Cambridge Assessment International Education

Cambridge IGCSE™

PHYSICS **0625/12**

Paper 1 Multiple Choice (Core) **February/March 2020**

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).

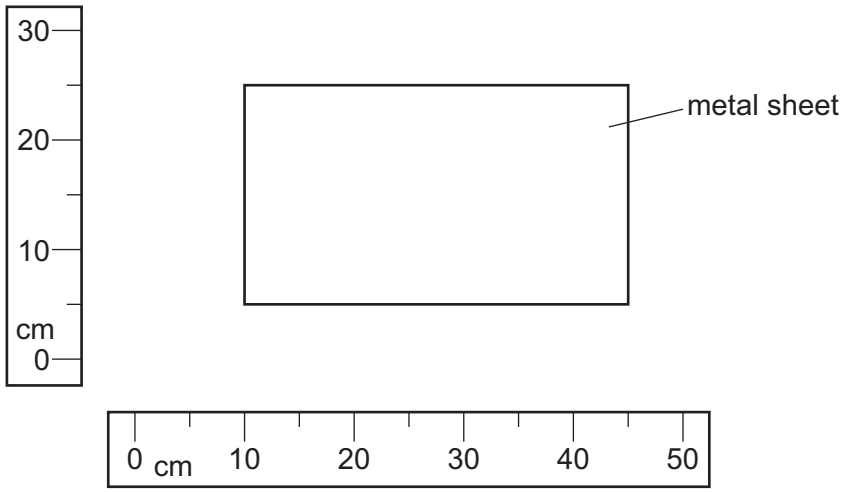
INFORMATION

- The total mark for this paper is 40.
- Each correct answer will score one mark. A mark will not be deducted for a wrong answer.
- Any rough working should be done on this question paper.

This document has **20** pages. Blank pages are indicated.

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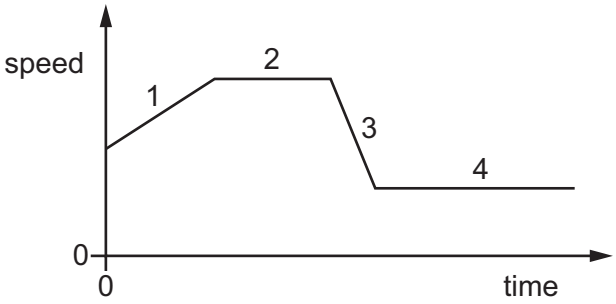
1 The diagram shows a rectangular metal sheet close to two rulers.



What is the area of the metal sheet?

A 700 cm^2 **B** 875 cm^2 **C** 900 cm^2 **D** 1125 cm^2

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



Which section of the graph shows acceleration and which section of the graph shows deceleration?

	acceleration	deceleration
A	1	2
B	1	3
C	2	4
D	3	1

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3 A steel ball is dropped from the top floor of a building. Air resistance can be ignored.

Which statement describes the motion of the ball?

A The ball falls with constant acceleration.

B The ball falls with constant speed.

C The ball falls with decreasing speed.

D The ball falls with increasing acceleration.

4 Diagram 1 shows a piece of flexible material that contains many pockets of air. Diagram 2 shows the same piece of flexible material after it has been compressed so that its volume decreases.

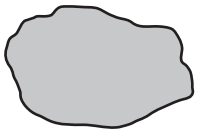


diagram 1
(before compression)

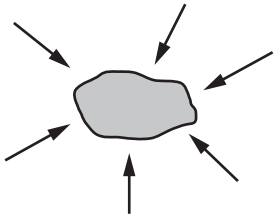


diagram 2
(after compression)

What happens to the mass and to the weight of the flexible material when it is compressed?

	mass	weight
A	increases	increases
B	increases	no change
C	no change	increases
D	no change	no change

5 On the Moon, the gravitational field strength g is 1.6 N / kg.

An object has a mass of 2.0 kg.

What is the weight of the object on the Moon?

A 0 N **B** 1.3 N **C** 3.2 N **D** 20.0 N

6 A measuring cylinder contains 40 cm^3 of water.

A solid metal ball is dropped into the water and the water level rises to 56 cm^3.

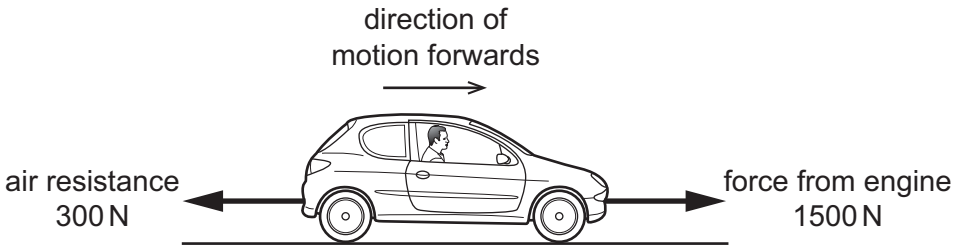
The mass of the ball is 80 g.

What is the density of the metal from which the ball is made?

A 0.20 g / cm^3 **B** 1.4 g / cm^3 **C** 2.0 g / cm^3 **D** 5.0 g / cm^3

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7 A car travels along a horizontal road at constant speed. Three horizontal forces act on the car. The diagram shows two of these forces.



What is the size and the direction of the third horizontal force acting on the car?

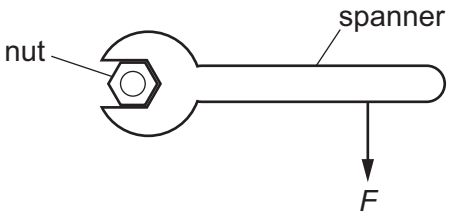
A 1200 N backwards

B 1200 N forwards

C 1800 N backwards

D 1800 N forwards

8 A force *F* is applied to a spanner, as shown.



Which action increases the moment of *F* about the centre of the nut?

A apply the force *F* to the end of the spanner handle

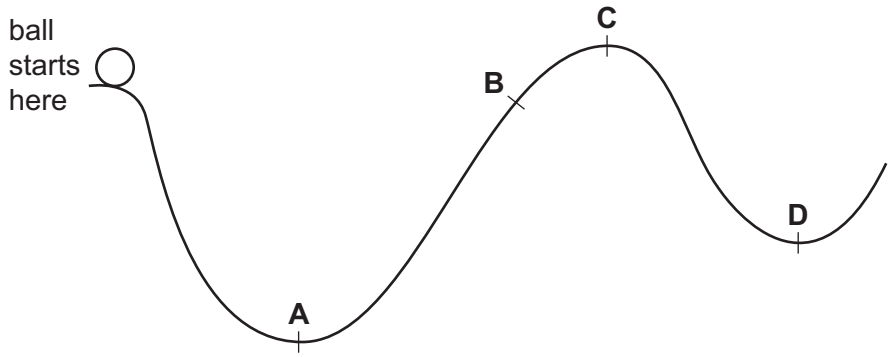
B apply the force *F* parallel to the spanner handle

C spray oil on the nut

D use a shorter spanner

9 A ball is released from rest and rolls down a track from the position shown.

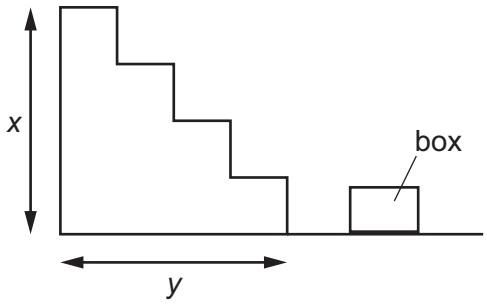
What is the furthest position that it is possible for the ball to reach?



10 Which row describes an advantage and a disadvantage of wind turbines?

	advantage	disadvantage
A	no fuel needed	harmful gases released
B	variable supply	fuel needed
C	no harmful gases released	variable supply
D	constant supply	noisy

11 A box of mass *m* and weight *W* is carried up some stairs of total height *x* and total width *y*.



On which quantities does the work done against gravity on the box depend?

A *m* and *y** **B** *W* and *x** **C** *W* and *y** **D** *x* and *y*

12 Diagram 1 shows a tube sealed at one end and partly immersed in mercury. The tube has a diameter *d*. The top of the mercury in the tube is a height *h* above the mercury reservoir.

diagram 1

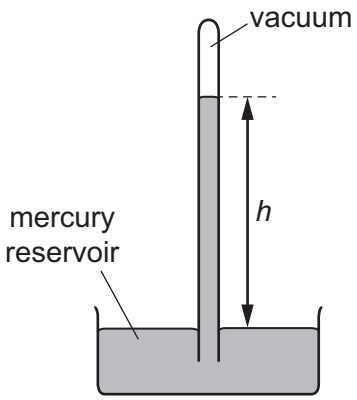
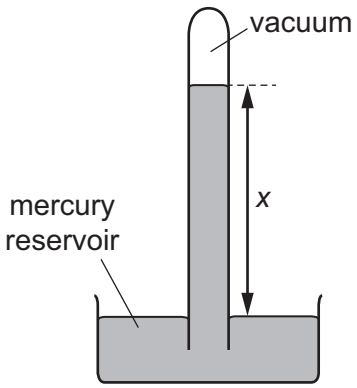


Diagram 2 shows a similar arrangement with a tube that has a diameter 2*d*.

diagram 2



What is the relationship between *h* and *x*?

A $x = 2h$

B $x = h$

C $x = \frac{h}{2}$

D $x = \frac{h}{4}$

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13 A skier is standing still on a flat area of snow.



The weight of the skier is 550 N. The total area of his skis in contact with the ground is 0.015 m^2.

What is the pressure exerted on the ground by the skier?

A 0.83 N / m^2 **B** 8.3 N / m^2 **C** 3700 N / m^2 **D** 37 000 N / m^2

14 The molecules of a substance in a particular state of matter move freely with random motion. The average speed of the molecules is increasing.

What is being described?

A a gas being heated

B a liquid evaporating

C a solid being heated

D a solid melting

15 A student measures the mass of warm water in an open container over two minutes. The container is kept at a constant temperature. The results are in the table.

time / minutes	mass / g
0.0	33.9
0.5	30.6
1.0	27.6
1.5	24.9
2.0	22.5

Why does the mass of the water change?

A The water evaporates.

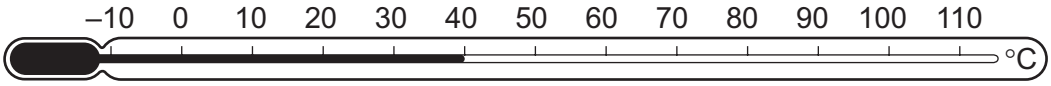
B The water freezes.

C The water condenses.

D The water boils.

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16 Which points are the fixed points of the liquid-in-glass thermometer shown?



A the beginning and end points of the column of liquid

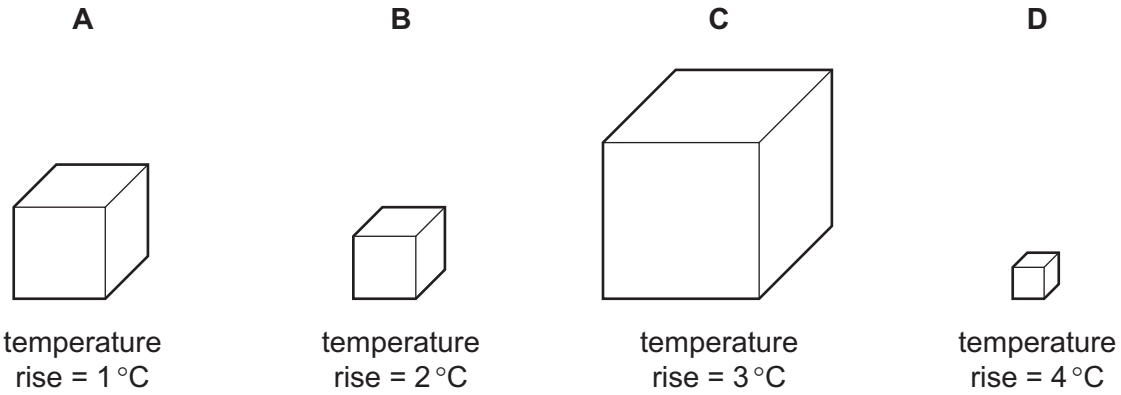
B the points marked –10 °C and 110 °C

C the points marked 0 °C and 100 °C

D the top and bottom points of the thermometer bulb

17 Four different metal blocks are given the same quantity of thermal energy.

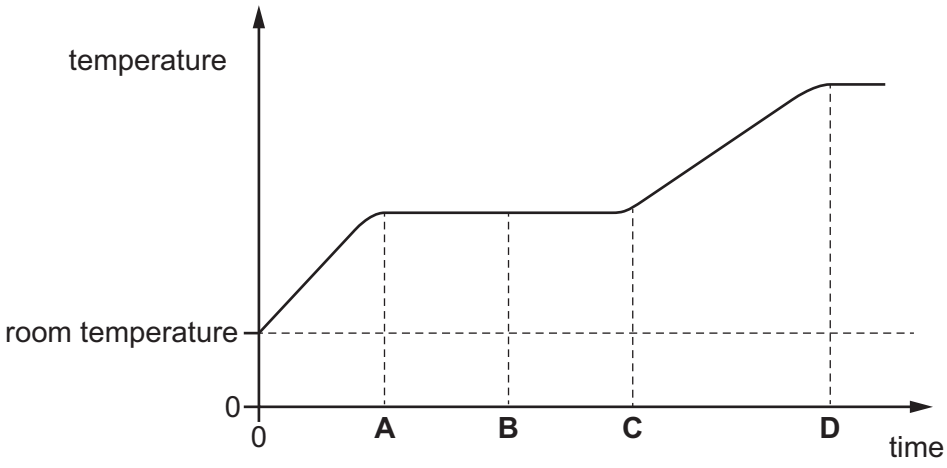
Which block has the greatest thermal capacity?



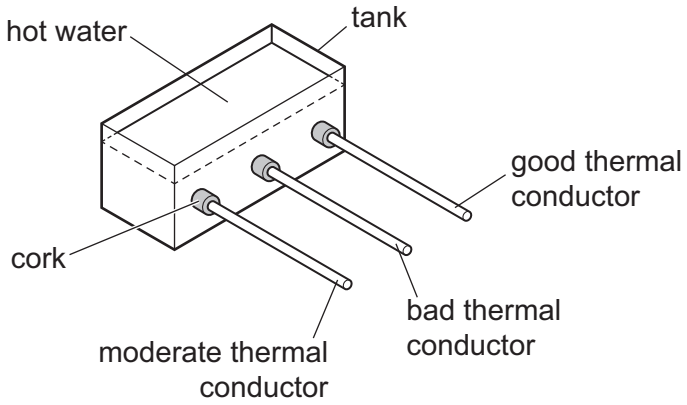
18 A solid is heated from room temperature.

The graph shows how its temperature changes with time as it is heated constantly.

At which time has it just become completely liquid?



19 Rods of the same shape and size are inserted through corks into a tank of hot water. Each rod is covered with a layer of solid wax that has a low melting point. After a period of time, some wax melts.



On which rod will the wax melt first?

A all at the same time

B good thermal conductor

C bad thermal conductor

D moderate thermal conductor

20 A boy jumps into an indoor swimming pool. He notices that the water appears to get colder as he goes deeper underwater. This is due to convection.

Which statement is correct?

A Cold water is more dense than warm water so it sinks to the bottom of the pool.

B Warm water is more dense than cold water so it rises to the surface of the pool.

C The molecules in cold water have more kinetic energy than the molecules in warm water so they move to the bottom of the pool faster.

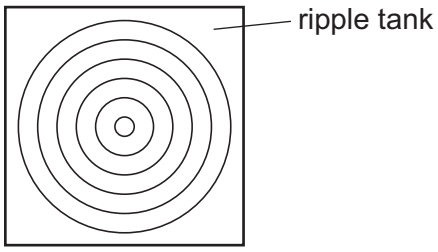
D The molecules in warm water are closer together than the molecules in cold water so they rise to the surface of the pool.

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[Turn over

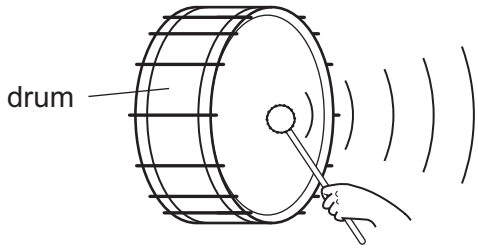
21 The diagrams show examples of wave motion.

1



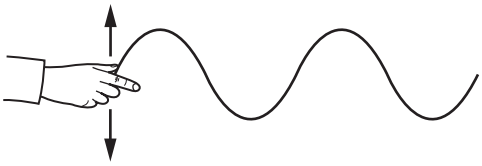
waves on water

2



waves in air

3



waves on a rope

4



waves in a spring

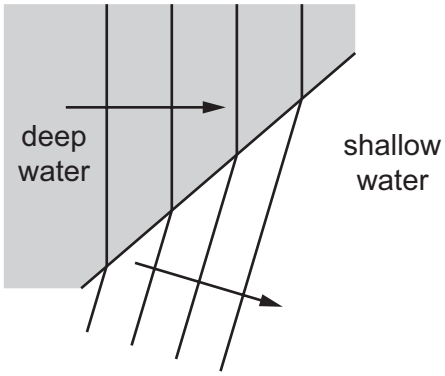
Which waves are longitudinal?

A 1 only **B** 2 and 3 only **C** 2, 3 and 4 **D** 2 and 4 only

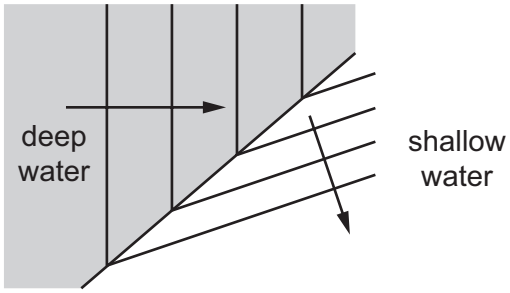
22 Waves on the surface of water travel from deep to shallow water.

Which diagram shows the correct path of the waves in the shallow water?

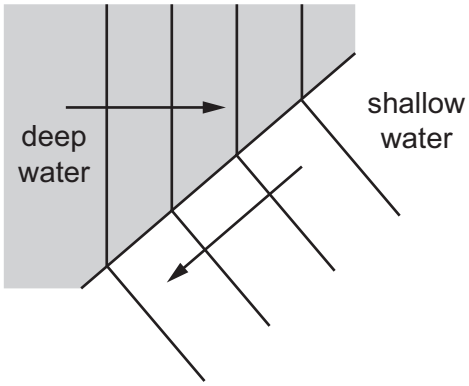
A



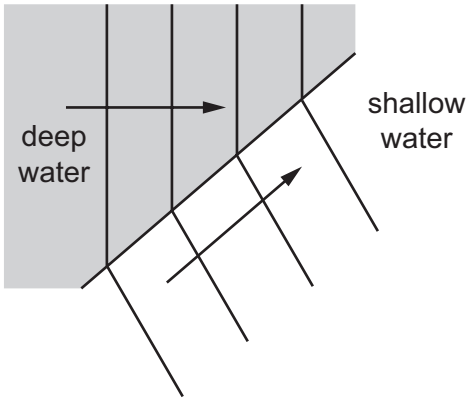
B



C

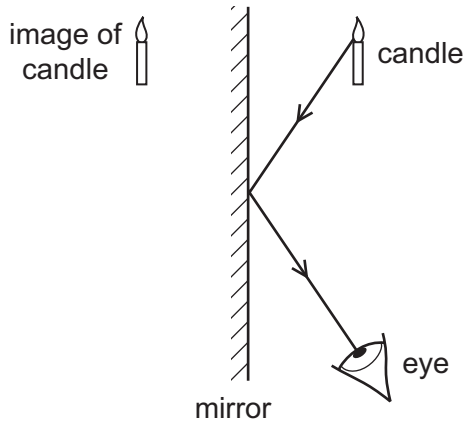


D

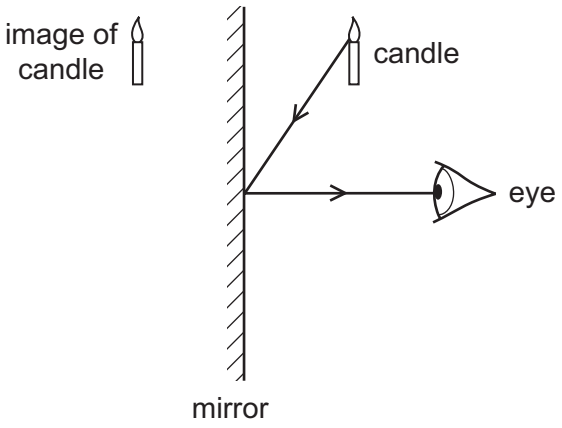


23 Which diagram shows how the light from a candle is reflected by a mirror, and shows the position of the image formed?

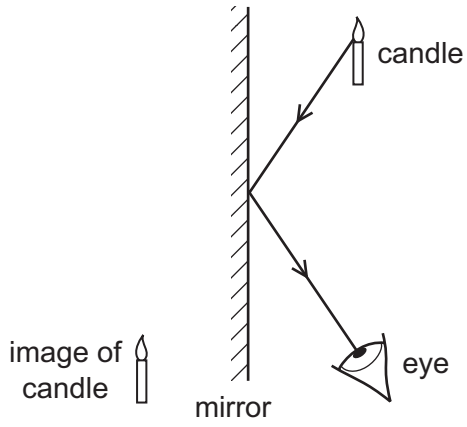
A



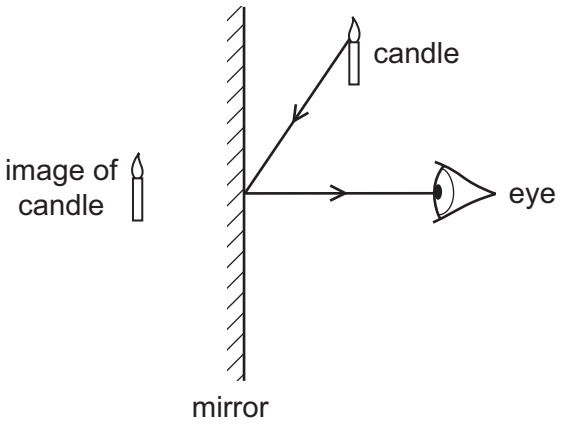
B



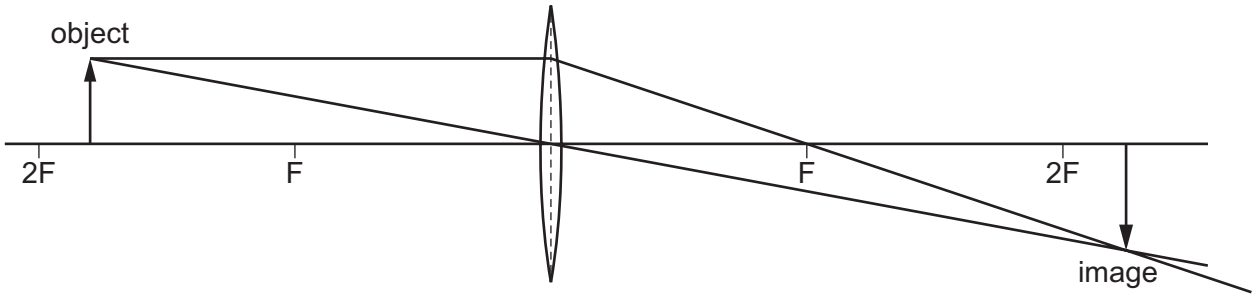
C



D



24 The diagram shows an image being formed by a converging lens.



Which description of the image formed is correct?

A enlarged and inverted

B enlarged and upright

C diminished and inverted

D diminished and upright

25 The horn on a ship makes a sound. The captain on the ship hears an echo from a cliff 4.0 s later.

The speed of sound is 340 m / s.

How far away is the cliff from the ship?

A 170 m **B** 340 m **C** 680 m **D** 1360 m

26 Bats produce ultrasound waves to navigate.

What is a possible frequency range for these waves?

A 0–20 Hz

B 20 Hz–2000 Hz

C 2 kHz–20 kHz

D 20 kHz–120 kHz

27 The table shows the forces that exist between magnetic poles.

Which row is correct?

	N pole and N pole	N pole and S pole
A	attraction	attraction
B	attraction	repulsion
C	repulsion	attraction
D	repulsion	repulsion

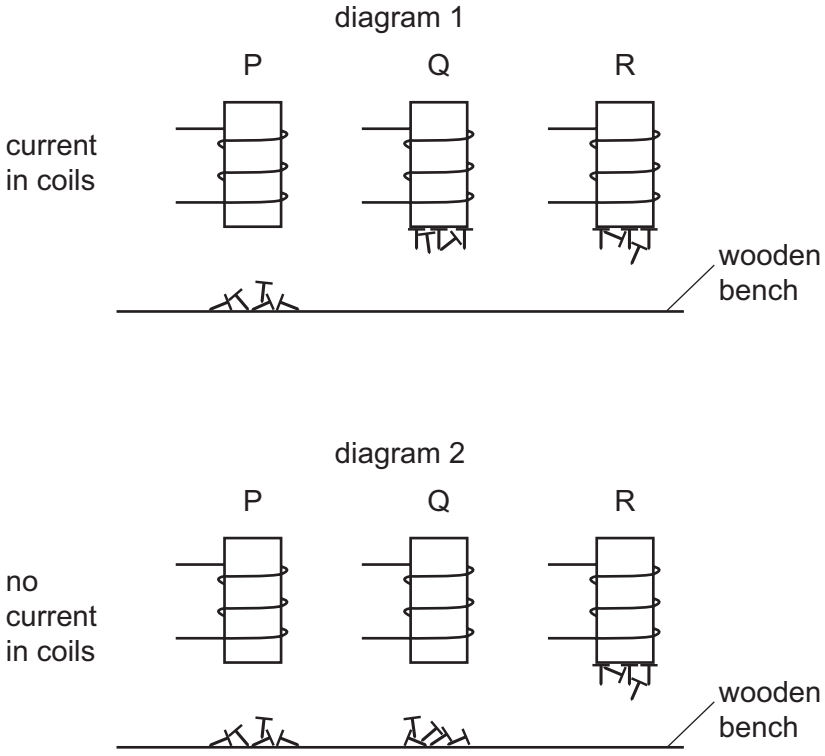
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28 The diagrams show three different metal rods P, Q and R, inside coils of wire.

Small iron nails are placed on a wooden bench under the rods.

Diagram 1 shows the situation when there are electric currents in the wires.

Diagram 2 shows the situation when the currents are switched off.



Which row correctly identifies the metal rods?

	P	Q	R
A	copper	soft iron	steel
B	soft iron	copper	steel
C	steel	soft iron	copper
D	copper	steel	soft iron

29 A polythene rod becomes negatively charged when it is rubbed with a cloth.

Which statement explains this?

A The rod gains electrons.

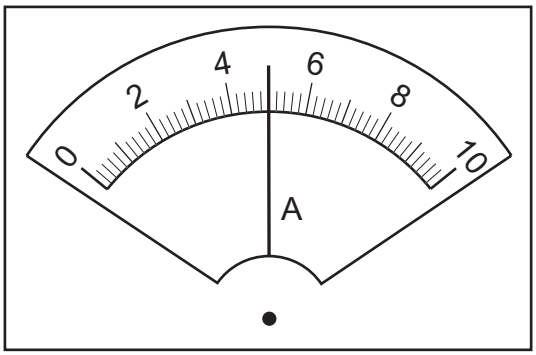
B The rod loses electrons.

C The rod gains protons.

D The rod loses protons.

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30 The diagram shows a reading on an ammeter.



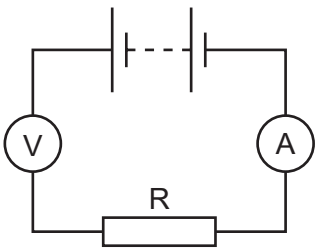
What is the reading?

A 0.45 A **B** 0.50 A **C** 4.5 A **D** 5.0 A

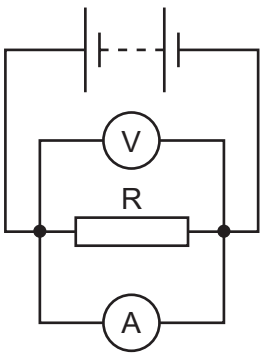
31 A student is to determine the resistance of resistor R. She uses a circuit including a voltmeter and an ammeter.

Which circuit should be used?

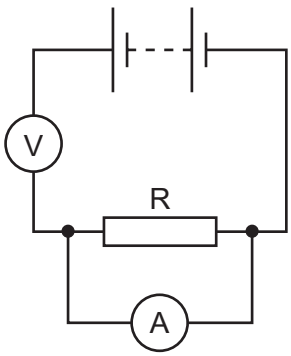
A



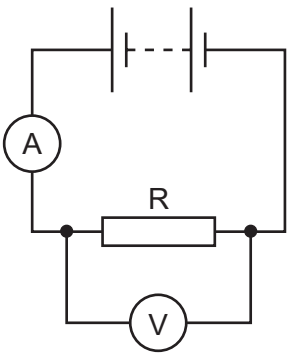
B



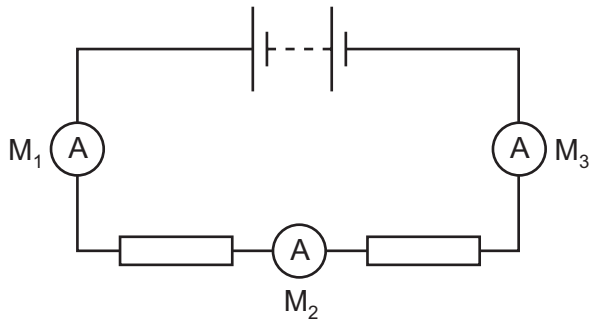
C



D



32 The diagram shows a battery connected to two resistors. Three ammeters M_1, M_2 and M_3 are connected in the circuit.



Ammeter M_1 reads 1.0 A.

What are the readings on M_2 and on M_3?

	reading on M_2 / A	reading on M_3 / A
A	0.0	0.0
B	0.5	0.5
C	0.5	1.0
D	1.0	1.0

33 Lamps in a circuit are connected in parallel.

What is the advantage of this?

A If one lamp breaks, the others remain lit.

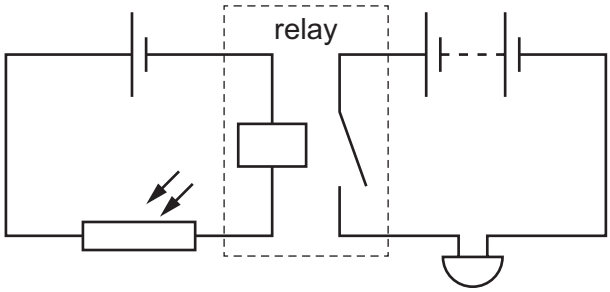
B Less current is taken from the power supply.

C The lamps use less power than if they were connected in series.

D The potential difference across each lamp is less than that of the power supply.

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34 The diagram shows a relay being used to control a buzzer.



What is the function of the circuit?

A The buzzer switches off when the circuit becomes cold.

B The buzzer switches off when the circuit becomes light.

C The buzzer switches on when the circuit becomes cold.

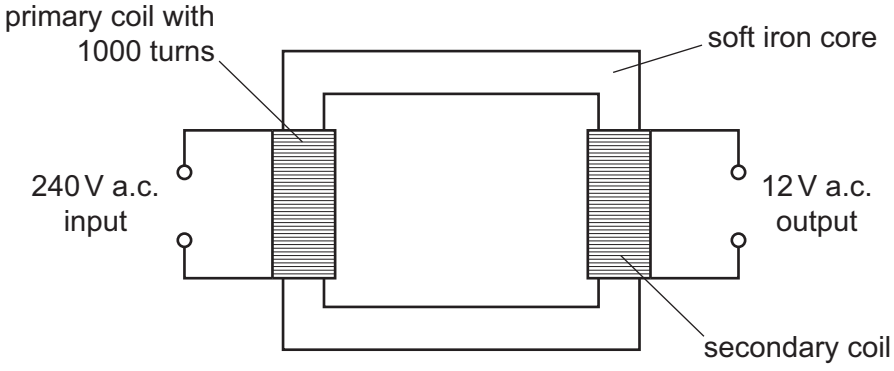
D The buzzer switches on when the circuit becomes light.

35 There is a 5 A fuse in the circuit of an appliance.

What is the purpose of the fuse and in which wire is it connected?

	purpose	wire in which it is connected
A	breaks the circuit if the current is greater than 5 A	earth
B	breaks the circuit if the current is greater than 5 A	live
C	breaks the circuit if the current is less than 5 A	earth
D	breaks the circuit if the current is less than 5 A	live

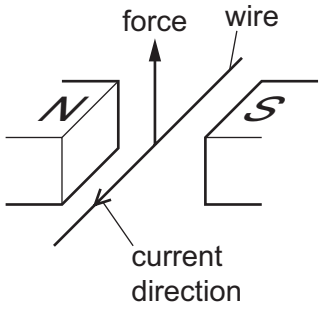
36 The diagram shows a transformer that has an output voltage of 12 V.



How many turns of wire are in the secondary coil?

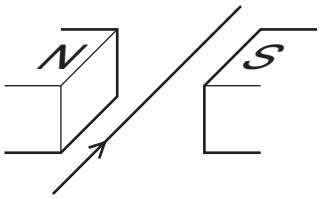
A 12 **B** 20 **C** 50 **D** 20 000

37 A current-carrying conductor is placed between two magnetic poles. The current causes a force to act on the wire.



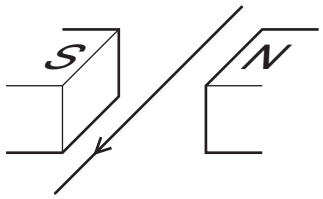
Three other arrangements P, Q and R, of the wire and magnetic poles are set up as shown.

P



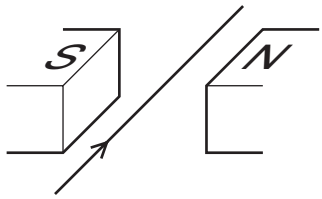
current reversed

Q



magnetic poles switched around

R



current reversed and magnetic poles switched around

Which arrangements will cause a force in the opposite direction to that shown in the top diagram?

A P, Q and R **B** P and Q only **C** P only **D** R only

38 The symbol for a radioactive nuclide of carbon is $^{14}_{6}C$.

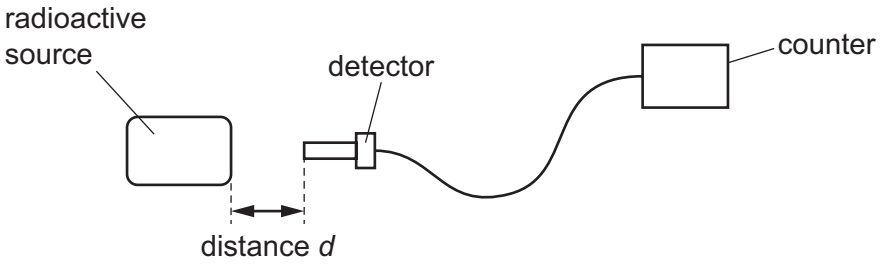
How many neutrons are in its nucleus?

A 6 **B** 8 **C** 14 **D** 20

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39 A student measures the rate at which ionising radiation is emitted from a radioactive substance.

He places a detector at different distances from the radioactive source.



The table shows how the reading on the counter varies with distance *d*.

The readings on the counter are corrected for background radiation.

distance *d* / cm	0	2	4	6
counter reading / counts per minute	1250	115	0	0

Which type of ionising radiation is being emitted by the substance?

A α-particles

B β-particles

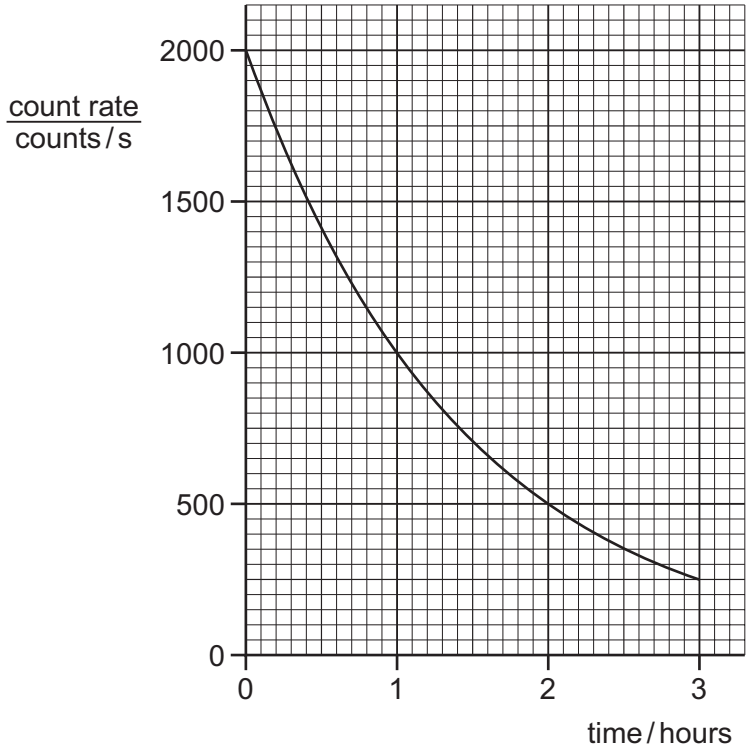
C γ-rays

D X-rays

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[Turn over

40 The graph shows the count rate from a radioactive source over a period of time.



What is the half-life of the source?

A 0.5 hour **B** 1.0 hour **C** 1.5 hours **D** 3.0 hours

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