Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

PHYSICS **0625/13**

Paper 1 Multiple Choice (Core) **May/June 2018**

45 minutes

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

9915199420

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).

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

This document consists of **16** printed pages.

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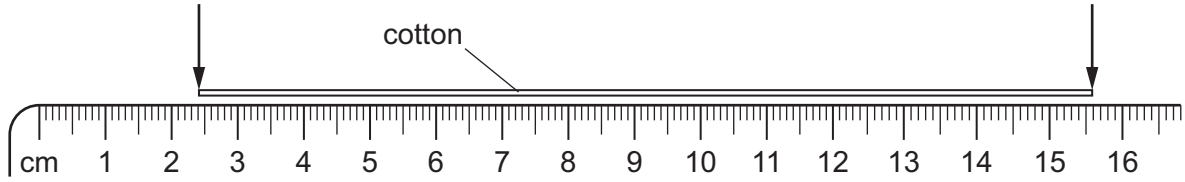
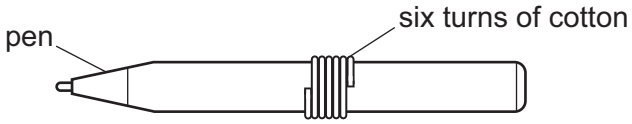
1 A length of cotton is measured between two points on a ruler.



When the length of cotton is wound closely around a pen, it goes round six times.



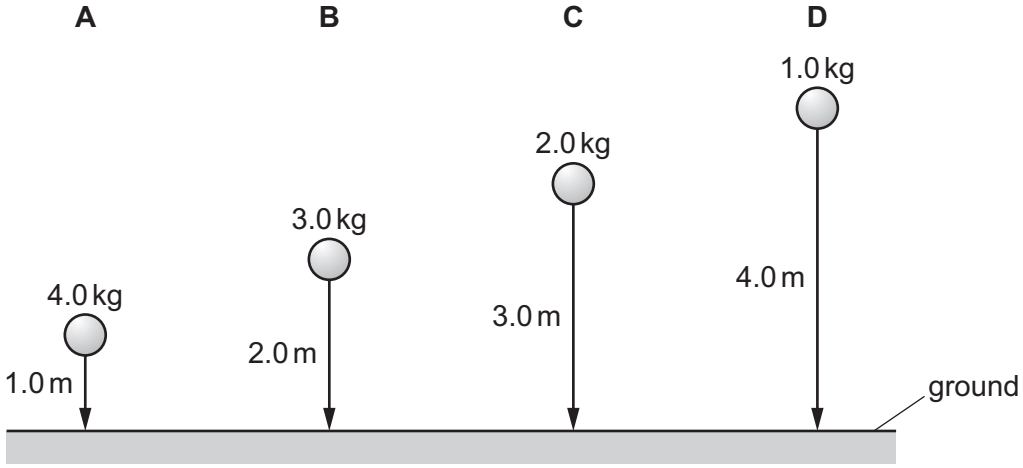
What is the distance once round the pen?

A 2.2 cm **B** 2.6 cm **C** 13.2 cm **D** 15.6 cm

2 Four balls with different masses are dropped from the heights shown.

Air resistance may be ignored.

Which ball has the greatest average speed?



3 A car takes 15 minutes to travel along a road that is 20 km long.

What is the average speed of the car?

A 0.75 km / h **B** 5.0 km / h **C** 80 km / h **D** 300 km / h

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4 A person steps onto a bathroom scales.

The bathroom scales records both mass and weight.

Which row shows the readings on the scales?

	mass	weight
A	60 N	600 kg
B	60 kg	600 N
C	600 kg	60 N
D	600 N	60 kg

5 Which properties of an object can be changed by a force?

A direction of motion, mass and speed

B direction of motion, shape and speed

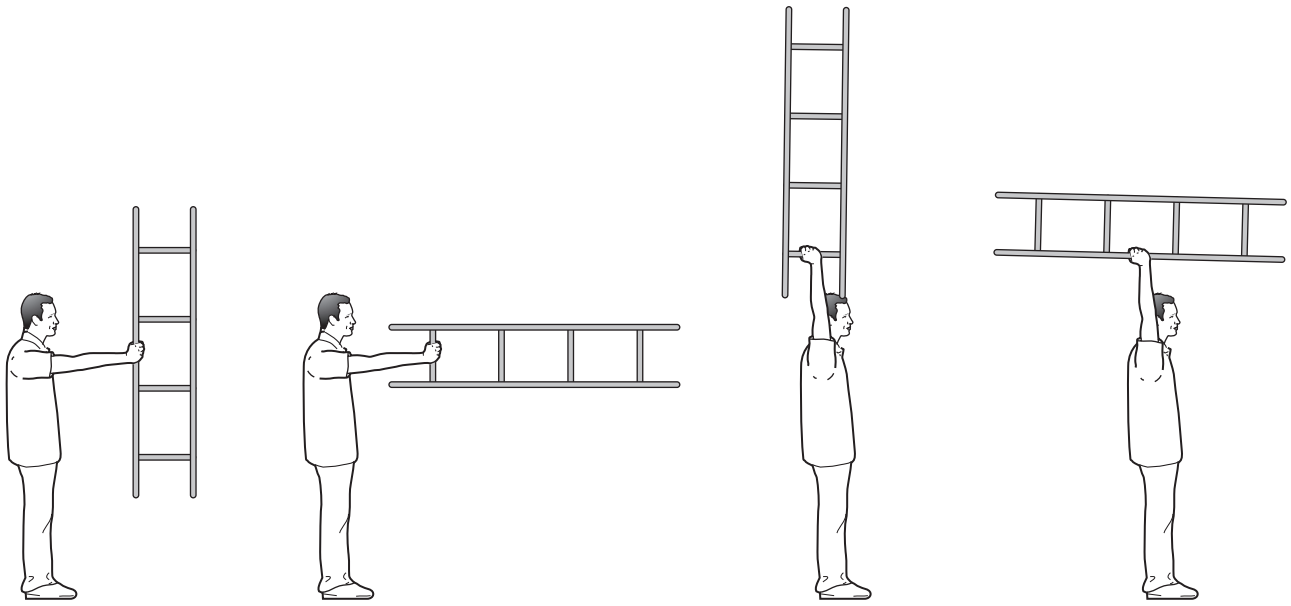
C direction of motion and speed only

D mass, shape and speed

6 A man holds a ladder in four different positions, pivoting around his shoulder.

The weight of the ladder causes a moment about the man's shoulder.

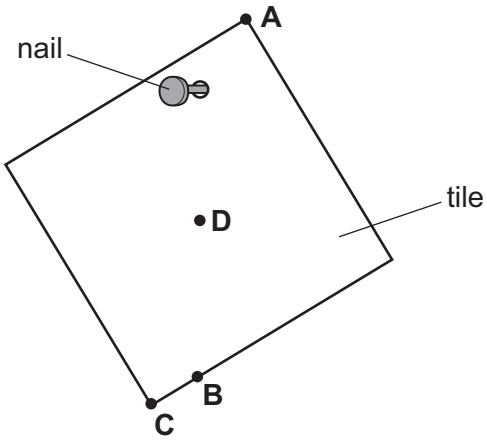
In which position is the moment greatest?



A **B** **C** **D**

7 A hole is drilled in a square tile. The diagram shows the tile hanging freely on a nail.

Where is the centre of mass of the tile?



8 Which method of drying clothes has the least impact on the environment?

A Evaporate the water in them in an electrically heated tumble dryer.

B Hang them on a washing line in direct sunlight.

C Remove the water from them in an electric spin dryer.

D Suspend them close to a coal fire.

9 A student does work by pulling a box across a horizontal floor.

She now pulls a second box along the same floor.

Which row indicates that the student is now doing twice as much work?

	force used to pull box	distance the box is pulled
A	is doubled	is doubled
B	is doubled	is halved
C	stays the same	is doubled
D	stays the same	is halved

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10 A simple barometer includes a column of mercury.

Which property of this column of mercury is used to give a measurement of atmospheric pressure?

A its cross-sectional area

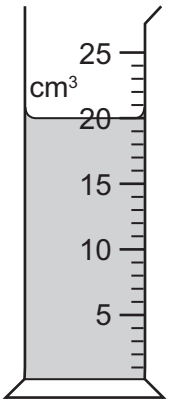
B its height

C its temperature

D its thermal capacity

11 The diagram shows some liquid in a measuring cylinder.

The mass of the liquid is 16 g.



What is the density of the liquid?

A $0.80\,g/cm^3$ **B** $1.25\,g/cm^3$ **C** $36\,g/cm^3$ **D** $320\,g/cm^3$

12 Brownian motion of particles is observed.

Which statements describe the movement of the particles?

1 The particles all travel along a curved path.

2 The particles move randomly.

3 The particles all travel in the same direction.

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

13 A pure liquid is left in an open beaker and some of the liquid molecules escape by evaporation.

Which statement about this process is correct?

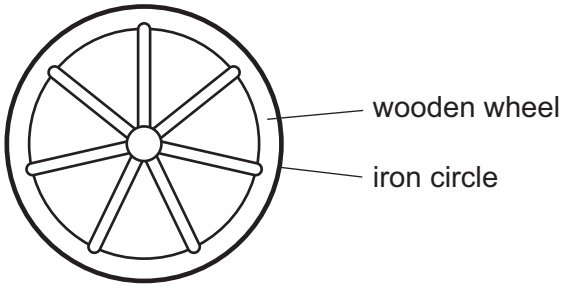
A None of the escaping molecules return to the liquid.

B The escaping molecules are generally the more energetic ones.

C The rate of escape of the molecules can be increased by increasing the depth of the liquid in the beaker.

D The temperature of the remaining liquid is unaffected by the escape of the molecules.

14 A wooden wheel can be strengthened by putting a tight circle of iron around it.



Which action would make it easier to fit the circle over the wood?

A cooling the iron circle

B heating the iron circle

C heating the wooden wheel and cooling the iron circle

D heating the wooden wheel but not heating or cooling the iron circle

15 A student wishes to calibrate a mercury-in-glass thermometer with a °C scale.

Which values should she use for the lower fixed point and for the upper fixed point?

	lower fixed point	upper fixed point
A	melting point of ice	boiling point of mercury
B	melting point of ice	boiling point of water
C	melting point of mercury	boiling point of mercury
D	melting point of mercury	boiling point of water

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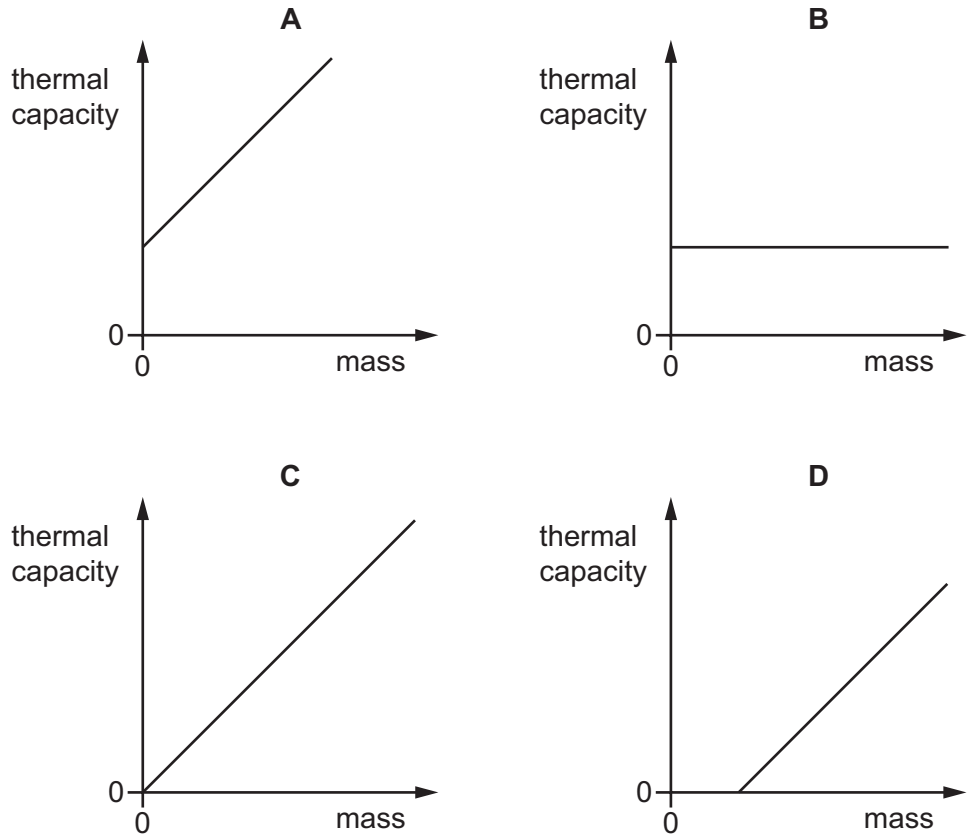
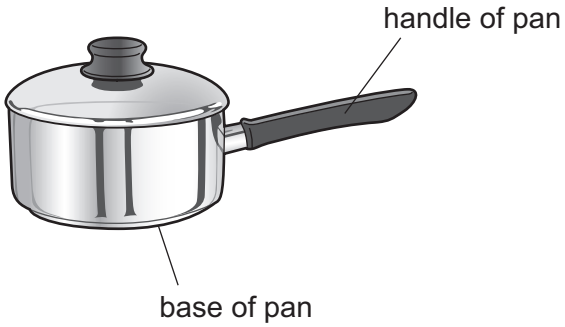
16 Which diagram shows how the thermal capacity of a silver object depends on its mass?



17 The diagram shows a pan used for cooking food.



Which row is correct for the materials used to make the base and the handle of the pan?

	base of pan	handle of pan
A	good thermal conductor	good thermal conductor
B	good thermal conductor	poor thermal conductor
C	poor thermal conductor	good thermal conductor
D	poor thermal conductor	poor thermal conductor

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[Turn over

18 A saucepan of water is heated from its base on an electric hob.

After five minutes the water near the top of the saucepan is becoming hot.

What is the main process of heat transfer within the water?

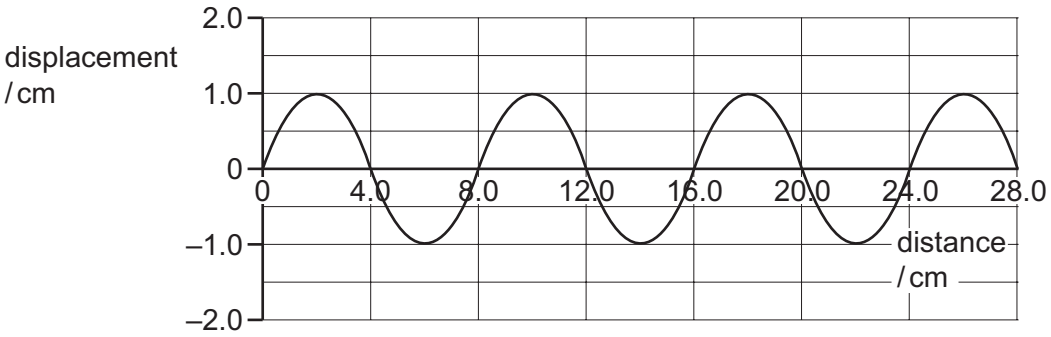
A condensation

B conduction

C convection

D radiation

19 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

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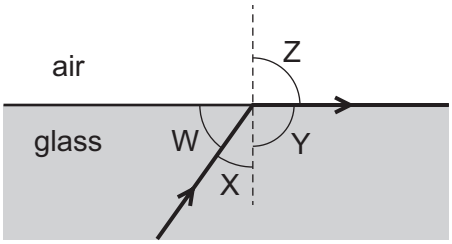
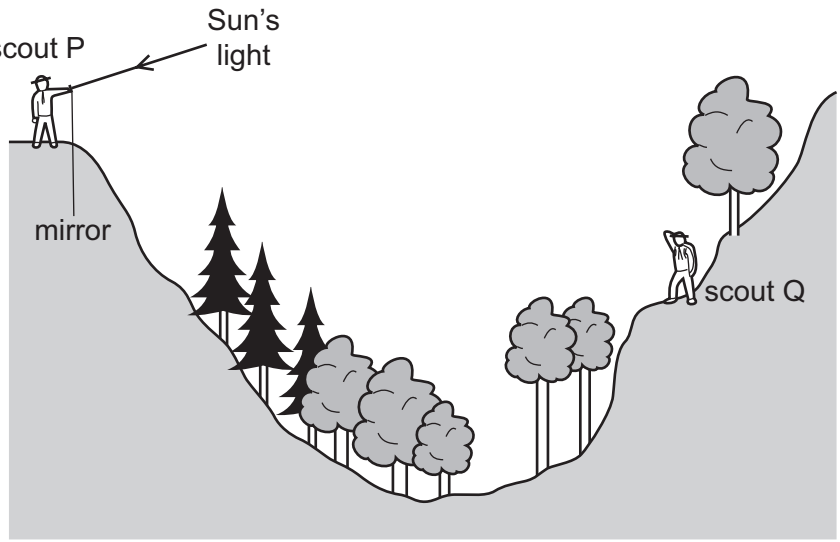
20 The diagram shows a ray of light passing from glass to air, at the critical angle.



Which angles are the angle of incidence and the angle of refraction?

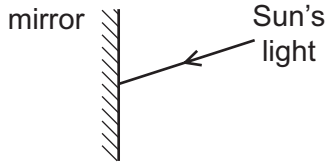
	angle of incidence	angle of refraction
A	W	Y
B	W	Z
C	X	Y
D	X	Z

21 Scout P signals to scout Q on the other side of a valley by using a mirror to reflect the Sun's light.

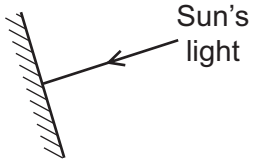


Which mirror position allows the Sun's light to be reflected to scout Q?

A

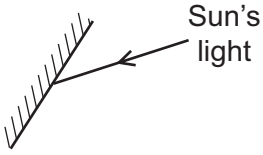


B



C

D



22 It takes 0.24 seconds for a microwave signal to travel from a transmitting station on Earth to a satellite and then back to the station on Earth. Microwaves travel at 3.0×10^8 m/s.

How far is the transmitting station from the satellite?

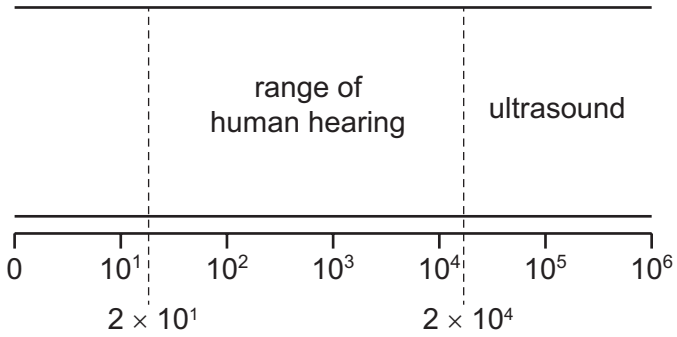
A 36 000 km

B 72 000 km

C 36 000 000 km

D 72 000 000 km

23 The diagram shows the ranges of human hearing and of ultrasound waves.



To which characteristic of sound waves do the numbers on the diagram refer?

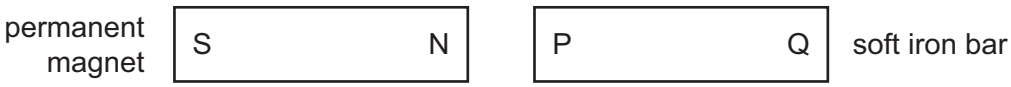
A amplitude in cm

B frequency in Hz

C speed in metres / second

D wavelength in metres

24 A permanent magnet is placed close to a bar of soft iron.



What are the polarities of end P and of end Q?

	end P	end Q
A	N	N
B	N	S
C	S	N
D	S	S

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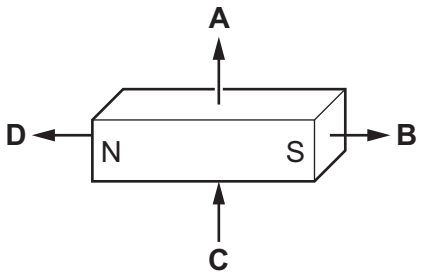
25 The diagram shows a permanent bar magnet placed on a wooden table. A student draws arrows to show the direction of the magnetic field at four points.

Which arrow shows the direction of the magnetic field at that position?



26 Which statement about electric charges is correct?

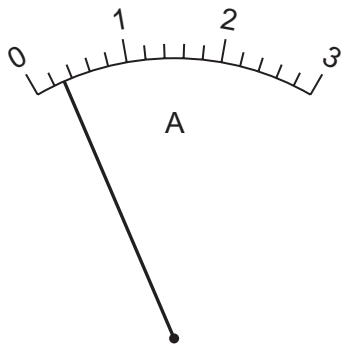
A Like charges attract and unlike charges attract.

B Like charges attract and unlike charges repel.

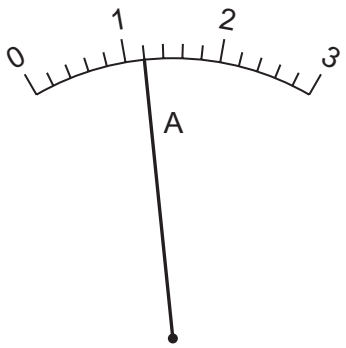
C Like charges repel and unlike charges attract.

D Like charges repel and unlike charges repel.

27 The diagrams show two readings on the same ammeter. Reading 1 is taken before the ammeter is connected in a circuit. Reading 2 shows the reading when the ammeter is connected in a circuit.



reading 1
not connected in a circuit



reading 2
connected in a circuit

What is the current in the circuit?

A 0.80 A **B** 0.90 A **C** 0.95 A **D** 1.20 A

28 A student measures the potential difference across a device and the current in the device.

Which calculation gives the resistance of the device?

A current + potential difference

B current ÷ potential difference

C potential difference ÷ current

D potential difference × current

29 A battery in an electric circuit is connected to a lamp.

Chemical energy in the battery is transferred to which other types of energy?

A internal energy only

B kinetic energy and sound energy

C light energy and thermal energy

D light energy only

30 Which component is represented by the symbol shown?

A fixed resistor

B fuse

C thermistor

D variable resistor

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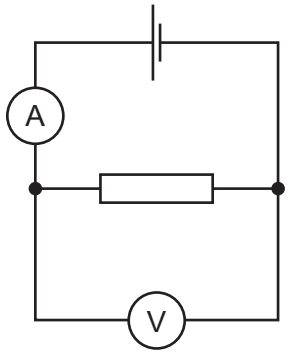
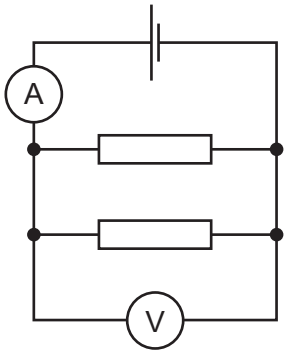
31 A student sets up a circuit which she calls circuit 1. She records the value of the current I_1, and calculates the resistance R_1 of the circuit.



circuit 1



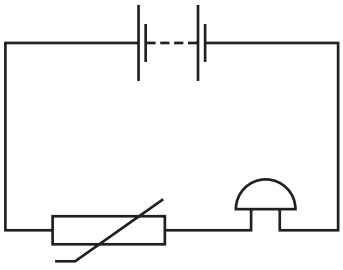
circuit 2

She then connects an identical resistor in parallel with the original resistor. She calls this circuit 2. She records current I_2 and calculates the total resistance R_2 of this circuit.

Which row correctly compares the two currents and the two resistances in the circuits?

	I_2	R_2
A	greater than I_1	greater than R_1
B	greater than I_1	less than R_1
C	less than I_1	greater than R_1
D	less than I_1	less than R_1

32 A student sets up this circuit.



What is the purpose of the circuit?

A to allow a lamp to be made dimmer or brighter as required

B to amplify the sound of a voice

C to light a lamp in the dark

D to sound a bell when the temperature rises

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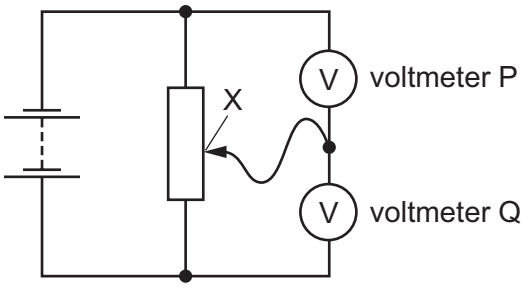
[Turn over

33 The diagram shows two voltmeters P and Q connected to a potential divider.

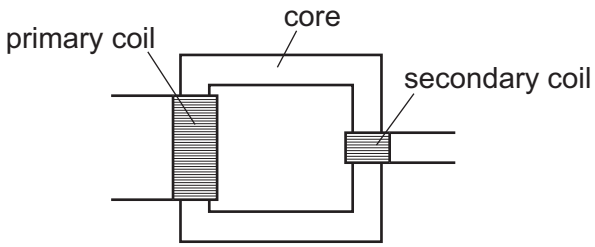


The sliding connection at point X is moved towards the top of the diagram.

What happens to the reading on P and to the reading on Q?

	reading on P	reading on Q
A	decreases	decreases
B	decreases	increases
C	increases	decreases
D	increases	increases

34 The diagram shows a transformer.



Which materials are the most suitable for the core and for the coils?

	core material	coil material
A	copper	copper
B	copper	iron
C	iron	copper
D	iron	iron

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35 A current-carrying conductor placed in a magnetic field experiences a force.

Which changes result in reversing the direction of the force?

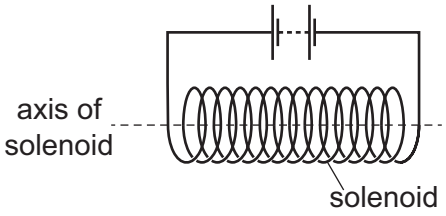
A Decrease the current, keeping the field direction constant.

B Increase the current and reverse the field direction.

C Increase the current, keeping the field direction constant.

D Reverse the current and reverse the field direction.

36 A solenoid is connected to a battery.



Which statement about the magnetic field at the centre of the solenoid is correct?

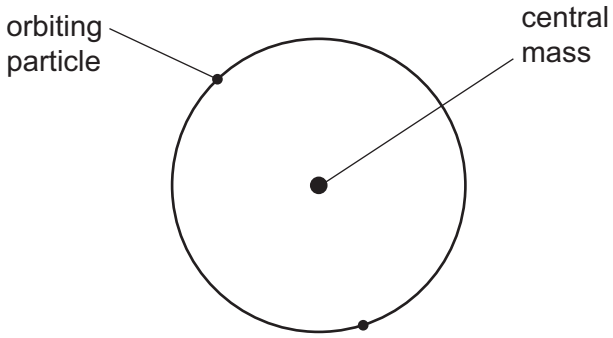
A The magnetic field along the axis is zero.

B The direction of the magnetic field is at an angle of 45° to the axis.

C The direction of the magnetic field is parallel to the axis.

D The direction of the magnetic field is perpendicular to the axis.

37 In the atomic model, an atom consists of a central mass, orbited by much smaller particles.



What is the name of the central mass and of the orbiting particles?

	central mass	orbiting particles
A	neutron	α-particles
B	neutron	electrons
C	nucleus	α-particles
D	nucleus	electrons

38 One isotope of lead is represented by the nuclide symbol $^{214}_{82}Pb$.

How many neutrons and how many protons does one nucleus of this isotope contain?

	number of neutrons	number of protons
A	82	132
B	82	214
C	132	82
D	214	82

39 Three sources of background radiation are listed.

1 cosmic rays

2 medical X-rays

3 radioactive emissions from radon gas from the ground

Which of these sources are naturally occurring?

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

40 The rates of emission from four radioactive sources are measured at 20 minute intervals.

Each row in the table shows the results for one of the radioactive sources.

Which source has the longest half-life?

	rate of emission / emissions per minute		
	time 0	time 20 min	time 40 min
A	120	60	30
B	120	110	101
C	240	60	15
D	240	170	122

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