Cambridge Assessment International Education

Cambridge IGCSE™

PHYSICS **0625/12**

Paper 1 Multiple Choice (Core) **February/March 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 A student has a measuring cylinder containing water and also has a balance.

Which of these could she use to find the volume of a small metal sphere?

She has no other apparatus.

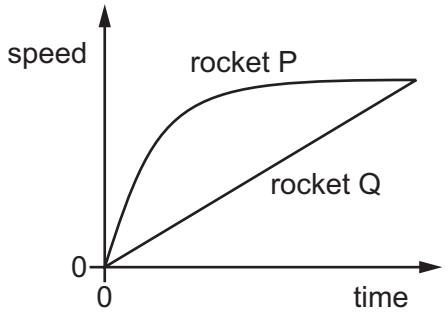
A either the measuring cylinder containing water or the balance

B the measuring cylinder containing water only

C the balance only

D neither the measuring cylinder nor the balance

2 Two rockets are launched at the same time from the surface of the Earth. The graph shows how the speeds of the rockets change with time.



Which statement about the rockets is correct?

A Both rockets travel the same distance.

B Rocket P accelerates and then decelerates.

C Rocket P travels further than rocket Q.

D Rocket Q has zero acceleration.

3 A train begins a journey from a station and travels 60 km in a time of 20 minutes.

What is the average speed of the train?

A 3.0 m/s **B** 5.0 m/s **C** 50 m/s **D** 60 m/s

4 What is weight?

A a frictional force

B a magnetic force

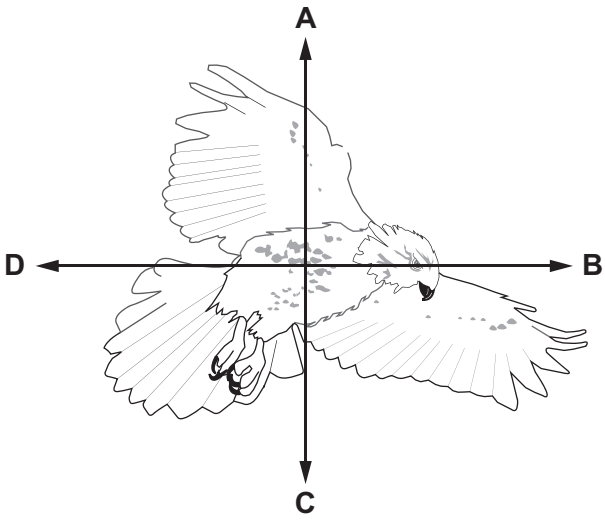
C a gravitational force

D an electromagnetic force

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5 The diagram shows a bird in flight. The bird is flying in a horizontal direction to the right.

In which direction does air resistance act on the bird?



6 A small bottle has a mass of 20 g when empty. The volume of the bottle is 10 cm^3.

When full of liquid, the total mass is 150 g.

What is the density of the liquid?

A 0.50 g/cm^3 **B** 2.0 g/cm^3 **C** 13 g/cm^3 **D** 15 g/cm^3

7 A rocket is travelling vertically upwards. Three vertical forces act on it.

The thrust acts upwards and is equal to 100 000 N.

The weight acts downwards and is equal to 80 000 N.

What is the air resistance force acting on the rocket when it is travelling upwards at constant speed?

A 20 000 N downwards

B 20 000 N upwards

C 180 000 N downwards

D 180 000 N upwards

8 Which energy source boils water to make steam in power stations?

A energy from tides

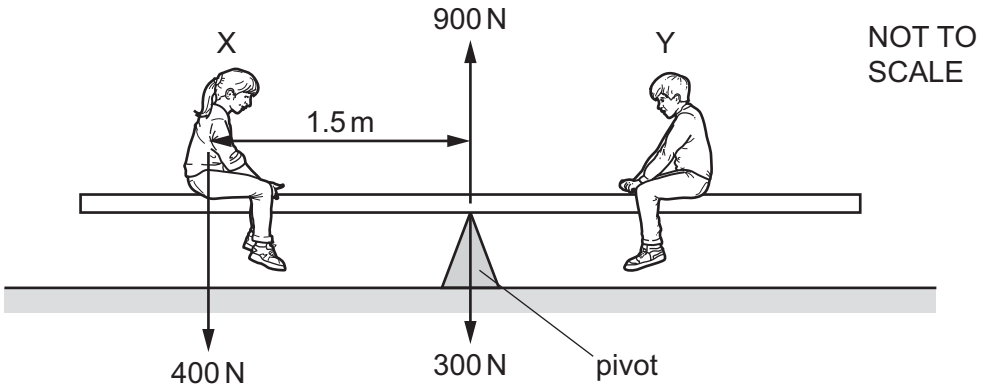
B energy from waves

C hydroelectric energy

D nuclear energy

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9 Two people X and Y sit on a see-saw, as shown.



X weighs 400 N and sits 1.5 m from the pivot.

The weight of the see-saw is 300 N and acts through the pivot.

When the see-saw is balanced, the pivot pushes up on the see-saw with a force of 900 N.

What is the weight of person Y and how far from the pivot is he sitting?

	weight of Y / N	distance from pivot / m
A	200	1.5
B	200	3.0
C	400	1.5
D	400	3.0

10 A horizontal force pulls a box along a horizontal surface.

The box gains 30 J of kinetic energy and 10 J of thermal energy is produced by the friction between the box and the surface.

How much work is done by the force?

A 10 J **B** 20 J **C** 30 J **D** 40 J

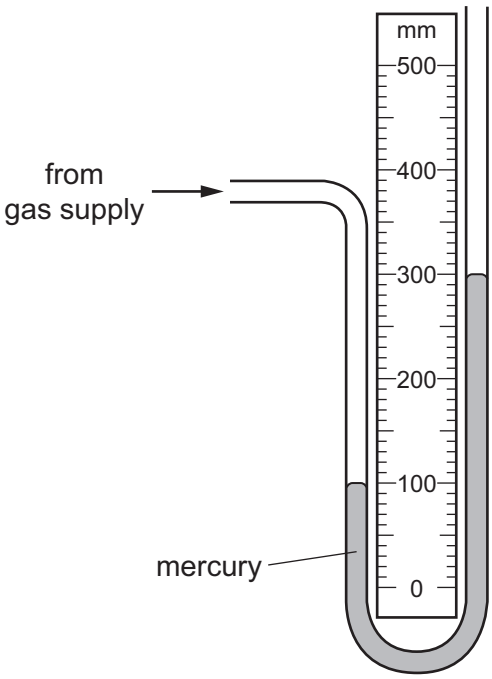
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11 The table shows the work done and the time taken by four machines.

Which machine is the most powerful?

	work done / kJ	time taken / s
A	100	10
B	100	20
C	200	10
D	200	20

12 The diagram shows a manometer connected to a gas supply.



What is the pressure of the gas supply?

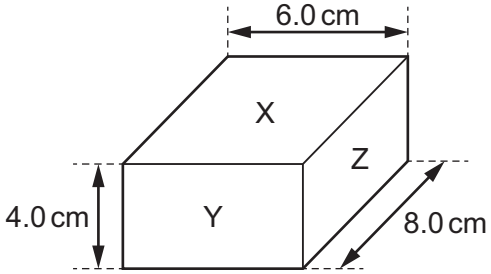
A 100 mm Hg above atmospheric pressure

B 100 mm Hg below atmospheric pressure

C 200 mm Hg above atmospheric pressure

D 200 mm Hg below atmospheric pressure

13 The diagram shows a box of dimensions 6.0 cm × 8.0 cm × 4.0 cm.



The box rests on a flat horizontal surface.

On which face must the box rest in order to exert the least pressure?

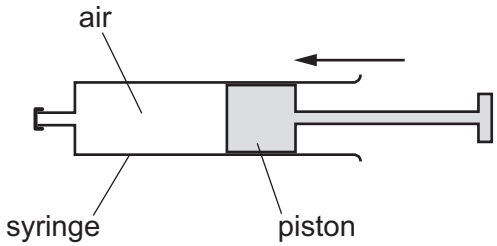
A face X

B face Y

C face Z

D The pressure is the same for all the faces.

14 Air in a sealed syringe is slowly compressed by moving the piston. The temperature of the air stays the same.



Which statement about the air is correct?

A The pressure of the air decreases because its molecules now travel more slowly.

B The pressure of the air decreases because the area of the syringe walls is now smaller.

C The pressure of the air increases because its molecules now hit the syringe walls more frequently.

D The pressure of the air increases because its molecules now travel more quickly.

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15 In an experiment, smoke particles are suspended in air and viewed through a microscope.

The smoke particles move about with short random movements.

Which of the following statements is correct?

A Air particles have large masses compared to smoke particles and they move in one direction only.

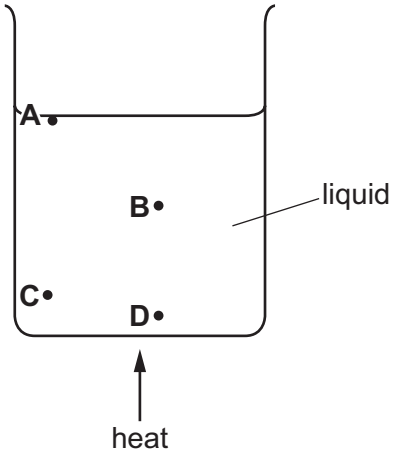
B Air particles have large masses compared to smoke particles and they move in random directions.

C Air particles move at high speeds compared to smoke particles and they move in one direction only.

D Air particles move at high speeds compared to smoke particles and they move in random directions.

16 A beaker of liquid is heated slowly so that the liquid evaporates.

During evaporation, from where do the more energetic molecules leave the liquid?



17 Four samples of materials with the same dimensions are tested.

Which material gives the highest rate of thermal conduction?

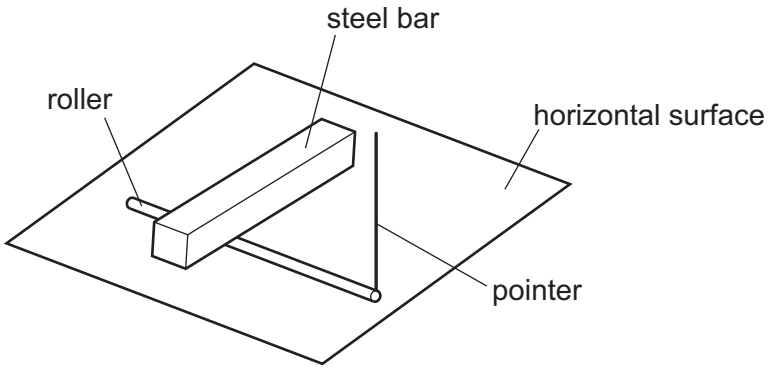
A rubber

B copper

C plastic

D steel

18 The diagram shows a simple type of thermometer.



The roller rests on a horizontal surface and the steel bar rests on top of the roller.

When the temperature changes, the pointer rotates.

Which physical property is being used to measure temperature?

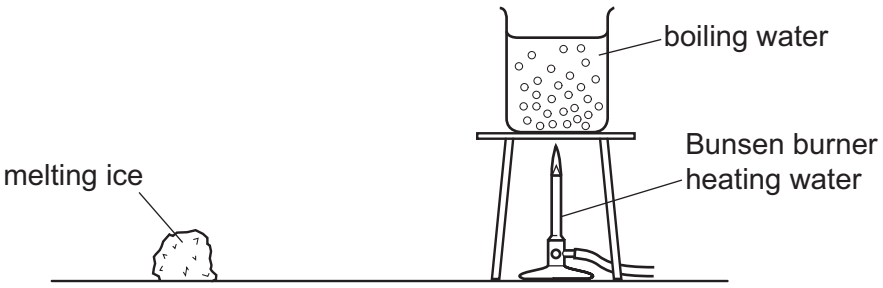
A the length of the pointer

B the length of the roller

C the length of the steel bar

D the thickness of the roller

19 A piece of melting ice at 0 °C and a beaker of boiling water are both in a laboratory. The laboratory is at 20 °C.



What is happening to the temperature of the melting ice and what is happening to the temperature of the boiling water?

	temperature of melting ice	temperature of boiling water
A	constant	constant
B	constant	increasing
C	increasing	constant
D	increasing	increasing

20 Four metal mugs with lids each contain the same volume of hot water at the same temperature.



The mugs are made from the same metal and are the same shape and size, but each has its outside surface painted with a different combination of texture and colour.

Which mug radiates thermal energy at the fastest rate?

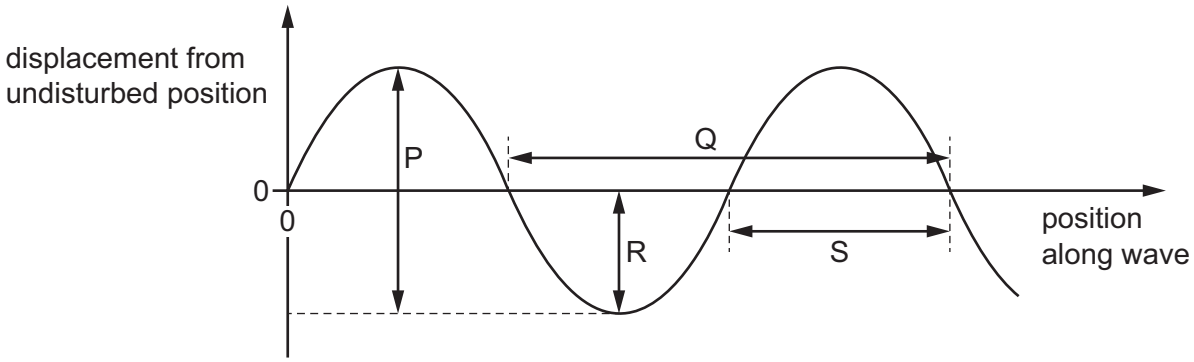
A the mug painted shiny white

B the mug painted dull white

C the mug painted shiny black

D the mug painted dull black

21 The diagram shows a wave.



Which dimensions describe the properties of the wave?

A P = amplitude, S = speed

B P = speed, Q = wavelength

C R = amplitude, Q = wavelength

D R = amplitude, S = wavelength

22 What causes the change in direction when light travels from air into glass?

A The amplitude of the light changes.

B The colour of the light changes.

C The frequency of the light changes.

D The speed of the light changes.

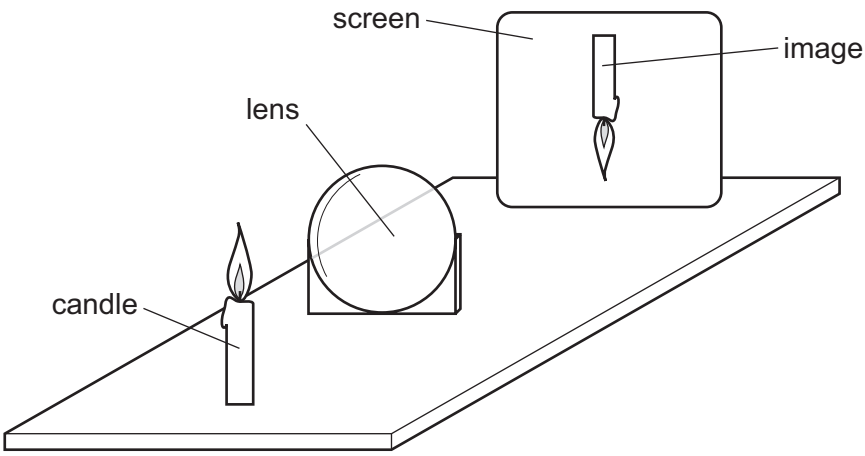
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23 Light from a torch is incident on a plane mirror. The angle of incidence is 38°.

What is the angle of reflection?

A 38° **B** 52° **C** 76° **D** 142°

24 A thin converging lens is used to produce a sharp image of a candle.



Various sharp images are produced on the screen by moving the lens and the screen backwards and forwards.

Which statement is **always** correct?

A The image is at the principal focus (focal point) of the lens.

B The image is bigger than the object.

C The image is closer to the lens than the object.

D The image is inverted.

25 Thermal radiation is part of the electromagnetic spectrum.

What is the name of this region of the spectrum?

A gamma rays

B infrared rays

C ultraviolet rays

D visible light rays

26 Which process causes a sound wave to produce an echo?

A diffraction

B dispersion

C reflection

D refraction

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27 A quiet sound is produced by a loudspeaker. The pitch of the sound remains constant but the loudness of the sound is increased.

Which property of the sound wave is increased?

A amplitude

B frequency

C speed

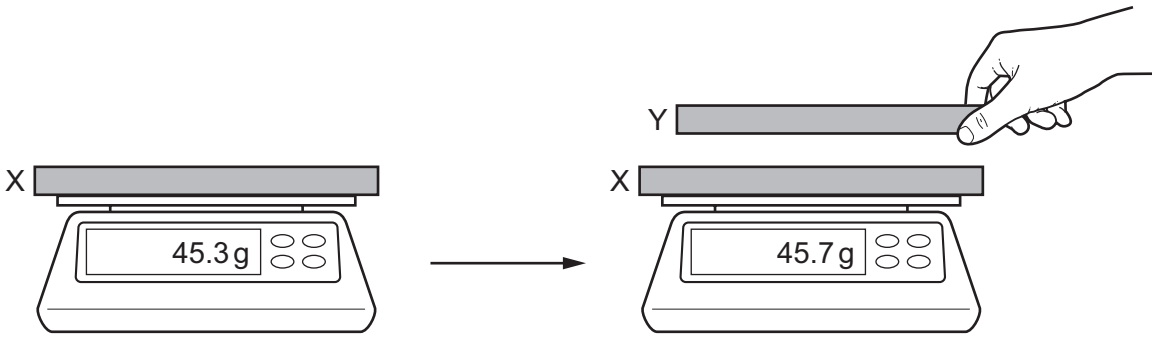
D wavelength

28 A soft-iron bar is not magnetised. It is held close to the N pole of a magnet and then to the S pole of the same magnet.

What will be the result?

	N pole	S pole
A	attracts	attracts
B	attracts	repels
C	repels	attracts
D	repels	repels

29 A charged rod X is placed on a balance and another rod Y is brought close to it, as shown.



Which combination of charges would cause the change in the balance reading shown?

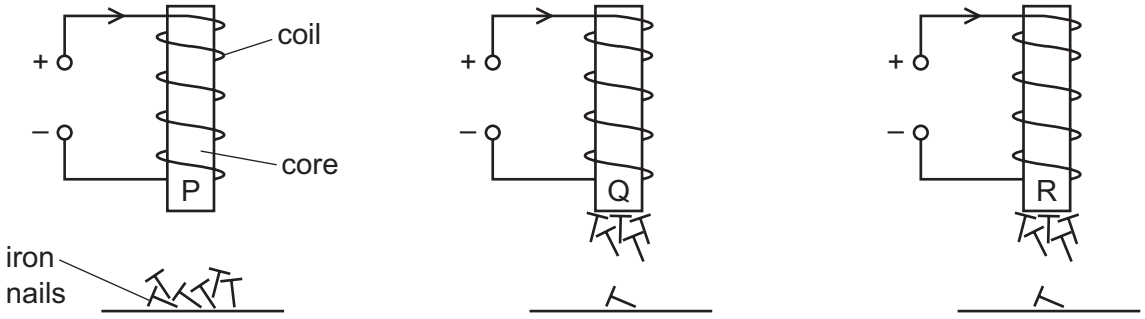
	X	Y
A	negative charge	negative charge
B	negative charge	positive charge
C	negative charge	no charge
D	positive charge	no charge

30 Three cores of different metals P, Q and R are placed inside identical coils of wire.

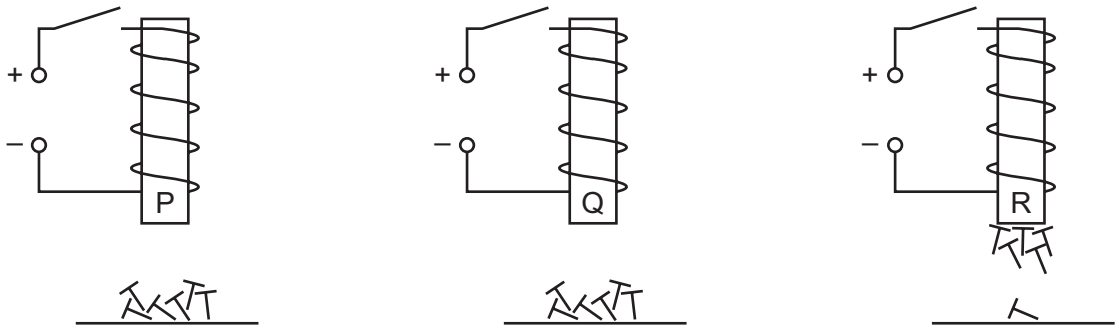
At least one of the metals is non-magnetic.

The cores are held above some iron nails.

The three diagrams show what happens when there is a current in the coils.



The three diagrams below show what happens when the current is then switched off.



Which core metals are magnetic?

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

31 A length of metal wire is used as a resistor in a circuit.

Which change to the wire results in an increase in current in the circuit?

A connecting a second identical length of wire in parallel with the original wire

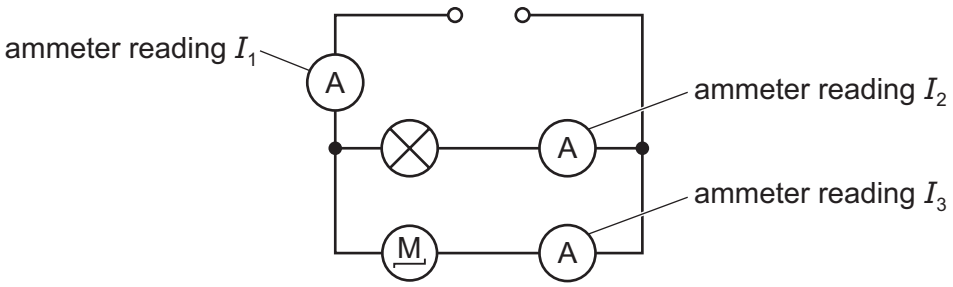
B connecting a second identical length of wire in series with the original wire

C decreasing the thickness of the wire

D increasing the length of the wire

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32 The diagram shows a circuit containing a power supply, a lamp and a motor. Three ammeters measure the current at different points in the circuit. The readings on the ammeters are I_1, I_2 and I_3.



Which statement about the ammeter readings is correct?

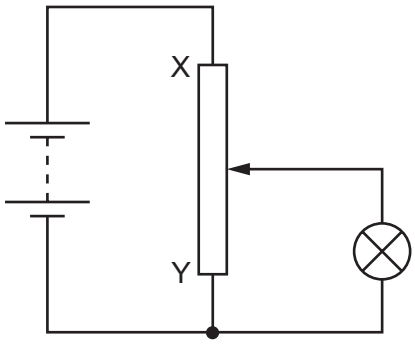
A All three readings are the same.

B I_1 is greater than I_2 and is greater than I_3.

C I_2 is greater than I_1 and is greater than I_3.

D I_3 is greater than I_1 and is greater than I_2.

33 A student designs a circuit to use as a dimmer switch for a lamp.



What happens to the brightness of the lamp and the potential difference (p.d.) across the lamp, when the slider is moved from X to Y?

	brightness of lamp	p.d. across the lamp
A	decreases	decreases
B	decreases	increases
C	increases	decreases
D	increases	increases

34 Which electrical component is connected in series with an electric circuit to protect it from damage by a very large current?

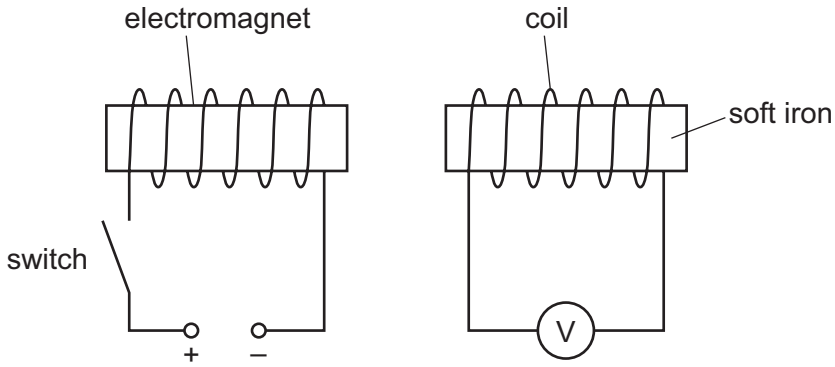
A earth wire

B fuse

C relay

D thermistor

35 The diagram shows an electromagnet near a coil of wire connected to a voltmeter. The reading on the voltmeter is zero.



The switch is closed. The electromagnet magnetises quickly.

What happens to the reading on the voltmeter?

A It keeps increasing.

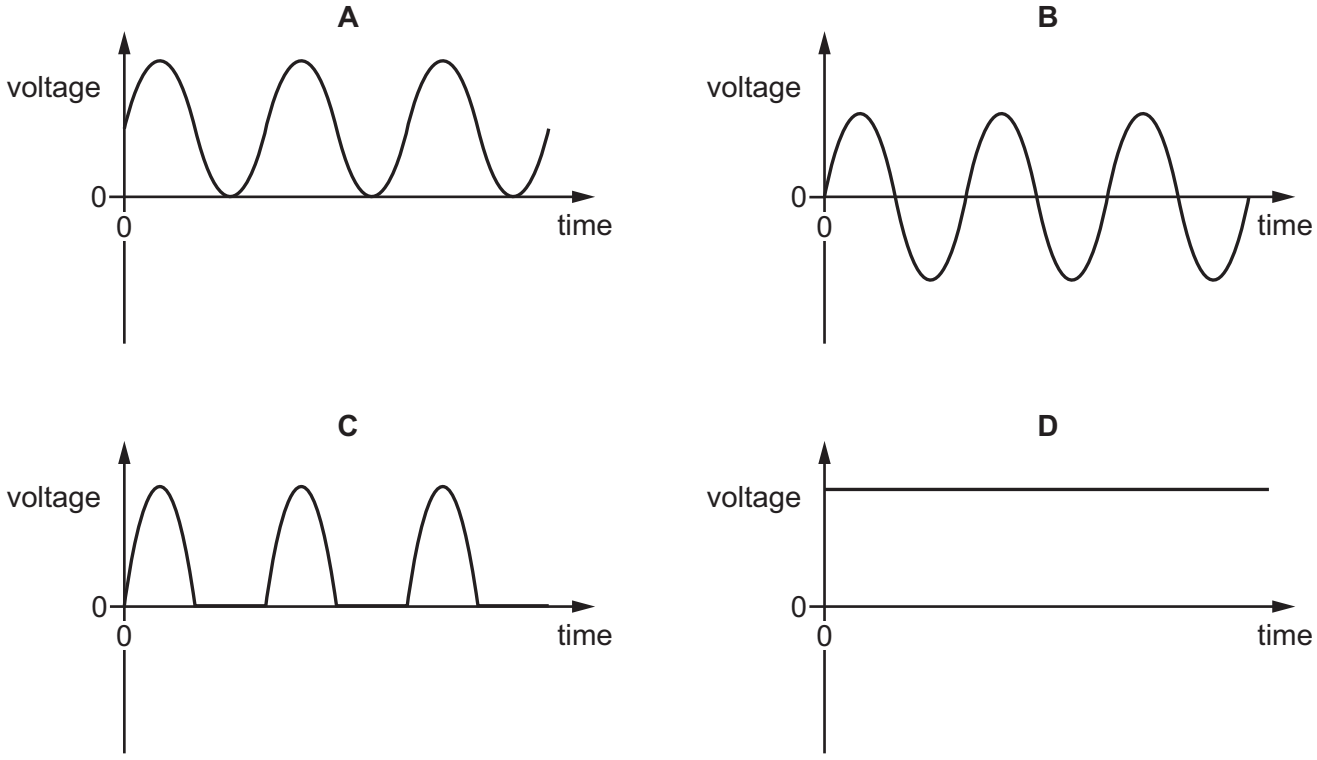
B It quickly increases and stays at maximum.

C It quickly increases and then decreases.

D It stays on zero.

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36 Which diagram represents the voltage output of a simple a.c. generator?



37 Three students are describing the structure of an atom.

student 1 All the positively charged particles are in the nucleus.

student 2 Positive electrons are in the nucleus.

student 3 Negative electrons orbit around the nucleus.

Which students are making a correct statement?

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

38 The symbol below describes a nuclide.

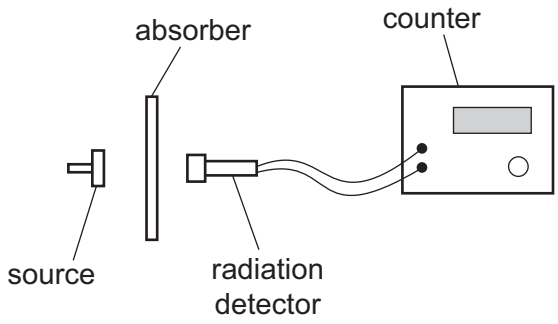
$$^{9}_{4}\mathrm{Be}$$

Which row is correct?

	proton number (Z)	nucleon number (A)
A	4	5
B	4	9
C	9	4
D	9	5

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39 The diagram shows a radioactivity experiment.



When a piece of paper is used as the absorber, the count rate drops to the background count rate.

Which radiation is the source emitting?

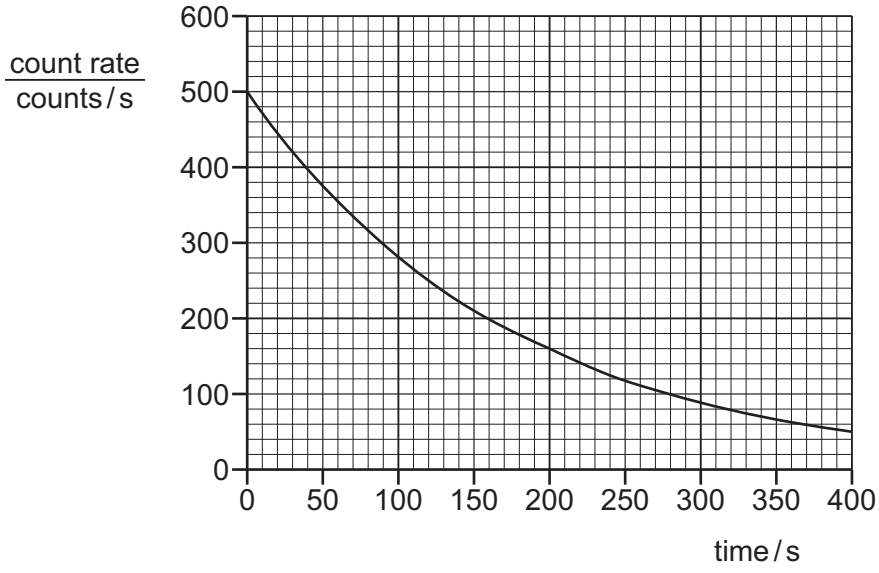
A α-radiation only

B β-radiation only

C γ-radiation only

D α-radiation, β-radiation and γ-radiation

40 The graph shows how the count rate from a radioactive sample changes with time.



What is the half-life for this sample?

A 90 s **B** 120 s **C** 200 s **D** 400 s

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