PEARSON EDEXCEL GCSE PHYSICS (HIGHER) · 1PH0

PHYSICS



EXAM QUESTION PACK

TOPIC 1: KEY CONCEPTS OF PHYSICS (PAPER 1)

SCORE	PERCENTAGE
/35	%

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Q1.

A steel ball has a volume of 3.6 cm^3 and a mass of 28 g.

(i) Calculate the density of steel in kg/m3.

(3)

density = ... kg/m^3

(ii) The steel ball is at a room temperature of 20 °C.

It is then put in a pan of boiling water maintained at 100 °C.

Calculate how much thermal energy the ball gains as its temperature increases from 20 °C to 100 °C.

Specific heat capacity of steel = 510 J/kg °C

Use an equation selected from the list of equations at the end of this paper.

(2)

thermal energy gained = ... J

(iii) The steel ball is put into a furnace where it melts.

Compare the motion of particles in the steel when they are in the solid state with their motion when in the molten (liquid) state.

(3)

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(Total for question = 8 marks)

Q2.

In a science fiction story, lightning is used as an energy source for accelerating a car.

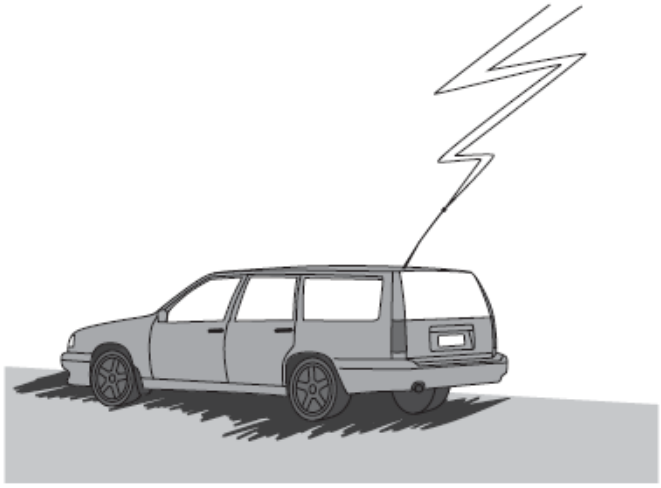


Figure 6

In the story, the car has a kinetic energy of 960 kJ at a speed of 40 m/s.

(i) Calculate the mass of the car.

(4)

mass = ... kg

(ii) Only 5% of the energy of the lightning bolt is transferred to the kinetic energy of the car.

Calculate the total energy of the lightning bolt in MJ.

(2)

energy = ... MJ

(Total for question = 6 marks)

Q3.

Figure 15 is a speed limit sign from a European motorway. The speeds

shown are in km/h (kilometres per hour).

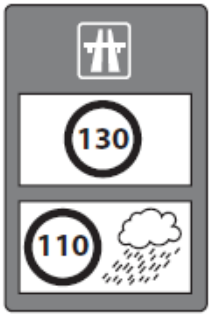


Figure 15

(i) The sign tells drivers to drive at a slower speed in wet weather.

Explain why it is safer for drivers to drive at a slower speed in wet weather.

(2)

.....

.....

.....

.....

(ii) Show that a speed of 31 m/s is less than a speed of 130 km/h.

(2)

(iii)

The driver's reaction time is the time between the driver seeing an emergency and starting to brake.

A car is travelling at a speed of 31 m/s.

The car travels 46 m between the driver seeing an emergency and starting to brake.

Calculate the driver's reaction time.

Give your answer to 2 significant figures.

(3)

driver's reaction time ..... s

(Total for question = 7 marks)

Q4.

Figure 5 is a speed limit sign from a European motorway.

The speeds shown are in km/h (kilometres per hour).

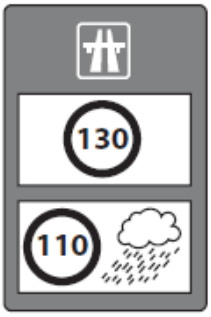


Figure 5

(i) The sign tells drivers to drive at a slower speed in wet weather.

Explain why it is safer for drivers to drive at a slower speed in wet weather.

(2)

.....

.....

.....

.....

(ii) Show that a speed of 31 m/s is less than a speed of 130 km/h.

(2)

(iii)

The driver's reaction time is the time between the driver seeing an emergency and starting to brake.

A car is travelling at a speed of 31 m/s.

The car travels 46 m between the driver seeing an emergency and starting to brake.

Calculate the driver's reaction time.

Give your answer to 2 significant figures.

(3)

driver's reaction time ..... s

(Total for question = 7 marks)

Q5.

Figure 3 is a speed limit sign from a European motorway.

The speeds shown are in km/h (kilometres per hour).

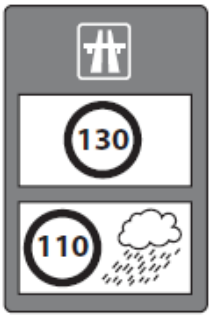


Figure 3

(i) The sign tells drivers to drive at a slower speed in wet weather.

Explain why it is safer for drivers to drive at a slower speed in wet weather.

(2)

.....

.....

.....

.....

(ii) Show that a speed of 31 m/s is less than a speed of 130 km/h.

(2)

(iii)

The driver's reaction time is the time between the driver seeing an emergency and starting to brake.

A car is travelling at a speed of 31 m/s.

The car travels 46 m between the driver seeing an emergency and starting to brake.

Calculate the driver's reaction time.

Give your answer to 2 significant figures.

(3)

driver's reaction time ..... s

(Total for question = 7 marks)

Q6.

Complete the sentence by putting a cross (☒) in the box next to your answer.

A student correctly estimated the length of a bee.

The length of a bee is about 2.0

(1)

☒ **A** mm

☒ **B** cm

☒ **C** m

☒ **D** km