Cambridge Assessment International Education

Cambridge IGCSE™

PHYSICS **0625/13**

Paper 1 Multiple Choice (Core) **October/November 2022**

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 **20** pages. Any blank pages are indicated.

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1 A student uses a ruler to measure the length of a spring.

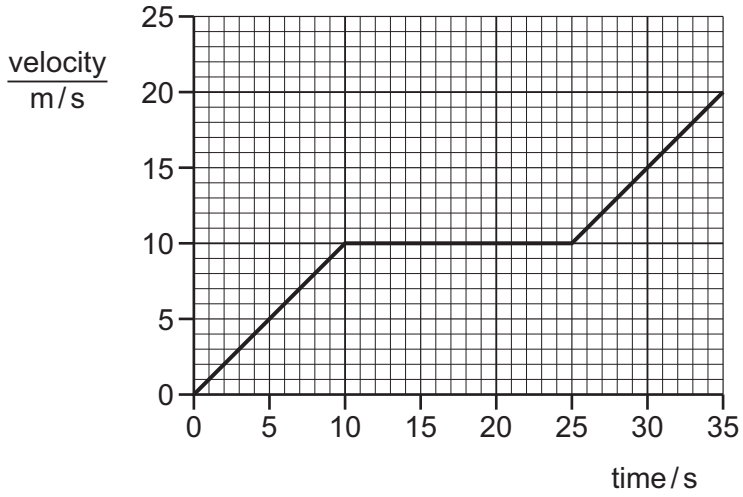
His results are shown.

14.9 cm 14.8 cm 14.8 cm 14.7 cm

What is the average length of the spring to three significant figures?

A 14.8 cm **B** 14.9 cm **C** 15.0 cm **D** 15 cm

2 The velocity–time graph for a car is shown.



What is the distance travelled by the car in 35 s?

A 250 m **B** 350 m **C** 450 m **D** 700 m

3 Which statements about weight are correct?

1 Weight is the quantity of matter in an object.

2 Weight is the force due to gravity acting on an object.

3 Weight is measured in kilograms.

4 Weight is measured in newtons.

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

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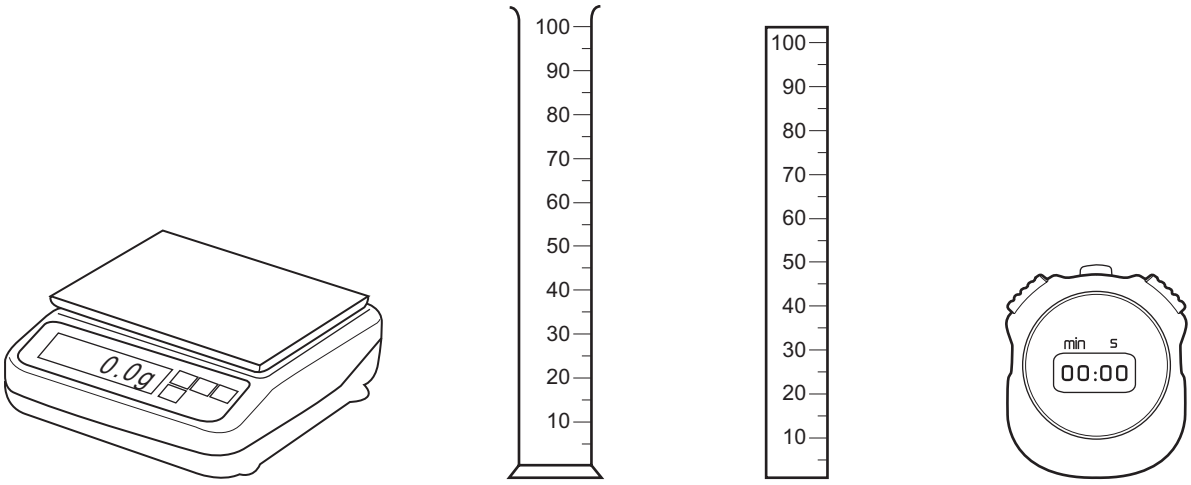
4 The diagram shows four pieces of laboratory apparatus.



balance | measuring cylinder | ruler | stop-watch

Which pieces of apparatus are used to find the density of a liquid?

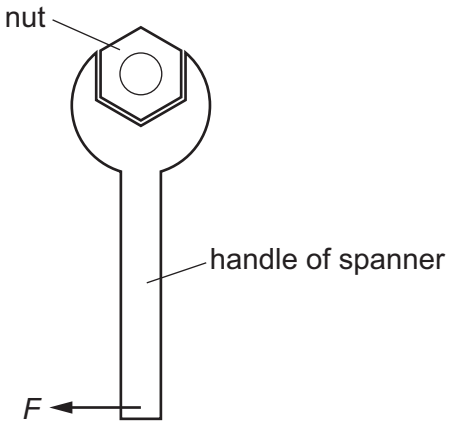
A balance and stop-watch

B balance and measuring cylinder

C measuring cylinder and ruler

D stop-watch and ruler

5 A spanner is used to tighten a nut on a bicycle wheel. A force *F* is needed.



How can the force *F* be reduced?

A Use a longer handle.

B Use a shorter handle.

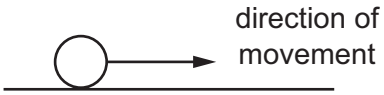
C Use a thinner handle.

D Use a thicker handle.

6 On which ball is a non-zero resultant force acting?

A

a ball moving at constant speed on a smooth surface

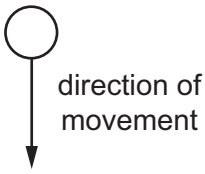


B

a ball at rest on a bench

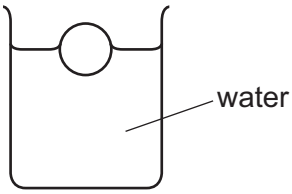
C

a free-falling ball which has just been released

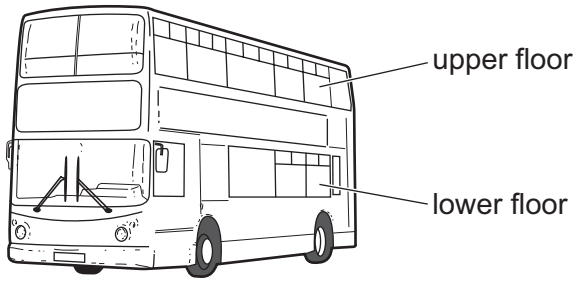


D

a ball floating on water



7 The diagram shows a bus with an upper floor and a lower floor.



Passengers on the upper floor are not allowed to stand while the bus is moving. Standing passengers make the bus less stable.

Why is this?

A The total weight is greater when they stand.

B There is too much pressure on the floor.

C The centre of mass is higher up.

D The density is greater.

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8 An object falls towards the Earth's surface.

What happens to the gravitational potential energy and to the kinetic energy of the object?

	gravitational potential energy	kinetic energy
A	decreases	decreases
B	decreases	increases
C	increases	decreases
D	increases	increases

9 What is the unit of work?

A J **B** N **C** N / kg **D** W

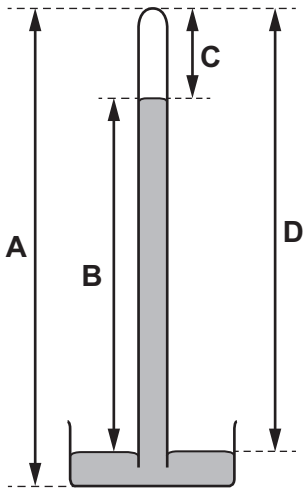
10 In some situations, a force does work.

Which set of conditions increases the quantity of work done by the force?

	magnitude of force	distance moved by the force
A	decreases	decreases
B	decreases	stays the same
C	increases	increases
D	stays the same	decreases

11 The diagram shows a simple mercury barometer.

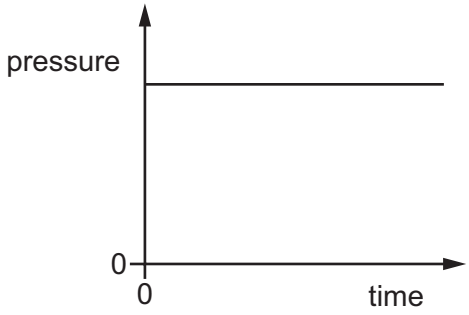
Which labelled distance decreases when atmospheric pressure increases?



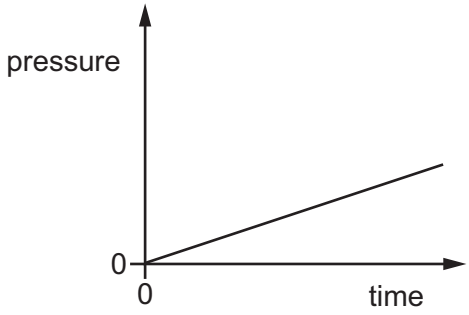
12 The pressure of a fixed mass of gas in a cylinder is measured. The volume of the gas in the cylinder is slowly decreased. The temperature of the gas does not change.

Which graph shows how the pressure of the gas changes during this process?

A



B



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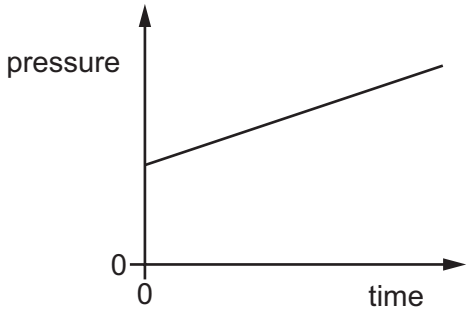
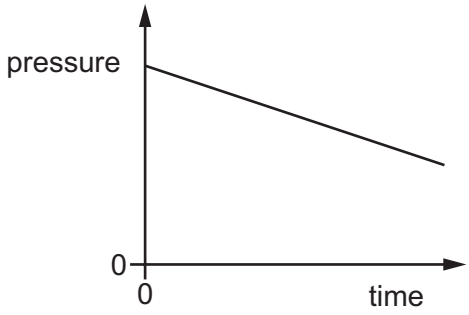


D



13 A liquid is evaporating.

What does it lose from its surface?

A less energetic ions

B less energetic molecules

C more energetic ions

D more energetic molecules

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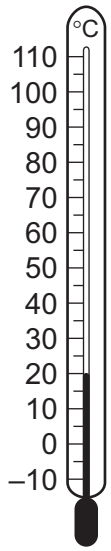
14 The diagram shows a thermometer calibrated in degrees Celsius.



What are the values of the lower fixed point and of the upper fixed point on the Celsius scale?

	lower fixed point / °C	upper fixed point / °C
A	–10	110
B	0	20
C	0	100
D	20	100

15 Which statements does the term 'melting point' refer to?

1 the temperature at which a liquid changes to solid without a change in temperature

2 the temperature at which a solid changes to liquid without a change in temperature

3 the temperature at which a liquid changes to vapour without a change in temperature

4 the temperature at which a vapour changes to liquid without a change in temperature

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

16 Which piece of equipment is designed to produce a type of electromagnetic wave?

A electric fire

B electric generator

C electric motor

D electromagnet

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17 How is energy transferred from the Sun to the Earth?

A by α-particles

B by conduction

C by convection

D by radiation

18 Wavefronts are incident on a boundary.

What is needed for the wave to refract at the boundary?

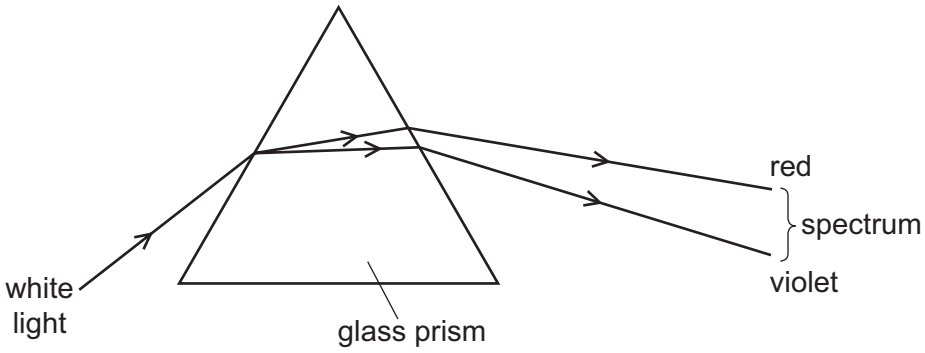
A a shiny surface at the boundary

B a small gap in the boundary

C different mediums either side of the boundary in which the frequency of the wave is different

D different mediums either side of the boundary in which the speed of the wave is different

19 A 60° glass prism disperses white light as shown.



The spectrum can be seen emerging from the prism.

Which spectrum shows the colours in the correct order?

A violet, green, blue, yellow, orange, red

B violet, blue, green, orange, yellow, red

C violet, blue, green, yellow, orange, red

D violet, green, blue, orange, yellow, red

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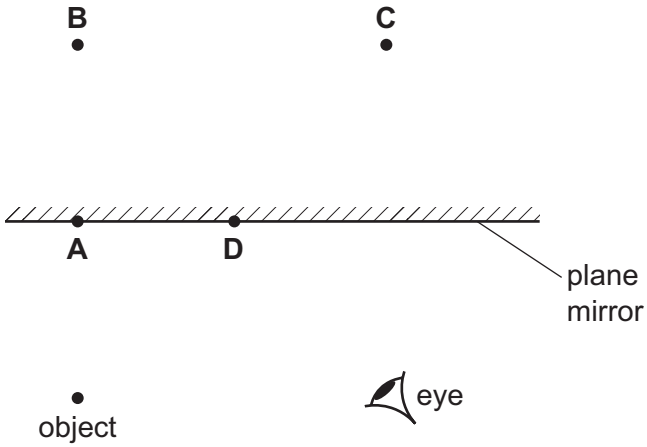
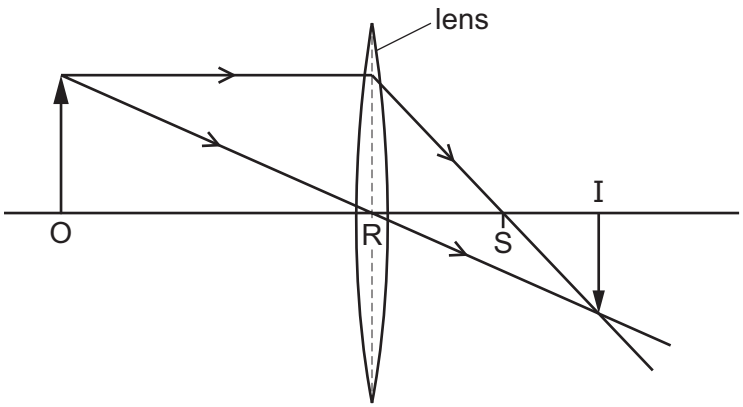
20 The diagram shows an object in front of a plane mirror.

At which labelled position is the image of the object formed?



21 The diagram shows the action of a thin converging lens on two rays of light. The rays are from the top of an object O. An inverted image I is formed.



Which name is given to the distance RS?

A principal axis

B principal focus

C focal length

D real length

22 Visible light has a frequency of approximately 5.0×10^{14} Hz.

M and N are two other types of electromagnetic radiation.

The frequency of M is 5.0×10^{6} Hz.

The frequency of N is 5.0×10^{15} Hz.

Which types of radiation are M and N?

	M	N
A	radio waves	infrared
B	radio waves	ultraviolet
C	ultraviolet	X-rays
D	X-rays	infrared

23 Which wave is **not** an electromagnetic wave?

A microwaves

B radio

C sound

D ultraviolet

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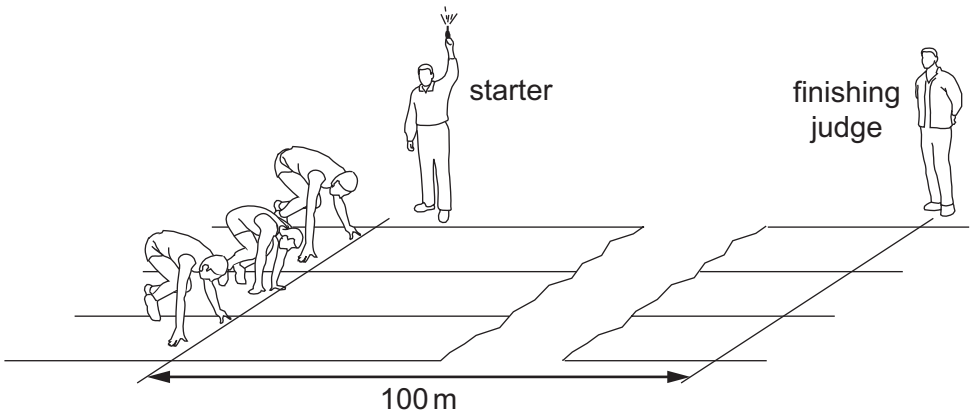
24 A 100 m race is started by firing a gun. The gun makes a bang and a puff of smoke at the same time.



When does the finishing judge see the smoke and when does he hear the bang?

	sees the smoke	hears the bang
A	almost immediately	almost immediately
B	almost immediately	after about 0.3 s
C	after about 0.3 s	almost immediately
D	after about 0.3 s	after about 0.3 s

25 Copper wires are used to connect an electric circuit.

Which particles flow in the wires when the circuit is switched on?

A atoms

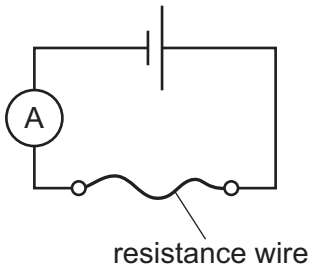
B electrons

C ions

D neutrons

26 A student is investigating a resistance wire.

She measures the current in a 50 cm length of resistance wire.



The student repeats the experiment using a 100 cm length of the same resistance wire.

What is the effect of this change on the current in the circuit and on the resistance of the wire?

	effect on current	effect on resistance
A	decreases	decreases
B	decreases	increases
C	increases	decreases
D	increases	increases

27 What is the full name of the term e.m.f.?

A electromotive field

B electromotive force

C electromotive frequency

D electromotive friction

28 A plastic rod is rubbed with a dry woollen cloth. The rod becomes positively charged.

Which statement is correct?

A Electrons move from the cloth to the rod.

B Electrons move from the rod to the cloth.

C Protons move from the cloth to the rod.

D Protons move from the rod to the cloth.

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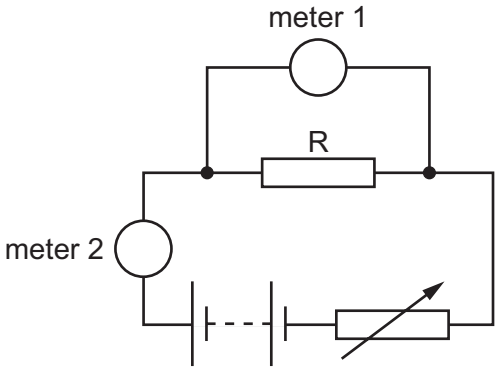
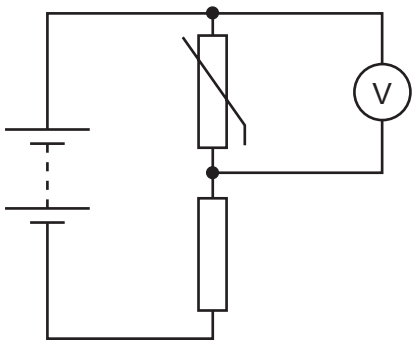
29 The diagram shows the circuit that a student uses to determine the resistance of resistor R.



Which row describes meter 1 and meter 2?

	meter 1	meter 2
A	ammeter	ammeter
B	ammeter	voltmeter
C	voltmeter	ammeter
D	voltmeter	voltmeter

30 The diagram shows a potential divider circuit.



The temperature of the thermistor increases.

What happens to the resistance of the thermistor, and what happens to the reading on the voltmeter?

	resistance of thermistor	voltmeter reading
A	decreases	decreases
B	decreases	increases
C	increases	decreases
D	increases	increases

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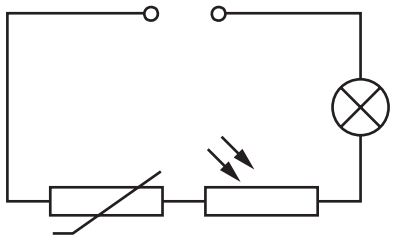
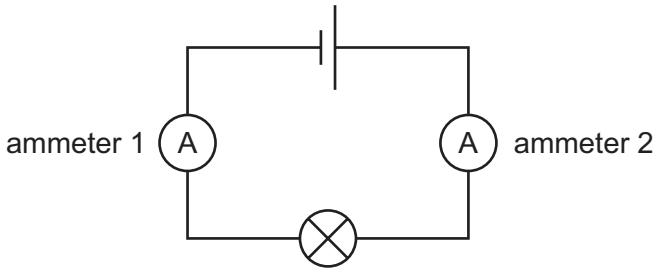
31 The diagram shows a series circuit containing a fixed voltage power supply, a thermistor, a light-dependent resistor (LDR) and a lamp.



Which set of conditions makes the lamp brightest?

	light intensity shining on LDR	temperature of thermistor
A	bright	high
B	bright	low
C	dim	high
D	dim	low

32 The diagram shows a circuit containing a cell, a lamp and two ammeters.



The current reading on ammeter 2 is 0.20 A.

What is the name for this type of circuit and what is the reading on ammeter 1?

	type of circuit	reading on ammeter 1
A	series	0.20 A
B	series	greater than 0.20 A
C	parallel	0.20 A
D	parallel	greater than 0.20 A

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33 The circuit connecting a room heater to the mains electricity supply has a fuse in it.

The fuse melts and switches off the circuit.

Why does the wire in the fuse melt?

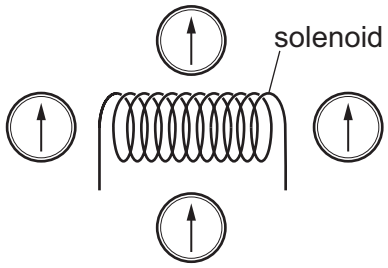
A The air in the room becomes too damp.

B The air in the room reaches its required temperature.

C The insulation around the circuit wire becomes damaged.

D The current in the circuit becomes too large.

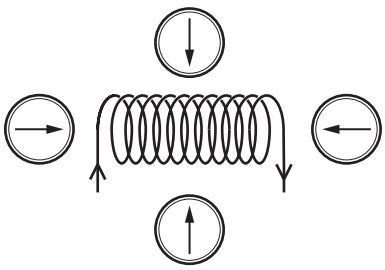
34 Four small compasses are placed around a solenoid.



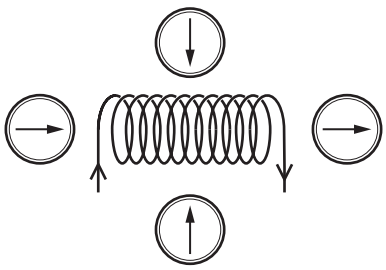
A current is now switched on in the solenoid.

Which diagram shows possible new directions of the compass needles?

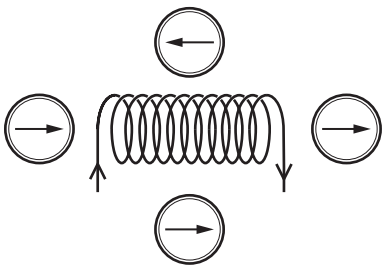
A



B



C



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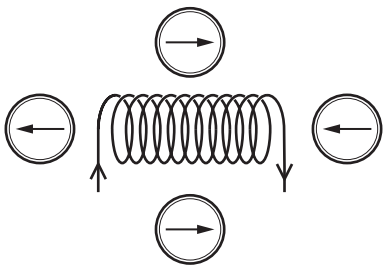


35 Which metal is used for the core of a transformer?

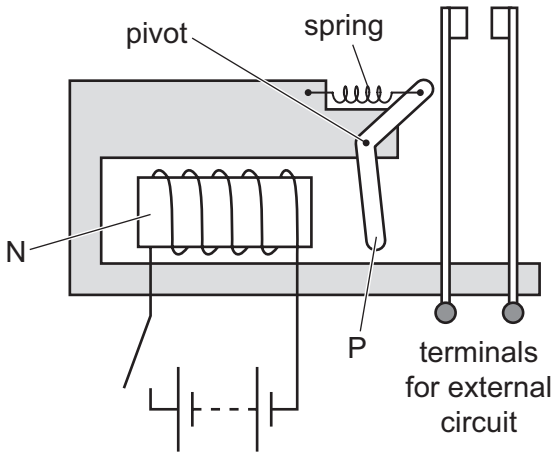
A aluminium

B copper

C soft iron

D steel

36 The diagram shows the design of a type of relay.



Two parts are labelled N and P.

From which metal is N made and from which metal is P made?

	N	P
A	soft iron	soft iron
B	soft iron	steel
C	steel	soft iron
D	steel	steel

37 A nuclide of cobalt contains 27 protons and 32 neutrons.

Which symbol represents this nuclide?

A $^{27}_{59}Co$ **B** $^{32}_{27}Co$ **C** $^{32}_{59}Co$ **D** $^{59}_{27}Co$

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38 In the processes shown, X and Y are elements.

Which process describes α-decay?

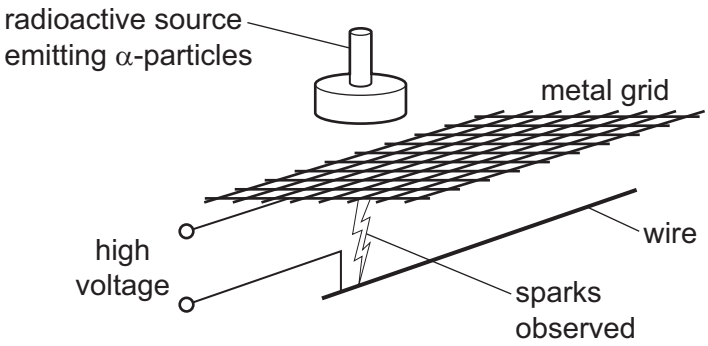
A Atoms of X collide with atoms of Y.

B Atoms of X emit atoms of Y.

C Atoms of X change into ions of Y.

D Atoms of X absorb α-particles.

39 A high-voltage power supply is connected to a metal grid and a wire, as shown.



When the radioactive source is placed close to the grid, sparks are observed in the position indicated.

Which statement explains why the sparks are formed?

A α-particles have a long range.

B α-particles have no charge.

C α-particles have no mass.

D α-particles are strongly ionising.

40 A radioactive substance has a half-life of 6 hours.

It has an initial rate of emission of 120 counts per second.

How long will it take for this rate of emission to fall to 30 counts per second?

A 1.5 hours **B** 12 hours **C** 30 hours **D** 240 hours

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