UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

PHYSICS **0625/13**

Paper 1 Multiple Choice **October/November 2011**

45 minutes

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

5380410204

READ THESE INSTRUCTIONS FIRST

Write in soft pencil.
Do not use staples, paper clips, highlighters, 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.

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.

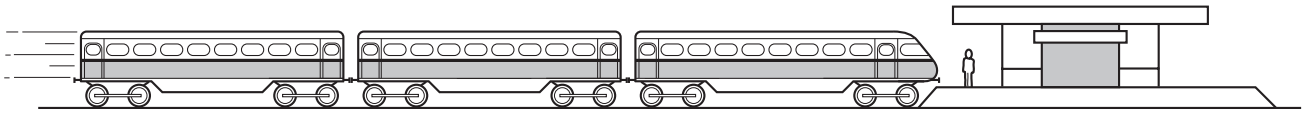
Read the instructions on the Answer Sheet very carefully.

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.

This document consists of **22** printed pages and **2** blank pages.

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1 A child is standing on the platform of a station.

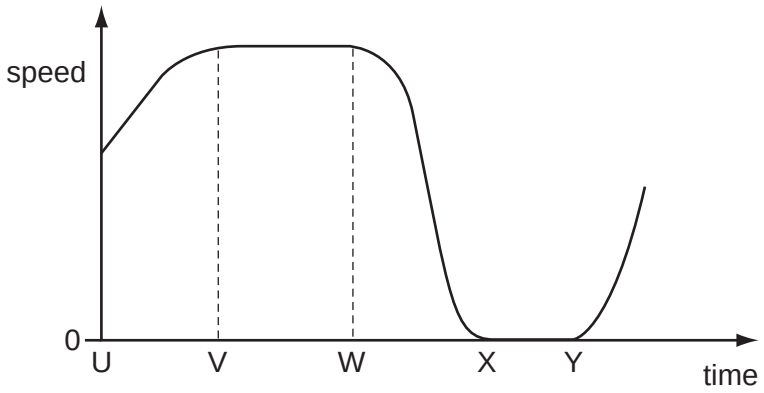


A train travelling at 30 m / s takes 3.0 s to pass the child.

What is the length of the train?

A 10 m **B** 27 m **C** 30 m **D** 90 m

2 The graph shows how the speed of a car changes with time.



Between which two times is the car stationary?

A U and V **B** V and W **C** W and X **D** X and Y

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3 A student wishes to measure the speed of sound in air. She plans to measure the time between making a sound and hearing the echo from a cliff.

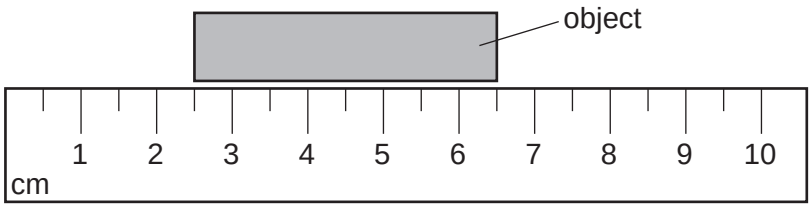


She will use the equation: speed = $\frac{\text{distance}}{\text{time}}$.

Which type of sound should she make and which distance should she use in her calculation?

	type of sound	distance to use
A	continuous sound	$\frac{\text{distance to cliff}}{2}$
B	continuous sound	distance to cliff × 2
C	short, sharp sound	$\frac{\text{distance to cliff}}{2}$
D	short, sharp sound	distance to cliff × 2

4 A ruler is used to measure the length of an object.

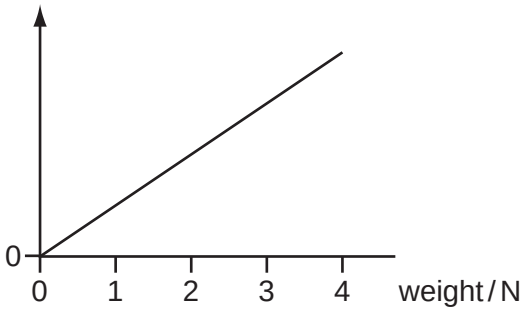


What is the length of the object?

A 3.0 cm **B** 4.0 cm **C** 5.0 cm **D** 6.5 cm

5 A student adds weights to an elastic cord. He measures the length of the cord for each weight.

He then plots a graph from the results, as shown.



Which length has he plotted on the vertical axis?

A measured length

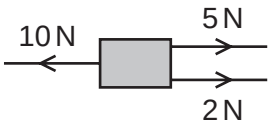
B original length

C (measured length – original length)

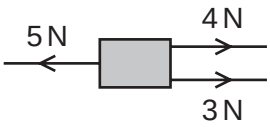
D (measured length + original length)

6 Which combination of forces produces a resultant force acting towards the right?

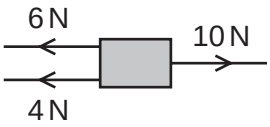
A



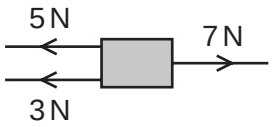
B



C

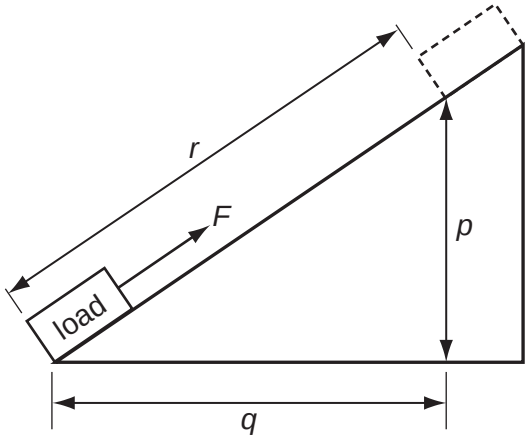


D



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7 A force *F* moves a load from the bottom of a slope to the top.



The work done by the force depends on the size of the force, and on a distance.

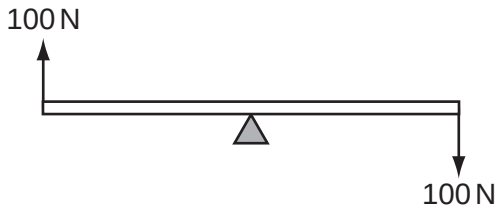
What is this distance?

A *p* **B** *q* **C** *r* **D** *p* + *q*

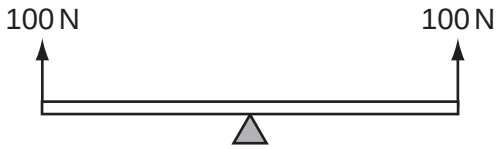
8 A uniform rod rests on a pivot at its centre. The rod is not attached to the pivot. Forces are then applied to the rod in four different ways, as shown. The weight of the rod can be ignored.

Which diagram shows the rod in equilibrium?

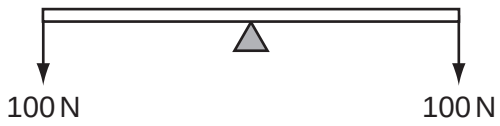
A



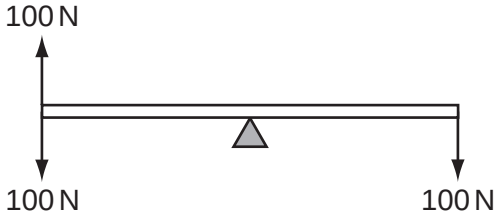
B



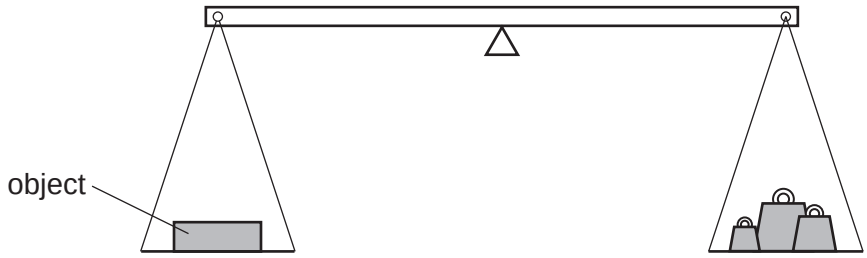
C



D



9 The weight of an object is to be found using the balance shown in the diagram.



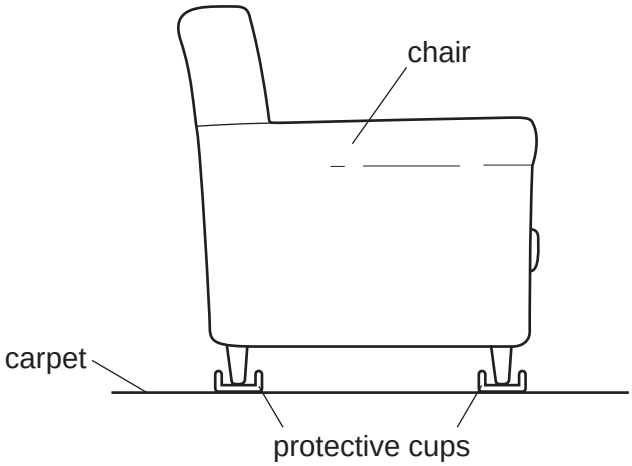
The object is put in the left-hand pan and various standard weights are put in the right-hand pan. These are the results.

weights in the right-hand pan	effect
0.1 N, 0.1 N, 0.05 N, 0.02 N	balance tips down slightly on the left-hand side
0.2 N, 0.1 N, 0.01 N	balance tips down slightly on the right-hand side

What is the best estimate of the weight of the object?

A 0.27 N **B** 0.29 N **C** 0.31 N **D** 0.58 N

10 A chair is placed on protective cups to prevent damage to the carpet underneath it.



How do the cups change the area of contact with the carpet and the pressure on it?

	area of contact	pressure
A	decreased	decreased
B	decreased	increased
C	increased	decreased
D	increased	increased

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11 A student is told to measure the density of a liquid and also of a large cube of metal.

Which pieces of equipment are sufficient to be able to take the measurements needed?

A balance, measuring cylinder and ruler

B balance and thermometer

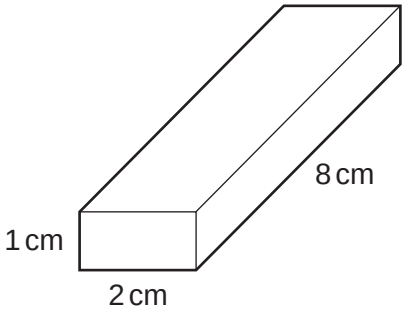
C measuring cylinder and ruler

D measuring cylinder, ruler and thermometer

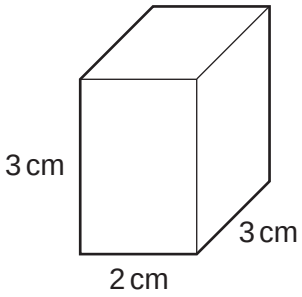
12 The diagrams show four blocks with the same mass.

Which block is made from the least dense material?

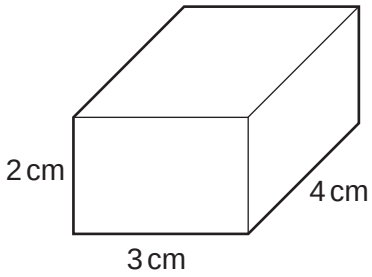
A



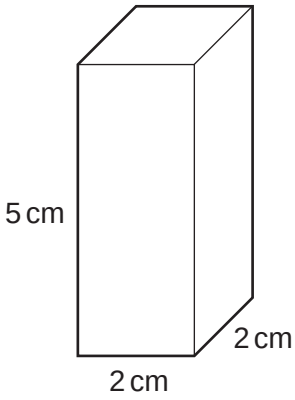
B



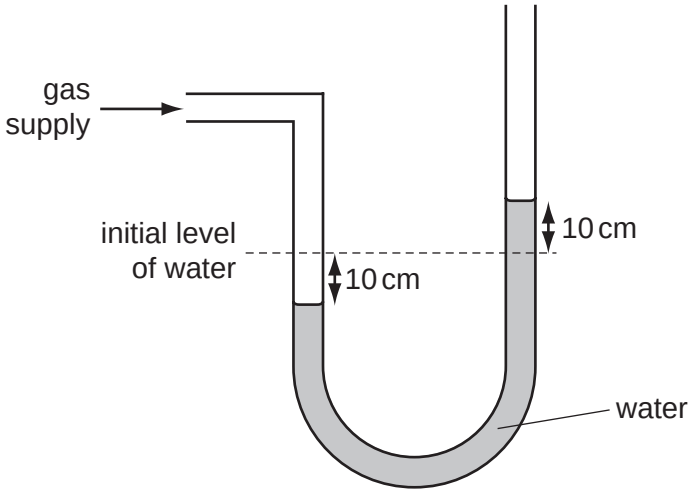
C



D



13 A water manometer is used to measure the pressure of a gas supply.



When it is attached to the gas supply, the water falls on the left side and rises on the right side. The difference in the levels of water on the two sides is now 20 cm.

What is the pressure of the gas supply?

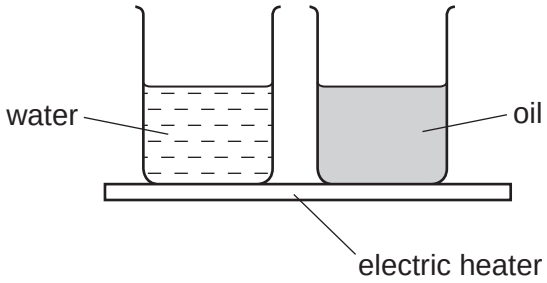
A the pressure due to 10 cm depth of water

B the pressure due to 20 cm depth of water

C the pressure due to 10 cm depth of water plus atmospheric pressure

D the pressure due to 20 cm depth of water plus atmospheric pressure

14 The diagram shows an electric heater being used to heat a beaker of water and an identical beaker of oil for several minutes.



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

Why is this?

A The oil has a higher boiling point than water.

B The oil has a higher thermal capacity than water.

C The oil has a lower boiling point than water.

D The oil has a lower thermal capacity than water.

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15 Evaporation occurs when molecules escape from a liquid surface into the air above it. During this process the temperature of the liquid falls.

Why does the temperature of the liquid fall?

A The molecules in the vapour expand because the pressure is less.

B The molecules left in the liquid have more space to move around.

C The molecules move more slowly when they escape into the air.

D The molecules with the highest energies escape into the air.

16 To mark the lower fixed point of a Celsius scale on a thermometer, the thermometer should be placed in

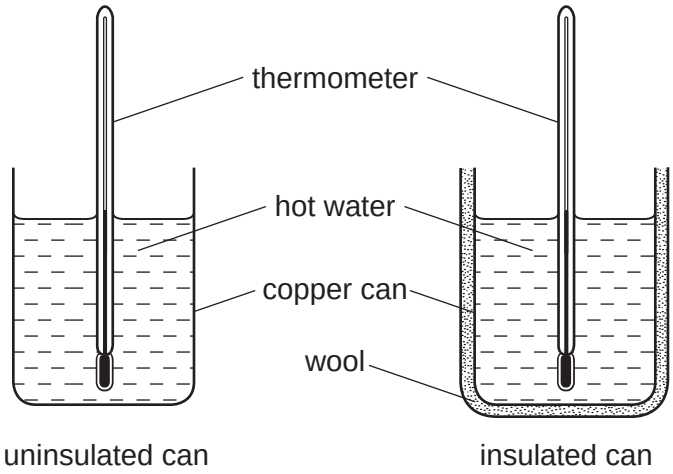
A pure alcohol.

B pure distilled water.

C pure melting ice.

D pure mercury.

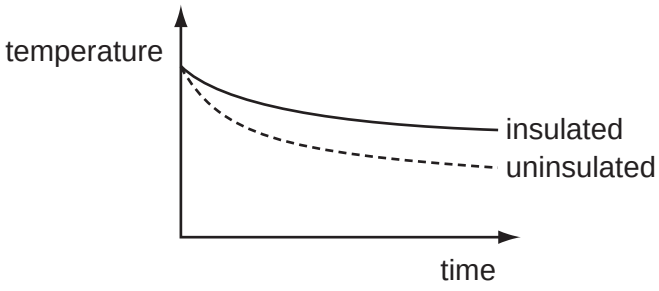
17 Two identical copper cans are filled with boiling water.



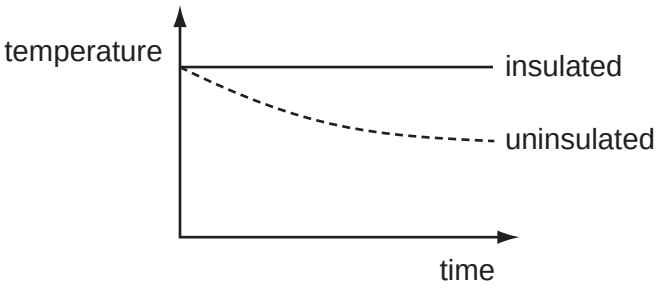
One can is insulated with wool. The temperature of the water in each can is taken every minute for several minutes. Graphs of the results are plotted.

Which graph shows the results obtained?

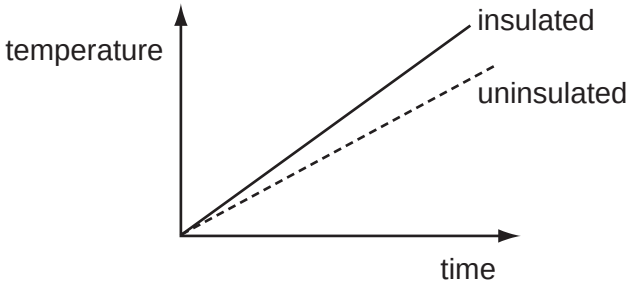
A



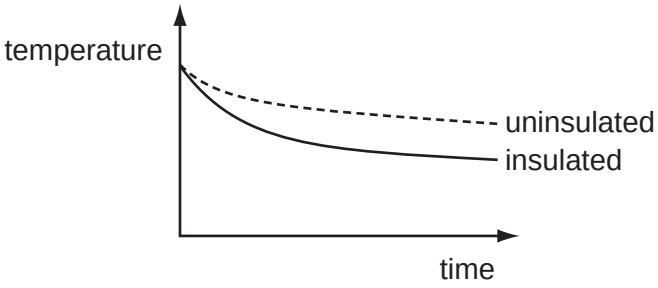
B



C



D

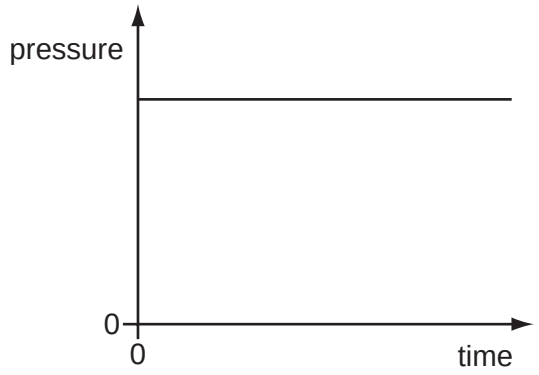


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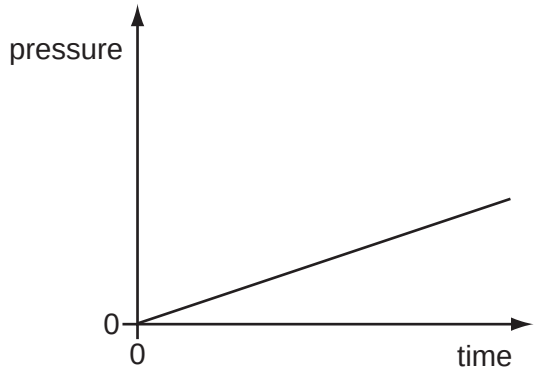
18 The pressure of a fixed mass of gas in a cylinder is measured. The volume of the gas in the cylinder is then slowly decreased. The temperature of the gas does not change.

Which graph could show the change of pressure of the gas during this process?

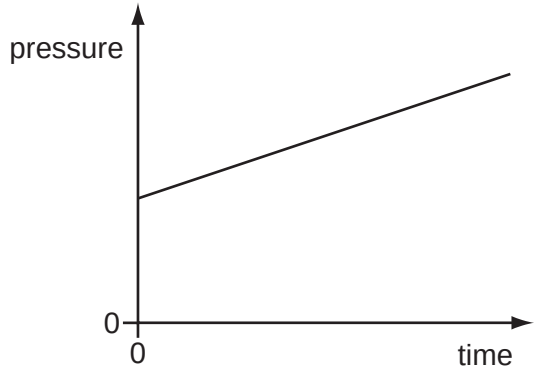
A



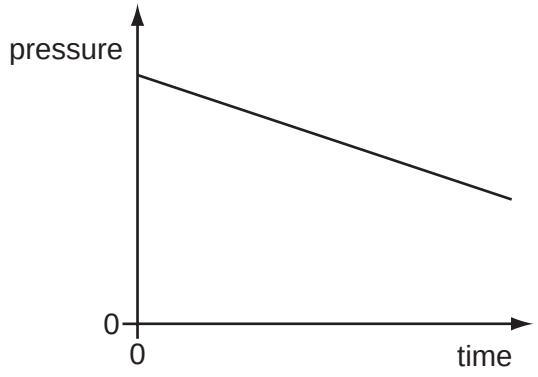
B



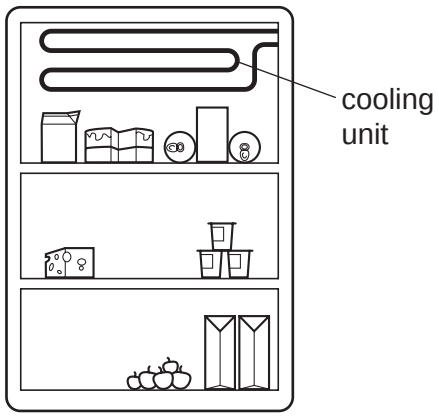
C



D



19 The diagram shows a cooling unit in a refrigerator.



Why is the cooling unit placed at the top?

A Cold air falls and warm air is displaced upwards.

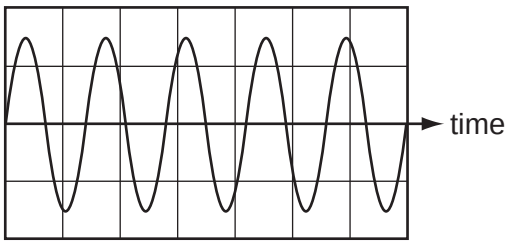
B Cold air is a bad conductor so heat is not conducted into the refrigerator.

C Cold air is a good conductor so heat is conducted out of the refrigerator.

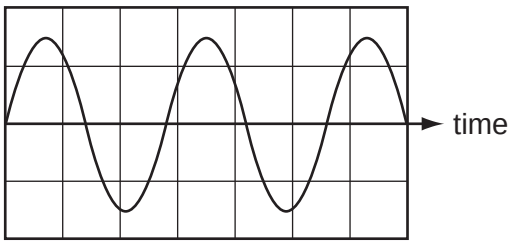
D Cold air remains at the top and so prevents convection.

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20 The diagrams show the wave shapes of two different sounds. The scales are the same in each diagram.



sound 1



sound 2

How does sound 2 compare with sound 1?

A Sound 2 is louder than sound 1.

B Sound 2 is quieter than sound 1.

C Sound 2 has a higher pitch than sound 1.

D Sound 2 has a lower pitch than sound 1.

21 The diagram shows the image of a clock in a plane mirror.

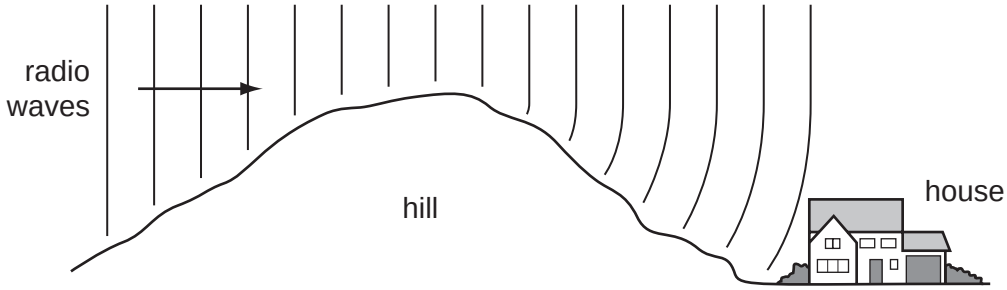


What time is shown?

A 02:25 **B** 02:35 **C** 09:25 **D** 09:35

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22 Radio waves are received at a house at the bottom of a hill.



The waves reach the house because the hill has caused them to be

A diffracted.

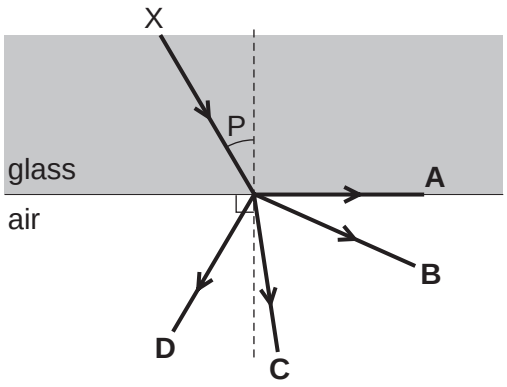
B radiated.

C reflected.

D refracted.

23 The diagram shows a ray of light travelling from X. Angle P is less than the critical angle.

In which direction does the ray continue?



24 Which of these waves is longitudinal?

A infra-red

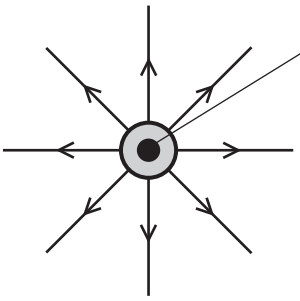
B radio

C sound

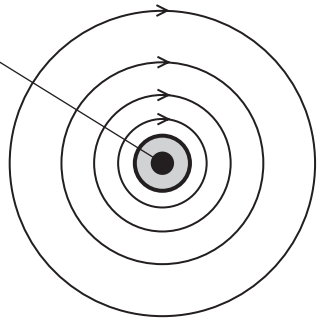
D water

25 Which diagram represents the direction of the magnetic field around a straight wire carrying a current out of the page?

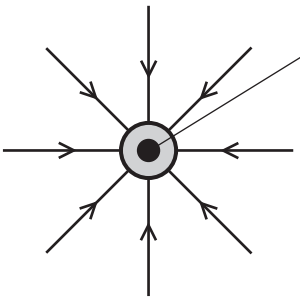
A



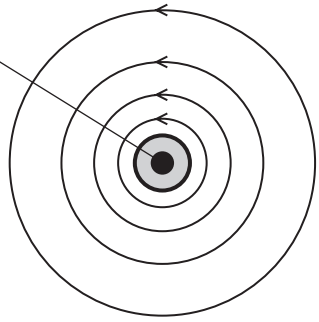
B



C

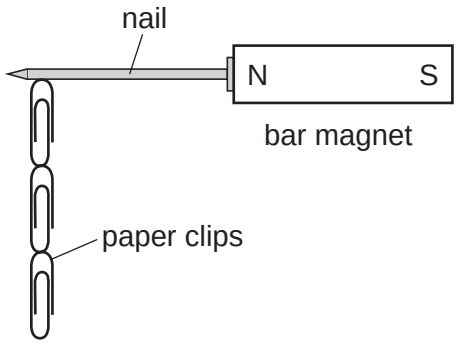


D



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26 Four nails, **A**, **B**, **C** and **D**, are tested to find which makes the strongest permanent magnet.



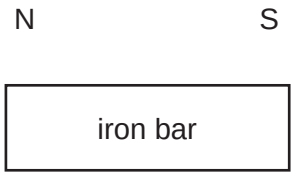
One of the nails is placed against a bar magnet and the number of paper clips which the nail can support is recorded. The bar magnet is then removed and the number of paper clips remaining attached to the nail is recorded. Each nail is tested in turn.

Which nail becomes the strongest permanent magnet?

nail	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

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27 A horseshoe magnet is brought near to an unmagnetised iron bar.

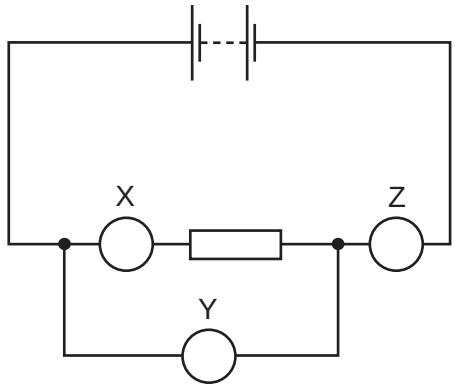


Which row in the table shows the magnetic poles induced in the iron bar and the direction of the forces between the bar and the magnet?

	magnetic poles induced in iron bar	force between iron bar and magnet
A	N S	attraction
B	N S	repulsion
C	S N	attraction
D	S N	repulsion

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28 The diagram shows an electric circuit containing three meters, X, Y and Z, all connected correctly.



What are meters X, Y and Z?

	X	Y	Z
A	ammeter	ammeter	ammeter
B	ammeter	voltmeter	ammeter
C	voltmeter	ammeter	voltmeter
D	voltmeter	voltmeter	voltmeter

29 Which symbols are used for the units of current and of resistance?

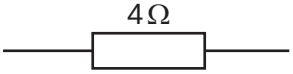
	unit of current	unit of resistance
A	A	W
B	A	Ω
C	C	W
D	C	Ω

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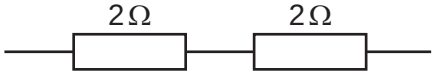
30 The diagrams show four arrangements of resistors.

Which arrangement has the **smallest** total resistance?

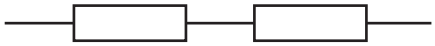
A



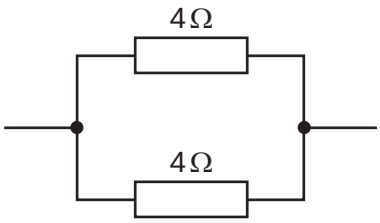
B



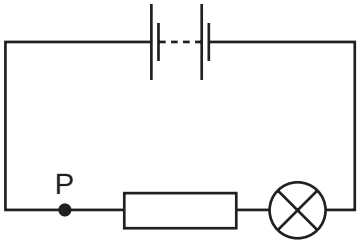
C



D



31 The diagram shows a lamp in a circuit.



Which change to the circuit would increase the current in the lamp?

A adding another resistor in parallel with the one in the circuit

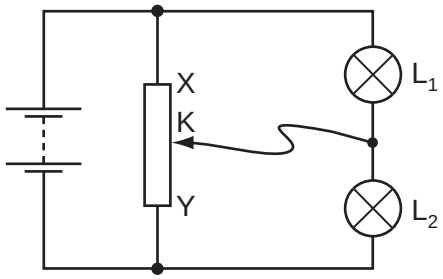
B adding another resistor in series with the one in the circuit

C decreasing the electromotive force (e.m.f.) of the battery in the circuit

D moving the lamp to point P in the circuit

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32 The diagram shows a potential divider circuit with two identical lamps L_1 and L_2.



The contact K is halfway between X and Y and the lamps are equally bright.

What will happen to the brightness of the lamps when contact K is moved a short distance towards X?

	lamp L_1	lamp L_2
A	brighter	brighter
B	brighter	dimmer
C	dimmer	brighter
D	dimmer	dimmer

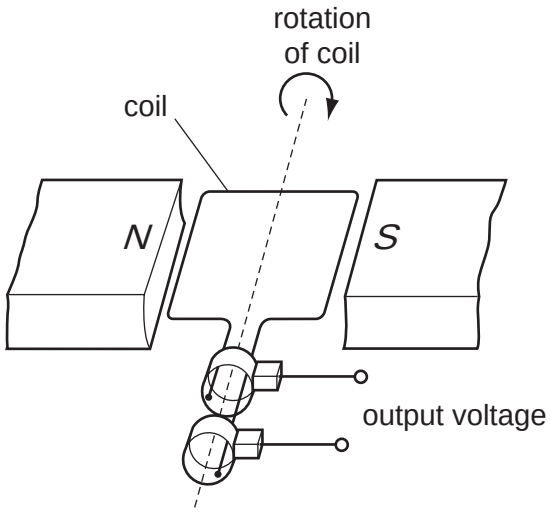
33 A fuse and a relay each use an effect of an electric current.

Which effect of an electric current is used by a fuse and which effect is used by a relay?

	effect used by a fuse	effect used by a relay
A	heating effect	heating effect
B	heating effect	magnetic effect
C	magnetic effect	heating effect
D	magnetic effect	magnetic effect

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34 The diagram shows an a.c. generator.



With the coil in the position shown, the output voltage is +10 V.

When does the output voltage become –10 V?

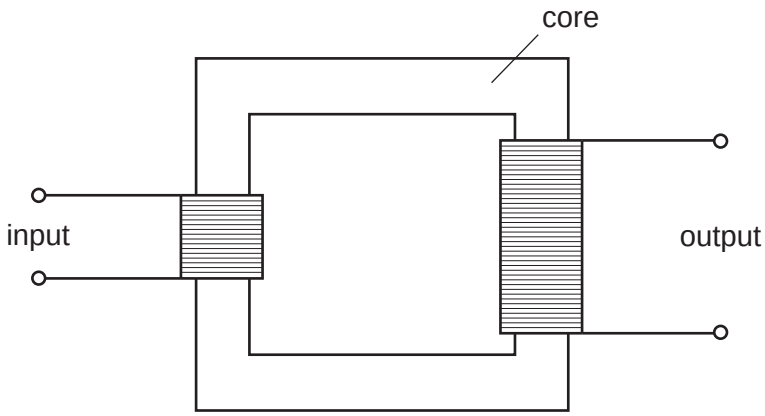
A when the coil has turned 90°

B when the coil has turned 180°

C when the coil has turned 270°

D when the coil has turned 360°

35 The diagram shows a simple transformer.



From which material should the core be made?

A aluminium

B copper

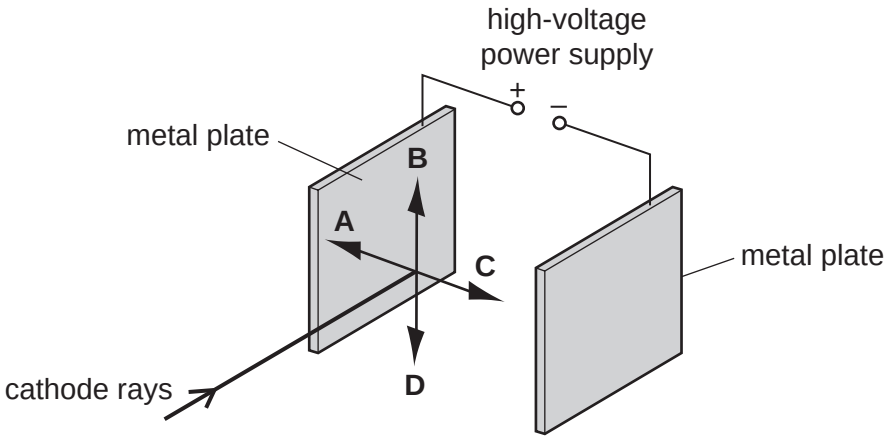
C iron

D steel

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36 Two parallel metal plates in a vacuum are connected to the terminals of a high-voltage power supply. A beam of cathode rays is passed into the space between the two plates, as shown.

In which direction does the beam of cathode rays deflect?



37 Cathode rays are emitted in a vacuum tube. They consist of particles that are found in atoms.

What is the name of the particles and how are the cathode rays produced?

	name of particles	how the cathode rays are produced
A	electrons	electromagnetic induction
B	electrons	thermionic emission
C	protons	electromagnetic induction
D	protons	thermionic emission

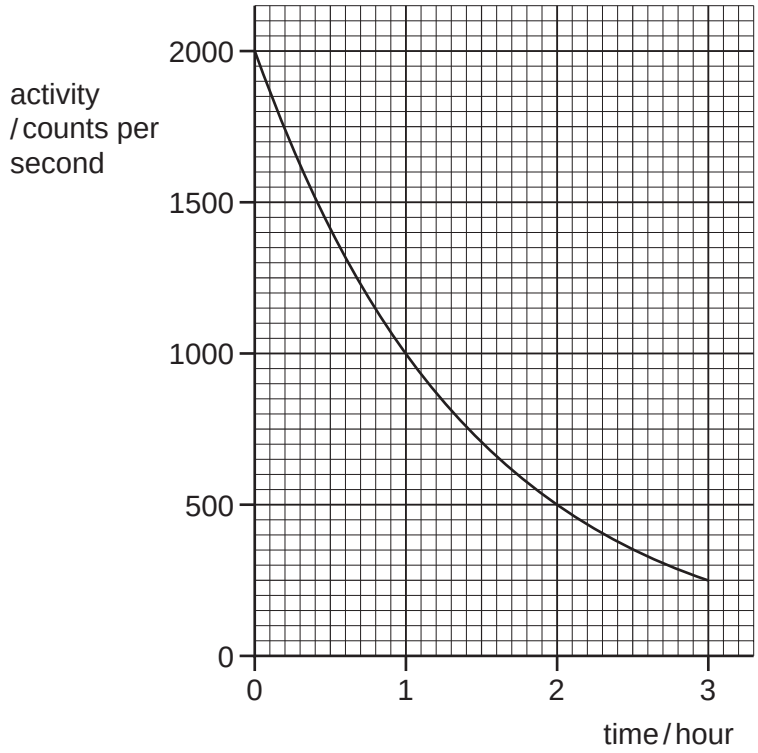
38 A nuclide of substance X has the symbol $^{26}_{12}X$.

How many electrons are there in a neutral atom of substance X?

A 12 **B** 14 **C** 26 **D** 38

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



What is the half-life of the source?

A $\frac{1}{2}$ hour **B** 1 hour **C** $1\frac{1}{2}$ hours **D** 3 hours

40 A scientist needs to use a source of γ-rays as safely as possible.

Which action will **not** reduce the amount of radiation that reaches the scientist?

A keeping the distance between the source and the scientist as large as possible

B keeping the temperature of the source as low as possible

C keeping the time for which the scientist uses the source as small as possible

D placing a lead screen between the scientist and the source

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