Cambridge Assessment International Education

# Cambridge IGCSE™

**PHYSICS** **0625/13**

Paper 1 Multiple Choice (Core) **May/June 2020**

**45 minutes**

You must answer on the multiple choice answer sheet.

You will need: Multiple choice answer sheet
Soft clean eraser
Soft pencil (type B or HB is recommended)

**INSTRUCTIONS**

- There are **forty** questions on this paper. Answer **all** questions.
- For each question there are four possible answers **A**, **B**, **C** and **D**. Choose the **one** you consider correct and record your choice in soft pencil on the multiple choice answer sheet.
- Follow the instructions on the multiple choice answer sheet.
- Write in soft pencil.
- Write your name, centre number and candidate number on the multiple choice answer sheet in the spaces provided unless this has been done for you.
- Do **not** use correction fluid.
- Do **not** write on any bar codes.
- You may use a calculator.
- Take the weight of 1.0 kg to be 10 N (acceleration of free fall = 10 m / $s^2$).

**INFORMATION**

- The total mark for this paper is 40.
- Each correct answer will score one mark. A mark will not be deducted for a wrong answer.
- Any rough working should be done on this question paper.

This document has **20** pages. Blank pages are indicated.


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**1** Diagram 1 shows a solid, rectangular-sided block.

View solution

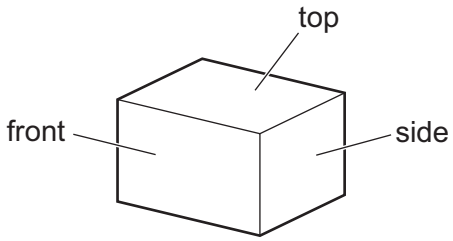



diagram 1

Diagram 2 shows the same block from the front and from the side.

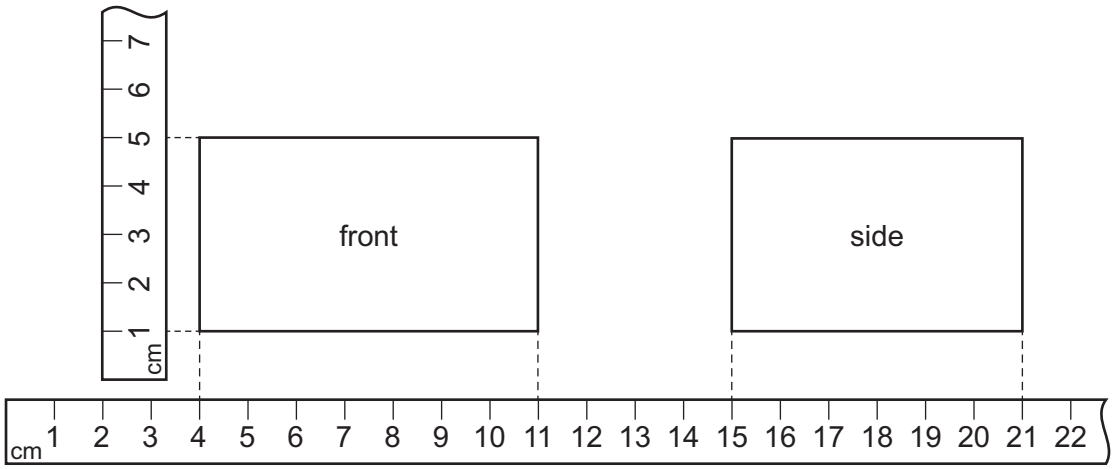



diagram 2

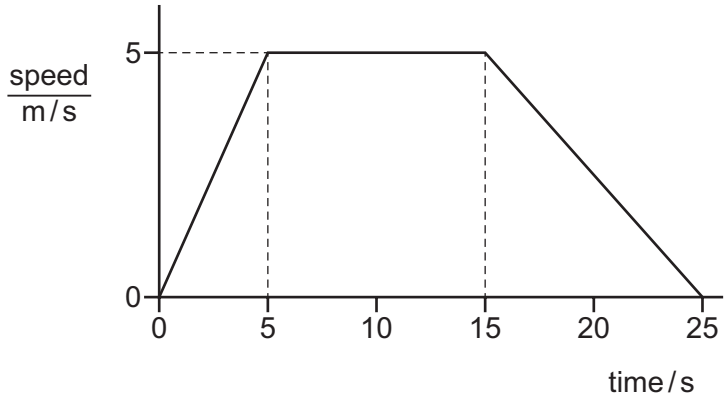
Metre rules have been shown close to the edges of the block.

What is the volume of the block?

**A** 120 $cm^3$ **B** 168 $cm^3$ **C** 264 $cm^3$ **D** 1155 $cm^3$

**2** The speed–time graph shows the motion of an object.

View solution




How far does the object travel at constant speed?

**A** 25 m **B** 50 m **C** 75 m **D** 125 m

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**3** Which statement about acceleration is correct?

View solution

**A** It is related to the changing speed of an object.

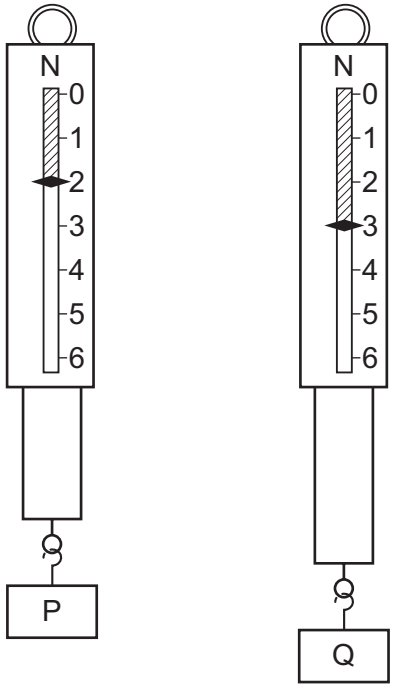
**B** It is the distance an object travels in one second.

**C** It is the force acting on an object divided by the distance it travels in one second.

**D** It is the force acting on an object when it is near to the Earth.

**4** Two metal blocks P and Q have identical dimensions. They hang on identical spring balances.

View solution




Which statement about P and Q is correct?

**A** They have different volumes and different weights.

**B** They have different volumes and equal weights.

**C** They have equal volumes and equal weights.

**D** They have equal volumes and different weights.

**5** Which row gives the correct weight for the mass shown?

View solution

The value of *g* is 10 N / kg.

| | mass / kg | weight / N |
|---|---|---|
| **A** | 2 | 20 |
| **B** | 10 | 1 |
| **C** | 10 | 10 |
| **D** | 20 | 2 |

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**6** A rectangular gymnasium is 50 m long, 25 m wide and 8.0 m high.

View solution

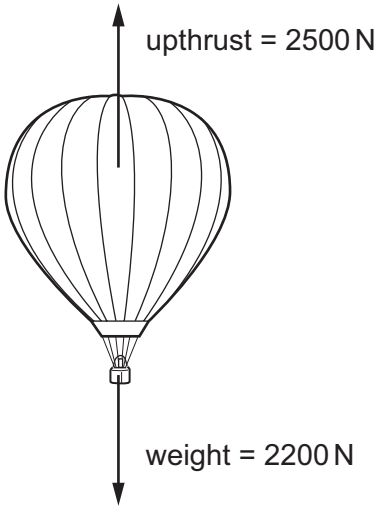
The density of air is 1.2 kg / $m^3$.

What is the best estimate of the mass of air in the gymnasium?

**A** 0.00012 kg **B** 100 kg **C** 8300 kg **D** 12 000 kg

**7** The diagram shows two of the three vertical forces acting on a hot-air balloon. The hot-air balloon is moving upwards at constant speed.

View solution




What is the air resistance acting on the hot-air balloon?

**A** 300 N downwards

**B** 300 N upwards

**C** 4700 N downwards

**D** 4700 N upwards

**8** Which statement about the moment of a force is **not** correct?

View solution

**A** If an object is balanced about a pivot the resultant moment on the object must be zero.

**B** The moment of a force is a measure of its turning effect.

**C** The moment of a force about a point is equal to: force × perpendicular distance from the point.

**D** The moment of a force about a point increases when the perpendicular distance of the force from the point decreases.

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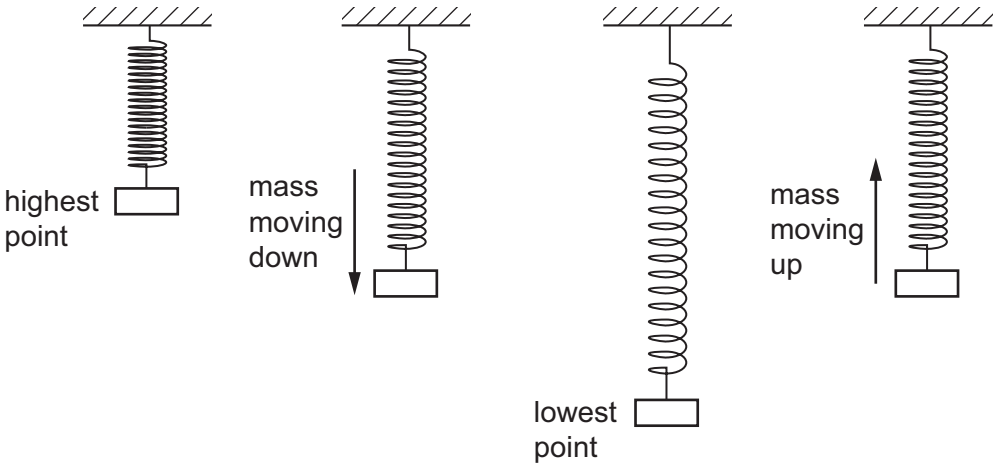
**9** A mass bounces up and down on a steel spring. The diagram shows the mass and the spring at different points during the motion.

View solution




At which point does the mass have the least gravitational potential energy and at which point is the most elastic energy stored in the spring?

| | least amount of gravitational potential energy | most elastic energy stored in spring |
|---|---|---|
| **A** | mass moving down | mass moving up |
| **B** | mass moving down | lowest point |
| **C** | lowest point | mass moving up |
| **D** | lowest point | lowest point |

**10** Which energy resource stores kinetic energy?

View solution

**A** coal

**B** nuclear fission

**C** solar

**D** wind

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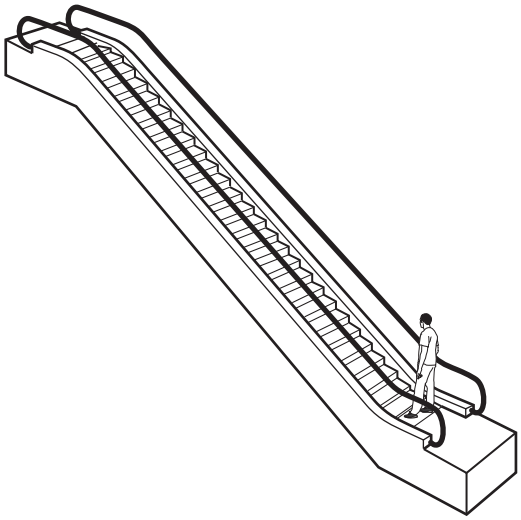
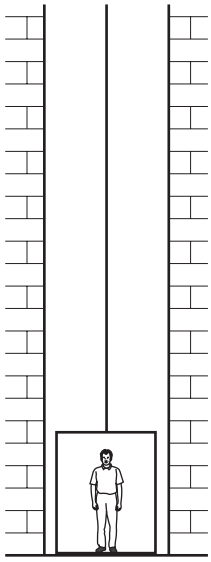
**11** A man can either take an escalator or a lift to travel up between two floors in a hotel.

View solution



escalator



lift

The escalator takes 20 seconds to carry the man between the two floors. The useful work done against gravity is *W*. The useful power developed is *P*.

The lift takes 30 seconds to carry the same man between the same two floors.

How much useful work against gravity is done by the lift, and how much useful power is developed by the lift?

| | useful work done against gravity by lift | useful power developed by lift |
|---|---|---|
| **A** | more than *W* | less than *P* |
| **B** | more than *W* | *P* |
| **C** | *W* | less than *P* |
| **D** | *W* | *P* |

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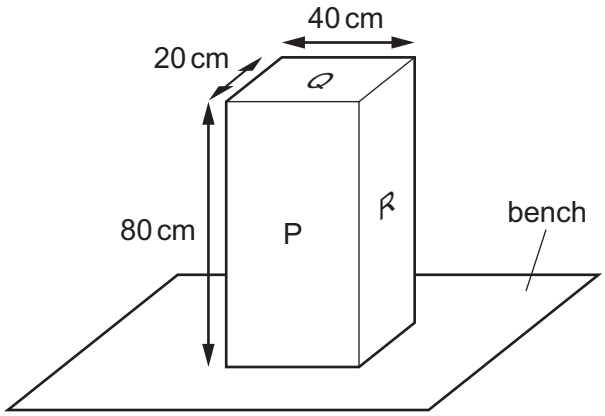
**12** The diagram shows a solid block resting on a bench. The dimensions of the block are shown.

View solution




On which labelled surface should the block rest to produce the smallest pressure on the bench?

**A** P

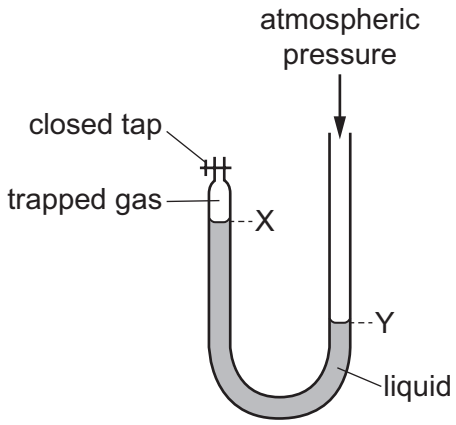
**B** Q

**C** R

**D** P, Q and R produce the same pressure

**13** The diagram shows a U-shaped glass tube, closed at one end by a tap. The glass tube contains a liquid as shown.

View solution




Some of the trapped gas is removed.

What will happen to the levels X and Y?

| | level X | level Y |
|---|---|---|
| **A** | higher | lower |
| **B** | higher | higher |
| **C** | lower | higher |
| **D** | lower | lower |

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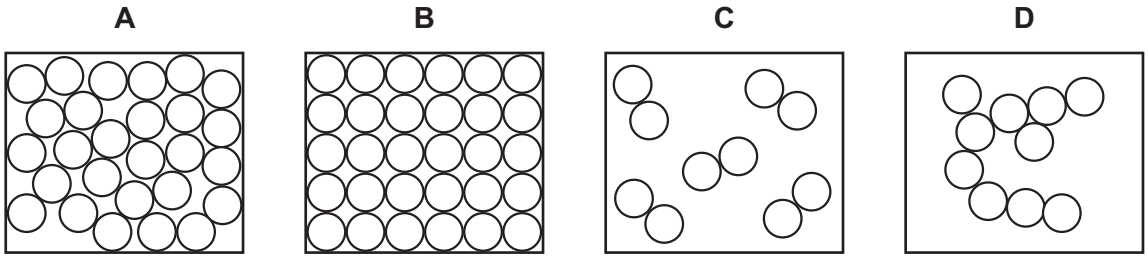
**14** What is the correct particle diagram for a solid?

View solution




**15** A sealed box contains a fixed mass of gas.

View solution

Which action results in each molecule of the gas colliding with the walls of the container less frequently and with a smaller force?

**A** Decrease the temperature of the gas.

**B** Decrease the volume of the container.

**C** Increase the temperature of the gas.

**D** Increase the volume of the container.

**16** The diagram shows a liquid-in-glass thermometer.

View solution




Which row gives the correct labels for the thermometer?

| | X | Y |
|---|---|---|
| **A** | water | narrow tube of uniform diameter |
| **B** | alcohol | narrow tube of uniform diameter |
| **C** | water | this end immersed in substance to be measured |
| **D** | alcohol | this end immersed in substance to be measured |

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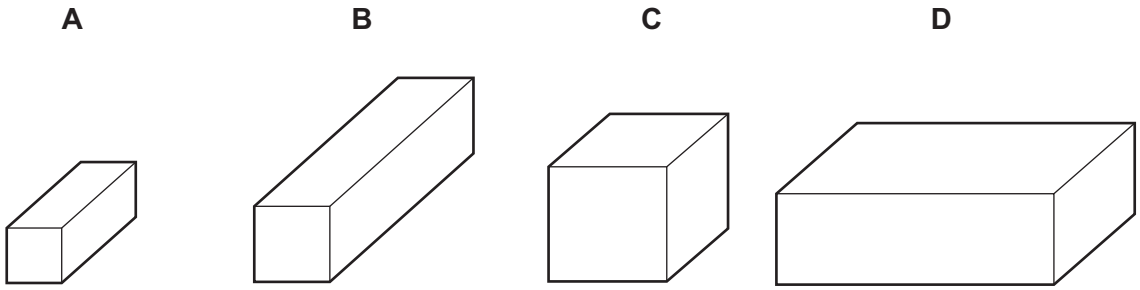
**17** The diagrams show four blocks of steel. The blocks are all drawn to the same scale.

View solution

The same quantity of thermal energy is given to each block.

Which block shows the greatest rise in temperature?




**18** A gas is cooled so that its molecules move more slowly, come closer together and do not move freely.

View solution

Which process is being described?

**A** boiling

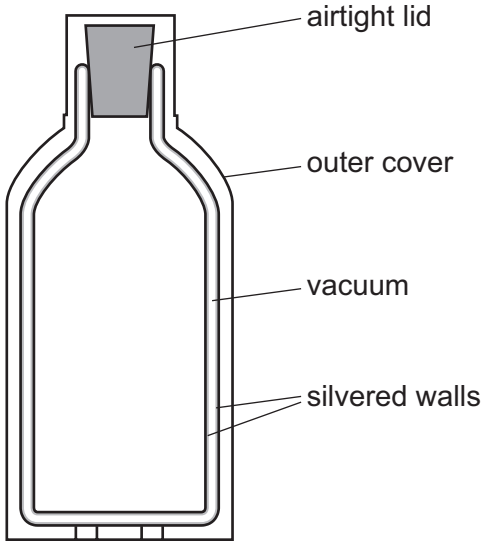
**B** condensing

**C** freezing

**D** melting

**19** The diagram shows a vacuum flask used to keep a liquid warm.

View solution




Which methods of heat loss are reduced by the **vacuum** between the silvered walls?

**A** conduction only

**B** conduction and convection only

**C** convection and radiation only

**D** conduction, convection and radiation

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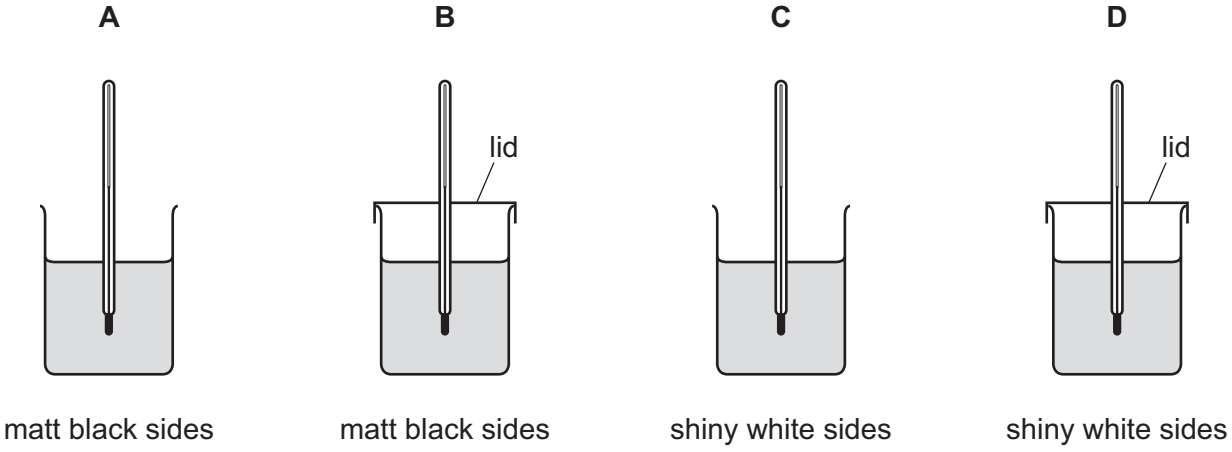
**20** Equal volumes of water at 100 °C are put in four containers. Two containers have matt black sides and two containers have shiny white sides. One of each type of container has a lid.

View solution

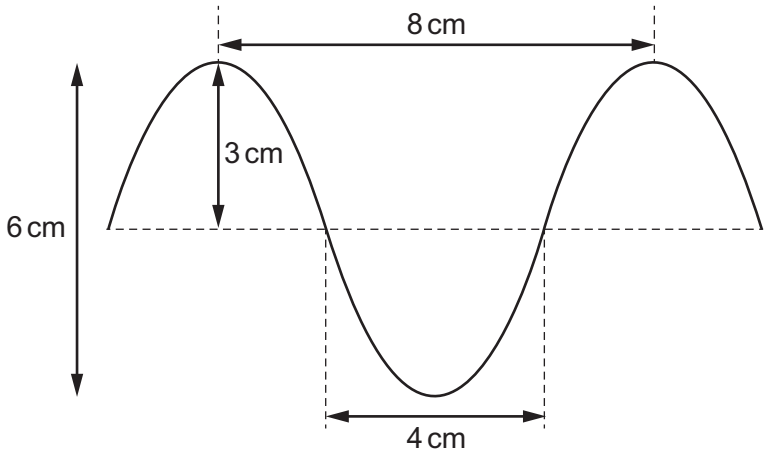
The containers are left for two minutes.

Which container has the highest temperature?




**21** The diagram shows a wave.

View solution




What are the amplitude and the wavelength of this wave?

| | amplitude / cm | wavelength / cm |
|---|---|---|
| **A** | 3 | 4 |
| **B** | 3 | 8 |
| **C** | 6 | 4 |
| **D** | 6 | 8 |

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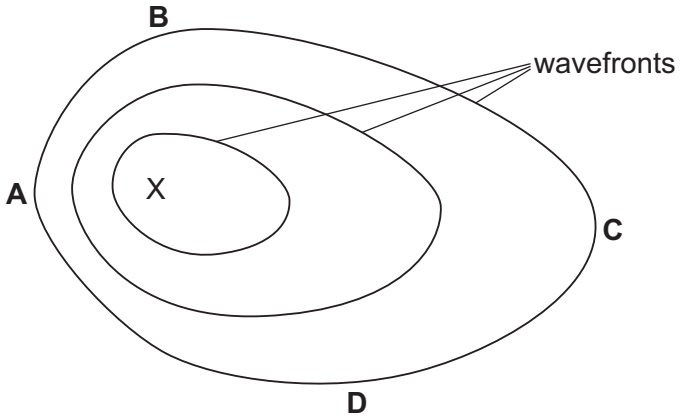
**22** Waves travel more quickly on the surface of water when the water is deep.

A stone is dropped at point X into a pool of varying depth. The diagram shows the first three wavefronts on the surface of the pool.

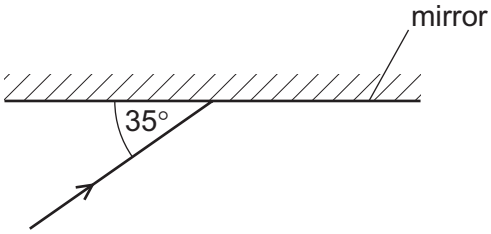
View solution

The region between X and which labelled point is likely to be the deepest?




**23** The diagram shows a ray of light incident on a plane mirror.

View solution




The angle between the ray and the mirror is 35°.

The ray is reflected by the mirror.

What is the angle of reflection?

**A** 35° **B** 55° **C** 70° **D** 110°

**24** A beam of white light is split into a spectrum of seven colours.

View solution

Which name is given to this process?

**A** diffraction

**B** dispersion

**C** reflection

**D** refraction

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**25** An intruder alarm sensor detects that a person is warmer than his surroundings.

View solution

Which type of electromagnetic wave does the sensor detect?

**A** infrared

**B** radio

**C** ultraviolet

**D** visible light

**26** A tuning fork produces a sound when it vibrates.

View solution

What is the effect on the sound produced when the tuning fork vibrates more times every second and with a larger amplitude?

**A** higher pitch and less loud

**B** higher pitch and louder

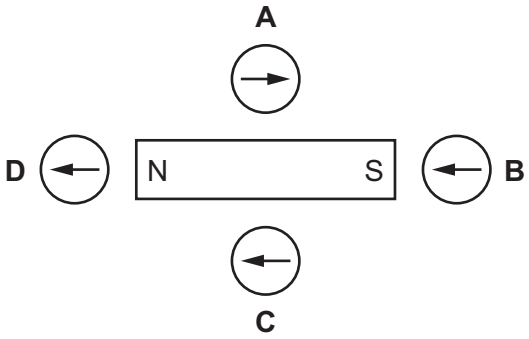
**C** lower pitch and less loud

**D** lower pitch and louder

**27** The diagram shows a magnet with some plotting compasses. The compasses show the direction of the magnetic field of the magnet.

View solution

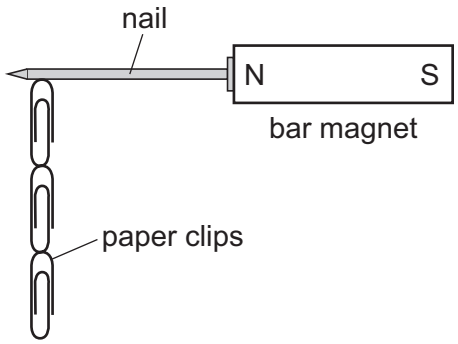
Which plotting compass has the needle pointing in the wrong direction?



**28** Four nails **A**, **B**, **C** and **D** are tested to find which makes the strongest permanent magnet.

One of the nails is placed against a bar magnet and the number of paper clips which the nail can support is recorded.

View solution



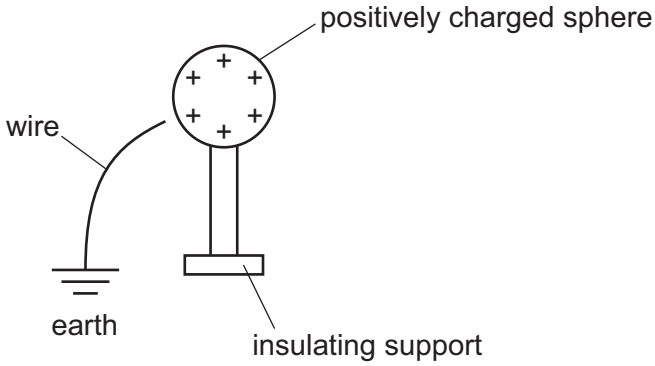

The bar magnet is then removed and the number of paper clips remaining attached to the nail is recorded. Each nail is tested individually.

Which nail becomes the strongest permanent magnet?

| | number of paper clips attached to the nail | |
|---|---|---|
| | bar magnet present | bar magnet removed |
| **A** | 2 | 0 |
| **B** | 2 | 1 |
| **C** | 4 | 3 |
| **D** | 5 | 2 |

**29** The diagram shows a positively charged conducting sphere and a wire connected to earth.

View solution




What happens when the wire is touched onto the sphere?

**A** Electrons flow from earth to the sphere.

**B** Electrons flow from the sphere to earth.

**C** Positive charges flow from earth to the sphere.

**D** Positive charges flow from the sphere to earth.

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**30** Three electrical quantities are listed.

View solution

- potential difference
- electromotive force
- current

Which quantities are measured in volts?

**A** potential difference only

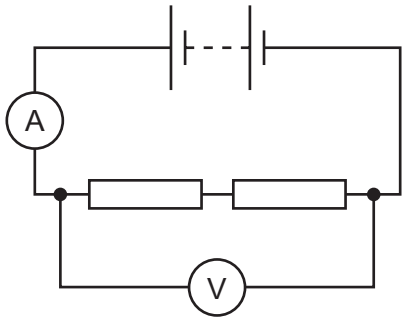
**B** potential difference and current only

**C** potential difference and electromotive force only

**D** potential difference, electromotive force and current

**31** A student uses the circuit shown to determine the resistance of two identical resistors.

View solution



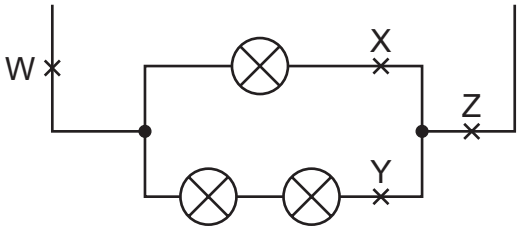

The voltmeter reading is 2.2 V and the ammeter reading is 0.25 A.

What is the resistance of each resistor?

**A** 0.275 Ω **B** 0.55 Ω **C** 4.4 Ω **D** 8.8 Ω

**32** The diagram shows part of a circuit containing three identical lamps.

View solution



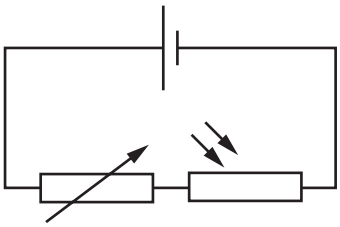

At which two points do the currents have the same value?

**A** W and X **B** W and Z **C** X and Y **D** Y and Z

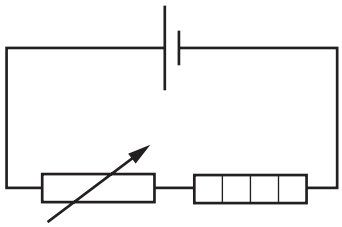
**33** Which circuit contains a thermistor and a heater?

View solution

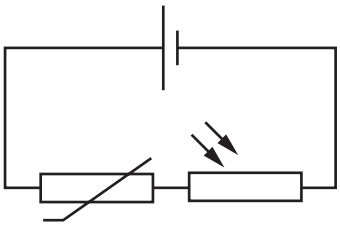
A



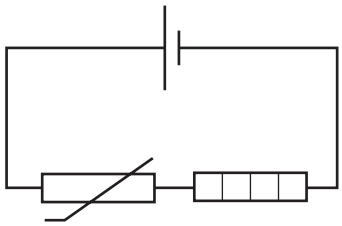
B



C



D



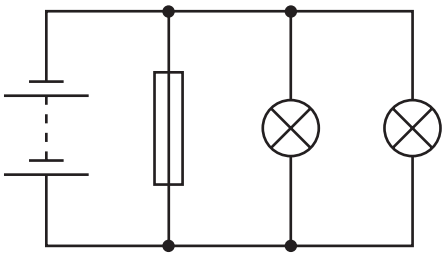
**34** A student constructs four circuits, each containing a fuse.

View solution

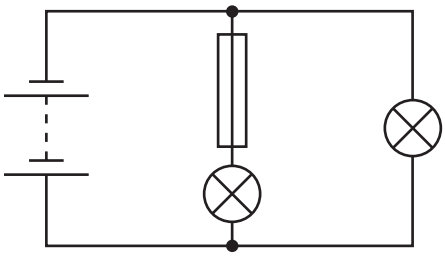
The fuse blows in one circuit and both lamps in the circuit go out.

In which circuit does the fuse blow and both lamps go out?

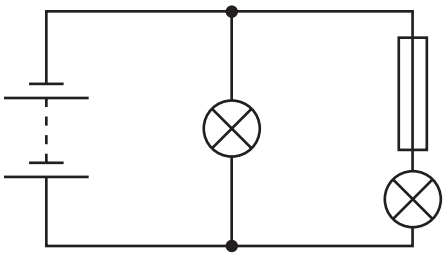
A



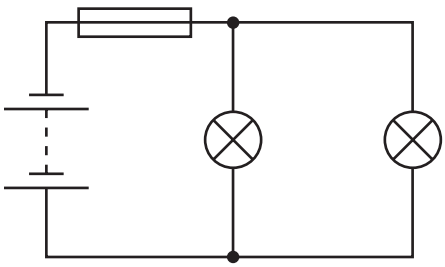
B



C

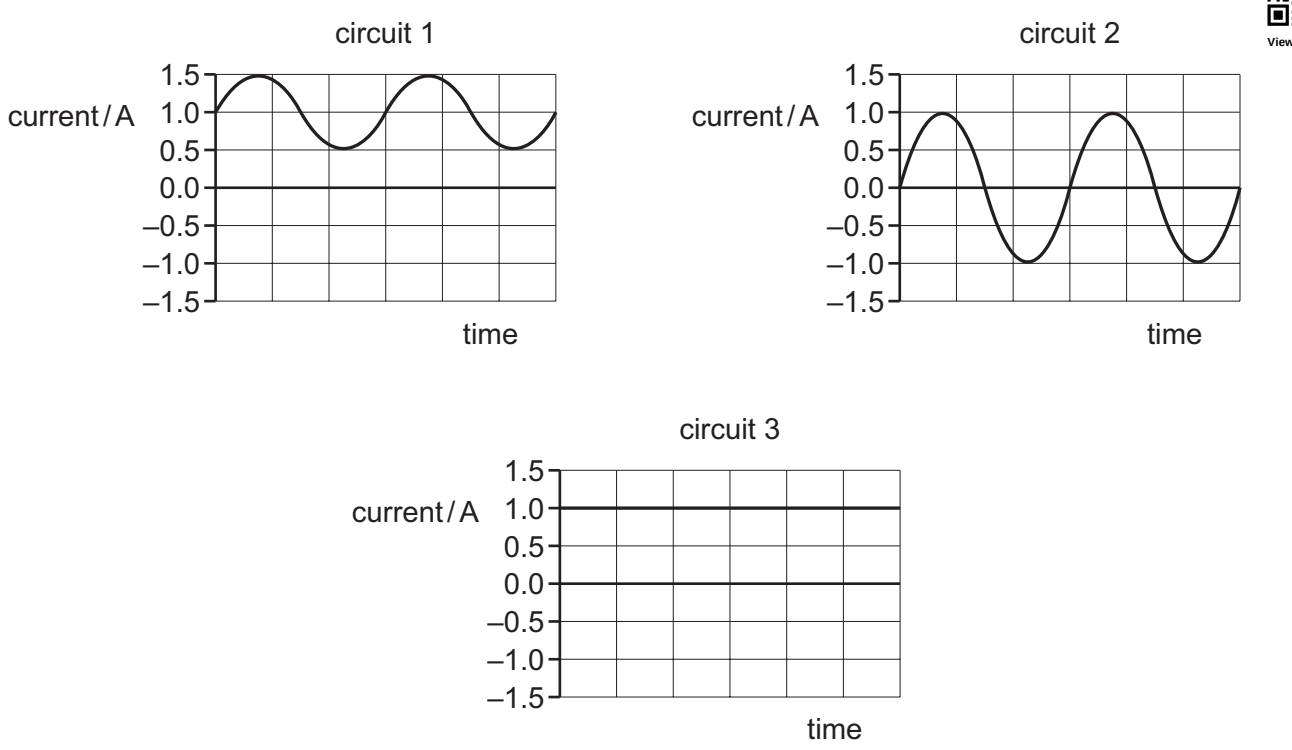


D



**35** The graphs show how the currents in three circuits vary with time.

View solution

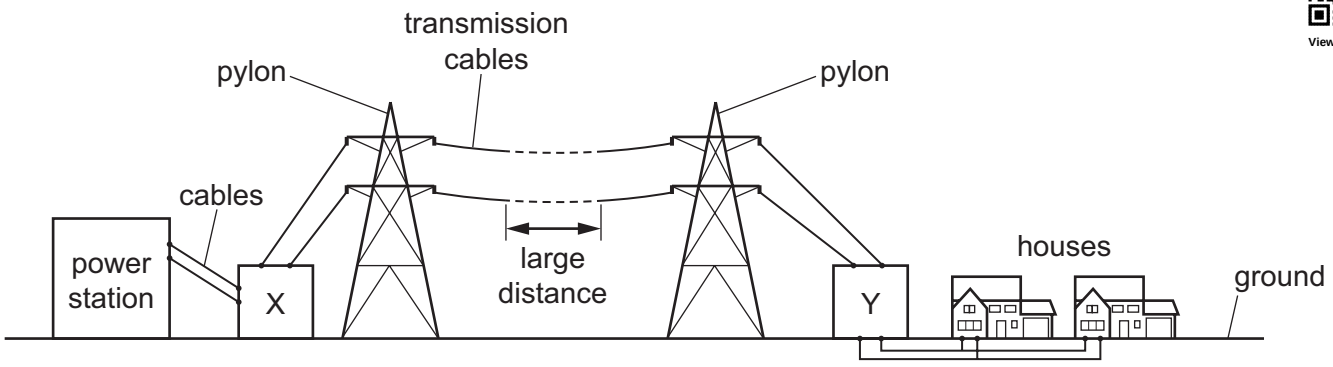



In which circuits is there a direct current?

**A** 1 and 2 **B** 1 and 3 **C** 2 only **D** 3 only

**36** The diagram represents the transmission of electricity from a power station to homes that are many kilometres away. Two transformers are labelled X and Y.

View solution




What type of transformers are X and Y?

| | X | Y |
|---|---|---|
| **A** | step-down transformer | step-down transformer |
| **B** | step-down transformer | step-up transformer |
| **C** | step-up transformer | step-down transformer |
| **D** | step-up transformer | step-up transformer |

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**37** A nuclide of the element iron has the symbol shown.

View solution

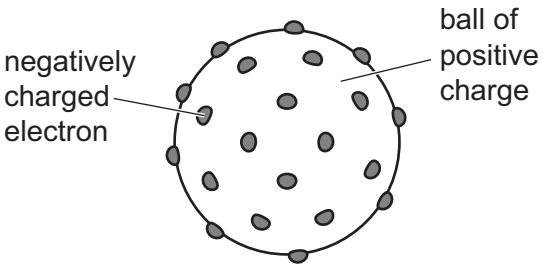
$$^{56}_{26}Fe$$

What does a neutral atom of this nuclide contain?

| | protons | neutrons | electrons |
|---|---|---|---|
| **A** | 26 | 30 | 26 |
| **B** | 26 | 56 | 30 |
| **C** | 30 | 26 | 56 |
| **D** | 56 | 26 | 30 |

**38** The diagram shows an early model of the structure of an atom.

View solution




This early model is different from the atomic model accepted today.

Which statement about the early model is **not** included in the model accepted today?

**A** The atom is mainly filled with a ball of positive charge.

**B** The electrons are negatively charged.

**C** There are positive and negative charges.

**D** There are small particles called electrons.

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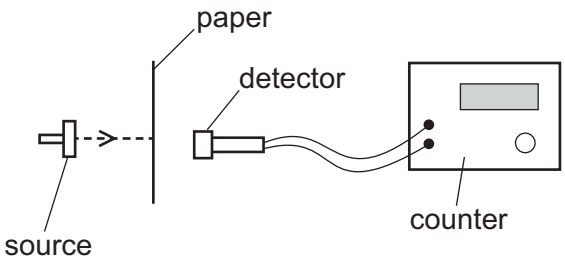
**39** A thin sheet of paper is placed between a radioactive source and a radiation detector. The count rate falls to a very low reading.

View solution




From this result, which type of radiation is the source emitting?

**A** $\alpha$-particles

**B** $\beta$-particles

**C** $\gamma$-rays

**D** X-rays

**40** Why should all radioactive materials be handled carefully?

View solution

**A** They all make anything they touch radioactive.

**B** They all catch fire very easily.

**C** They all emit ionising radiation.

**D** They all have long half-lives.

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