Practice Question Set For GCSE
Subject : Physics
Paper-1 Topic : 2_Motion and Forces

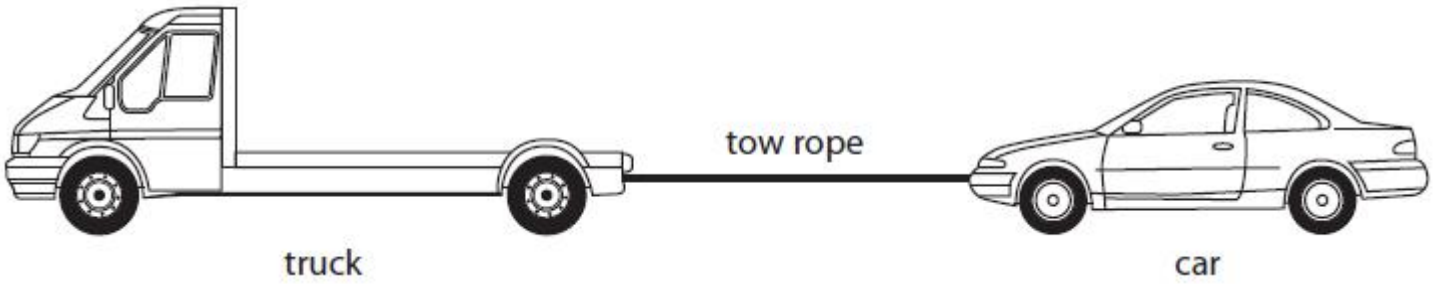
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Name of the Student:_____
Max. Marks : 20 Marks **Time : 20 Minutes**

Q1.

A truck is towing a car along a level road at a constant velocity.

A tow rope is attached to the truck and the car.



(a) Which of these shows the directions of the forces between the car and the tow rope?

Put a cross (☒) in the box next to your answer.

(1)

	force exerted by car on tow rope	force exerted by tow rope on car
☐ A	←	→
☐ B	→	←
☐ C	→	→
☐ D	←	←

(b) The truck has to provide a force of 4000 N to the left on the car to keep the car at a constant velocity.

Complete the sentence by putting a cross (☒) in the box next to your answer.
The resultant force on the car is

(1)

- ☐ **A** 0 N
- ☐ **B** 4000 N to the left
- ☐ **C** 4000 N to the right
- ☐ **D** 8000 N to the left

(c) Both vehicles are travelling at 13 m/s.

The driver of the truck then accelerates at 1.2 m/s^2 until both vehicles are travelling at 20 m/s.

(i) Calculate the time taken for this acceleration.

(3)

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time = ... s

(ii) The mass of the car is 1400 kg.
Calculate the resultant force on the car needed to produce an acceleration of 1.2 m/s^2.

(2)

force = ... N

(iii) A rope can withstand a tension of 12 000 N before it breaks. The weight of the car is 14 000 N.
Discuss whether this rope could be strong enough to tow the car with the truck.

(3)

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(Total for Question = 10 marks)

Q2.

Some students investigate a model of the craters produced by meteorite impacts.

They drop balls into a tray filled with sand.

They use six balls with different masses.

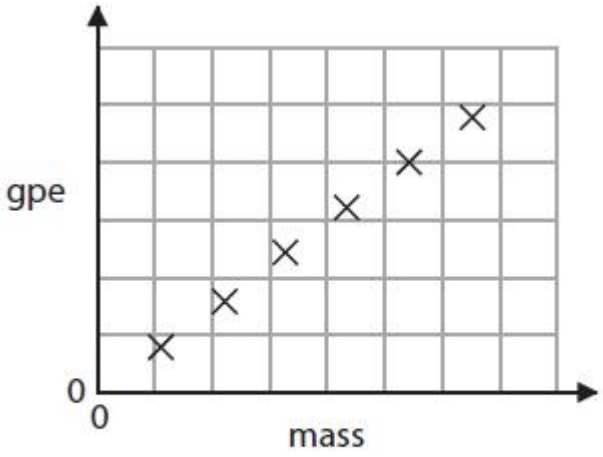
They drop each ball from the same height.

(a) (i) Which one of these graphs shows the relationship between the gravitational potential energy (gpe) of the balls and their mass when they are all at the same height?

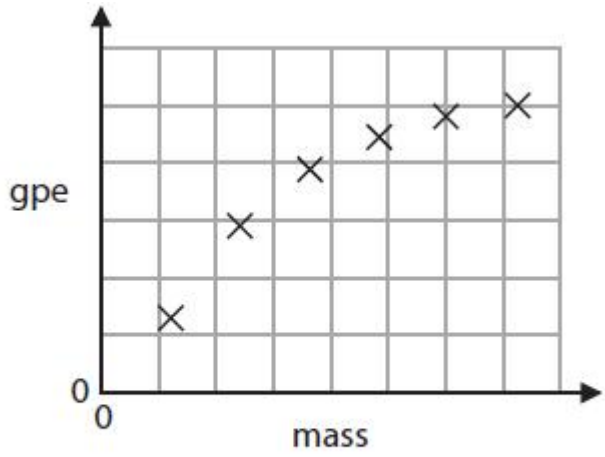
Put a cross (☒) in the box next to your answer.

(1)

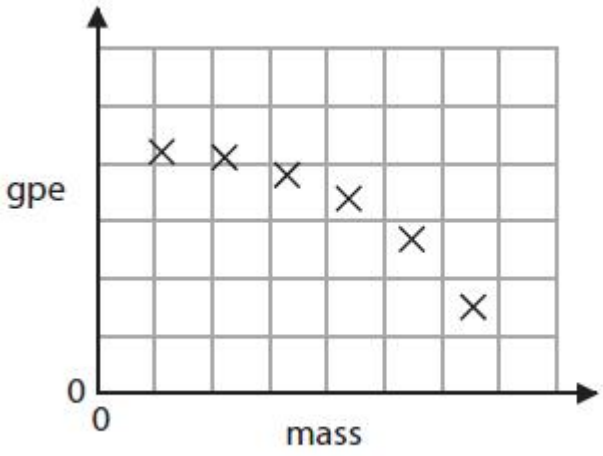
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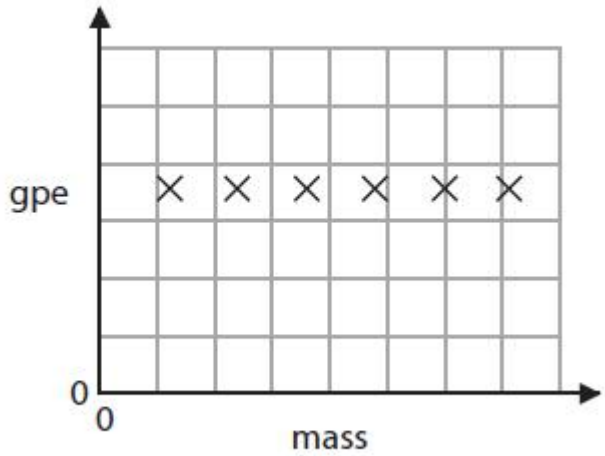
☒ A



☒ B



☒ C



☒ D

(ii) Describe how the energy of a ball changes as it drops towards the sand.

(2)

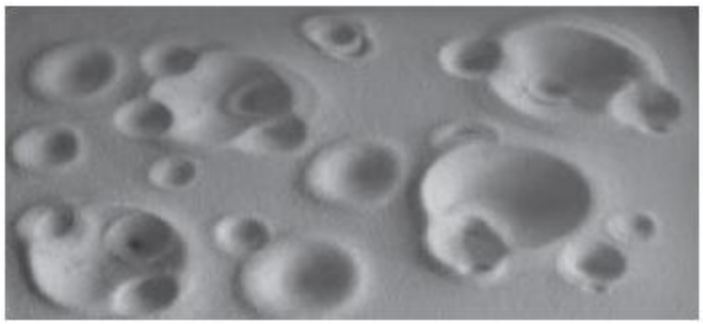
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(b) This photograph shows the sand after several balls have hit it.



The students read this information in a textbook:

'When work is done, energy is transferred.'

Explain how work is done when the balls impact on the sand.

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(2)

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(c) When one ball hits the sand, it has a velocity of 6.2 m/s.

It has a momentum of 0.46 kg m/s.

(i) Calculate the mass of the ball.

(3)

mass of ball = ... kg

(ii) The ball takes 0.17 s to come to rest after it hits the sand.
Calculate the average impact force.

(2)

average impact force = ... N

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