Cambridge Assessment International Education

# Cambridge IGCSE™

**PHYSICS** **0625/12**

Paper 1 Multiple Choice (Core) **May/June 2022**

**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 / $s^2$).

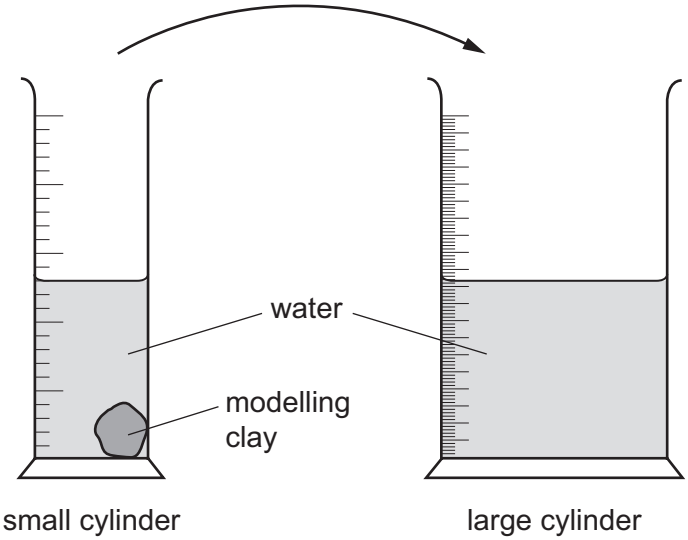
**INFORMATION**

- The total mark for this paper is 40.
- Each correct answer will score one mark.
- Any rough working should be done on this question paper.

This document has **16** pages.


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**[Turn over**

**1** A lump of modelling clay is moved from a small measuring cylinder to a large measuring cylinder that has twice the diameter.




The reading on the small measuring cylinder goes down by 20 $cm^3$.

By how much does the reading on the large cylinder go up?

**A** 10 $cm^3$ **B** 20 $cm^3$ **C** 40 $cm^3$ **D** 80 $cm^3$

**2** What is used to determine the distance travelled by an object in motion?

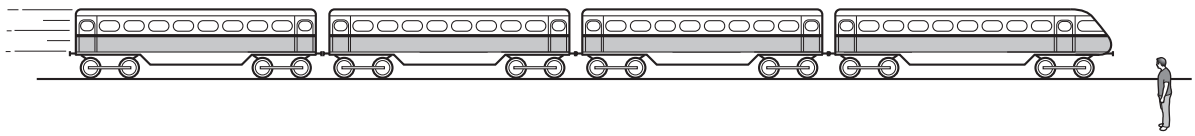
**A** the area under a distance–time graph

**B** the area under a speed–time graph

**C** the gradient of a distance–time graph

**D** the gradient of a speed–time graph

**3** A man stands next to a railway track.



A train travelling at 40 m / s takes 2.0 s to pass the man.

What is the length of the train?

**A** 20 m **B** 38 m **C** 40 m **D** 80 m

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**4** An object is moved from point X to point Y.

The acceleration of free fall at X is different from that at Y.

Which statement about the object at Y is correct?

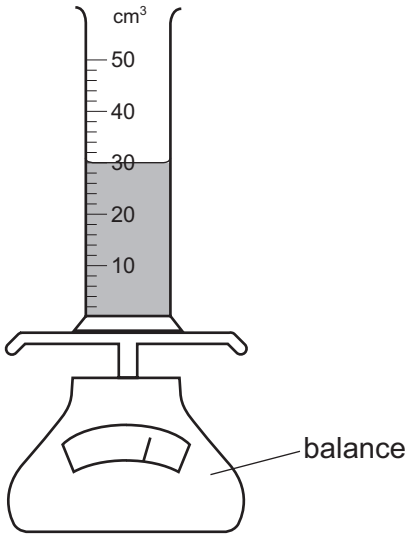
**A** Both its mass and its weight are different from those at X.

**B** Both its mass and its weight are the same as those at X.

**C** Its mass is the same as at X but its weight is different.

**D** Its weight is the same as at X but its mass is different.

**5** A measuring cylinder contains 30 $cm^3$ of a liquid.



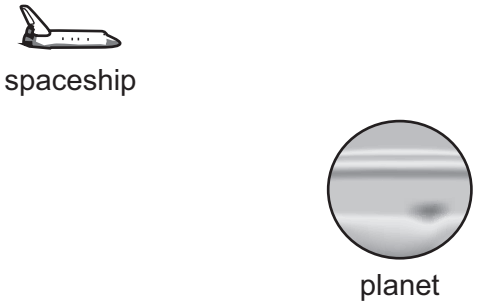

Some more of the liquid is added until the liquid level reaches the 50 $cm^3$ mark.

The reading on the balance increases by 30 g.

What is the density of the liquid?

**A** 0.60 $g/cm^3$ **B** 0.67 $g/cm^3$ **C** 1.5 $g/cm^3$ **D** 1.7 $g/cm^3$

**6** A spaceship approaches and passes a planet.




What can the force of gravity between the spaceship and planet achieve?

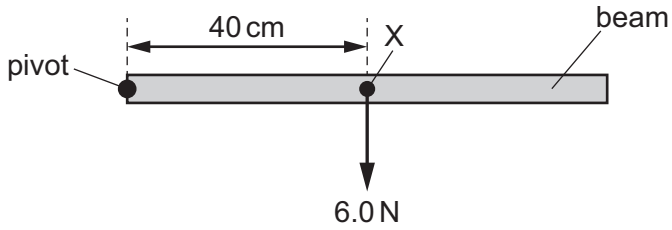
**A** It can change the direction of the spaceship, or slow it down, but not speed it up.

**B** It can change the direction of the spaceship, or speed it up, but not slow it down.

**C** It can slow down the spaceship, or speed it up, but not change its direction.

**D** It can change the direction of the spaceship, slow it down, or speed it up.

**7** A beam is pivoted at one end, as shown.




The beam weighs 6.0 N and its weight acts at a point X 40 cm from the pivot.

A force of 4.0 N is applied to the beam causing it to balance horizontally.

In which direction and where is the 4.0 N force applied?

**A** vertically downwards at 20 cm to the left of X

**B** vertically downwards at 20 cm to the right of X

**C** vertically upwards at 20 cm to the left of X

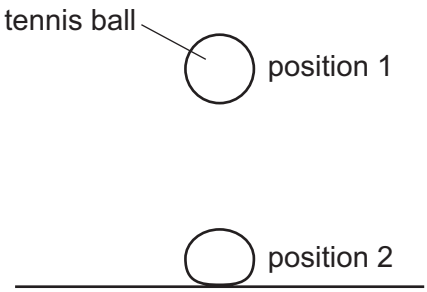
**D** vertically upwards at 20 cm to the right of X

**8** What are the conditions for an object to be in equilibrium?

| | forces on object | moment on object |
|---|---|---|
| **A** | no resultant force | no resultant moment |
| **B** | no resultant force | resultant moment |
| **C** | resultant force | no resultant moment |
| **D** | resultant force | resultant moment |

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**9** A tennis ball is dropped from position 1. It falls vertically onto a hard surface at position 2.




Which energy changes have taken place between position 1 and position 2?

**A** gravitational potential → kinetic → chemical

**B** gravitational potential → kinetic → elastic (strain)

**C** kinetic → gravitational potential → chemical

**D** kinetic → gravitational potential → elastic (strain)

**10** A force does work moving an object in the direction of the force.

Which change in the force and distance **always** increases the work done?

| | force | distance |
|---|---|---|
| **A** | greater | same |
| **B** | greater | smaller |
| **C** | same | smaller |
| **D** | smaller | smaller |

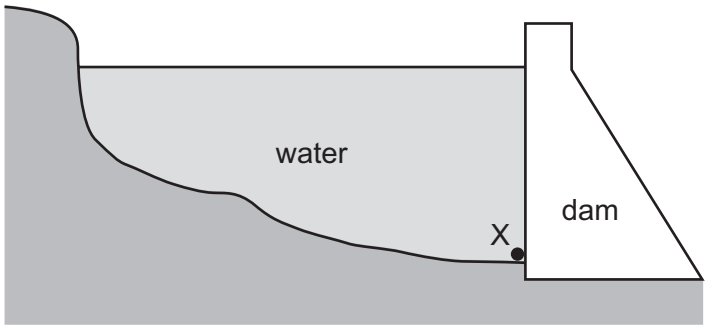
**11** The table shows the weights and base areas of four metal blocks.

Which block exerts the greatest pressure on its base?

| | weight / N | area of base / $m^2$ |
|---|---|---|
| **A** | 3 000 | 0.20 |
| **B** | 10 000 | 0.50 |
| **C** | 16 000 | 2.0 |
| **D** | 20 000 | 1.5 |

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**12** The diagram shows a deep reservoir formed by a dam.




On what does the pressure at X depend?

**A** the depth of the water at X

**B** the length of the reservoir

**C** the surface area of the water

**D** the thickness of the dam wall

**13** A particular state of matter consists of molecules that move freely in random directions at high speed. The average speed of the molecules is decreasing.

Which state of matter is being described?

**A** a gas cooling

**B** a gas being heated

**C** a solid cooling

**D** a liquid being heated

**14** Small pollen particles are suspended in water.

When viewed with a microscope, the pollen particles can be seen to be moving about irregularly.

What causes this movement?

**A** The pollen particles are being bombarded by the heavier particles of the water.

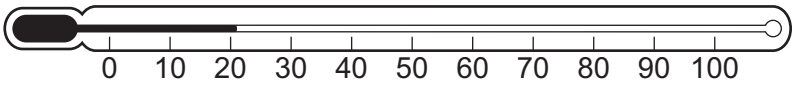
**B** The pollen particles are being bombarded by the lighter particles of the water.

**C** The temperature of the water is higher than that of the pollen particles.

**D** The temperature of the water is lower than that of the pollen particles.

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




Which physical property of the thermometer is used to measure temperature?

**A** expansion of glass

**B** expansion of liquid

**C** mass of glass

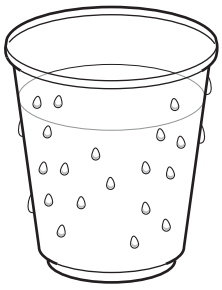
**D** mass of liquid

**16** An engineer investigates the increase in temperature of the oil in a car engine when it is first switched on.

Which row is correct?

| | change in internal energy | explanation |
|---|---|---|
| **A** | increase | The random kinetic energy of the particles increases. |
| **B** | increase | The oil evaporates when it is heated. |
| **C** | decrease | The potential energy of the particles increases. |
| **D** | decrease | The oil changes state to a gas when it is heated. |

**17** A glass contains an iced drink on a warm and humid day. Water starts to form on the outside of the glass.



What is the name of the effect by which the water forms?

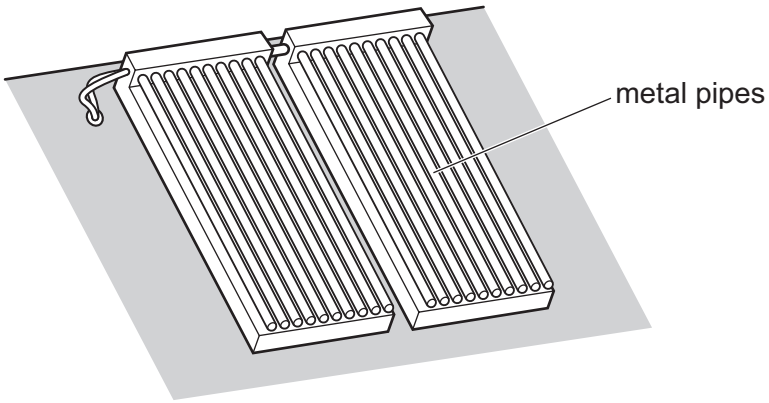
**A** condensation

**B** conduction

**C** convection

**D** evaporation

**18** The diagram shows solar water panels on the roof of a house. The panels absorb energy from the Sun to heat up the water in the metal pipes.



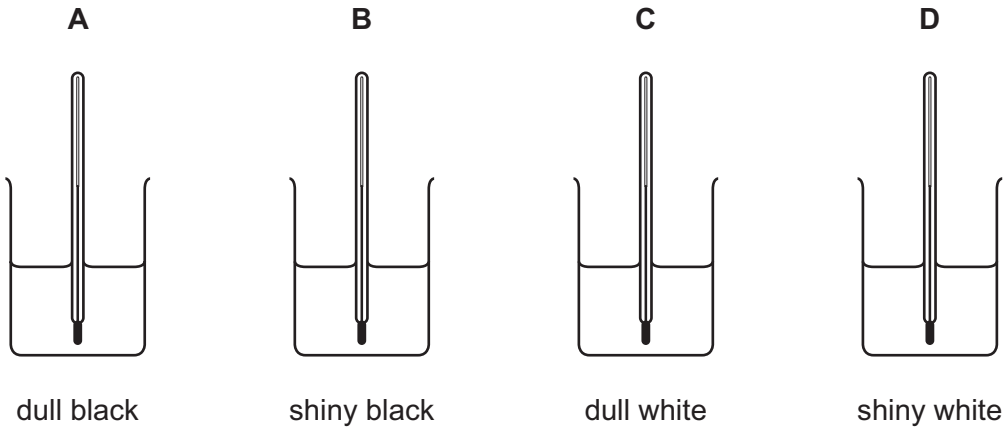

Which row describes how energy is transferred from the Sun and through the metal of the pipes?

| | from the Sun | through the metal of the pipes |
|---|---|---|
| **A** | conduction | conduction |
| **B** | conduction | convection |
| **C** | radiation | conduction |
| **D** | radiation | convection |

**19** Four beakers containing equal volumes of water at 10 °C are placed outside in full sunshine on a hot day.

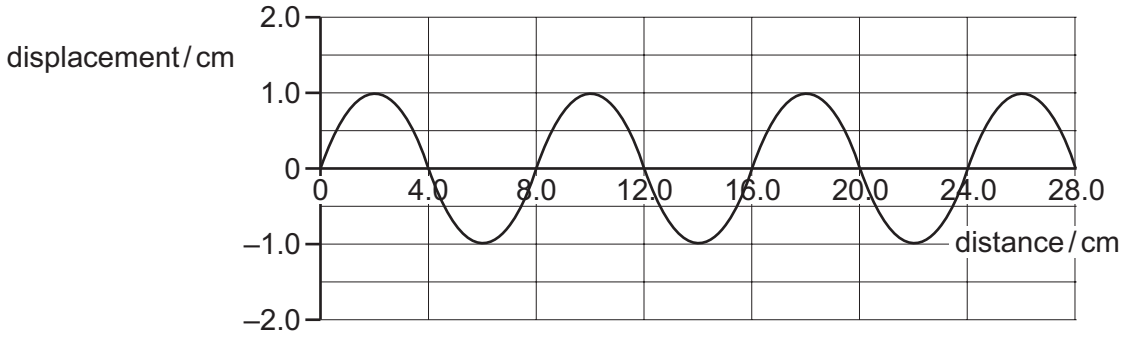
The four beakers are identical except for their surface colour and texture.

Which beaker will heat up the quickest?




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**20** The diagram shows a wave.




Which row is correct?

| | amplitude of the wave / cm | wavelength of the wave / cm |
|---|---|---|
| **A** | 1.0 | 4.0 |
| **B** | 1.0 | 8.0 |
| **C** | 2.0 | 4.0 |
| **D** | 2.0 | 8.0 |

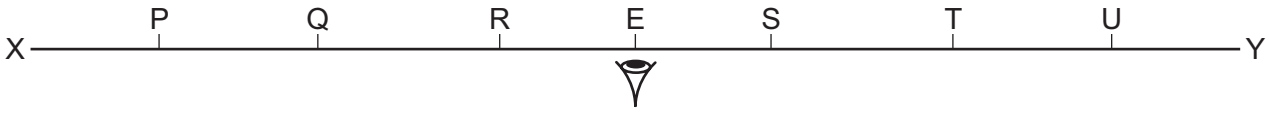
**21** A girl is sitting on a rock in the sea looking at passing waves. She notices that five complete wavelengths pass her in 20 s.

What is the frequency of this wave?

**A** 0.25 Hz **B** 4.0 Hz **C** 15 Hz **D** 100 Hz

**22** A student uses one eye to look at images in a plane mirror.




Objects are placed on the line XY.

Which objects give rise to images that can be seen by the eye at E?

**A** P, Q, R, S, T and U

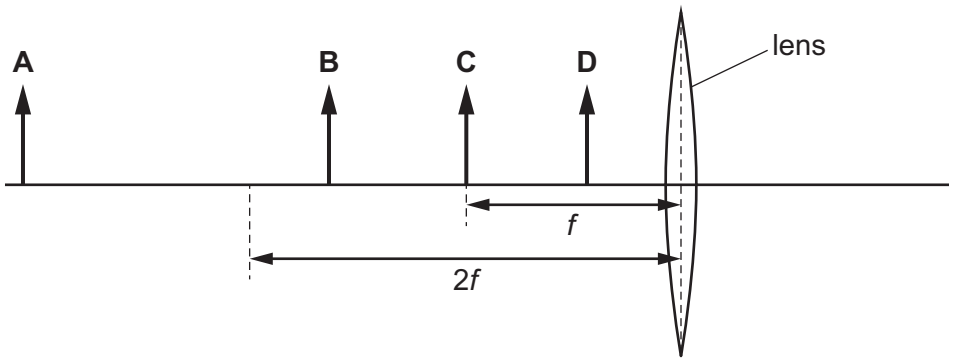
**B** Q, R, S and T only

**C** P and U only

**D** R and S only

**23** An object is placed in front of a converging lens. The lens has a focal length *f*.

In which labelled position should the object be placed in order to produce a real image that is smaller than the object?




**24** Microwaves, green light and infrared are three types of electromagnetic radiation.

What is their order when listed by wavelength from the shortest wavelength to the longest?

**A** green light → infrared → microwaves

**B** green light → microwaves → infrared

**C** infrared → green light → microwaves

**D** microwaves → infrared → green light

**25** Which statement correctly compares radio waves and X-rays?

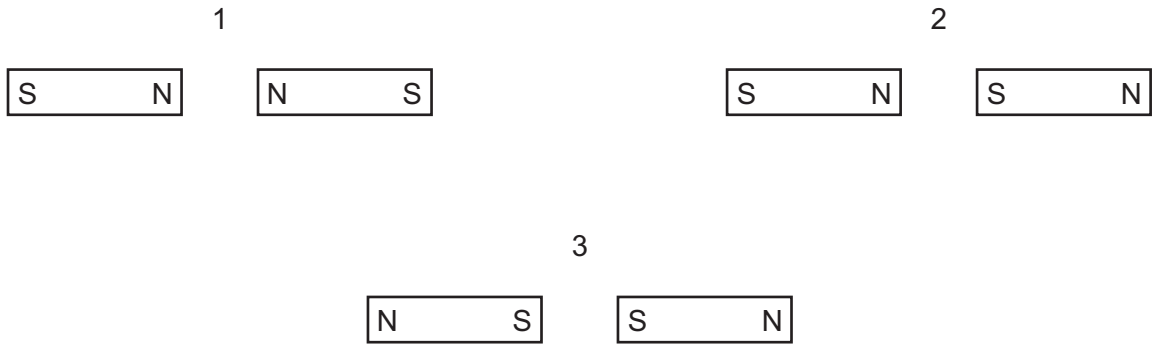
**A** Radio waves have a longer wavelength and a greater speed in a vacuum.

**B** Radio waves have a longer wavelength and the same speed in a vacuum.

**C** Radio waves have a shorter wavelength and a greater speed in a vacuum.

**D** Radio waves have a shorter wavelength and the same speed in a vacuum.

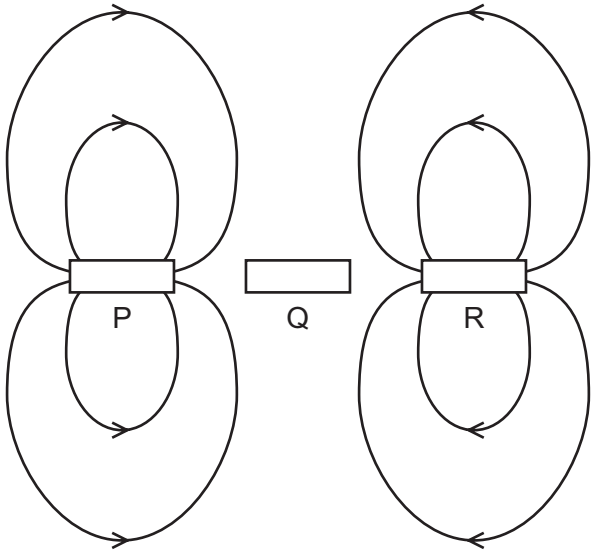
**26** The three diagrams each show two magnets.




In which diagrams do the two magnets attract each other?

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

**27** The diagram shows the magnetic fields around three objects, P, Q and R, placed close to each other.




Which row shows the nature of each of the objects?

| | P | Q | R |
|---|---|---|---|
| **A** | permanent magnet N S | copper rod | permanent magnet N S |
| **B** | permanent magnet N S | copper rod | permanent magnet S N |
| **C** | permanent magnet N S | iron rod | permanent magnet N S |
| **D** | permanent magnet N S | iron rod | permanent magnet S N |

**28** Iron filings are picked up by an electromagnet.

The current in the electromagnet is switched off and the filings fall on a plastic bench.

A plastic comb is rubbed with a woollen cloth and held just above the iron filings.

Some of the filings jump and stick to the comb.

Which statement correctly explains the last observation?

**A** The comb has been electrically charged by rubbing with the cloth.

**B** The comb has been magnetised by rubbing with the cloth.

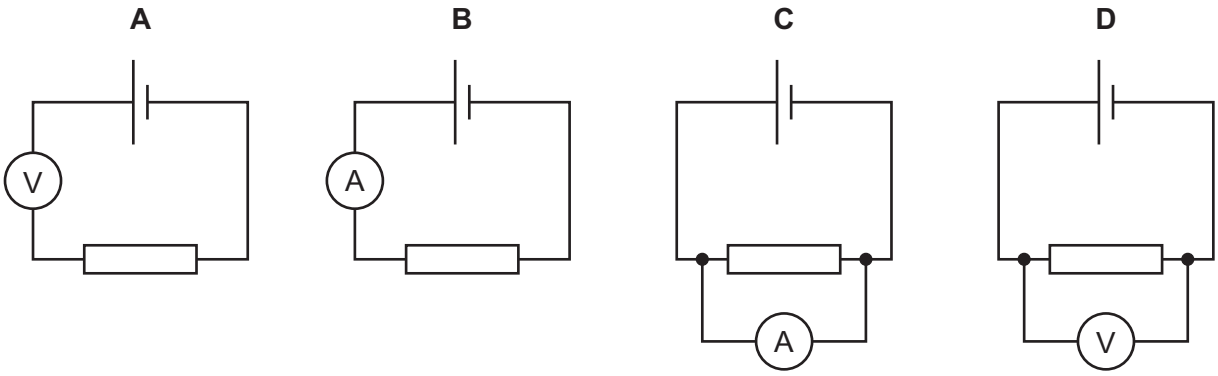
**C** The filings have been electrically charged by the electromagnet.

**D** The filings have been magnetised by the electromagnet.

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**29** Four circuits are set up.

In which circuit does the meter measure the potential difference (p.d.) across the resistor?




**30** A resistor has a potential difference (p.d.) of 12 V across it and a current of 0.60 A in it.

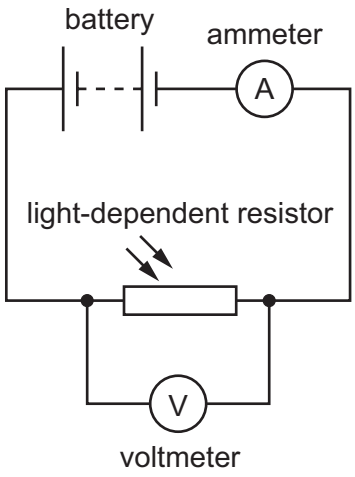
What is the resistance of the resistor?

**A** 0.050 Ω **B** 2.0 Ω **C** 7.2 Ω **D** 20 Ω

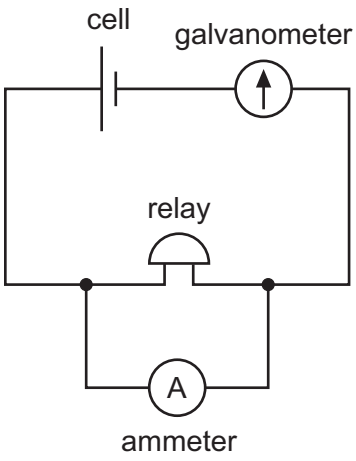
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**31** Which circuit is correctly labelled?

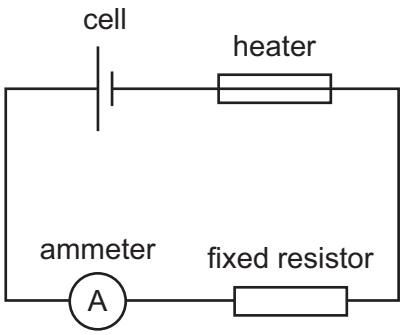
**A**



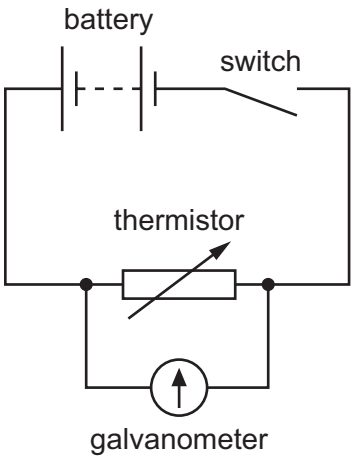

**B**



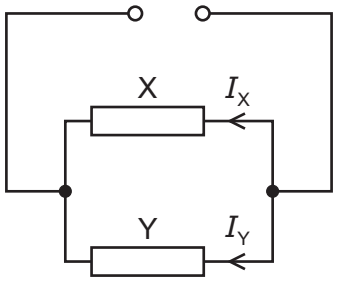

**C**




**D**



**32** The diagram shows an electric circuit.




$I_X$ is the current in resistor X. $I_Y$ is the current in resistor Y.

Which statement describes the current from the power supply?

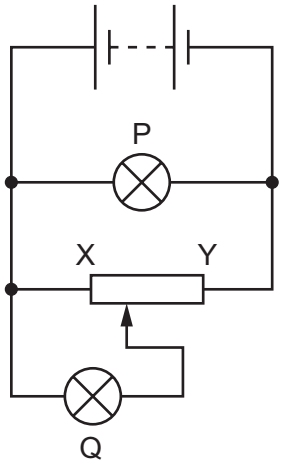
**A** greater than $I_X$ and greater than $I_Y$

**B** greater than $I_X$ and less than $I_Y$

**C** less than $I_X$ and greater than $I_Y$

**D** less than $I_X$ and less than $I_Y$

**33** The diagram shows a battery connected to a potential divider and to two lamps, P and Q.




The slider on the potential divider is moved from end X to end Y of the resistor.

Which row shows the effect on the brightness of each lamp?

| | brightness of P | brightness of Q |
|---|---|---|
| **A** | brighter | brighter |
| **B** | brighter | dimmer |
| **C** | unchanged | brighter |
| **D** | unchanged | dimmer |

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**34** Why is a fuse used in an electrical circuit?

**A** so that the current can have only one value

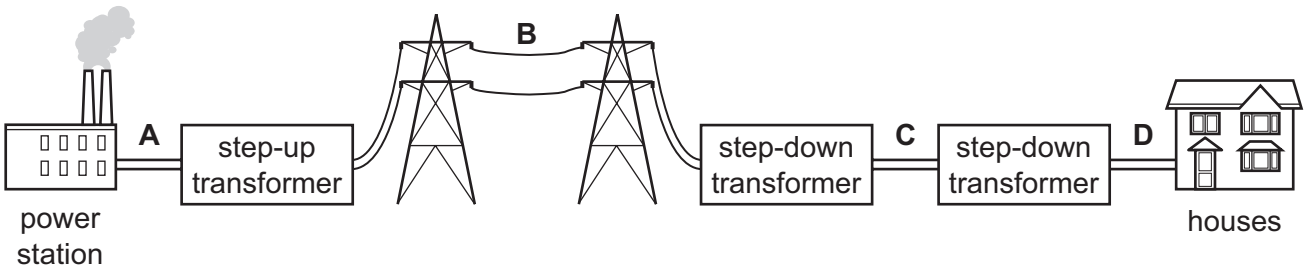
**B** to prevent the current becoming too large

**C** to provide a path to earth if a fault occurs

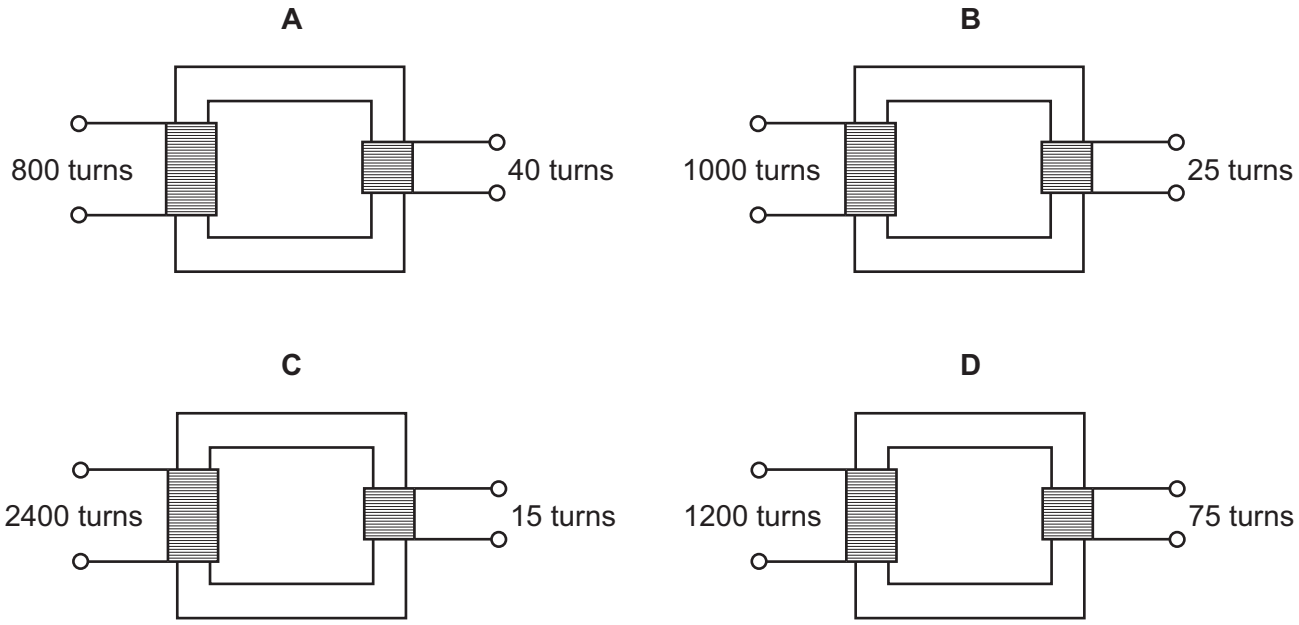
**D** to save electrical energy

**35** Electrical power is transmitted from power stations to homes using the National Grid.

In which part of the National Grid is the voltage highest?




**36** Which transformer can change a 240 V a.c. input into a 15 V a.c. output?




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**37** The coils in two electric motors are identical in size, but motor 1 is observed to spin more quickly than motor 2.

Three suggestions are made to explain this observation.

1 The current in the coil of motor 1 is greater than the current in the coil of motor 2.

2 The number of turns on the coil of motor 1 is greater than on the coil of motor 2.

3 The magnets in motor 1 are stronger than the magnets in motor 2.

Which suggestions give a possible explanation for this observation?

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

**38** Which statement describes two atoms of different isotopes of an element?

**A** two atoms with the same nucleon number but different proton number

**B** two atoms with a different nucleon number but the same proton number

**C** two atoms with the same nucleon number and the same proton number

**D** two atoms with a different nucleon number and different proton number

**39** A radioactive source has a half-life of 0.5 hours.

A detector near the source shows a reading of 6000 counts per second.

Background radiation can be ignored.

What is the reading on the detector 1.5 hours later?

**A** 750 counts per second

**B** 1500 counts per second

**C** 2000 counts per second

**D** 3000 counts per second

**40** Some nuclei are unstable. They emit radiation and change into nuclei of a different element.

What is this process called?

**A** convection

**B** electromagnetic induction

**C** radioactive decay

**D** the motor effect

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