Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

PHYSICS **0625/11**

Paper 1 Multiple Choice (Core) **October/November 2017**

45 minutes

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

* 2 7 2 9 5 9 7 8 5 0 *

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 **19** printed pages and **1** blank page.

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1 A student measures the volume of a cork.

He puts some water into a measuring cylinder and then one glass ball. He puts the cork and then a second, identical glass ball into the water as shown.

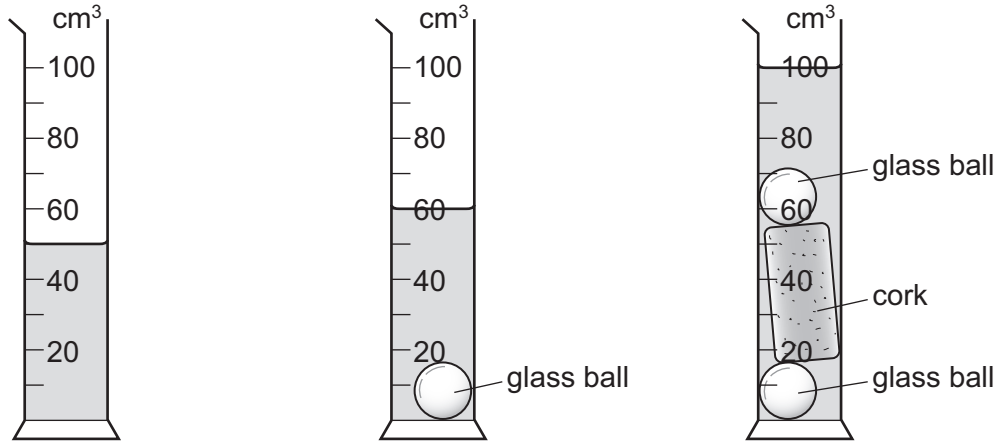


diagram 1 diagram 2 diagram 3

Diagram 1 shows the first water level.

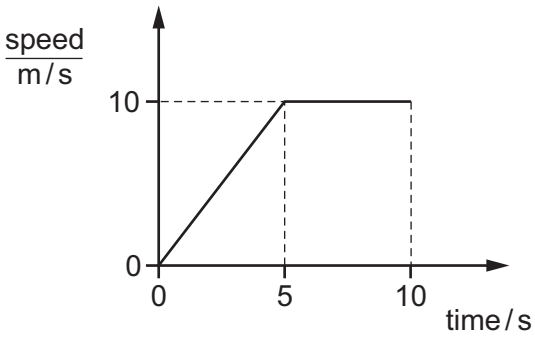
Diagram 2 shows the water level after one glass ball is added.

Diagram 3 shows the water level after the cork and the second glass ball are added.

What is the volume of the cork?

A 30 cm^3 **B** 40 cm^3 **C** 50 cm^3 **D** 100 cm^3

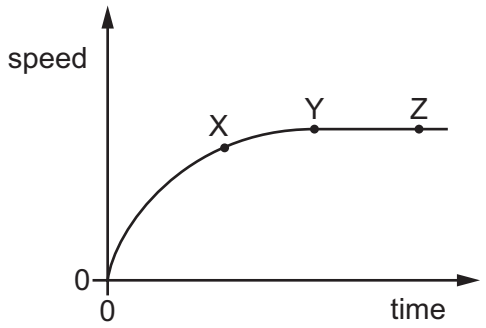
2 The graph shows how the speed of a car varies over a period of 10 s.



How far does the car travel during the 10 s?

A 10 m **B** 50 m **C** 75 m **D** 100 m

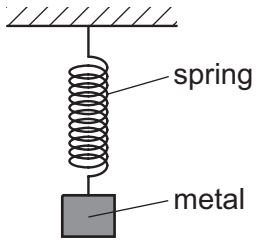
3 The diagram shows how the speed of a falling object changes with time.



Which row describes the motion of the object between X and Y, and between Y and Z?

	between X and Y	between Y and Z
A	accelerating	at rest
B	accelerating	constant speed
C	decelerating	at rest
D	decelerating	constant speed

4 A spring is stretched by hanging a piece of metal from it.



Which name is given to the force that stretches the spring?

A friction

B mass

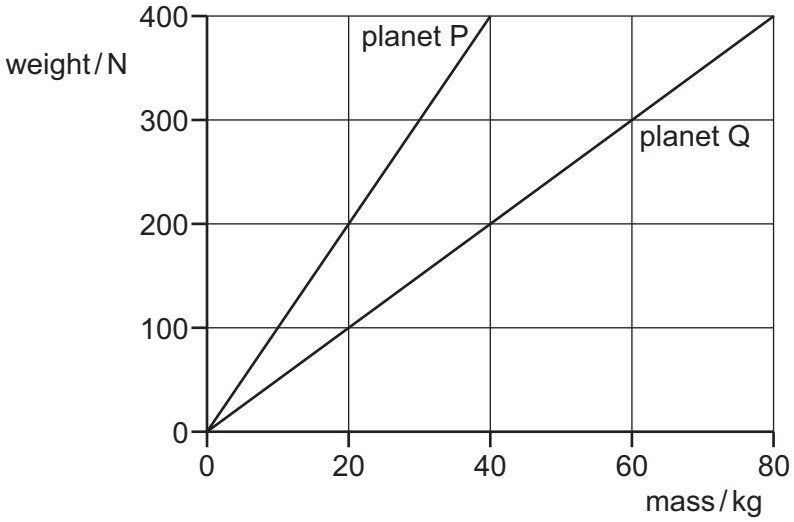
C pressure

D weight

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[Turn over

5 The graph shows how weight varies with mass on planet P and on planet Q.



An object weighs 400 N on planet P. The object is taken to planet Q.

Which row is correct?

	mass of object on planet Q / kg	weight of object on planet Q / N
A	40	200
B	40	400
C	80	200
D	80	400

6 What is needed to determine the density of a regularly shaped block?

A a balance and a beaker

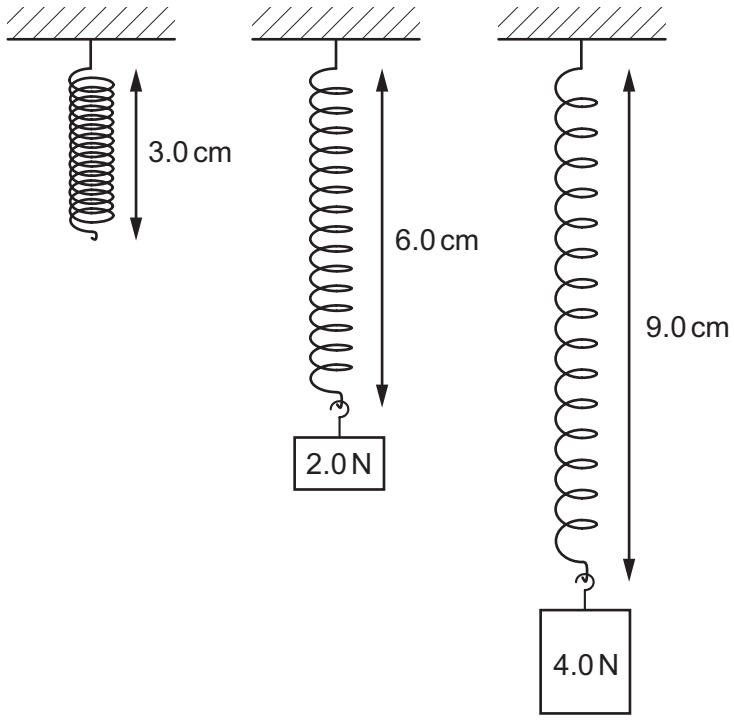
B a balance and a ruler

C a measuring cylinder and a beaker

D a measuring cylinder and a ruler

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7 A student conducts an experiment by hanging different loads on a spring. The diagrams show the lengths of the spring with different loads.



Which row gives the correct extensions of the spring?

	extension / cm		
	0 N	2.0 N	4.0 N
A	0	3.0	3.0
B	0	3.0	6.0
C	3.0	3.0	3.0
D	3.0	6.0	9.0

8 A car mechanic is trying to loosen a wheel nut. He applies a force to the end of a spanner (wrench) at right-angles to the spanner.

Which method provides the largest turning effect on the nut?

A applying double the force to a spanner that is half as long

B applying double the force to a spanner that is twice as long

C applying double the force to the same spanner

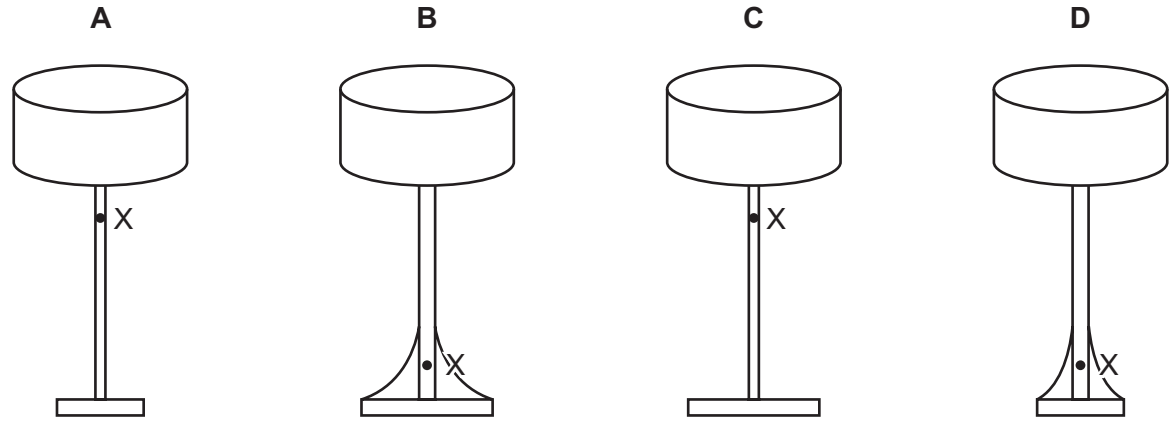
D applying the same force to a spanner that is twice as long

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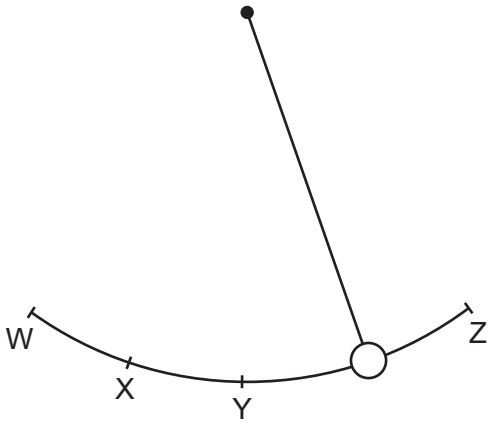
[Turn over

9 The diagrams show four table lamps resting on a table. The position of the centre of mass of each lamp is labelled X.

Which lamp is the most stable?



10 A pendulum bob swings from W, through points X and Y, to Z and then back to W.



Which statement is correct?

A The gravitational potential energy of the bob is smallest at W.

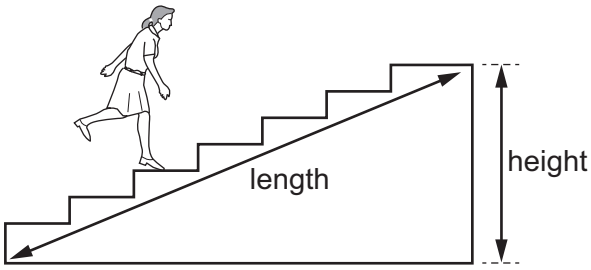
B The gravitational potential energy of the bob is smallest at X.

C The gravitational potential energy of the bob is smallest at Y.

D The gravitational potential energy of the bob is the same at all points of the swing.

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11 A student runs up a flight of stairs.



Which information is **not** needed to calculate the rate at which the student is doing work against gravity?

A the height of the flight of stairs

B the length of the flight of stairs

C the time taken to run up the stairs

D the weight of the student

12 What is a manometer used to determine?

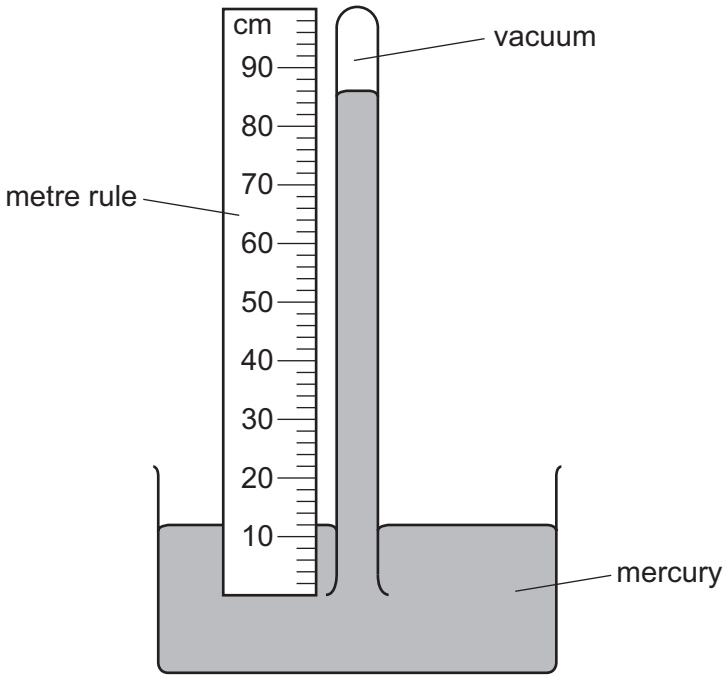
A the difference between two densities

B the difference between two forces

C the difference between two heights

D the difference between two pressures

13 The diagram shows a simple mercury barometer.



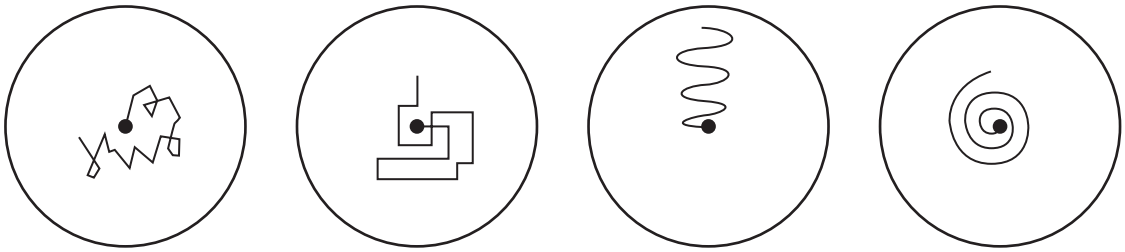
Which length is used to find the value of atmospheric pressure?

A 12 cm **B** 74 cm **C** 86 cm **D** 100 cm

14 A pollen grain in a beaker of still water is viewed through a microscope.

Which diagram shows the most likely movement of the pollen grain?

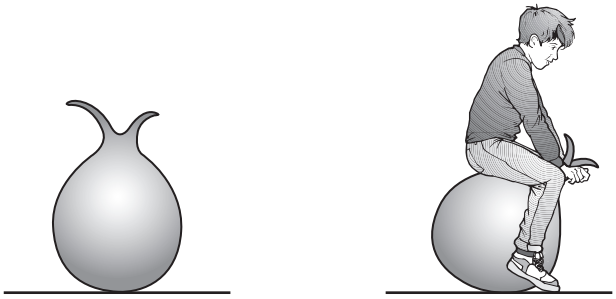
A **B** **C** **D**



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15 The diagram shows an air-filled rubber toy. A child sits on the toy and its volume decreases.

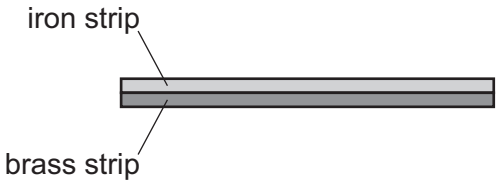
The temperature of the air in the toy does not change.



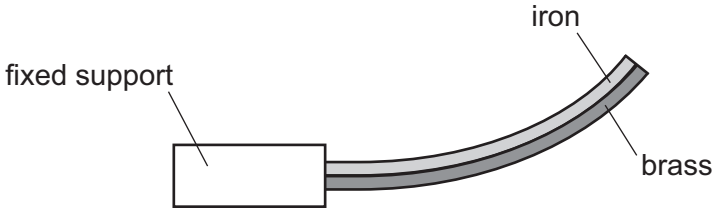
How does the air pressure in the toy change and why?

	pressure	reason
A	decreases	air molecules move more slowly
B	decreases	air molecules strike the rubber less frequently
C	increases	air molecules move more quickly
D	increases	air molecules strike the rubber more frequently

16 A strip of iron and a strip of brass are firmly attached to each other along their entire length. This combination is a bimetallic strip.



This bimetallic strip is heated and it bends as shown.



The bimetallic strip is now cooled and becomes straight again.

What causes the bimetallic strip to become straight again?

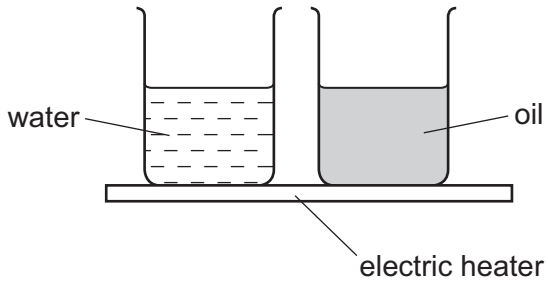
A The brass contracts more than the iron.

B The brass expands more than the iron.

C The iron contracts more than the brass.

D The iron expands more than the brass.

17 The diagram shows an electric heater being used to heat a beaker of water and an identical beaker containing oil. Both are heated for one minute.



The temperature of the water and the temperature of the oil increase steadily. The increase in temperature of the oil is much greater than that of the water.

Why is this?

A Oil has a higher boiling point than water.

B Oil has a lower boiling point than water.

C The oil has a larger thermal capacity than the water.

D The oil has a smaller thermal capacity than the water.

18 The air temperature in a cold room is 15 °C.

A heater that contains water at 50 °C is used to heat the room.

By which process is most of the thermal energy transferred throughout the air in the room?

A conduction

B convection

C evaporation

D radiation

19 Which statement about convection currents is correct?

A Convection currents occur because, when cooled, liquids contract and become more dense.

B Convection currents occur because, when warmed, liquids expand and become more dense.

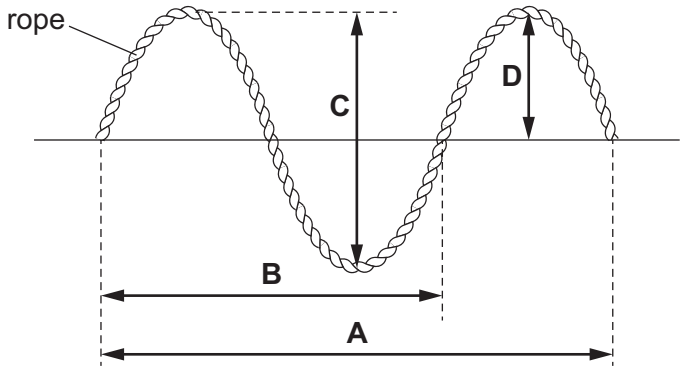
C Convection currents only occur in liquids.

D Convection currents only occur in solids and liquids.

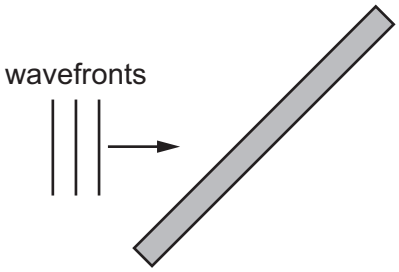
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20 The diagram represents a wave travelling along a rope.

Which labelled arrow indicates the wavelength of the wave?

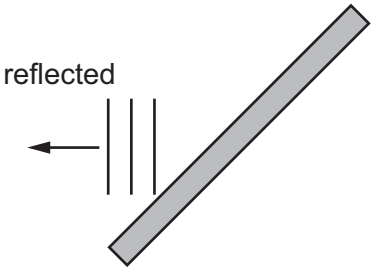


21 The diagram represents plane wavefronts of a water wave about to strike a solid barrier.

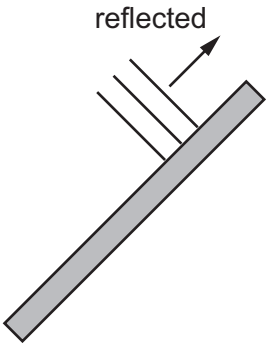


Which diagram shows the position of the wavefronts after reflection at the barrier?

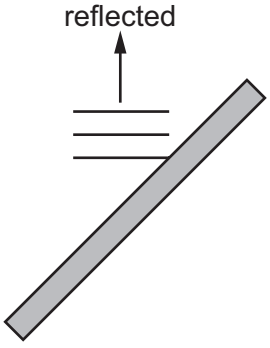
A



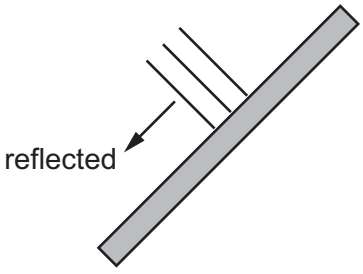
B



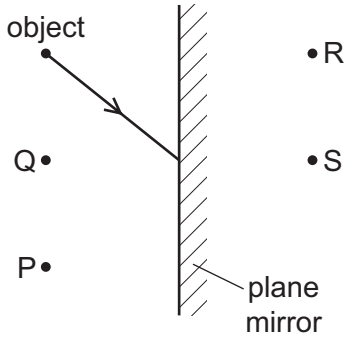
C



D



22 The diagram shows an object in front of a plane mirror. A ray of light from the object is incident on the mirror.

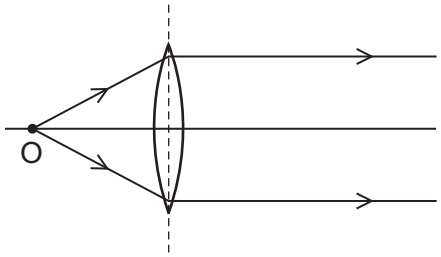


Through which point does the reflected ray pass, and at which point is the image of the object formed?

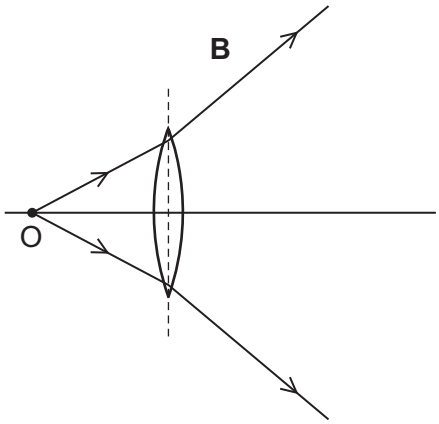
	point through which reflected ray passes	point at which image is formed
A	P	R
B	P	S
C	Q	R
D	Q	S

23 Which ray diagram shows a converging lens forming a real image of a small object O?

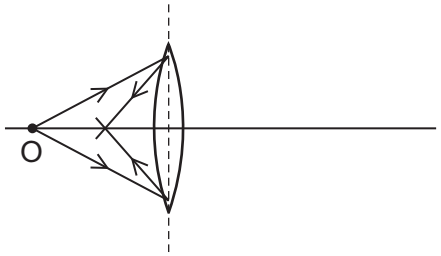
A



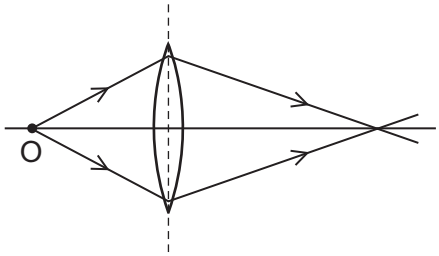
B



C



D



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24 Visible light, X-rays and microwaves are all components of the electromagnetic spectrum.

Which statement about the waves is correct?

A In a vacuum, microwaves travel faster than visible light and have a shorter wavelength.

B In a vacuum, microwaves travel at the same speed as visible light and have a shorter wavelength.

C In a vacuum, X-rays travel faster than visible light and have a shorter wavelength.

D In a vacuum, X-rays travel at the same speed as visible light and have a shorter wavelength.

25 Space is a vacuum. Waves from stars are used to reveal information about the stars.

Which type of waves do **not** reveal information about stars?

A infra-red

B radio waves

C ultrasound

D γ-rays

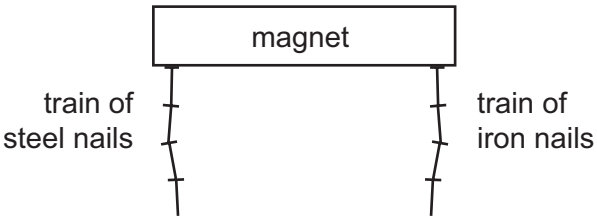
26 A student stands 180 m in front of a vertical, flat cliff and bangs together two pieces of wood to make a short, loud sound.

A timer records the echo of the sound 1.5 seconds after the pieces of wood are banged together.

Based on this result, what is the speed of sound?

A 120 m / s **B** 240 m / s **C** 270 m / s **D** 540 m / s

27 A train of steel nails and a train of iron nails hang from a strong magnet.



The trains are then carefully removed from the magnet.

What happens to the trains?

A Both trains fall apart.

B Both trains stay together.

C Only the train of iron nails falls apart.

D Only the train of steel nails falls apart.

28 The north pole of a bar magnet is placed in turn next to each end of a rod X. One end of the rod moves away from the north pole but the other end moves towards the north pole.

The experiment is repeated with the bar magnet and a different rod Y but this time both ends of the rod move towards the north pole.

From which materials could the rods X and Y be made?

	rod X	rod Y
A	soft iron	copper
B	soft iron	soft iron
C	steel	copper
D	steel	soft iron

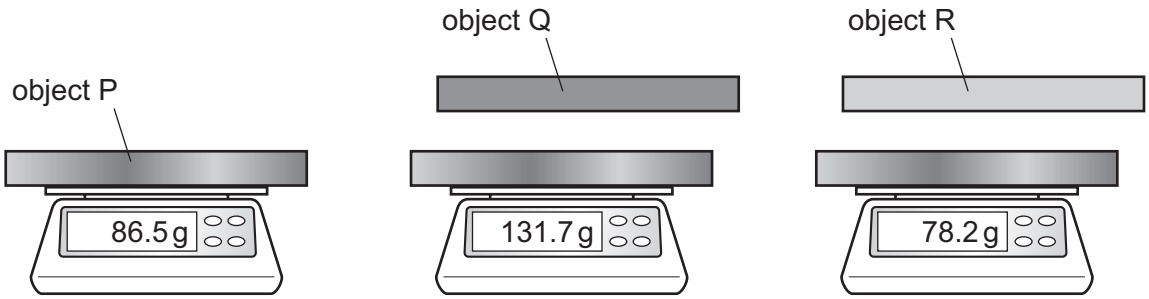
29 A student investigates the electrostatic charges on three objects P, Q and R.

The student places object P on the insulated pan of a balance and notes the reading on the balance.

The student then holds object Q a small distance above object P and notes the reading on the balance.

Finally, the student holds object R the small distance above object P and notes the reading on the balance.

The student's observations are shown.



Which row gives possible charges that explain these observations?

	charge on P	charge on Q	charge on R
A	negative	positive	negative
B	negative	negative	negative
C	positive	positive	negative
D	positive	negative	positive

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30 Which equation is used to calculate resistance?

A resistance = p.d. + current

B resistance = p.d. – current

C resistance = p.d. × current

D resistance = p.d. ÷ current

31 A student connects a circuit with a power supply, a lamp and an ammeter.

Where must the ammeter be connected?

A in parallel with the lamp to measure current in the lamp

B in parallel with the lamp to measure potential difference across the lamp

C in series with the lamp to measure current in the lamp

D in series with the lamp to measure potential difference across the lamp

32 Two 3.0 Ω resistors are connected in parallel.

Which statement about their combined resistance is correct?

A The combined resistance is less than 3.0 Ω.

B The combined resistance is 3.0 Ω.

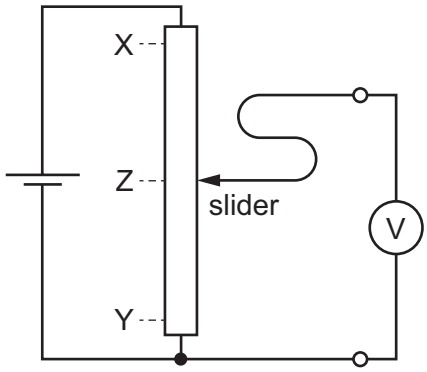
C The combined resistance is more than 3.0 Ω but less than 6.0 Ω.

D The combined resistance is 6.0 Ω.

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[Turn over

33 The diagram shows a potential divider circuit.

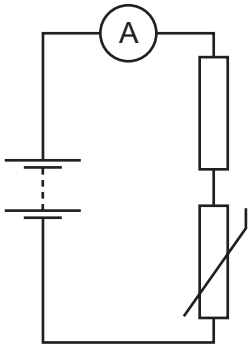


How does the movement of the slider affect the voltmeter reading?

	movement of slider	voltmeter reading
A	Z to X	falls to zero
B	Z to X	increases
C	Z to Y	falls to zero
D	Z to Y	increases

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34 The diagram shows a circuit with a fixed resistor connected in series with a thermistor and an ammeter.



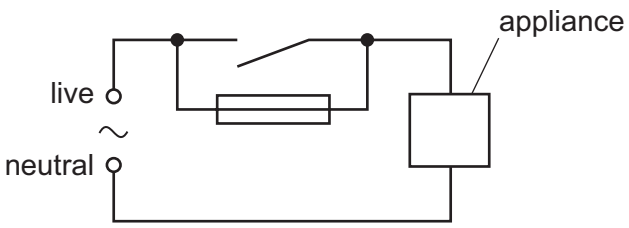
Which row shows how temperature change affects the resistance of the thermistor and the current in the circuit?

	temperature	resistance of thermistor	current in circuit
A	decreases	decreases	increases
B	decreases	increases	decreases
C	increases	decreases	decreases
D	increases	increases	increases

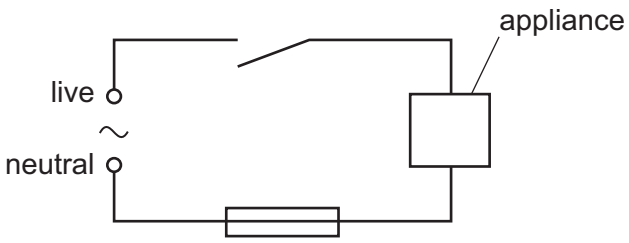
35 An appliance is connected to a mains supply. Its circuit also contains a switch and a fuse.

Which circuit shows the fuse in the correct position?

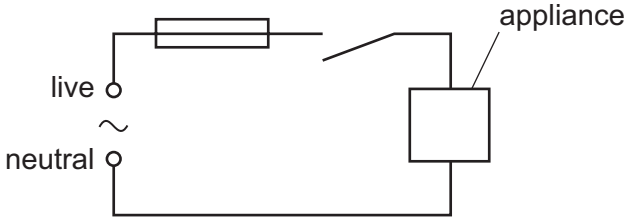
A



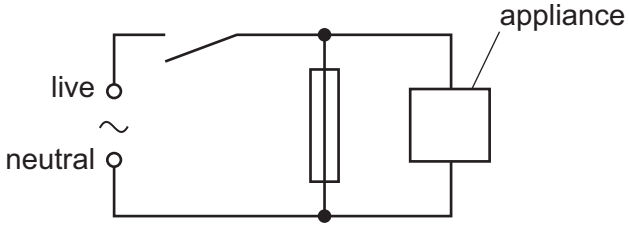
B



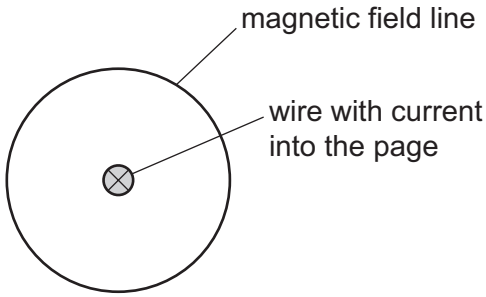
C



D



36 There is an electric current in a straight wire in the direction into the page. This produces a magnetic field around the wire. All the field lines are circles but only one field line is shown.



Which row describes the magnetic field?

	direction of the field lines	spacing of the field lines
A	anti-clockwise	evenly spaced over the whole field
B	anti-clockwise	more widely spaced further from the wire
C	clockwise	evenly spaced over the whole field
D	clockwise	more widely spaced further from the wire

37 A wire carrying a current is placed in a magnetic field. The wire experiences a force due to the field.

Which action does **not** change the direction of the force?

A increasing the current and reversing the field direction

B increasing the current, keeping the field direction constant

C reversing the current and increasing the field strength

D reversing the current, keeping the field direction constant

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38 Different isotopes of chlorine are represented as $^{35}_{17}Cl$ and $^{37}_{17}Cl$.

They behave the same way chemically.

Why is this?

A They have the same nuclide notation.

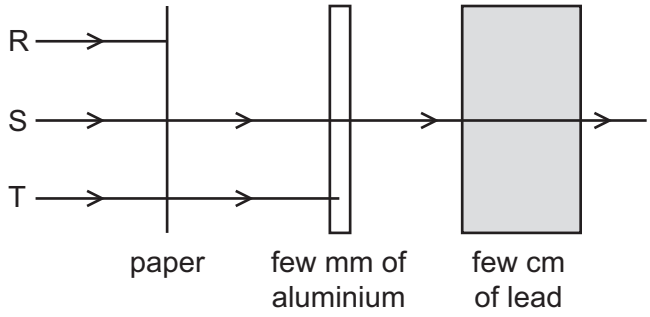
B They have the same number of neutrons.

C They have the same number of nucleons.

D They have the same number of protons.

39 A radioactive source emits three types of radiation R, S and T.

The diagram shows an experiment set up to study the penetrating properties of R, S and T.



Which types of radiation are R, S and T?

	R	S	T
A	α-particles	β-particles	γ-rays
B	α-particles	γ-rays	β-particles
C	β-particles	α-particles	γ-rays
D	γ-rays	β-particles	α-particles

40 What is meant by the *half-life* of a radioactive isotope?

A half of the time taken for all of the original nuclei to decay

B the time taken for half of the original nuclei to decay

C the time taken for the charges on all the nuclei to halve

D the time taken for the mass of each nucleus to halve

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