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CAMBRIDGE
International Education

# Cambridge IGCSE™

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**PHYSICS** **0625/33**

Paper 3 Theory (Core) **May/June 2026**

**1 hour 15 minutes**

You must answer on the question paper.

No additional materials are needed.

**INSTRUCTIONS**

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen. Do **not** use correction fluid or tape.
- Do **not** write on any bar codes.
- You may use a calculator.
- You should show all your working and use appropriate units.
- Take the weight of 1.0 kg to be 9.8 N (acceleration of free fall = 9.8 m/s$^2$).

**INFORMATION**

- The total mark for this paper is 80.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **16** pages. Any blank pages are indicated.

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**[Turn over**

**1** **(a)** Figure 1.1 shows the speed–time graph for a student in a race.

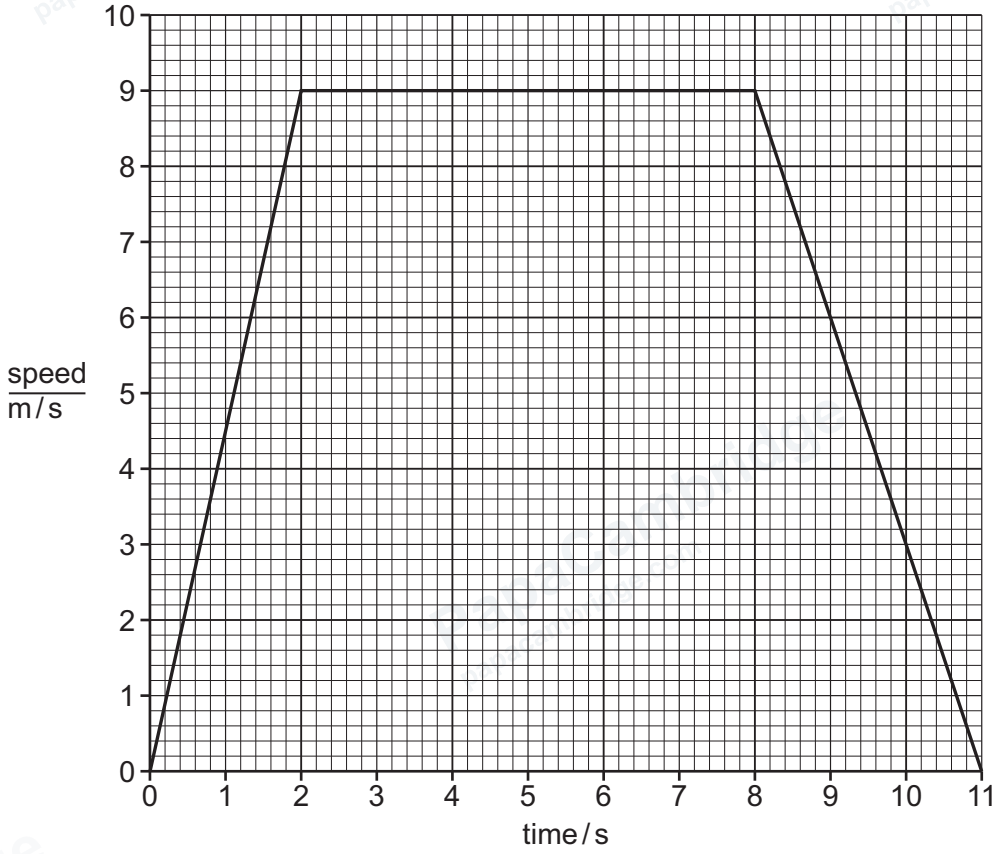


**Figure 1.1**

**(i)** Determine the speed of the student at time = 1.0 s.

speed = ..... m/s [1]

**(ii)** Describe the speed of the student between:

- time = 2.0 s and time = 8.0 s .....
- time = 8.0 s and time = 11 s .....

[2]

**(iii)** Calculate the distance travelled by the student between time = 2.0 s and time = 8.0 s.

distance = ..... m [3]

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**(b)** In a different race, the student runs a distance of 400 m in a time of 2.0 minutes.

Calculate the average speed of the student. Give your answer in m/s.

average speed = ..... m/s [4]

[Total: 10]

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**2** **(a)** A machine lifts a block of ice as shown in Figure 2.1.

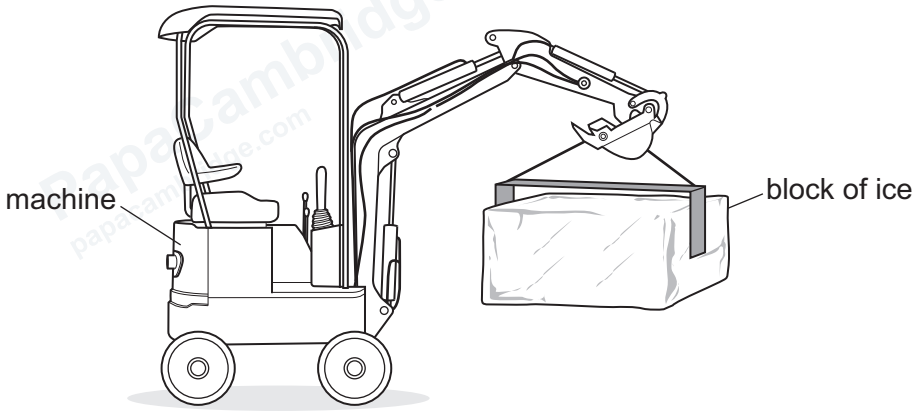


**Figure 2.1**

The weight of the block of ice is 650 N.

**(i)** The machine lifts the block of ice a vertical height of 1.2 m.

Calculate the work done on the block of ice. Include the unit.

work done = ..... unit ..... [4]

**(ii)** Calculate the mass of the block of ice.

mass = ..... kg [3]

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**(b)** Another block of ice is lying on the ground, as shown in Figure 2.2.

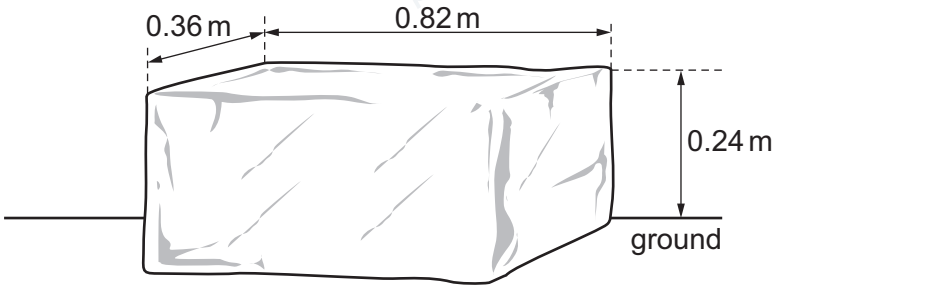


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**Figure 2.2**

The weight of the block of ice is 650 N.

Calculate the pressure on the ground caused by the block of ice in the position shown in Figure 2.2.

pressure = ..... $N/m^2$ [4]

[Total: 11]

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**3** A scientist determines the density of a pebble.

**(a)** The scientist measures the mass of the pebble.

State the name of a suitable instrument for measuring the mass of a pebble.

..... [1]

**(b)** The scientist measures the volume of the pebble.

The scientist has a measuring cylinder, a beaker containing water and a displacement can, as shown in Figure 3.1.

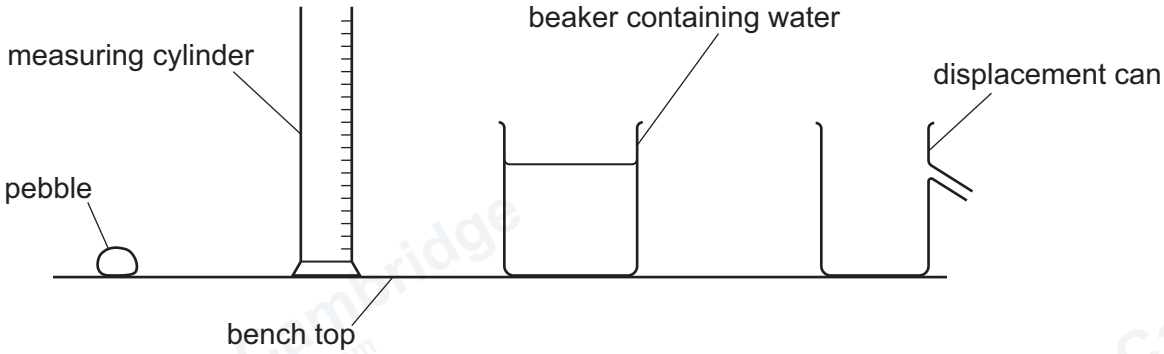


**Figure 3.1**

Describe how to determine the volume of the pebble, using any of the equipment in Figure 3.1.

.....

.....

.....

.....

.....

..... [4]

**(c)** The scientist's measurements are shown.

mass of pebble = 120 g
volume of pebble = 52 $cm^3$

Calculate the density of the pebble.

density of the pebble = ..... $g/cm^3$ [3]

[Total: 8]

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4 **(a)** A hot furnace heats some solid metal until the metal becomes liquid.

**(i)** Name the process by which a solid becomes a liquid.

..... [1]

**(ii)** A craftsman pours the liquid metal into a mould, as shown in Figure 4.1. The metal cools until it is solid.

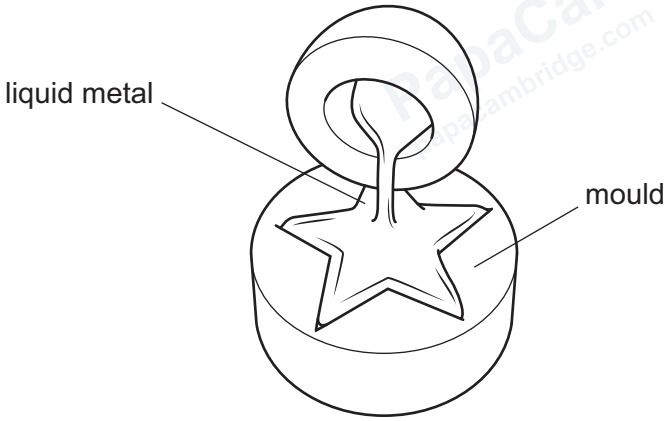


**Figure 4.1**

Describe the arrangement, separation and motion of the particles in a solid.

.....

.....

.....

.....

.....

..... [3]

**(b)** **(i)** State the term for the lowest possible temperature.

..... [1]

**(ii)** State the value, in °C, of the lowest possible temperature.

lowest possible temperature = ..... °C [1]

[Total: 6]

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**5** Figure 5.1 shows equipment for heating water. All the equipment is on a roof. The storage tank and the copper pipe are filled with water. The Sun heats the water in the copper pipe.

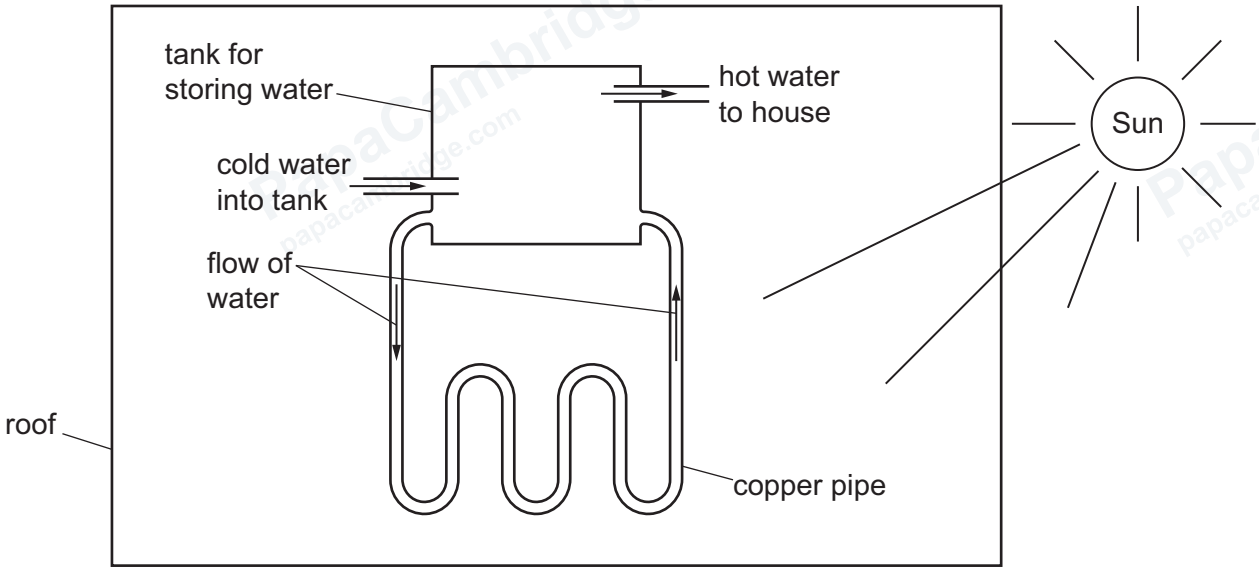


**Figure 5.1**

**(a) (i)** State the name of the process of thermal energy transfer from the Sun to the copper pipe.

..... [1]

**(ii)** The surface of the copper pipe is black.

Explain why the surface of the copper pipe is black.

.....

..... [2]

**(iii)** State the name of the process of thermal energy transfer through the copper.

..... [1]

**(b)** Explain why the hot water is at the top of the tank. Use your ideas about the density of water.

.....

.....

.....

..... [3]

[Total: 7]

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**6** The chart in Figure 6.1 shows the regions of the electromagnetic spectrum.
Two of the regions are **not** labelled.

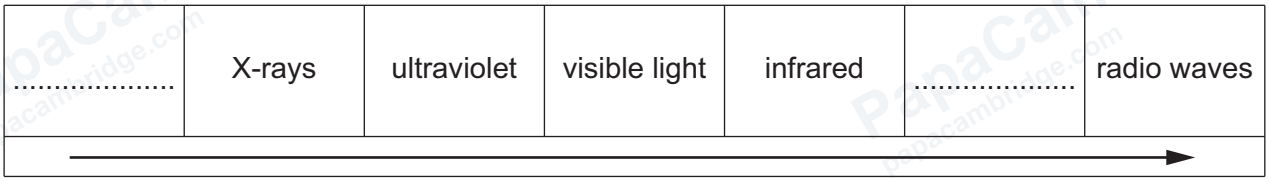


**Figure 6.1**

**(a)** Complete the labelling in Figure 6.1. [2]

**(b)** State the property of electromagnetic waves that increases in the direction of the arrow in Figure 6.1.

..... [1]

**(c)** Compare the speed of X-rays with the speed of radio waves in a vacuum.

Complete the sentence.

In a vacuum, the speed of X-rays is ..... [1]

**(d)** The different regions of the electromagnetic spectrum have different uses.

Describe **one** use for X-rays.

..... [1]

**(e)** Energy emitted by the Sun is mostly in **three** regions of the electromagnetic spectrum.

State the **three** regions.

1 .....

2 .....

3 .....

[2]

[Total: 7]

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**7** **(a)** Figure 7.1 shows a ray of light striking a plane mirror.

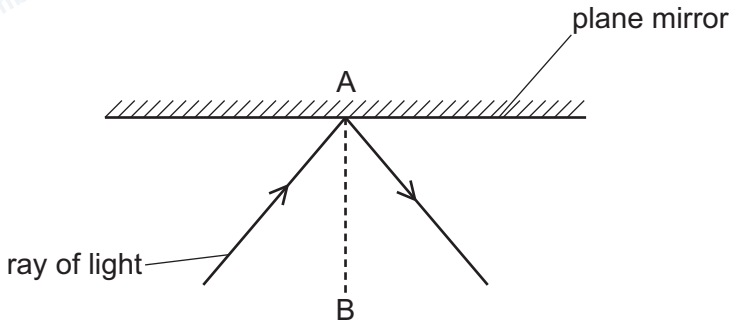


**Figure 7.1**

**(i)** State the name of the dashed line AB in Figure 7.1.

..... [1]

**(ii)** On Figure 7.1, indicate the angle of incidence by writing an X. [1]

**(iii)** State the law of reflection.

.....

..... [1]

**(iv)** A child places a toy in front of a plane mirror.

State **three** characteristics of the image formed by the plane mirror.

1 .....

2 .....

3 .....

[2]

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**(b)** An object O is close to a converging lens.

Figure 7.2 shows a ray of light from the object passing through the converging lens.

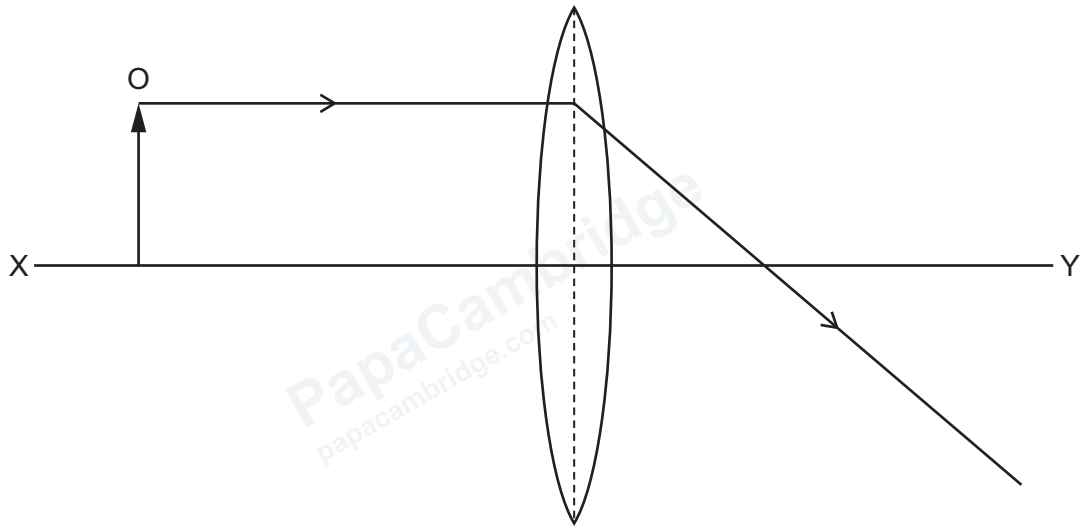


**Figure 7.2**

**(i)** State the name of the line labelled XY.

..... [1]

**(ii)** On Figure 7.2, draw another ray from the top of O and continue the ray until it crosses the path of the ray in Figure 7.2. [1]

**(iii)** The converging lens forms an image of object O.

On Figure 7.2, draw an arrow to represent the image of O and label it I. [1]

**(iv)** On Figure 7.2, indicate **one** principal focus for the converging lens. Indicate the principal focus by writing an F. [1]

[Total: 9]

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**8** A heater is connected to a 230 V mains supply.

The current in the heater is 11.5 A.

**(a)** Calculate the resistance of the heater.

resistance = ..... Ω [3]

**(b)** Calculate the power of the heater.

power = ..... W [3]

**(c)** The current in the heater is large.

Give **one** reason why large currents can be dangerous.

..... [1]

**(d)** The live wire connects to a fuse which protects the circuit.

Explain how a fuse protects the circuit.

.....

.....

..... [2]

**(e)** The current in the heater is normally 11.5 A.

State a suitable value for the fuse.

Choose **one** of these values: 5A, 10A, 13A or 30A.

..... [1]

[Total: 10]

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**9** **(a)** Table 9.1 shows some features of three types of radioactive emission.
The table is incomplete.

**Table 9.1**

| type of radioactive emission | nature of radioactive emission | charge on radioactive emission |
|---|---|---|
| alpha ($\alpha$) | helium nucleus | |
| beta ($\beta$) | | –1 |
| gamma ($\gamma$) | | 0 |

Complete Table 9.1 by adding the missing information. [3]

**(b)** The nuclide notation for lithium-7 is:

$$^{7}_{3}\text{Li}.$$

**(i)** Determine the number of protons in a nucleus of lithium-7.

number of protons = ..... [1]

**(ii)** Determine the number of neutrons in a nucleus of lithium-7.

number of neutrons = ..... [1]

**(c)** The isotope radium-223 is radioactive and has a half-life of 11 days.

Calculate the fraction of a sample of radium-223 that remains after 33 days.

fraction remaining = ..... [2]

[Total: 7]

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**10** **(a)** State the approximate time taken for the Moon to orbit the Earth. Include the unit.

time = ..... unit ..... [1]

**(b)** Name the force that keeps the Moon in orbit around the Earth.

..... [1]

**(c)** A spacecraft on the Moon sends a radio signal to the Earth.
The radio signal takes 1.28 s to travel from the Moon to the Earth.
The speed of the radio signal is $3.0 \times 10^8$ m/s.

Calculate the distance from the Moon to the Earth.

distance = ..... m [3]

[Total: 5]

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