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.

6608142237

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.

© UCLES 2020

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

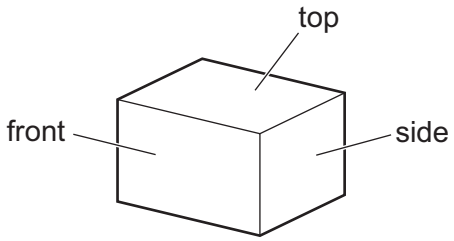


diagram 1

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

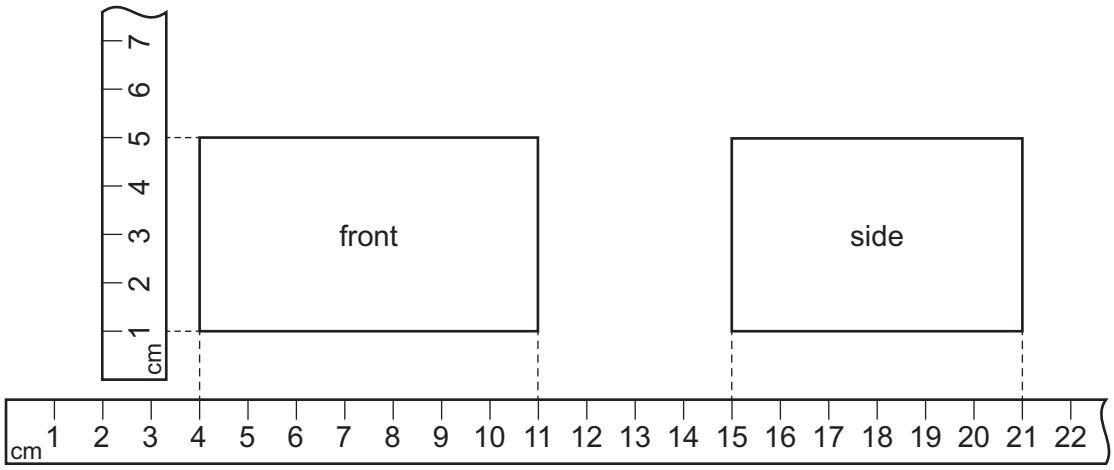


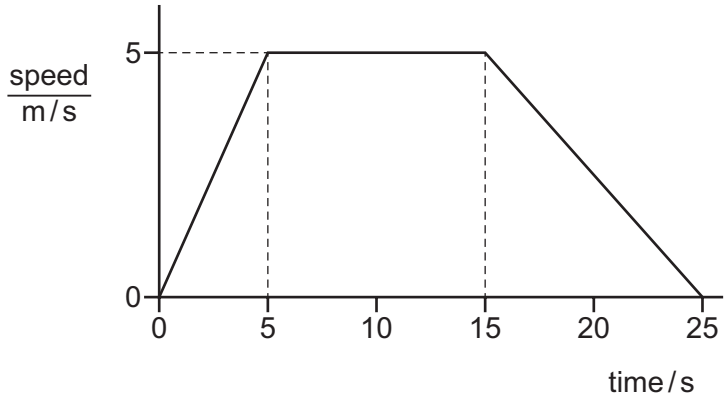
diagram 2

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.



How far does the object travel at constant speed?

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

© UCLES 2020

3 Which statement about acceleration is correct?

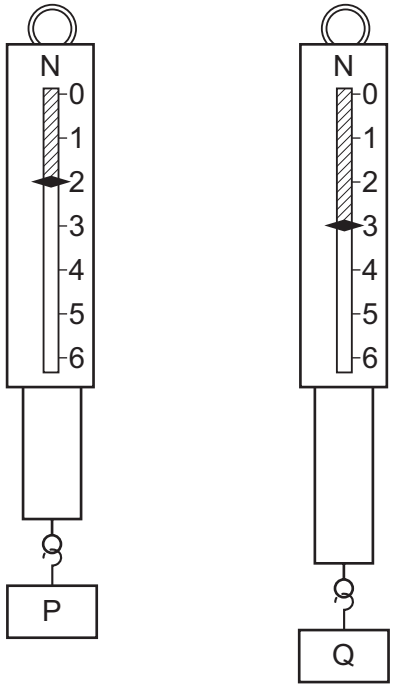
A It is related to the changing speed of an object.

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.



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?

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

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

© UCLES 2020

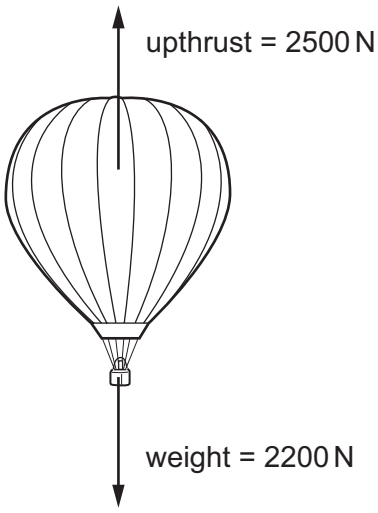
6 A rectangular gymnasium is 50 m long, 25 m wide and 8.0 m high.

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.



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?

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

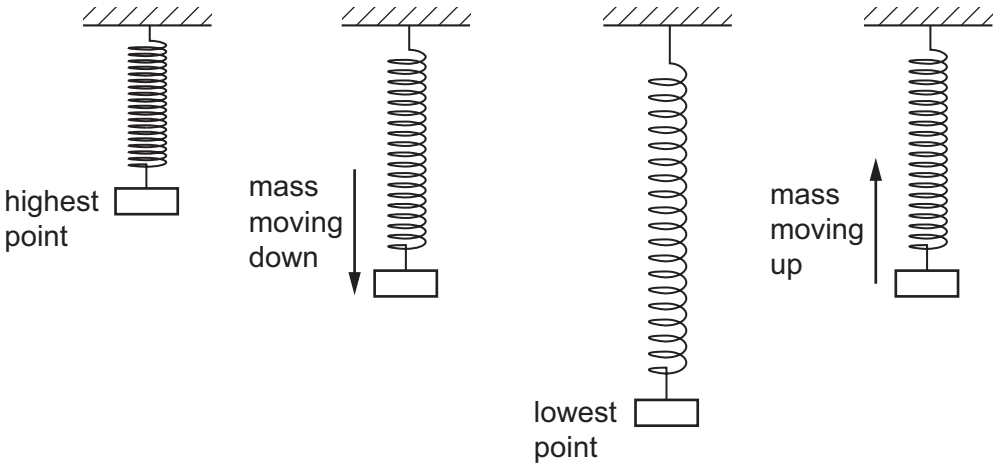
B The moment of a force is a measure of its turning effect.

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.

© UCLES 2020

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.



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?

A coal

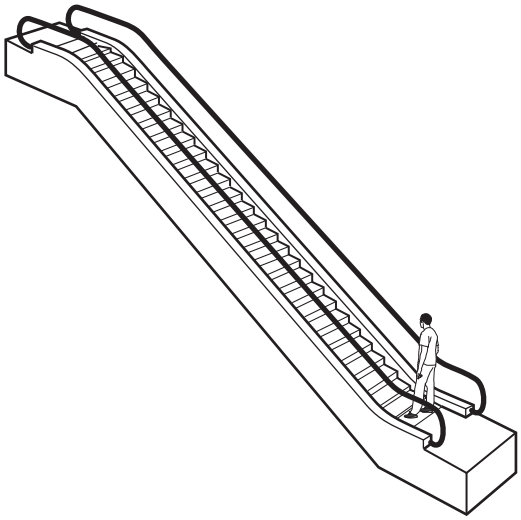
B nuclear fission

C solar

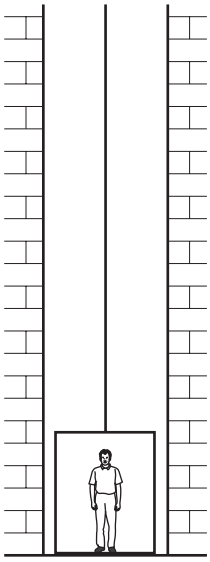
D wind

© UCLES 2020

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



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*.

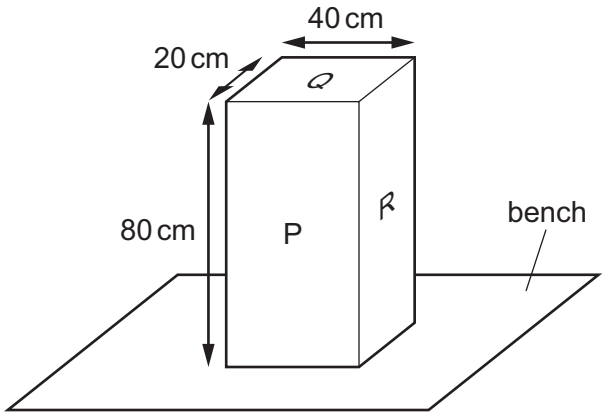
The lift takes 30 seconds to carry the same man between the same two floors.

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*

© UCLES 2020

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



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

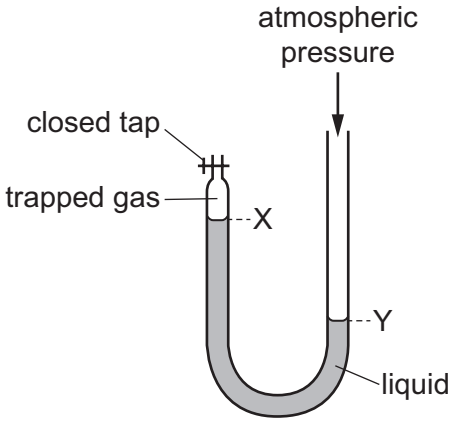
A P

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.

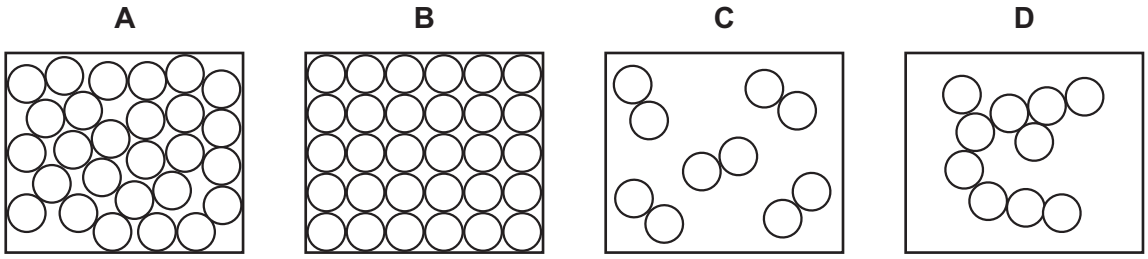


Some of the trapped gas is removed.

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

14 What is the correct particle diagram for a solid?



15 A sealed box contains a fixed mass of gas.

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.



Which row gives the correct labels for the thermometer?

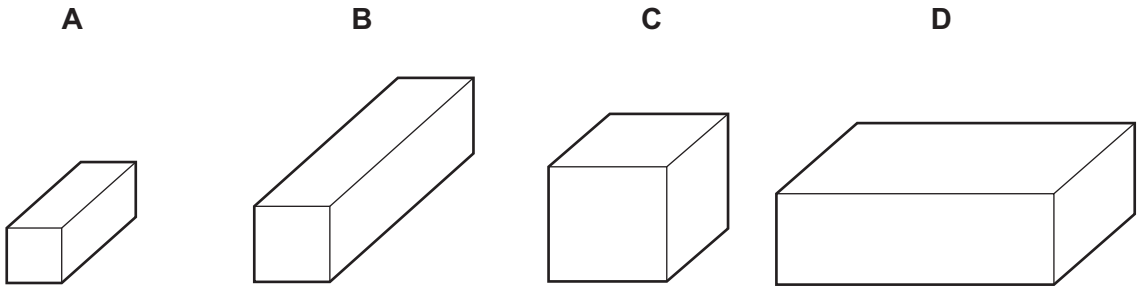
	X	Y
A	water	narrow tube of uniform diameter
B	alcohol	narrow tube of uniform diameter
C	water	this end immersed in substance to be measured
D	alcohol	this end immersed in substance to be measured

© UCLES 2020

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

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.

Which process is being described?

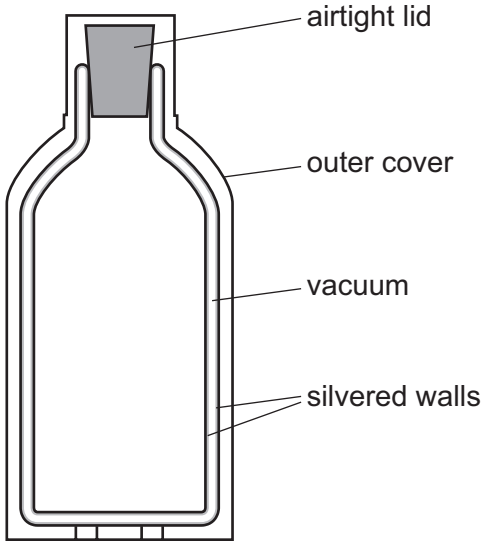
A boiling

B condensing

C freezing

D melting

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



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

A conduction only

B conduction and convection only

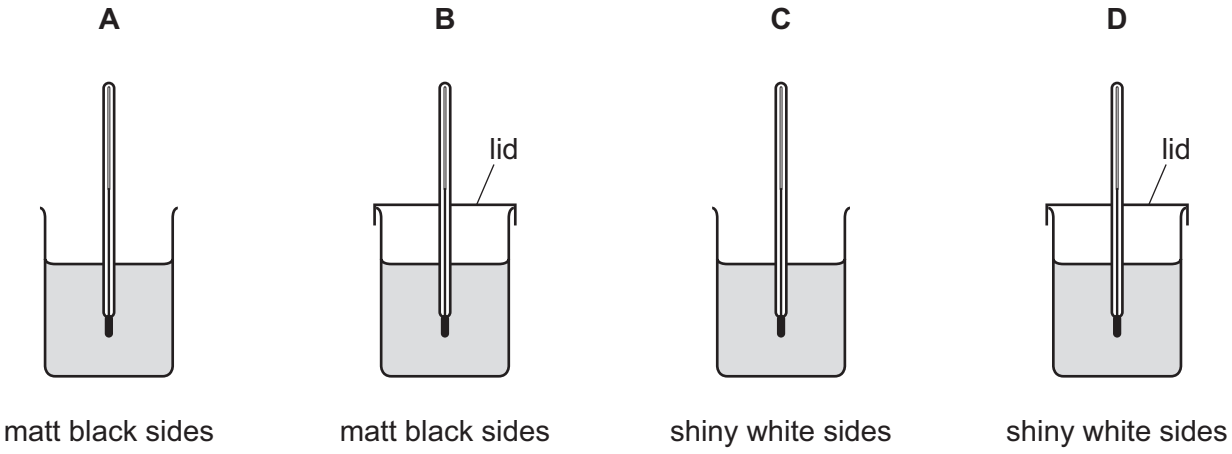
C convection and radiation only

D conduction, convection and radiation

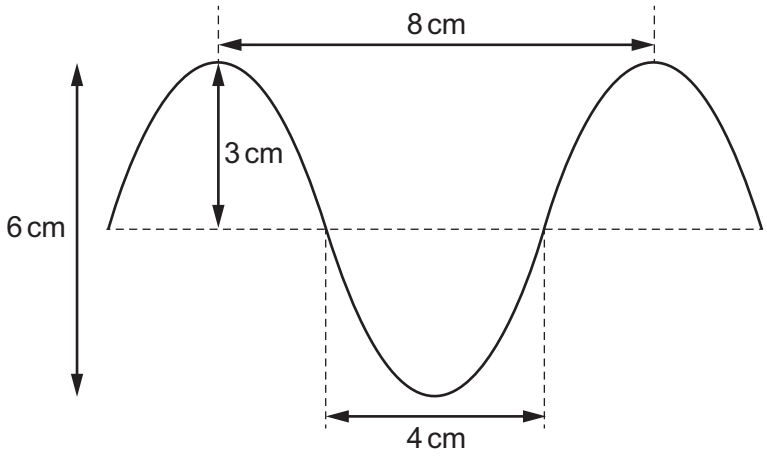
20 Equal volumes of water at 100 °C are put in four containers. Two containers have matt black sides and two containers have shiny white sides. One of each type of container has a lid.

The containers are left for two minutes.

Which container has the highest temperature?



21 The diagram shows a wave.



What are the amplitude and the wavelength of this wave?

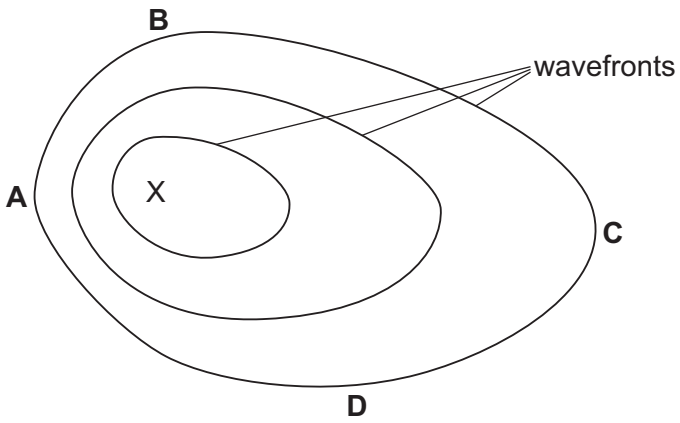
	amplitude / cm	wavelength / cm
A	3	4
B	3	8
C	6	4
D	6	8

© UCLES 2020

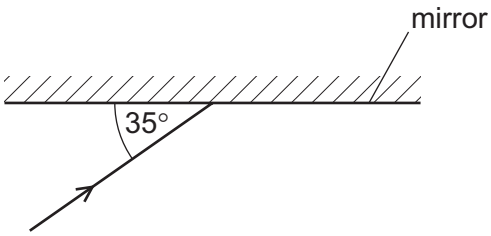
22 Waves travel more quickly on the surface of water when the water is deep.

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.

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.



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.

Which name is given to this process?

A diffraction

B dispersion

C reflection

D refraction

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

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.

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

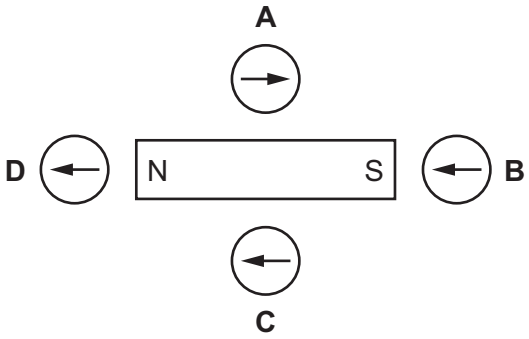
B higher pitch and louder

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.

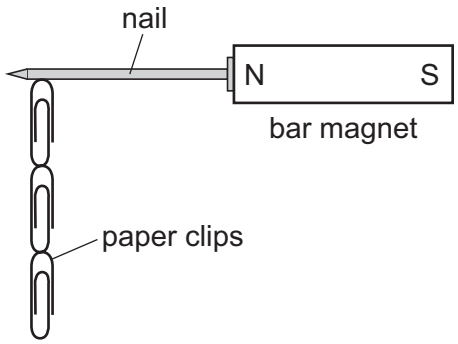
Which plotting compass has the needle pointing in the wrong direction?



© UCLES 2020

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.

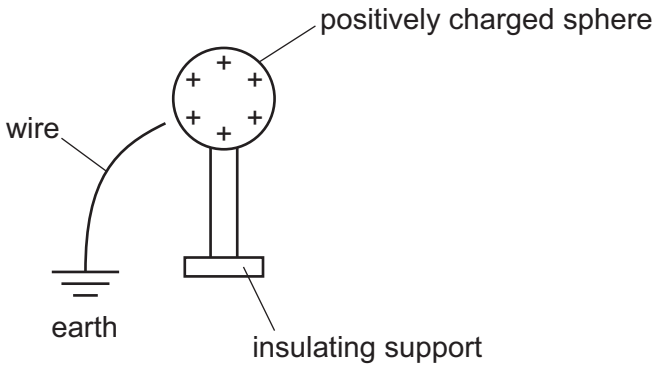


The bar magnet is then removed and the number of paper clips remaining attached to the nail is recorded. Each nail is tested individually.

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.



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.

30 Three electrical quantities are listed.

- potential difference
- electromotive force
- current

Which quantities are measured in volts?

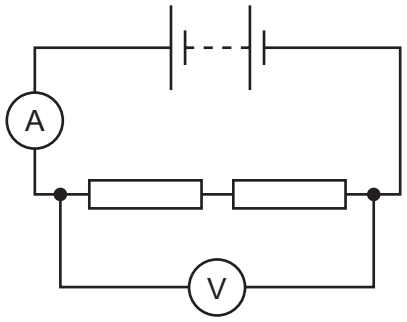
A potential difference only

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.

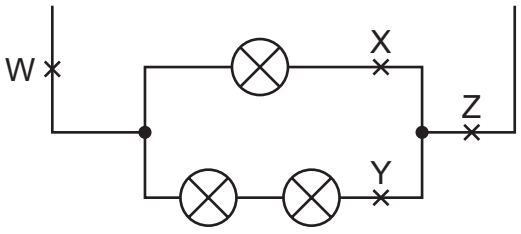


The voltmeter reading is 2.2 V and the ammeter reading is 0.25 A.

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.



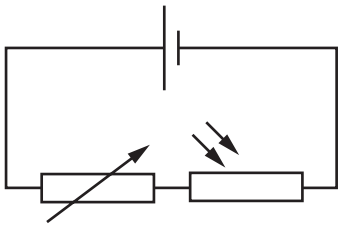
At which two points do the currents have the same value?

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

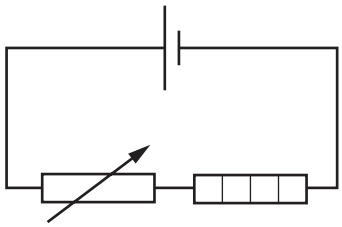
© UCLES 2020

33 Which circuit contains a thermistor and a heater?

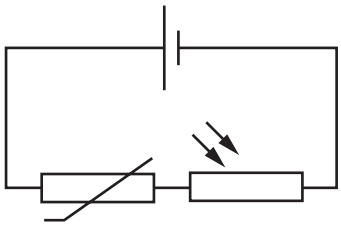
A



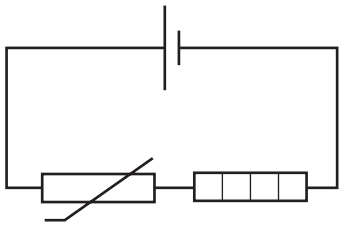
B



C



D

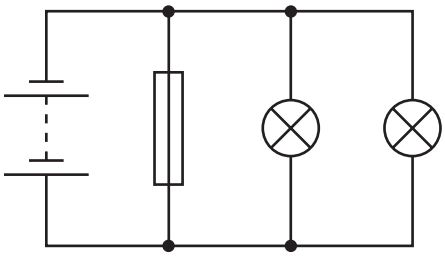


34 A student constructs four circuits, each containing a fuse.

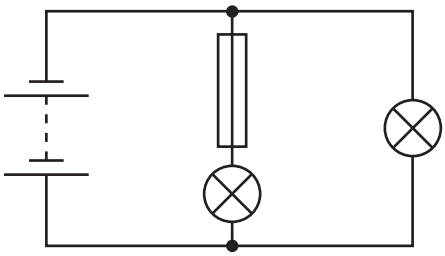
The fuse blows in one circuit and both lamps in the circuit go out.

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

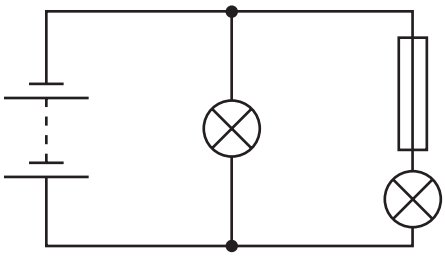
A



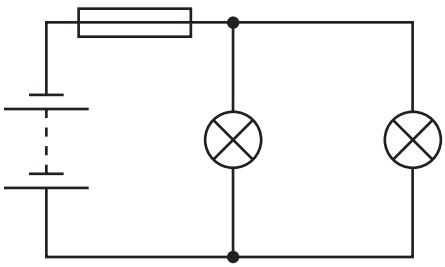
B



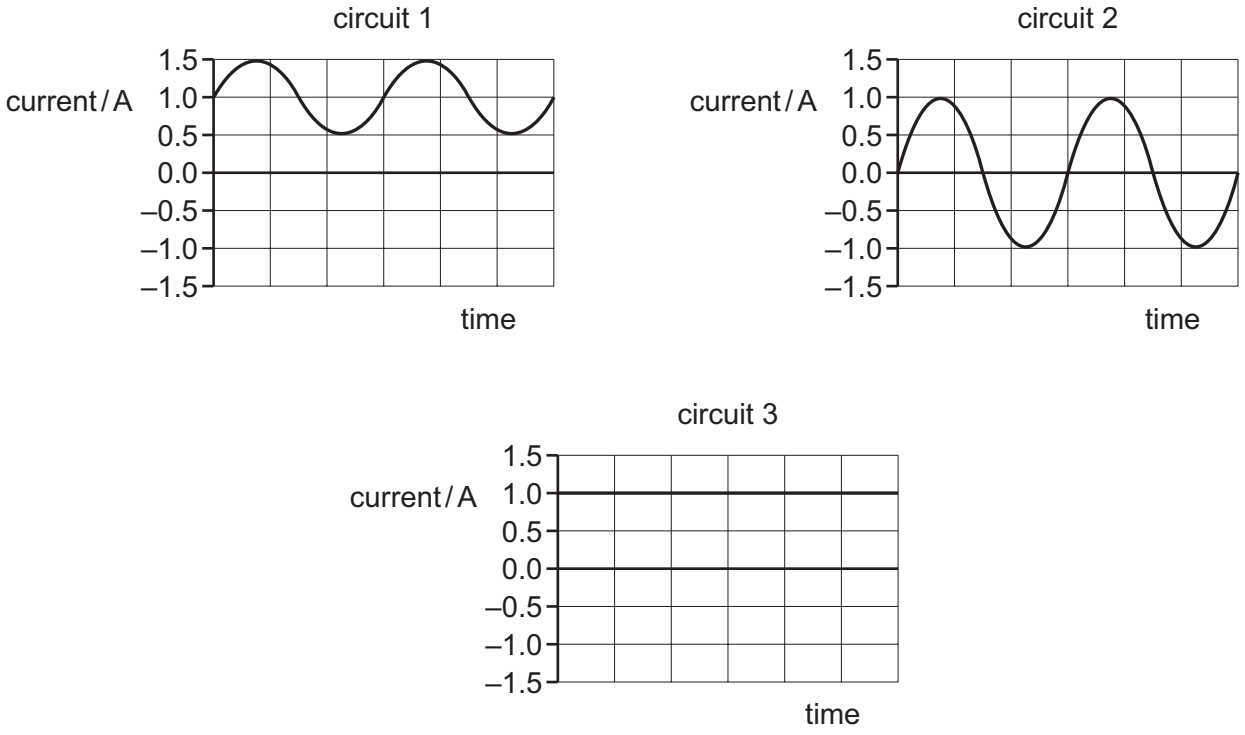
C



D



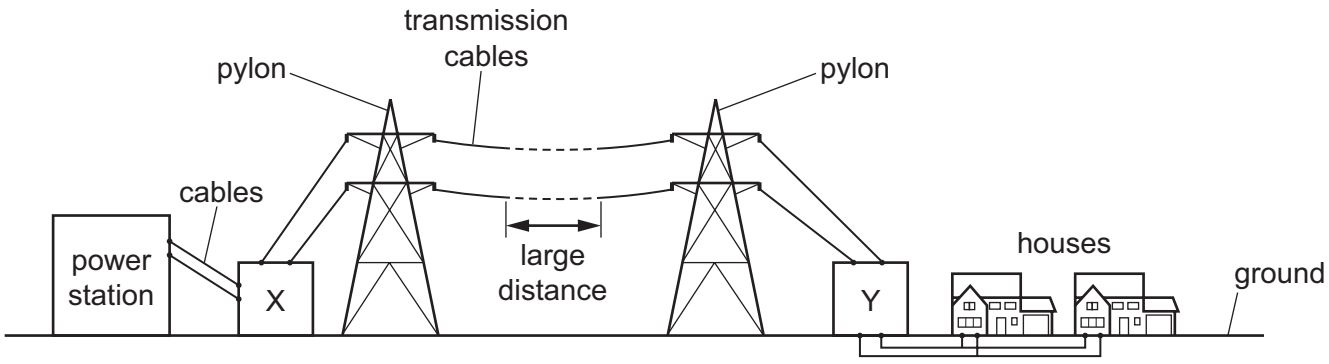
35 The graphs show how the currents in three circuits vary with time.



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.



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

© UCLES 2020

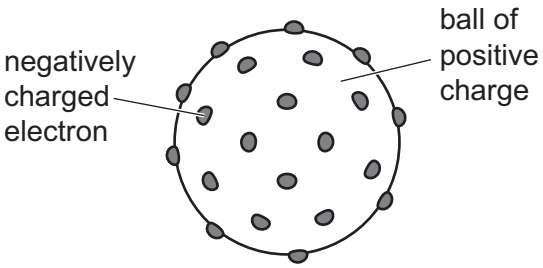
37 A nuclide of the element iron has the symbol shown.

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

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.



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?

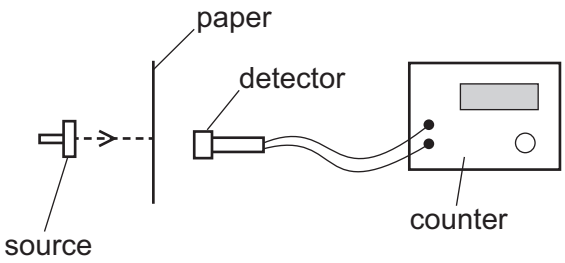
A The atom is mainly filled with a ball of positive charge.

B The electrons are negatively charged.

C There are positive and negative charges.

D There are small particles called electrons.

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.



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

A α-particles

B β-particles

C γ-rays

D X-rays

40 Why should all radioactive materials be handled carefully?

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.

© UCLES 2020

BLANK PAGE

BLANK PAGE

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced online in the Cambridge Assessment International Education Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at www.cambridgeinternational.org after the live examination series.

Cambridge Assessment International Education is part of the Cambridge Assessment Group. Cambridge Assessment is the brand name of the University of Cambridge Local Examinations Syndicate (UCLES), which itself is a department of the University of Cambridge.

© UCLES 2020