a person from the sea.

(a) (i)   The mass of the rescued person is 72 kg.

Use the equation in the box to calculate the weight of the rescued person.

weight = mass × gravitational field strength

gravitational field strength = 10 N/kg

Show clearly how you work out your answer.

_____

_____

Weight = _____ N

(2)

(ii)   An electric motor is used to lift the person up to the helicopter.
The motor lifts the person at a constant speed.

State the size of the force, **T**, in the cable.

Force **T** = _____ N

(1)

(b)   To lift the person up to the helicopter, the electric motor transformed 21 600 joules of energy usefully.

(i)   Use a form of energy from the box to complete the following sentence.

gravitational potential   heat   sound

The electric motor transforms electrical energy to kinetic energy. The kinetic

energy is then transformed into useful _____ energy.

(1)

(ii)   It takes 50 seconds for the electric motor to lift the person up to the helicopter.

Use the equation in the box to calculate the power of the electric motor.

$$\text{power} = \frac{\text{energy transformed}}{\text{time}}$$

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

Choose the unit from the list below.

coulomb (C)   **hertz (Hz)**   **watt (W)**

_____

_____

Power = _____

(3)

(Total 7 marks)

Q3.

A high-speed train accelerates at a constant rate in a straight line.

The velocity of the train increases from 30 m/s to 42 m/s in 60 seconds.

(a)   (i)   Calculate the change in the velocity of the train.

_____

Change in velocity = _____ m/s

(1)

(ii)   Use the equation in the box to calculate the acceleration of the train.

$$\text{acceleration} = \frac{\text{change in velocity}}{\text{time taken for change}}$$

Show clearly how you work out your answer and give the unit.
Choose the unit from the list below.

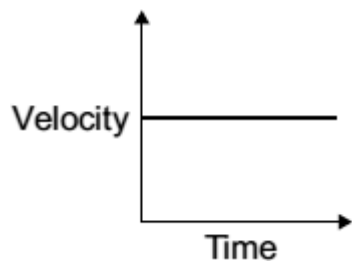**m/s**   **m/s^2**   **N/kg**   **Nm**

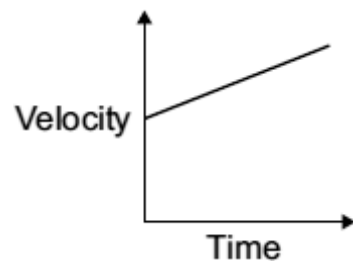_____

_____

Acceleration = _____

(2)

(b)   Which **one** of the graphs, **A**, **B** or **C**, shows how the velocity of the train changes as it accelerates?
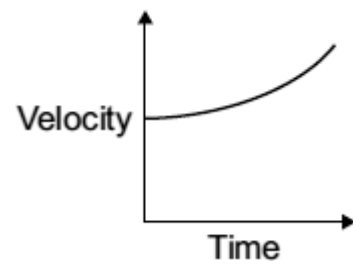
Write your answer, **A**, **B** or **C**, in the box.

A	B	C

Graph ☐

(1)
(Total 4 marks)