Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

PHYSICS **0625/12**

Paper 1 Multiple Choice (Core) **October/November 2019**

45 minutes

Additional Materials: Multiple Choice Answer Sheet
Soft clean eraser
Soft pencil (type B or HB recommended)

5658967703

READ THESE INSTRUCTIONS FIRST

Write in soft pencil.
Do not use staples, paper clips, glue or correction fluid.
Write your name, centre number and candidate number on the Answer Sheet in the spaces provided unless this has been done for you.
DO **NOT** WRITE IN ANY BARCODES.

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 separate Answer Sheet.

Read the instructions on the Answer Sheet very carefully.

Each correct answer will score one mark. A mark will not be deducted for a wrong answer.
Any rough working should be done in this booklet.
Electronic calculators may be used.
Take the weight of 1.0 kg to be 10 N (acceleration of free fall = 10 m / s^2).

This syllabus is regulated for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **15** printed pages and **1** blank page.

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1 A measuring cylinder contains 10 cm^3 of water.

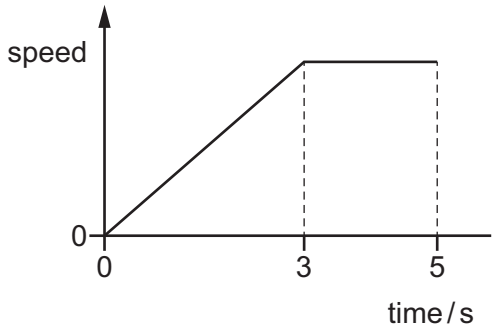
A piece of steel is lowered into the measuring cylinder until it is fully submerged. The volume reading increases to 12 cm^3.

A second piece of steel is lowered into the measuring cylinder so that it is also fully submerged. The volume reading increases to 15 cm^3.

Which row shows the volumes of the two pieces of steel?

	volume of first piece of steel / cm^3	volume of second piece of steel / cm^3
A	2	3
B	2	5
C	12	3
D	12	15

2 The graph shows the motion of a car for a five-second period.



Which row is correct?

	the car is at rest at	the car is moving at a constant speed at
A	0.0 s	2.0 s
B	0.0 s	4.0 s
C	4.0 s	0.0 s
D	4.0 s	2.0 s

3 A car travels at an average speed of 60 km / h for 15 minutes.

How far does the car travel in 15 minutes?

A 4.0 km **B** 15 km **C** 240 km **D** 900 km

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4 A box is placed on the ground. An upward force of 15 N is needed to lift the box at constant speed.

Which row correctly describes the box?

	mass of the box	weight of the box
A	1.5 kg	15 N
B	15 N	1.5 kg
C	15 N	150 kg
D	150 kg	15 N

5 The table gives the mass and the volume of three objects P, Q and R.

object	mass / g	volume / cm^3
P	23	36
Q	170	720
R	240	340

Which objects can float in a liquid of density 0.85 g / cm^3?

A P and Q only

B P and R only

C Q and R only

D P, Q and R

6 A student measures the length of a spring. She then attaches different weights to the spring. She measures the length of the spring for each weight.

The table shows her results.

weight / N	length / mm
0	520
1.0	524
2.0	528
3.0	533
4.0	537
5.0	540

What is the extension of the spring with a weight of 3.0 N attached to it?

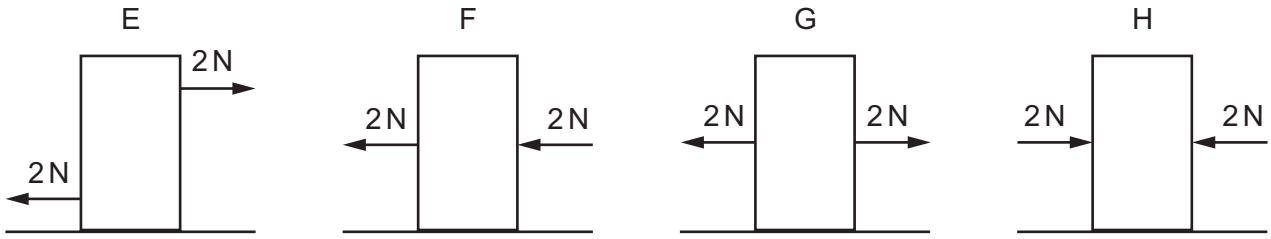
A 4 mm **B** 5 mm **C** 12 mm **D** 13 mm

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7 What is the unit of the moment of a force?

A N **B** N/kg **C** N/m **D** Nm

8 The diagrams show a block of wood on a frictionless surface. In each diagram, the block has two forces acting on its sides.



Which diagrams show the block in equilibrium?

A E, G and H only

B E and F only

C G and H only

D E, F, G and H

9 Brakes are used to slow down a moving car.

Into which form of energy is most of the kinetic energy converted as the car slows down?

A chemical

B elastic

C thermal

D sound

10 What is the unit of thermal energy?

A °C **B** N **C** J **D** W

11 Which source of energy is non-renewable?

A oil

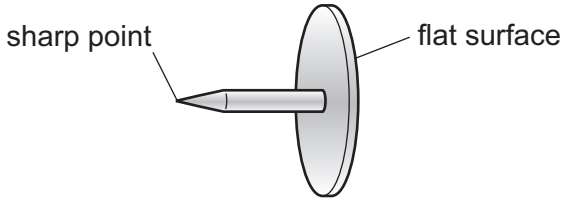
B solar

C tidal

D wind

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12 A drawing pin (thumb tack) has a sharp point at one end and a flat surface at the other end.



The pin is pushed into a wooden board.

How do the pressure and the force at the sharp point compare with the pressure and the force on the flat surface?

	force at the sharp point	pressure at the sharp point
A	greater than on the flat surface	greater than on the flat surface
B	greater than on the flat surface	less than on the flat surface
C	the same as on the flat surface	greater than on the flat surface
D	the same as on the flat surface	less than on the flat surface

13 A metal block of weight *W* rests on a table. In order to calculate the pressure that the block exerts on the table, one other quantity must be known.

What is the other quantity?

A the area of contact between the block and the table

B the density of the block

C the mass of the block

D the volume of the block

14 Which row describes the arrangement and the motion of the molecules in a gas?

	arrangement	motion
A	far apart	move freely
B	far apart	vibrate only
C	tightly packed	move freely
D	tightly packed	vibrate only

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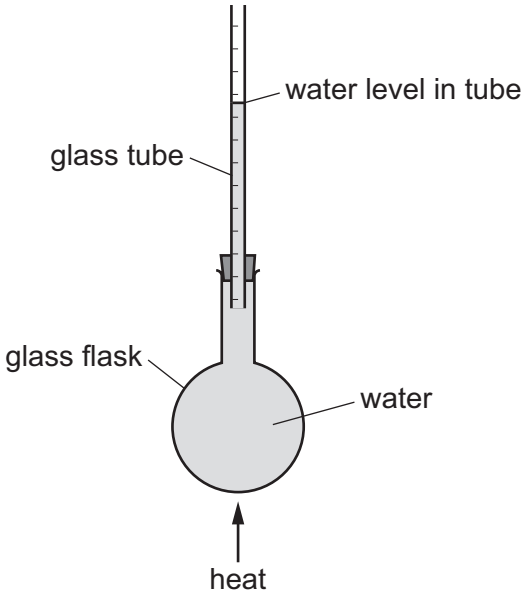
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15 A driver of a car measures the pressure of the air in the tyres. He measures the pressure again after a long journey. The pressure reading has increased.

Which row states what has happened to the speed of the air molecules and the temperature of the air in the tyres?

	speed of molecules	temperature
A	decreases	decreases
B	decreases	increases
C	increases	decreases
D	increases	increases

16 Some water in a glass flask is gently heated.



Why does the water level in the glass tube rise during heating?

A Only the glass flask expands.

B Only the water expands.

C The glass flask expands more than the water.

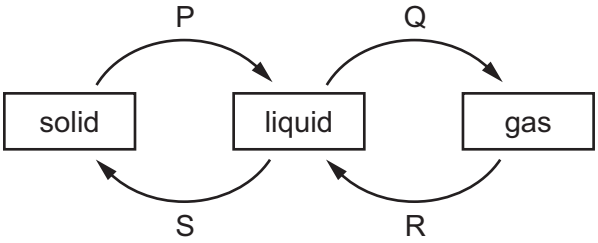
D The water expands more than the glass flask.

17 What is the temperature difference between the fixed points on the °C temperature scale?

A 10 °C **B** 100 °C **C** 110 °C **D** 120 °C

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18 The diagram shows four labelled changes of state between solid, liquid and gas.



Which changes need an energy input?

A P and Q **B** Q and R **C** R and S **D** S and P

19 Which method of thermal transfer occurs when the density of some of a liquid decreases and the liquid moves upwards?

A conduction

B convection

C evaporation

D radiation

20 The diagram shows a tent made from a new material.



What type of material should the tent be made of to reflect the radiant energy from the Sun?

	material texture	material surface colour
A	dull	black
B	dull	white
C	shiny	black
D	shiny	white

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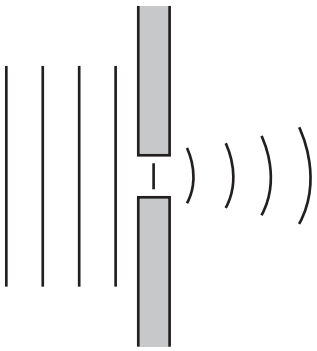
21 Which row correctly describes the vibrations of a transverse wave and also gives a correct example of a transverse wave?

	description of vibration	example of a transverse wave
A	right-angles to the wave direction	sound
B	right-angles to the wave direction	water wave
C	parallel to the wave direction	sound
D	parallel to the wave direction	water wave

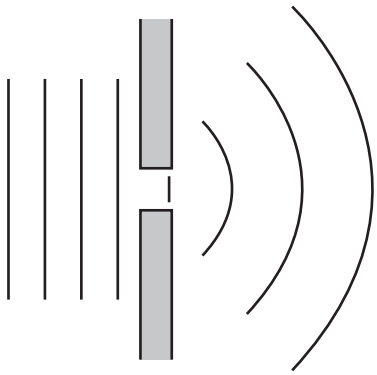
22 Plane water waves approach a narrow gap in a barrier.

Which diagram shows the diffraction pattern that would occur?

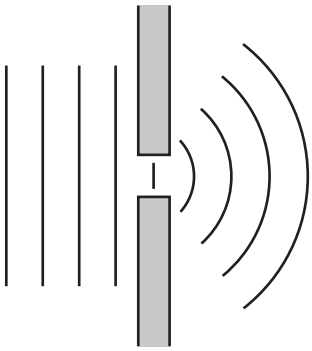
A



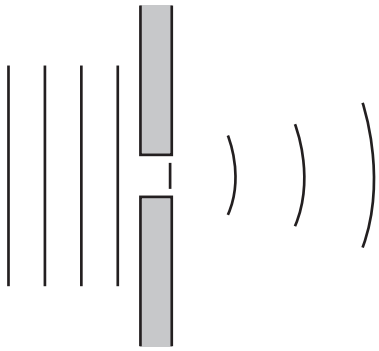
B



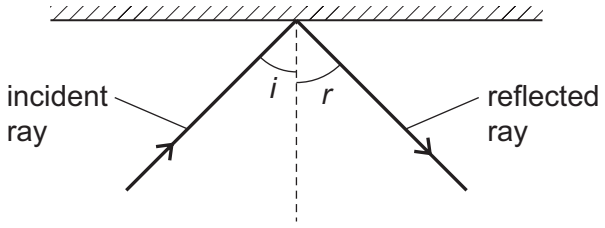
C



D



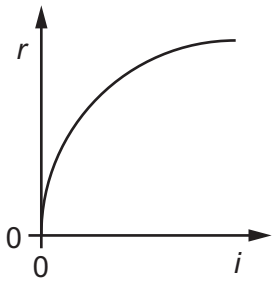
23 A ray of light is incident on a plane mirror. A student measures the angle of incidence *i* and the angle of reflection *r*.



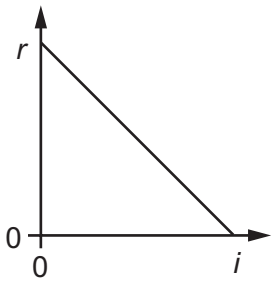
The student varies the angle of incidence and then plots a graph of *r* against *i*.

What does the graph look like?

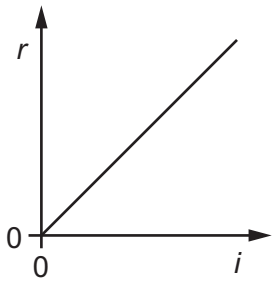
A



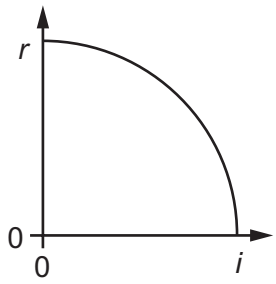
B



C

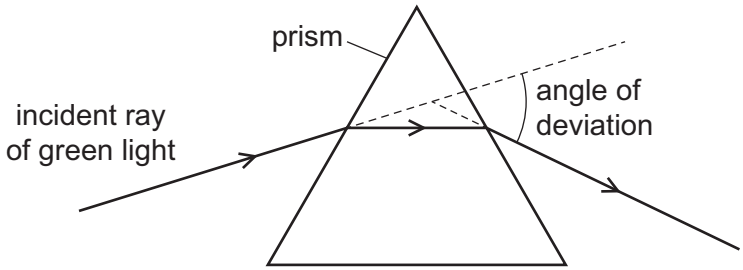


D



24 The diagram shows the path of a ray of green light through a glass prism.

The angle of deviation is the angle between the incident ray and the ray leaving the prism.

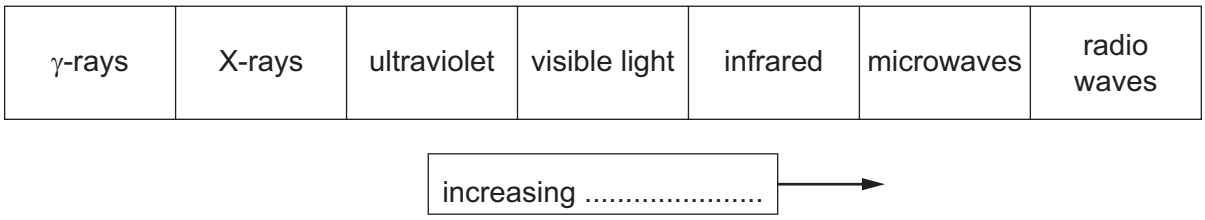


When a ray of white light is incident on the prism, it separates into the colours of the visible spectrum.

What is the name of this effect and which colour of light has the smallest angle of deviation?

	name of effect	colour with smallest angle of deviation
A	diffraction	red
B	diffraction	violet
C	dispersion	red
D	dispersion	violet

25 The diagram shows the electromagnetic spectrum.



A word is missing from the label below the spectrum.

Which word is missing?

A amplitude

B frequency

C speed

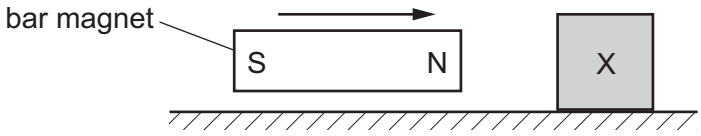
D wavelength

26 A man hears a starting pistol fire 1.5 seconds after he sees a puff of smoke from the pistol. The sound and the smoke are made at the same time. The starting pistol is 450 metres away from the man.

What is the speed of sound calculated from this observation?

A 150 m / s **B** 300 m / s **C** 330 m / s **D** 625 m / s

27 A bar magnet is slowly moved towards an unmagnetised metal object X.



When it is a few centimetres away, the object begins to slide towards the magnet.

Why does this happen?

A X is a non-magnetic material and magnetism is induced in it.

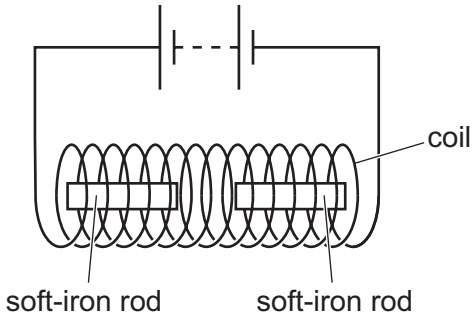
B X is a non-magnetic material and magnetism is not induced in it.

C X is a magnetic material and magnetism is induced in it.

D X is a magnetic material and magnetism is not induced in it.

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28 Two soft-iron rods are placed end-to-end inside a coil. The coil is connected to a battery.



The connections from the battery to the coil are now reversed.

What happens to the soft-iron rods in each case?

	battery connections as shown	battery connections reversed
A	rods attract	rods attract
B	rods attract	rods repel
C	rods repel	rods attract
D	rods repel	rods repel

29 A plastic rod is rubbed with a dry cloth. The rod becomes positively charged.

Why has the rod become positively charged?

A It has gained electrons.

B It has gained neutrons.

C It has lost electrons.

D It has lost neutrons.

30 Which quantity has the same unit as potential difference (p.d.)?

A current

B electromotive force (e.m.f.)

C resistance

D moment of a force

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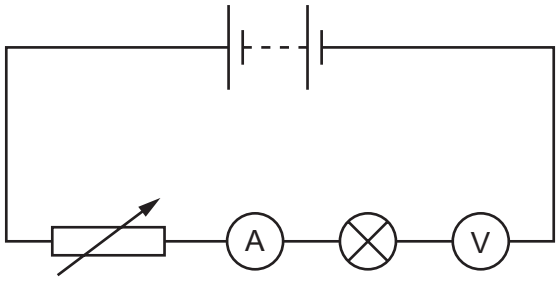
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31 A student determines the resistance of an electric lamp.

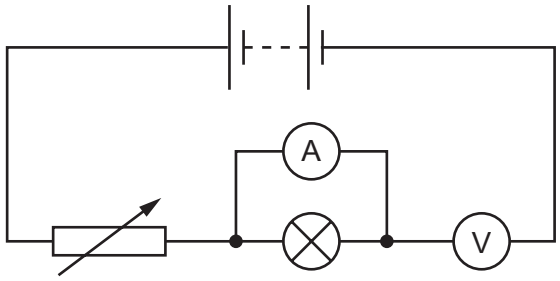
He measures the current in the lamp and the potential difference (p.d.) across it.

Which circuit did he use?

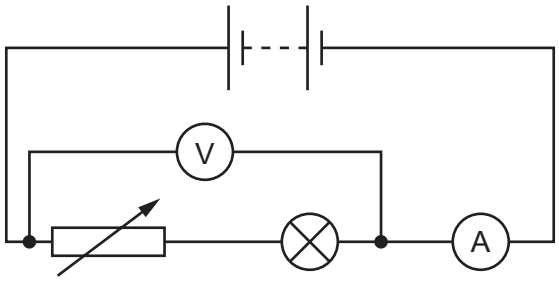
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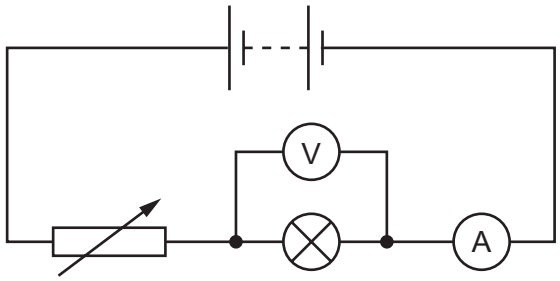
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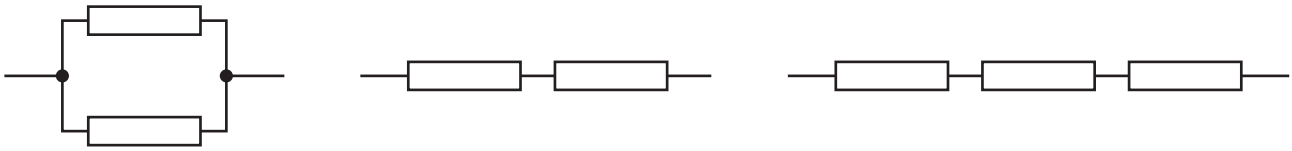
C



D



32 Identical resistors are connected together to form arrangements X, Y and Z.



X Y Z

What is the correct order of the resistances of the arrangements from the largest to the smallest?

A $X \rightarrow Y \rightarrow Z$

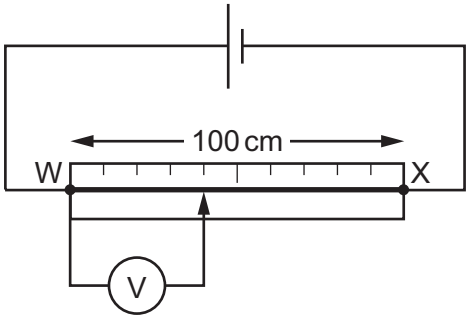
B $Y \rightarrow X \rightarrow Z$

C $Z \rightarrow X \rightarrow Y$

D $Z \rightarrow Y \rightarrow X$

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33 The circuit shows a wire WX connected to a cell.



The potential difference (p.d.) between W and X is 1.5 V.

What is the reading on the voltmeter?

A 0.4 V **B** 0.6 V **C** 0.9 V **D** 4.0 V

34 Where must a fuse be connected in a mains electric circuit?

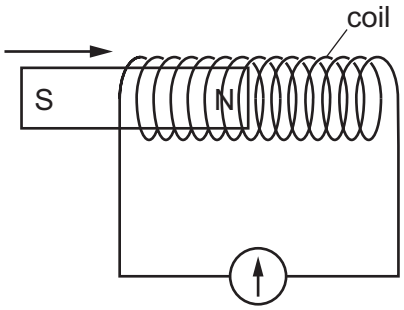
A the earth wire only

B the live wire only

C the neutral wire only

D the live wire and the earth wire

35 The N-pole of a magnet is moved into a coil of wire connected to a galvanometer.



The needle of the galvanometer moves.

Which situation **must** give a smaller galvanometer reading?

A Use a coil with fewer turns and a stronger magnet.

B Use a coil with fewer turns and a weaker magnet.

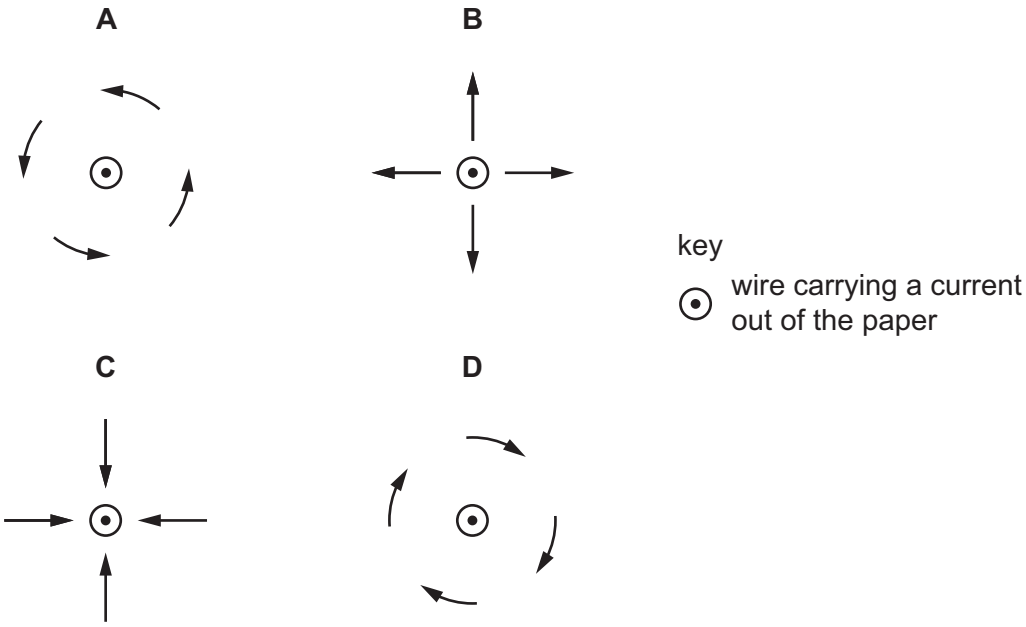
C Use a coil with more turns and a stronger magnet.

D Use a coil with more turns and a weaker magnet.

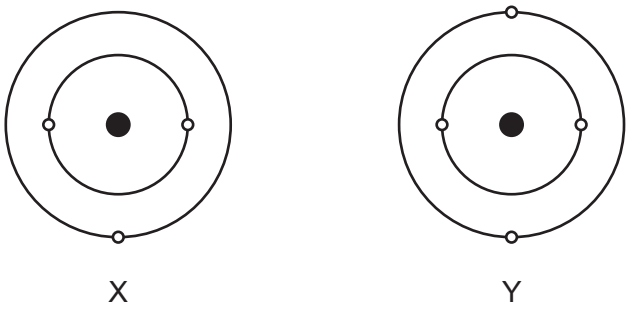
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36 The diagram shows a conductor carrying current in a direction out of the plane of the page.

Which set of arrows represents the direction of the magnetic field due to this current?



37 The diagrams show the simple atomic structure for two neutral atoms X and Y of different elements.



Which row is correct?

	atom with more electrons	atom with a more positively charged nucleus
A	X	X
B	X	Y
C	Y	X
D	Y	Y

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38 A nuclide of chlorine has the symbol shown.

$$^{35}_{17}Cl$$

What is the nucleon number of this nuclide of chlorine?

A 17 **B** 18 **C** 35 **D** 52

39 Which type of radiation can be stopped by a sheet of paper?

A α-particles

B β-particles

C γ-rays

D X-rays

40 Why are some radioactive sources stored in boxes made from lead?

A Lead absorbs emissions from the radioactive sources.

B Lead decreases the half-life of radioactive sources.

C Lead increases the half-life of radioactive sources.

D Lead repels emissions from the radioactive sources.

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