Cambridge Assessment International Education

# Cambridge IGCSE™

**PHYSICS** **0625/11**

Paper 1 Multiple Choice (Core) **May/June 2024**

**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 9.8 N (acceleration of free fall = 9.8 m / $s^2$).

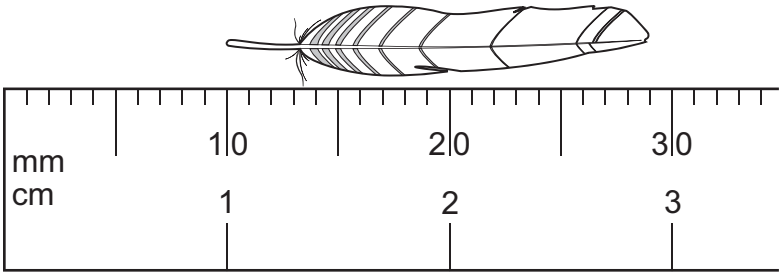
**INFORMATION**

- 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 an enlarged drawing of the end of a metre ruler. It is being used to measure the length of a small feather.

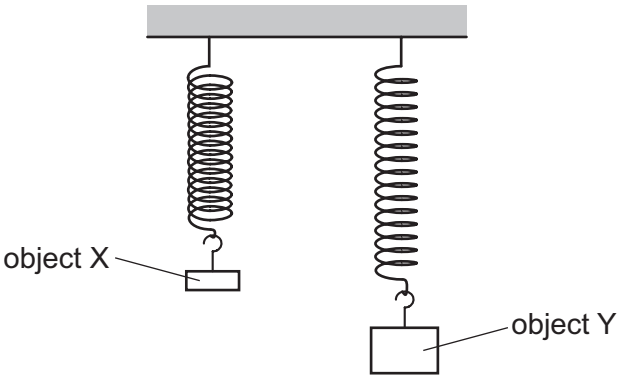



What is the length of the feather?

**A** 19 mm **B** 29 mm **C** 19 cm **D** 29 cm

**2** The diagram shows two objects, X and Y, suspended from identical springs.

The extension of each spring is different.

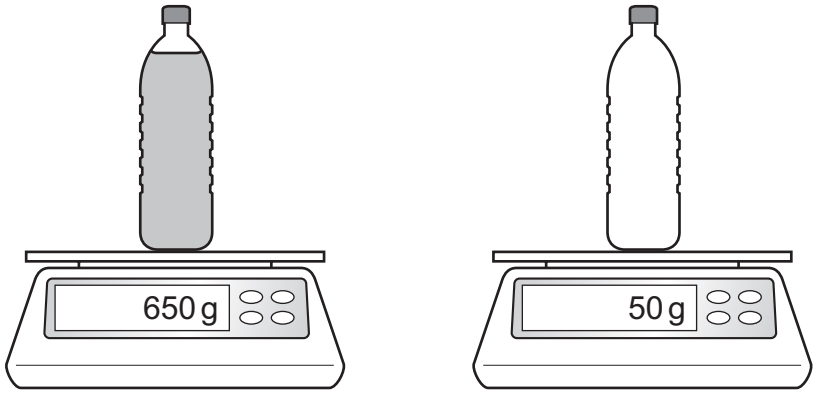



Which row compares the mass and the weight of the two objects?

| | mass | weight |
|---|---|---|
| **A** | both objects have the same mass | both objects have the same weight |
| **B** | both objects have the same mass | the weight of X is less than the weight of Y |
| **C** | the mass of X is less than the mass of Y | both objects have the same weight |
| **D** | the mass of X is less than the mass of Y | the weight of X is less than the weight of Y |

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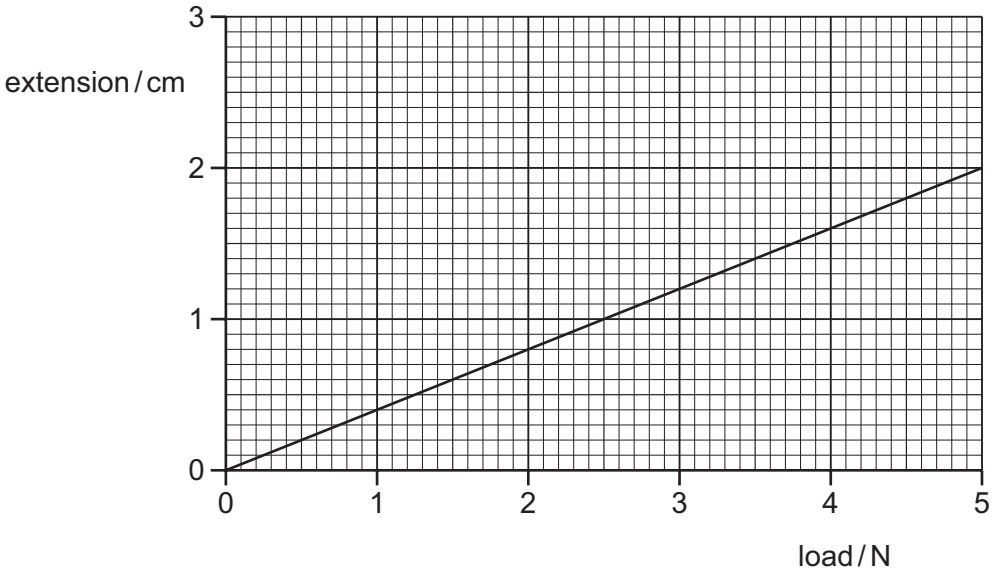
**3** A plastic bottle contains 750 $cm^3$ of oil. The diagram shows the mass of the bottle being measured when it is full and then when it is empty.




What is the density of the oil?

**A** 0.80 g / $cm^3$ **B** 0.93 g / $cm^3$ **C** 1.1 g / $cm^3$ **D** 1.3 g / $cm^3$

**4** The extension–load graph for a spring is shown. The unstretched length of the spring is 15.0 cm.



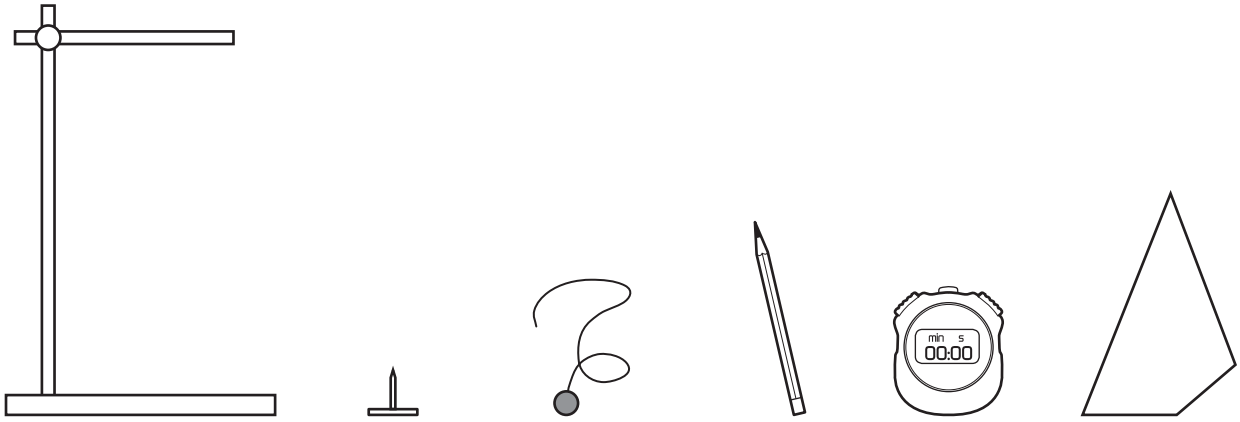

When an object of unknown weight is suspended on the spring, the length of the spring is 16.4 cm.

What is the weight of the object?

**A** 0.55 N **B** 0.67 N **C** 3.5 N **D** 4.1 N

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**5** A student determines the position of the centre of gravity of a piece of card. The diagram shows the equipment that is available. The equipment is not drawn to scale.




clamp and stand | pin | weight on a thin string | pencil | stop-watch | card

Which piece of equipment is **not** needed?

**A** pencil

**B** pin

**C** weight on a thin string

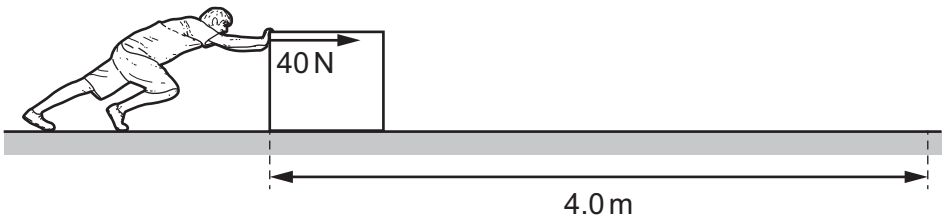
**D** stop-watch

**6** A cyclist stops his bicycle using the brakes.

Which row about energy stores is correct?

| | decreases | increases |
|---|---|---|
| **A** | kinetic energy store of bicycle | chemical energy store of brakes |
| **B** | kinetic energy store of bicycle | thermal energy store of brakes |
| **C** | thermal energy store of brakes | kinetic energy store of bicycle |
| **D** | thermal energy store of brakes | chemical energy store of bicycle |

**7** A man applies a force of 40 N to push a box along the floor.



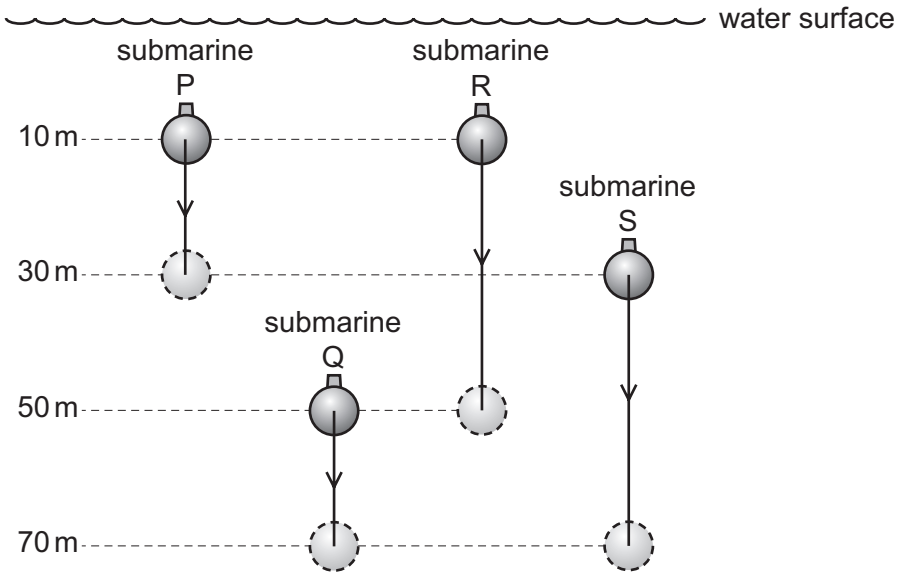

How much power is required to push the box 4.0 m in 3.0 seconds?

**A** 3.3 W **B** 30 W **C** 53 W **D** 480 W

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**8** Four identical submarines, P, Q, R and S, are lowered from one depth to another in water of a constant density.

The initial and final depths of each submarine are shown.




Which row is correct for the difference in pressure from the initial to the final depth of each submarine?

| | least change in pressure | greatest change in pressure |
|---|---|---|
| **A** | submarines P and Q | submarines R and S |
| **B** | submarines P and Q | submarine R only |
| **C** | submarine P only | submarines R and S |
| **D** | submarine P only | submarine R only |

**9** Some terms describing changes of state are listed.

1 boiling

2 solidification

3 condensation

4 evaporation

Which two terms identify the same change of state?

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

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**10** Diagram 1 shows apparatus being used to observe smoke particles.

Diagram 2 shows how a smoke particle moves randomly.

diagram 1

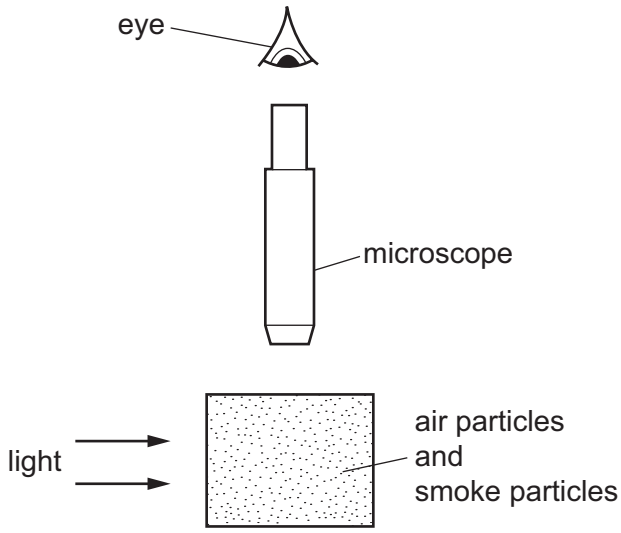
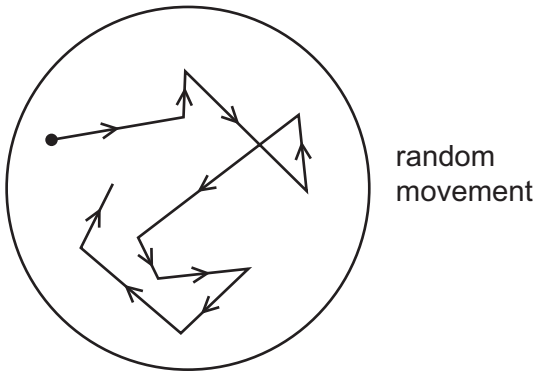



diagram 2




Why do the smoke particles move randomly?

**A** They are hit by air particles.

**B** They are less dense than air.

**C** They are moved by convection currents.

**D** They gain energy from the light.

**11** How is a temperature in degrees Celsius (°C) converted to a temperature in kelvin (K)?

**A** Add 273 to the temperature in °C.

**B** Divide the temperature in °C by 273.

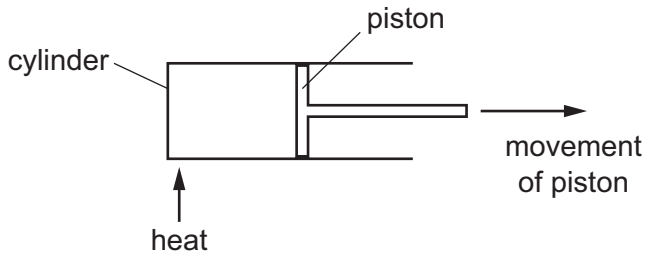
**C** Multiply the temperature in °C by 273.

**D** Subtract 273 from the temperature in °C.

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**12** The diagram shows a frictionless piston inside a cylinder.

The air inside the cylinder is heated. The piston moves in the direction shown.




Which statement about the air inside the cylinder is correct?

**A** The temperature and volume increase at constant pressure.

**B** The temperature and pressure increase at constant volume.

**C** The temperature, volume and pressure all increase.

**D** The volume and pressure increase at constant temperature.

**13** What increases when the temperature of a copper block increases?

**A** the number of copper atoms in the block

**B** the melting point of the block

**C** the internal energy of the block

**D** the density of the block

**14** A textbook gives the description of a thermal process as ‘more-energetic molecules escape from the surface of a liquid which causes the liquid to cool’.

Which process is being described?

**A** boiling

**B** Brownian motion

**C** condensation

**D** evaporation

**15** In which situation is radiation the **main** method by which energy is transferred?

**A** heating a pan of water using a gas camping stove

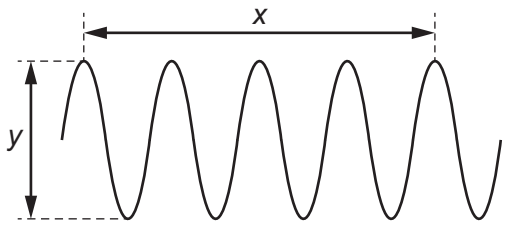
**B** energy reaching the Earth from the Sun

**C** heating the air in a room with a convection heater

**D** giving gravitational potential energy to a glider when it is lifted by thermal currents

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**16** The diagram represents a wave.




Which row gives the wavelength and the amplitude of the wave?

| | wavelength | amplitude |
|---|---|---|
| **A** | $x$ | $y$ |
| **B** | $y$ | $x$ |
| **C** | $x$ | $\frac{y}{2}$ |
| **D** | $\frac{x}{4}$ | $\frac{y}{2}$ |

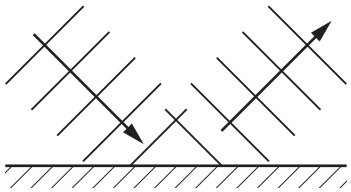
**17** Which row describes a seismic P-wave?

| | type of wave | direction of vibration |
|---|---|---|
| **A** | longitudinal | parallel to the direction of propagation of the wave |
| **B** | longitudinal | perpendicular to the direction of propagation of the wave |
| **C** | transverse | parallel to the direction of propagation of the wave |
| **D** | transverse | perpendicular to the direction of propagation of the wave |

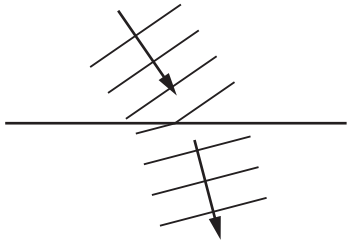
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**18** Which diagram shows waves diffracting?

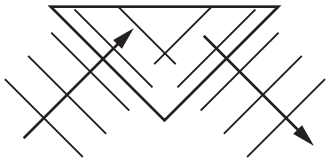
**A**



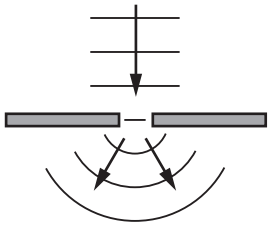
**B**



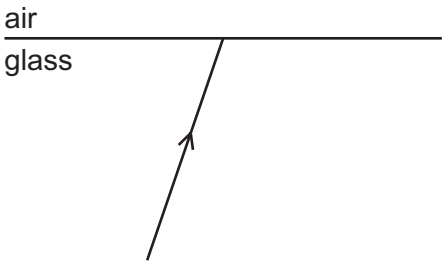
**C**



**D**



**19** The diagram shows a ray of light in glass incident on the surface between the glass and air.




What happens if the angle of incidence is made larger than the critical angle for the glass?

**A** The angle of refraction becomes equal to 90°.

**B** There is a refracted ray and a ray reflected inside the glass.

**C** There is a refracted ray only.

**D** There is only a ray reflected inside the glass.

**20** Red light of frequency $430 \times 10^{12}$ Hz has a wavelength of $700 \times 10^{-9}$ m.

What is possible for blue light?

**A** a frequency of $190 \times 10^{12}$ Hz and a wavelength of $450 \times 10^{-9}$ m

**B** a frequency of $190 \times 10^{12}$ Hz and a wavelength of $950 \times 10^{-9}$ m

**C** a frequency of $670 \times 10^{12}$ Hz and a wavelength of $450 \times 10^{-9}$ m

**D** a frequency of $670 \times 10^{12}$ Hz and a wavelength of $950 \times 10^{-9}$ m

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**21** Infrared is a useful type of electromagnetic radiation. However, excessive exposure to infrared can cause harmful effects.

Which row gives a use and a harmful effect for infrared?

| | use | harmful effect |
|---|---|---|
| **A** | detection of cancer | mutations |
| **B** | intruder alarms | skin burns |
| **C** | detection of fake bank notes | cell damage |
| **D** | thermal imaging | internal heating of body cells |

**22** The table shows data for the hearing ranges of different animals.

Which animal has the most similar hearing range to a human?

| | animal | hearing range / Hz |
|---|---|---|
| **A** | turtle | 20–1000 |
| **B** | mouse | 1000–1 000 000 |
| **C** | moth | 20 000–300 000 |
| **D** | elephant | 16–12 000 |

**23** Which description of ultrasound is correct?

**A** longitudinal waves with a frequency greater than 20 000 Hz

**B** longitudinal waves with a frequency less than 20 Hz

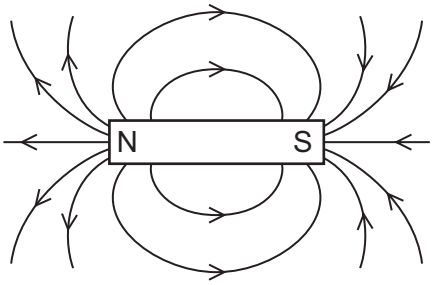
**C** transverse waves with a frequency greater than 20 000 Hz

**D** transverse waves with a frequency less than 20 Hz

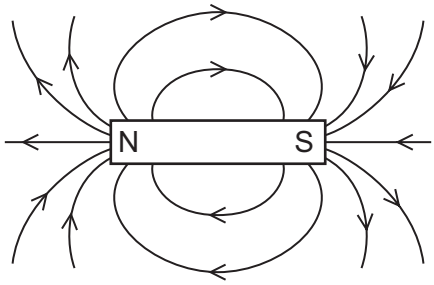
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**24** Which diagram shows the pattern and the direction of the magnetic field lines around a bar magnet?

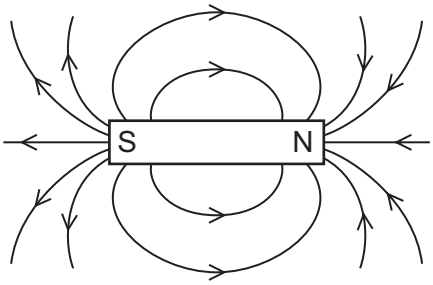
**A**



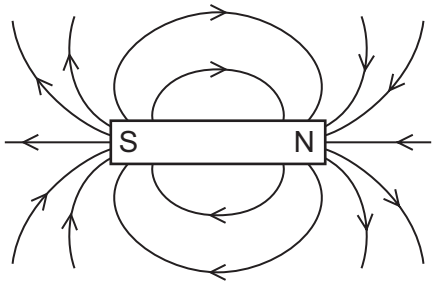

**B**




**C**




**D**




**25** Which material is a good electrical conductor?

**A** glass

**B** copper

**C** rubber

**D** wood

**26** What is an electric current and how is an ammeter positioned in a circuit to measure the current in a resistor?

| | what is an electric current? | positioning of an ammeter |
|---|---|---|
| **A** | a flow of charge | in parallel with the resistor |
| **B** | a flow of charge | in series with the resistor |
| **C** | a flow of voltage | in parallel with the resistor |
| **D** | a flow of voltage | in series with the resistor |

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**[Turn over**

**27** Which unit is used for the potential difference (p.d.) between two points in an electrical circuit?

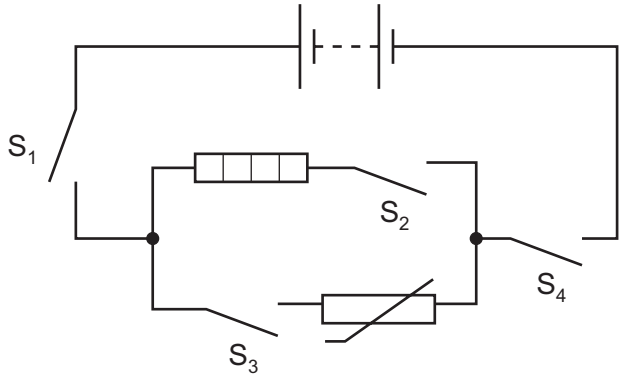
**A** ampere (A)

**B** joule (J)

**C** ohm (Ω)

**D** volt (V)

**28** The circuit in the diagram contains four switches, $S_1$, $S_2$, $S_3$ and $S_4$.




Which three switches must be closed for the heater to work?

**A** $S_1$, $S_2$ and $S_3$

**B** $S_1$, $S_2$ and $S_4$

**C** $S_1$, $S_3$ and $S_4$

**D** $S_2$, $S_3$ and $S_4$

**29** The metal case of an electrical appliance is fitted with an earth connection.

What is the purpose of this?

**A** to complete the circuit supplying the appliance so that it works

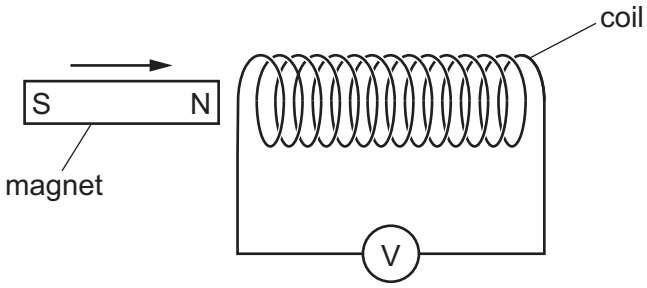
**B** to ensure that the cables supplying the appliance do not become damp

**C** to prevent the cables supplying the appliance from overheating

**D** to protect a user of the appliance from electric shock

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**30** A student moves a magnet into a coil, as shown. The voltmeter measures the magnitude of the electromotive force (e.m.f.) induced in the coil.




Which quantity does **not** affect the magnitude of the induced e.m.f.?

**A** the number of turns per unit length in the coil

**B** the polarity of the magnet

**C** the speed of the magnet

**D** the strength of the magnet

**31** A student makes a small d.c. motor. The teacher supplies the following equipment.

- battery
- ammeter
- voltmeter
- coil of wire
- magnets
- resistor

The student is also able to use other equipment if he wishes.

Which equipment **must** be used?

**A** ammeter, battery and resistor

**B** ammeter, coil of wire and voltmeter

**C** battery, coil of wire and magnets

**D** magnets, resistor and voltmeter

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**[Turn over**

**32** A simple model of the atom consists of small particles orbiting a central nucleus.

Which row is correct?

| | charge on nucleus | charge on orbiting particles |
|---|---|---|
| **A** | negative | negative |
| **B** | negative | positive |
| **C** | positive | negative |
| **D** | positive | positive |

**33** What is the charge on a proton and what is the charge on a neutron?

| | proton | neutron |
|---|---|---|
| **A** | +1 | –1 |
| **B** | +1 | 0 |
| **C** | –1 | +1 |
| **D** | –1 | 0 |

**34** An isotope of radon is radioactive. It decays by emitting an $\alpha$-particle.

What happens to the nucleus of a radon atom during the emission of the $\alpha$-particle?

**A** It becomes the nucleus of a different isotope of radon with fewer neutrons.

**B** It becomes the nucleus of a different isotope of radon with more neutrons.

**C** It becomes the nucleus of an element with a higher proton number.

**D** It becomes the nucleus of an element with a lower proton number.

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

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.

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**36** A box is used for storing radioactive sources.

What is the best material to use for lining the box to prevent radiation from escaping?

**A** aluminium

**B** lead

**C** paper

**D** plastic

**37** The Earth is a planet that orbits the Sun once in approximately 365 days.

What does this enable us to explain?

**A** the cycle of day and night

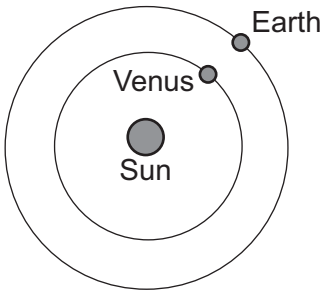
**B** the cycle of phases of the moon

**C** the periodic nature of the seasons

**D** the apparent daily motion of the Sun

**38** The radius of the orbit of Venus around the Sun is $110 \times 10^6$ km.

The radius of the orbit of the Earth around the Sun is $150 \times 10^6$ km.




The speed of light is $0.30 \times 10^6$ km / s.

How long does light take to travel from Venus to the Earth when these planets are closest to each other?

**A** 130 s **B** 370 s **C** 500 s **D** 870 s

**39** What are the three main types of radiation emitted by the Sun?

**A** infrared, radio waves and ultraviolet

**B** infrared, visible light and ultraviolet

**C** microwaves, visible light and X-rays

**D** radio waves, X-rays and ultraviolet

**40** What is a light-year?

**A** the time for light to travel 1 km in space

**B** the time for light to travel from the Sun to the Earth

**C** the distance travelled in space by light in one year

**D** the distance travelled by light from the Sun to the Earth

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