Practice Question Set For GCSE
Subject : Physics
Paper-1 Topic : Motion And Forces

Name of the Student:_____
Max. Marks : 21 Marks **Time : 21 Minutes**

Q1.

The gravitational field strength on the Moon is 1.6 N/kg.
The mass of a rock on the Moon is 6.0 kg.

Calculate the weight of this rock on the Moon.

State the unit of weight.

Use the equation

weight = mass × gravitational field strength

(3)

weight of rock = ... unit .....

(Total for question = 3 marks)

Q2.

Figure 3 shows a Mars Exploration Rover.

(Source: *photojournal.jpl.nasa.gov*)

Figure 3

The mass of the rover is 190 kg.

(i) The gravitational field strength on Earth is 10 N / kg.

Calculate the weight of the rover on Earth.
Use the equation

weight = mass × gravitational field strength

(1)

weight on Earth = ... N

(ii) The weight of the rover on Mars is 700 N.

Calculate the gravitational field strength on Mars.

(2)

gravitational field strength on Mars = ... N/kg

(Total for question = 3 marks)

Q3.

A student investigates the motion of a trolley along a horizontal runway using the apparatus in Figure 4.

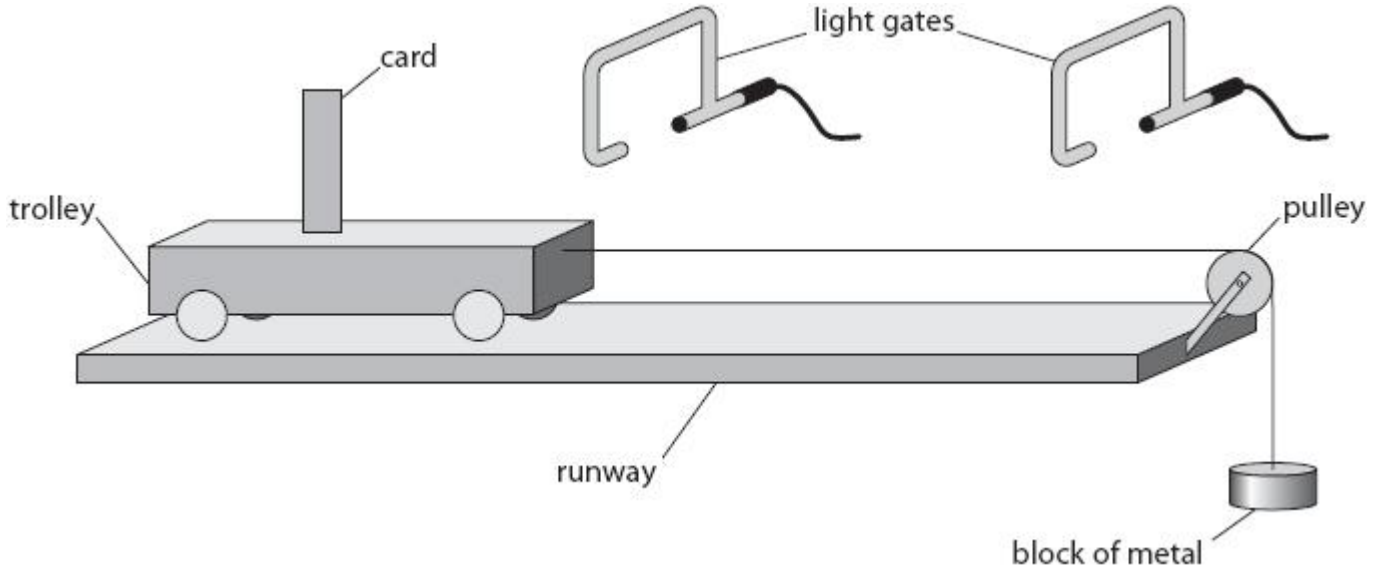

Figure 4

A trolley is attached to a string passing over a pulley.

A block of metal hangs on the end of the string.

Each light gate measures the time it takes for the card to pass through the gate.

When the trolley is released, it moves along the track.

A computer measures the time it takes for the card to pass between each light gate.

(i) The card took 0.080 s to pass through the first light gate.

The width of the card is 5 cm.
Calculate the average speed, in m/s, of the trolley through the first light gate.

(2)

average speed = ... m/s

Another trolley passes through the first light gate at a velocity of 0.72 m/s.

This trolley passes through the second light gate at a velocity of 1.1 m/s.

The time it takes for the card on the trolley to travel between the two light gates is 0.53 s.

(ii) State the equation relating acceleration, change in velocity and time.

(1)

(iii) Calculate the acceleration of the trolley between the two light gates.

(2)

acceleration = ... m/s^2

(Total for question = 5 marks)

Q4.

A student investigates the motion of a trolley along a horizontal runway using the apparatus in Figure 4.

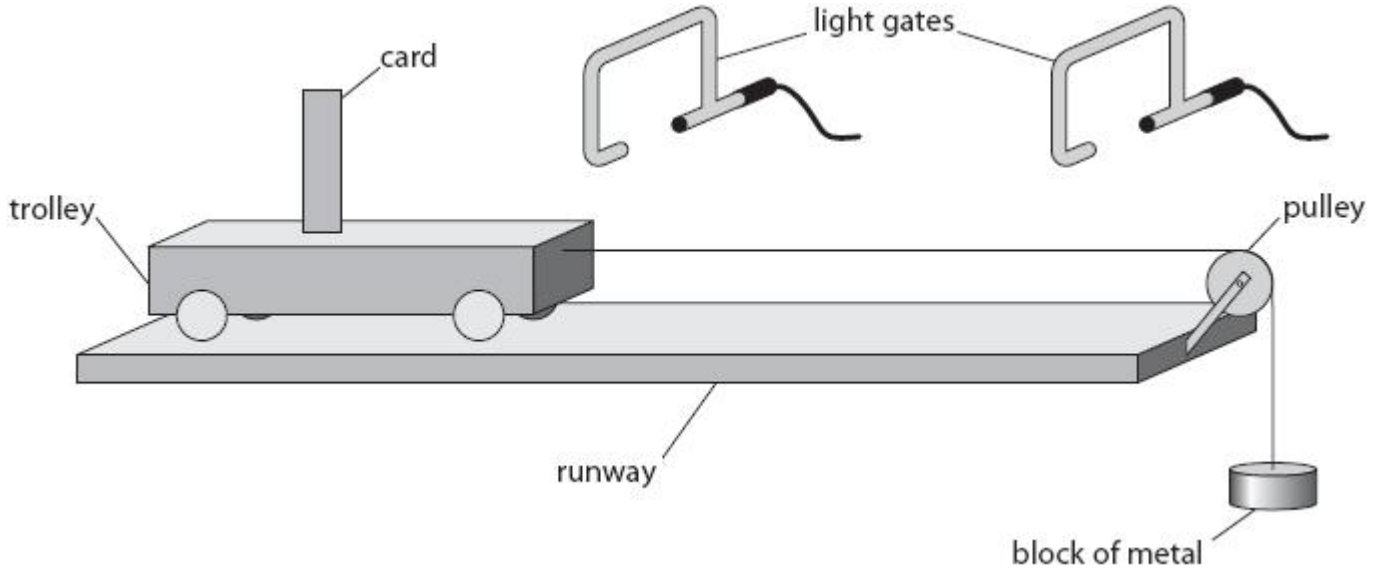

Figure 4

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Figure 5 shows a graph of acceleration against force for three trollies of different mass that are pulled along the runway.

The graphs for the trollies are labelled P, Q and R.

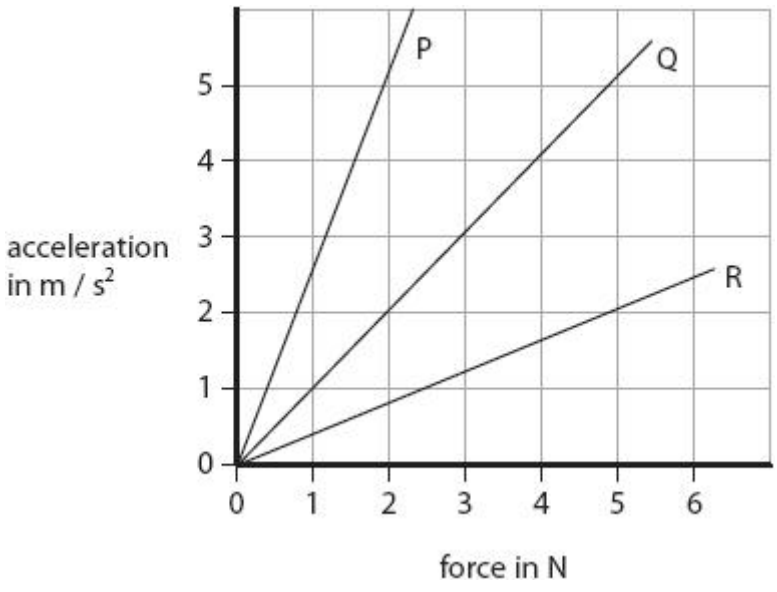

Figure 5

Use the information from the graph.

(i) Calculate the mass of trolley Q

(2)

mass of trolley Q = ... kg

(ii) Describe how the graph shows that trolley R has the greatest mass.

(2)

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(Total for question = 4 marks)

Q5.

(i) The car is moving at 90 km/h when the driver has to stop.

Calculate the thinking time of the driver.
Using the equation:
time = distance ÷ average speed

(2)

thinking time = ... s

(ii) A car has a mass of 1300 kg.

Calculate the kinetic energy of the car when it is travelling at 20 m/s.

(2)

kinetic energy = ... J

(Total for question = 4 marks)

Q6.

Figure 5 shows the apparatus a student uses to investigate how the stopping distance of a toy car depends on the type of surface that it is stopping on.

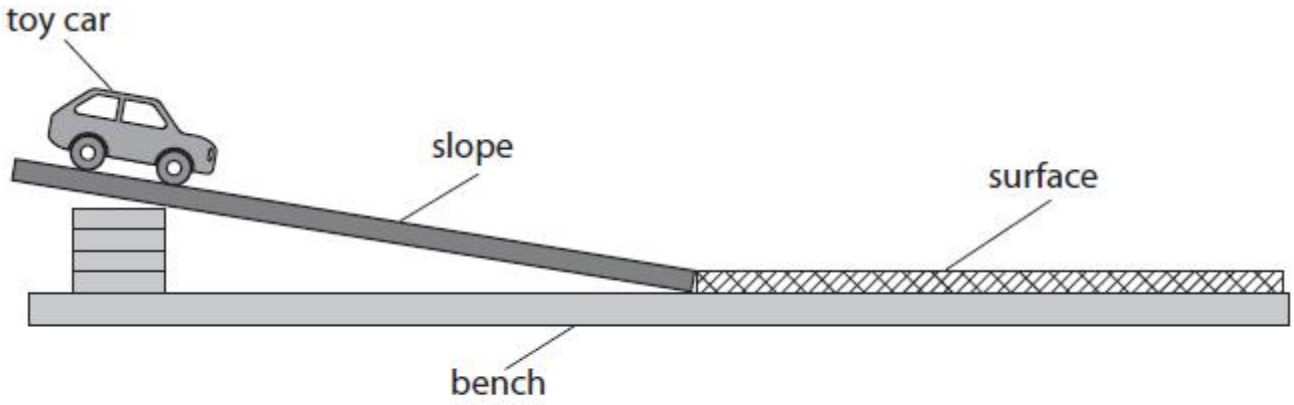

Figure 5

Describe an experiment to find out how the stopping distance depends on the surface that stops the toy car.

(2)

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(Total for question = 2 marks)