Cambridge Assessment International Education

Cambridge IGCSE™

PHYSICS **0625/11**

Paper 1 Multiple Choice (Core) **May/June 2021**

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).

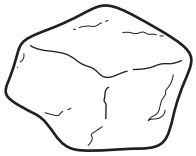
INFORMATION

- 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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1 The diagram shows a stone of irregular shape.



Which property of the stone can be found by lowering it into a measuring cylinder half-filled with water?

A length

B mass

C volume

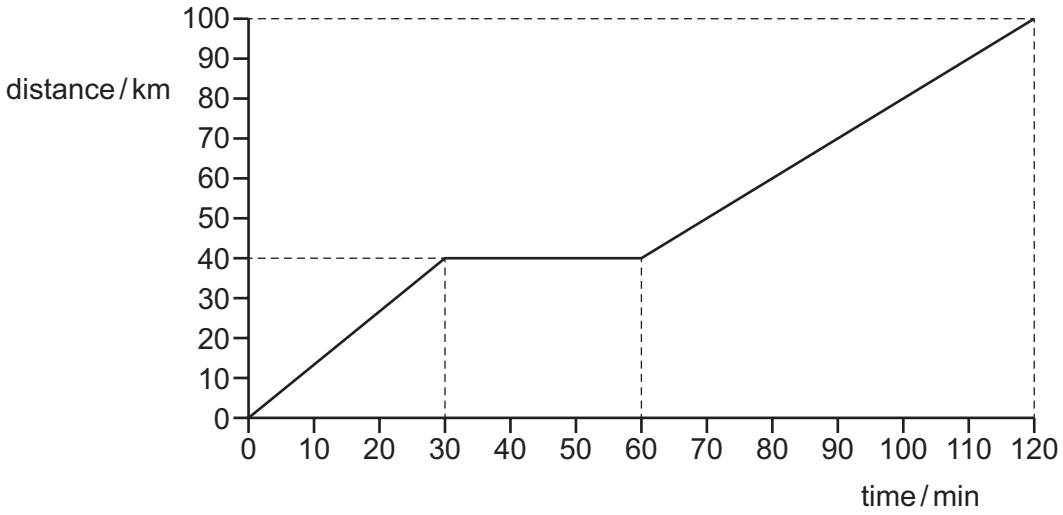
D weight

2 Two stones of different weights fall at the same time from a table. Air resistance may be ignored.

What will happen and why?

	what will happen	why
A	Both stones hit the floor at the same time.	Acceleration of free fall is constant.
B	Both stones hit the floor at the same time.	They fall at constant speed.
C	The heavier stone hits the floor first.	Acceleration increases with weight.
D	The heavier stone hits the floor first.	Speed increases with weight.

3 The distance–time graph for a motorway journey is shown.



What is the average speed for the journey?

A 50 km / h **B** 67 km / h **C** 70 km / h **D** 83 km / h

4 Diagram 1 shows a sealed plastic bottle containing a hollow glass sphere and a steel ball.

Diagram 2 shows the same bottle after it has been shaken.

Diagram 3 shows the same bottle after it has been shaken again until the broken glass is in tiny pieces.

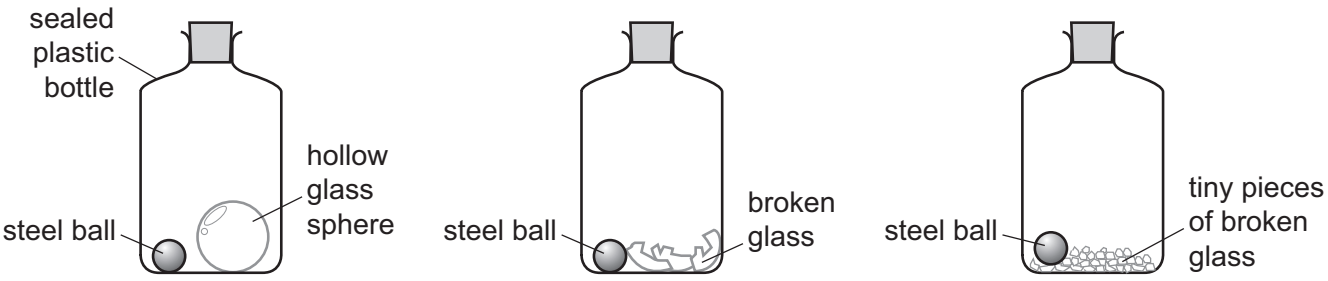


diagram 1 diagram 2 diagram 3

The mass of the bottle and contents in diagram 1 is m_1.

The mass of the bottle and contents in diagram 2 is m_2.

The mass of the bottle and contents in diagram 3 is m_3.

Which statement gives the correct relation between m_1, m_2 and m_3?

A m_1 is equal to m_2 and m_2 is equal to m_3.

B m_1 is greater than m_2 and m_2 is greater than m_3.

C m_1 is less than m_2 and m_2 is greater than m_3.

D m_1 is less than m_2 and m_2 is less than m_3.

5 On Mars, the acceleration of free fall g is $3.7\,\text{m/s}^2$.

What is the weight of a 2.0 kg mass on Mars?

A 0.54 N **B** 1.9 N **C** 7.4 N **D** 20 N

6 The mass of an empty flask is 34 g.

The volume of liquid added to the flask is $20\,\text{cm}^3$.

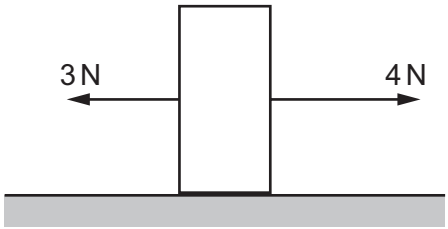
The total mass of the flask and the liquid is 50 g.

What is the density of the liquid?

A $0.80\,\text{g/cm}^3$ **B** $1.25\,\text{g/cm}^3$ **C** $2.50\,\text{g/cm}^3$ **D** $4.20\,\text{g/cm}^3$

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7 The diagram shows a solid object on a flat surface, with two forces acting on the object.



What is the resultant force on the object?

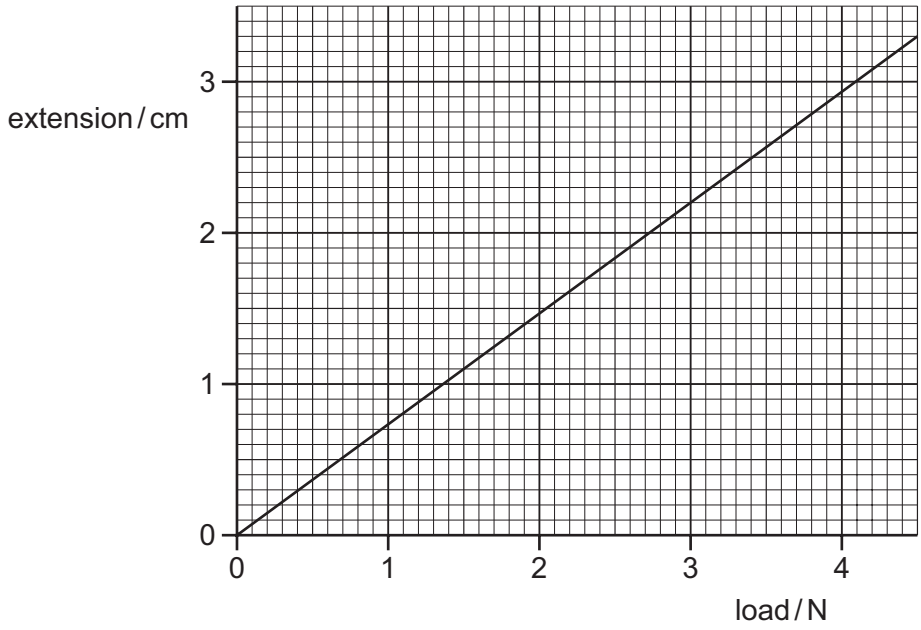
A 1 N to the left

B 1 N to the right

C 7 N to the left

D 7 N to the right

8 The extension–load graph for a spring is shown. The unstretched length of the spring is 17.0 cm.



When an object is suspended from the spring, the length of the spring is 19.2 cm.

What is the weight of the object?

A 1.4 N **B** 1.6 N **C** 2.6 N **D** 3.0 N

9 Which situation involves no work being done and no energy being transferred?

A a car skidding to a stop on a road

B a crane lifting a load

C a heavy load hanging from a strong bar

D a student dragging a big box over a rough floor

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10 A student suggests that there are several ways of transferring energy to a small, stationary block of iron on a smooth table. He makes the following suggestions.

1 Heat it.

2 Shine light on it.

3 Pass a current through it.

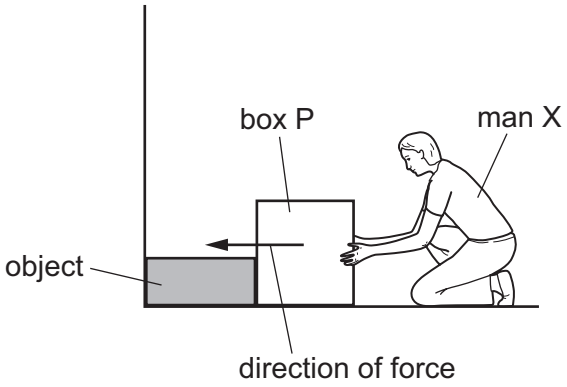
Which suggestions are correct?

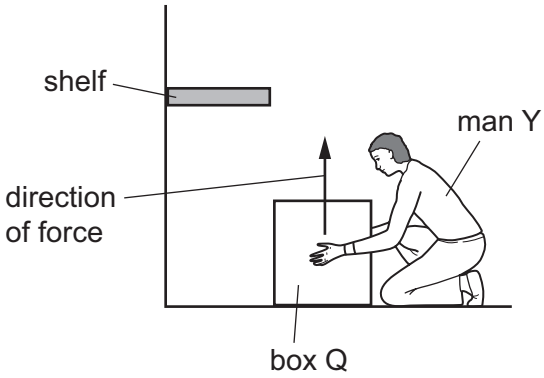
A 1 and 2 only **B** 1 and 3 only **C** 2 and 3 only **D** 1, 2 and 3

11 Two men, X and Y, try to move identical heavy boxes, P and Q.

Man X tries to push box P along the floor. The box does not move because an object is in the way.

Man Y lifts box Q from the floor onto a shelf.





Which man does the most work on their box, and which box gains the most energy?

	man doing most work	box gaining most energy
A	X	P
B	X	Q
C	Y	P
D	Y	Q

12 A book has a mass of 400 g.

The surface of the book in contact with a table has dimensions 0.10 m × 0.20 m.

The gravitational field strength g is 10 N / kg.

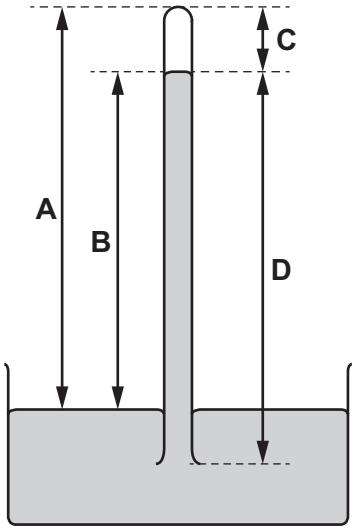
What is the pressure exerted on the table due to the book?

A $0.08\,N/m^2$ **B** $8.0\,N/m^2$ **C** $20\,N/m^2$ **D** $200\,N/m^2$

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13 A mercury barometer is used to measure atmospheric pressure.

Which distance gives a measure of the atmospheric pressure?



14 Air trapped in a sealed bottle increases in temperature.

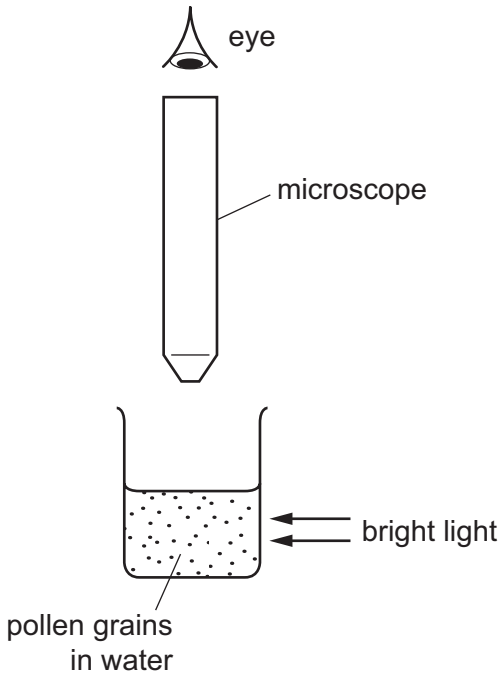
Which row shows the changes that occur to the trapped air?

	pressure of the air	average speed of molecules in the air
A	decreases	decreases
B	decreases	increases
C	increases	decreases
D	increases	increases

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15 Very small pollen grains are suspended in water. A bright light shines from the side.

When looked at through a microscope, small specks of light are seen to be moving in a random, jerky manner.



What are the moving specks of light?

A pollen grains being hit by other pollen grains

B pollen grains being hit by water molecules

C water molecules being hit by other water molecules

D water molecules being hit by pollen grains

16 Why are small gaps left between the metal rails of a railway track?

A to allow for expansion of the rails on a hot day

B to allow for contraction of the rails on a hot day

C to allow for expansion of the rails on a cold day

D to allow for contraction of the rails on a cold day

17 All thermometers require a physical property that changes with temperature.

Which property would **not** be suitable for use in a thermometer?

A pressure

B volume

C electrical resistance

D mass

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18 The thermal capacity of object Y is greater than that of object Z.

What is a consequence of this?

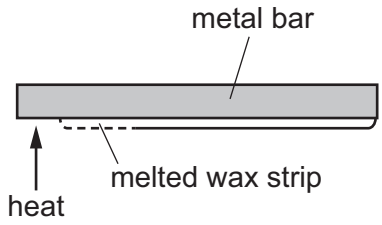
A Object Y needs less thermal energy to melt it than object Z.

B Object Y needs less thermal energy to raise its temperature by 1 °C than object Z.

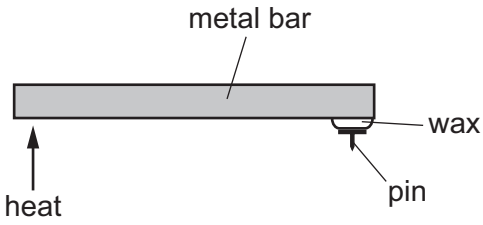
C Object Y needs more thermal energy to melt it than object Z.

D Object Y needs more thermal energy to raise its temperature by 1 °C than object Z.

19 Two students carry out different experiments to compare the abilities of different metals to conduct thermal energy.



experiment 1



experiment 2

In experiment 1, the bar is heated for one minute and the length of wax strip that melts is measured.

In experiment 2, the bar is heated and the time taken for the pin to drop off is measured.

What happens to each of these measurements when a better conductor of thermal energy is tested?

	length of melted wax strip	time taken for the pin to drop
A	decreases	decreases
B	decreases	increases
C	increases	decreases
D	increases	increases

20 In which substances is convection a method of thermal energy transfer?

A air and water only

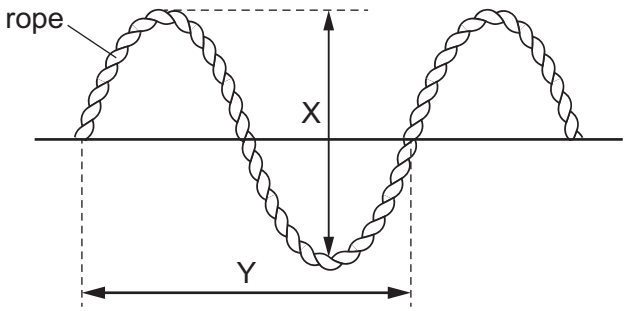
B air only

C air, water and wood

D water only

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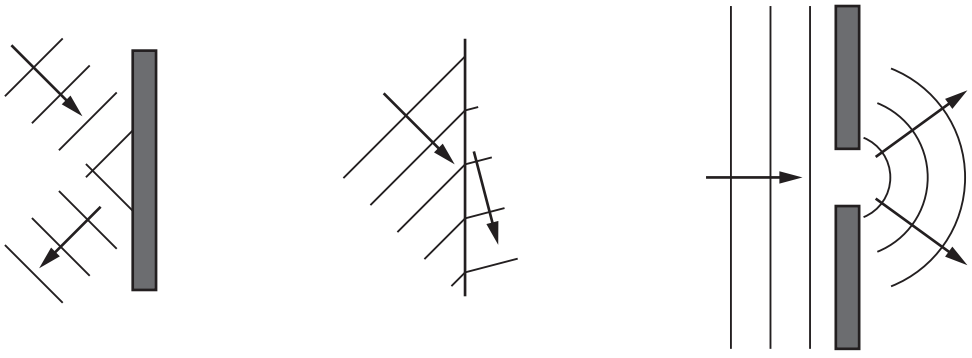
21 The diagram represents a wave on a rope.



Which type of wave is shown and which labelled arrow shows the wavelength of the wave?

	type of wave	wavelength
A	longitudinal	X
B	longitudinal	Y
C	transverse	X
D	transverse	Y

22 The diagrams show water waves in three different situations. The arrows show the direction of travel of the waves.

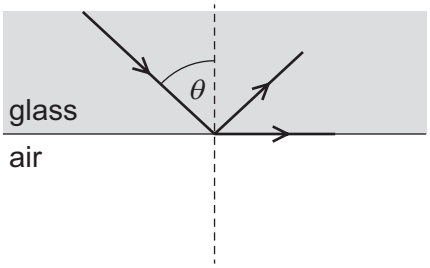


1 2 3

What does each diagram show?

	1	2	3
A	diffraction	reflection	refraction
B	diffraction	refraction	reflection
C	reflection	diffraction	refraction
D	reflection	refraction	diffraction

23 The diagram shows a narrow beam of light incident on a glass-air boundary. Some of the light emerges along the surface of the glass and some is reflected back into the glass.

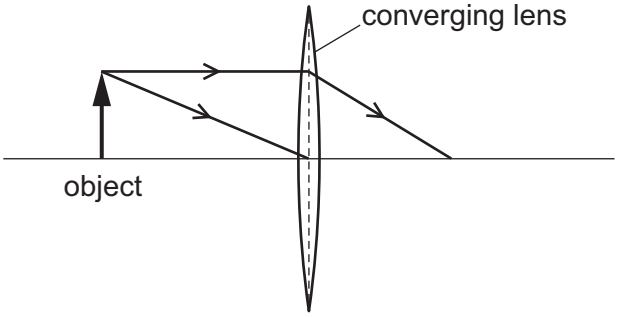


Which row is correct?

	this is an example of total internal reflection	angle θ is the critical angle
A	no	yes
B	no	no
C	yes	no
D	yes	yes

24 An object is placed in front of a thin converging lens.

The diagram shows the paths of two rays from the top of the object.



An image of the object is formed on a screen to the right of the lens.

How does this image compare with the object?

A It is larger and inverted.

B It is larger and the same way up.

C It is smaller and inverted.

D It is smaller and the same way up.

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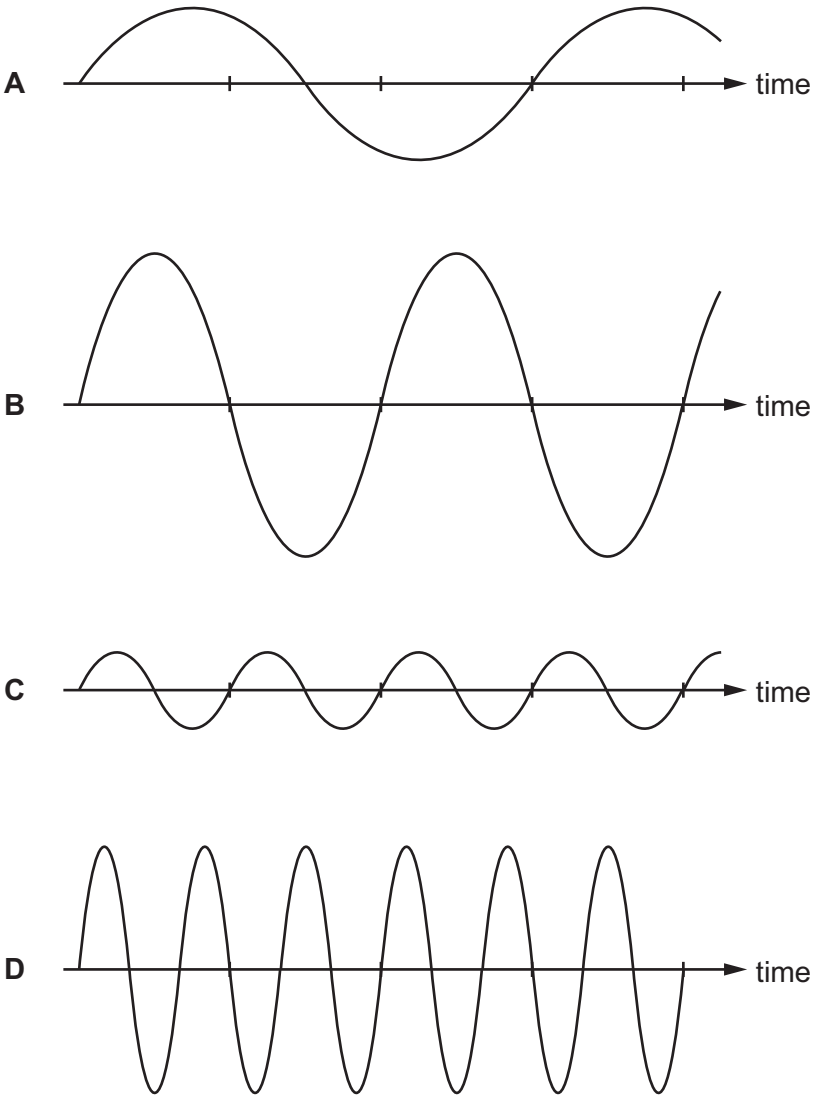
25 A student is asked to give two uses of four different types of electromagnetic radiation.

In which row are both the uses correct?

	radiation	use 1	use 2
A	radio	sterilising medical equipment	mobile phone masts
B	microwaves	mobile phones	sterilising medical equipment
C	infrared	remote controllers	intruder alarms
D	X-rays	security in airports	intruder alarms

26 The diagrams represent the waves produced by four sources of sound. The scales are the same for all the diagrams.

Which sound has the highest frequency?



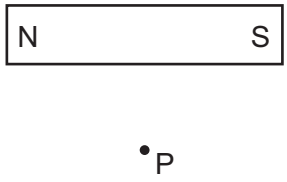
27 Diagram 1 shows a small compass needle with its poles marked. It is not near any magnetic materials.

Diagram 2 shows a bar magnet with its poles marked. The compass needle is placed at point P.

diagram 1



diagram 2



In which direction will the N pole of the compass needle point?

A to the left

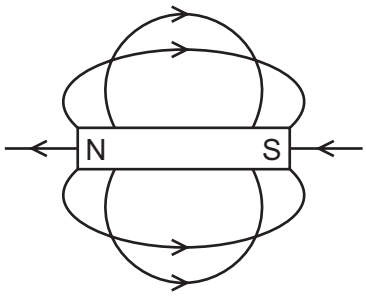
B to the right

C down the page

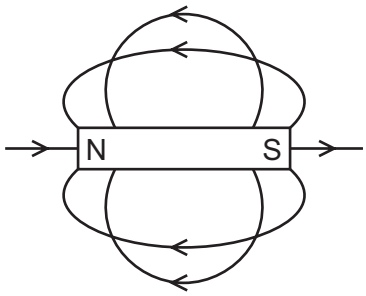
D up the page

28 Which diagram shows the pattern and direction of the magnetic field lines around a bar magnet?

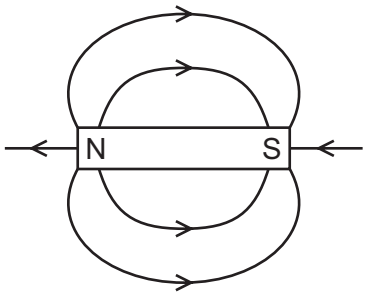
A



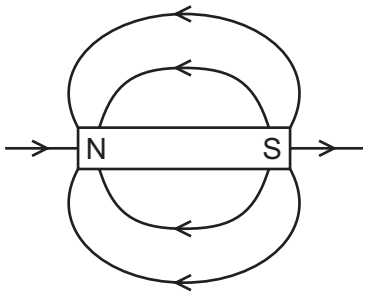
B



C



D



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29 A student rubs a plastic rod with a cloth.

The rod becomes positively charged.

What has happened to the rod?

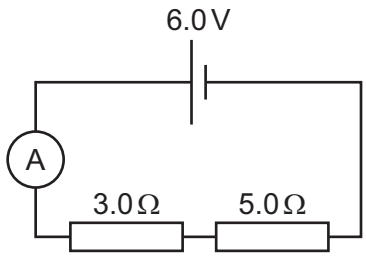
A It has gained electrons.

B It has gained protons.

C It has lost electrons.

D It has lost protons.

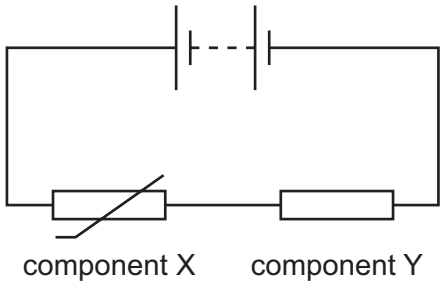
30 The circuit diagram shows a cell connected to an ammeter and two resistors.



What is the current in the circuit?

A 0.75 A **B** 1.3 A **C** 12 A **D** 48 A

31 The diagram shows an electrical circuit.



Which row describes what happens when the temperature rises?

	resistance of component X	potential difference (p.d.) across component Y
A	decreases	decreases
B	decreases	increases
C	increases	decreases
D	increases	increases

32 Diagram 1 shows a resistor connected in a circuit. Diagram 2 shows an identical resistor connected in parallel with the first one.

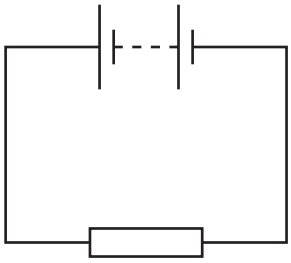


diagram 1

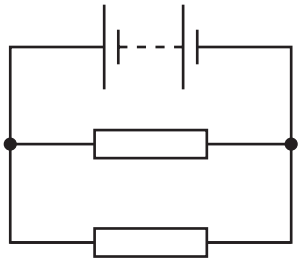


diagram 2

What is the combined resistance of the two resistors?

A greater than in the circuit of diagram 1

B less than in the circuit of diagram 1

C the same as in the circuit of diagram 1

D zero

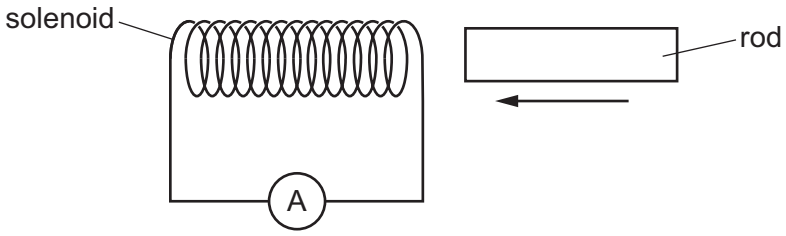
33 The current in a lamp connected on its own to the mains supply is 0.60 A.

A table decoration has three of these lamps connected in parallel.

Which rating of fuse is suitable to protect this circuit?

A 0.2 A **B** 0.6 A **C** 1.0 A **D** 5.0 A

34 A solenoid is connected to a very sensitive ammeter. A rod is inserted into one end of the solenoid. The ammeter shows that there is a small electric current in the solenoid while the rod is moving.



Which rod is being inserted?

A a heated copper rod

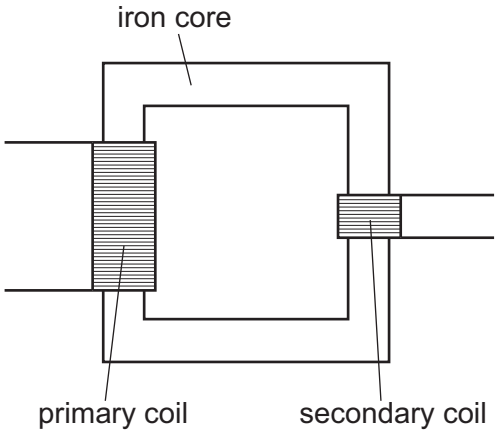
B a magnetised steel rod

C an uncharged nylon rod

D a radioactive uranium rod

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35 The diagram shows a transformer. There are 460 turns on the primary coil and 24 turns on the secondary coil. The primary voltage is 230 V.



What is the secondary voltage?

A 2.0 V **B** 12 V **C** 48 V **D** 4400 V

36 A class is designing a d.c. motor. To achieve a greater turning effect, three suggestions are made.

1 Have a larger current in the coil of the motor.

2 Have a stronger magnet in the motor.

3 Put a larger number of turns on the coil.

Which suggestions will help to increase the turning effect?

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

37 The charge on a proton is e.

What is the charge on an electron and what is the charge on a neutron?

	electron	neutron
A	e	e
B	e	0
C	$-e$	$-e$
D	$-e$	0

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38 The nuclide notation of the isotope strontium-90 is $^{90}_{38}Sr$.

Which statement is correct?

A A nucleus of strontium-90 has 38 neutrons.

B A nucleus of strontium-90 has 52 neutrons.

C A nucleus of strontium-90 has 90 electrons.

D A nucleus of strontium-90 has 90 neutrons.

39 Which statement about α-particles and γ-rays is correct?

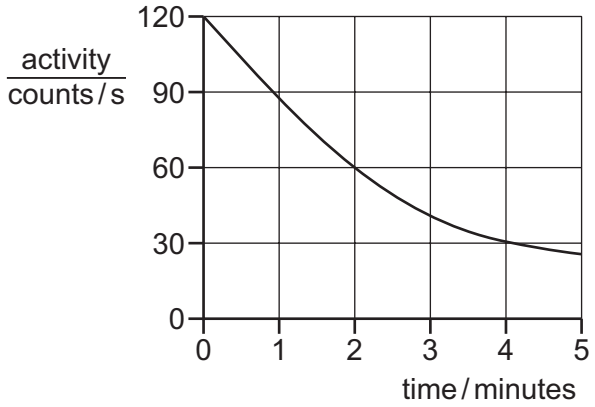
A α-particles are a form of electromagnetic radiation.

B α-particles penetrate materials more easily than γ-rays.

C The emission of an α-particle produces a nucleus of a different element.

D γ-rays are more ionising than α-particles.

40 The graph shows the activity of a radioactive source over a period of time.



What is the half-life of the source?

A 1.0 minute **B** 2.0 minutes **C** 2.5 minutes **D** 4.0 minutes

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