Cambridge Assessment International Education

Cambridge IGCSE™

PHYSICS **0625/13**

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

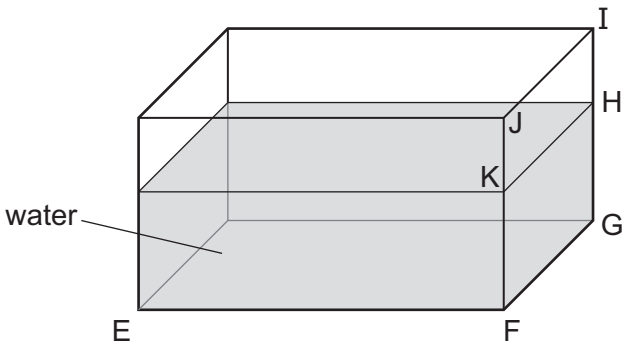
- The total mark for this paper is 40.
- Each correct answer will score one mark.
- Any rough working should be done on this question paper.

This document has **16** pages. Any blank pages are indicated.

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1 A student uses a ruler to find the volume of water in a tank.

She measures the lengths EF and FG.



What other length does she need to measure?

A FJ **B** FK **C** HI **D** IJ

2 Which statement is correct?

A speed = distance travelled × time taken

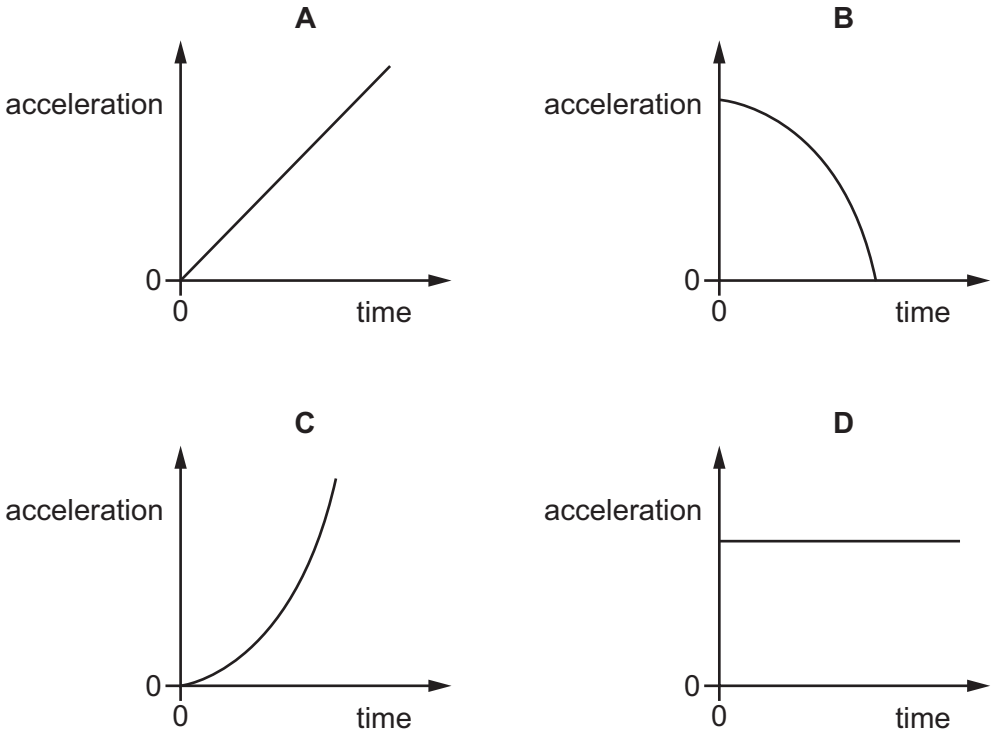
B speed = velocity in a given direction

C $\text{velocity} = \frac{\text{time taken}}{\text{distance travelled}}$

D velocity = speed in a given direction

3 A stone falls freely from the top of a cliff. Air resistance may be ignored.

Which graph shows how the acceleration of the stone varies with time as it falls?



4 Which statement about weight is correct?

A It is a measure of the quantity of matter in an object.

B It is the gravitational force on an object that has mass.

C It is equivalent to the acceleration of free fall.

D It is the gravitational force per unit mass.

5 A student uses the equation $\rho = \frac{m}{V}$.

Which row shows the correct meaning of these symbols?

	ρ	m	V
A	density	mass	velocity
B	density	mass	volume
C	pressure	mass	volume
D	pressure	moment	velocity

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[Turn over

6 What is the point at which the weight of an object appears to act?

A the centre of gravity of the object

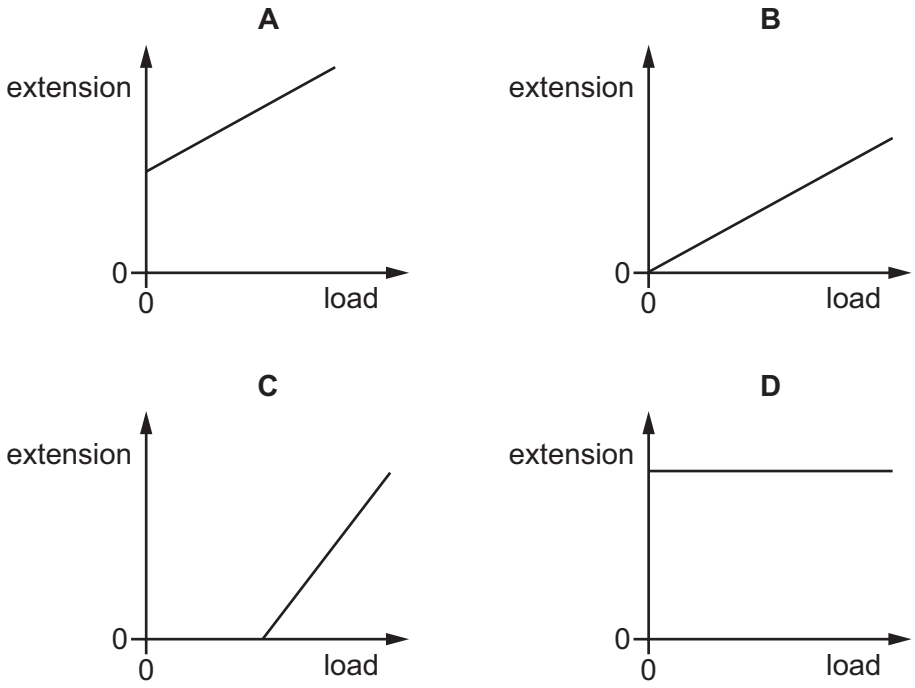
B the density of the object

C the moment of a force about a point

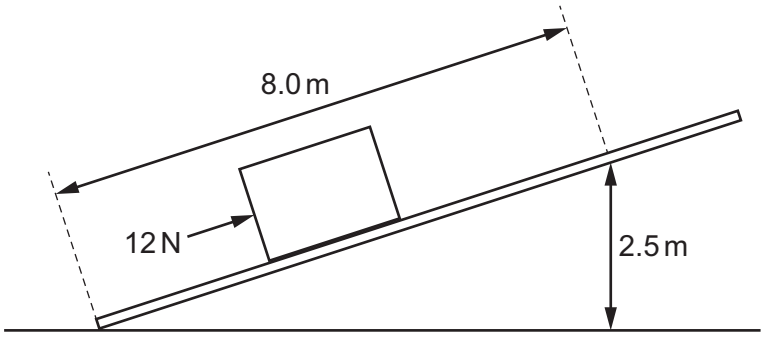
D the pressure on the object due to its depth

7 A spring is stretched by adding loads to it.

Which diagram shows the extension–load graph for the spring?



8 The diagram shows a force of 12 N being used to push a box up a slope. The box is moved 8.0 m along the slope. This lifts the box through a vertical height of 2.5 m.



How much work is done pushing the box from the bottom to the top of the slope?

A 1.5 J **B** 4.8 J **C** 30 J **D** 96 J

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9 Which energy resource is non-renewable?

A biofuel

B energy from the Sun

C nuclear fuel

D water behind a dam

10 What is the relationship between the power of a motor, the force exerted by the motor, the distance moved by the force and the time taken?

A $\text{power} = \dfrac{\text{distance moved} \times \text{time taken}}{\text{force}}$

B power = force × distance moved × time taken

C $\text{power} = \dfrac{\text{force} \times \text{time taken}}{\text{distance moved}}$

D $\text{power} = \dfrac{\text{force} \times \text{distance moved}}{\text{time taken}}$

11 How is pressure defined?

A area per unit force

B force per unit area

C mass per unit area

D mass per unit volume

12 A fixed mass of gas is trapped in a cylinder with a piston. The volume of the gas is slowly reduced at constant temperature without any particles of gas escaping.

Which statement is correct?

A The force exerted by the gas on the piston will decrease because the particles move more quickly.

B The force exerted by the gas on the piston will decrease because the particles move more slowly.

C The force exerted by the gas on the piston will increase because the particles are hitting the piston harder.

D The force exerted by the gas on the piston will increase because the particles are hitting the piston more frequently.

13 The air temperature rises from 10 °C to 40 °C.

What is the change in temperature, expressed in kelvin?

A 30 K **B** 50 K **C** 243 K **D** 303 K

14 Which effect is **not** due to thermal expansion?

A convection currents in air

B expansion of a bubble rising through a fizzy drink

C expansion of a liquid in a thermometer

D lengthening of overhead power lines in the summer

15 On a hot summer day, the level of the water in a pond falls.

Which statement explains this?

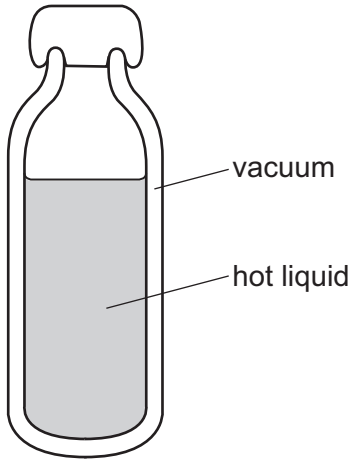
A The least energetic water particles escape from the surface and do not return.

B The least energetic water particles escape from the surface and then return.

C The most energetic water particles escape from the surface and do not return.

D The most energetic water particles escape from the surface and then return.

16 The diagram shows a vacuum flask used to keep liquid hot.



How does thermal energy pass through the vacuum?

A conduction and convection only

B conduction only

C convection only

D radiation only

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17 The diagrams show two transverse waves X and Y and are to the same scale.



Which row is correct?

	wave with the largest amplitude	wave with the largest wavelength
A	X	X
B	X	Y
C	Y	X
D	Y	Y

18 Which row shows an example of a transverse wave and an example of a longitudinal wave?

	transverse	longitudinal
A	light	radio
B	radio	sound
C	sound	water
D	water	light

19 A ray of light is reflected from a plane mirror.

Which angle is the angle of reflection?

A the angle between the incident ray and the normal

B the angle between the incident ray and the reflected ray

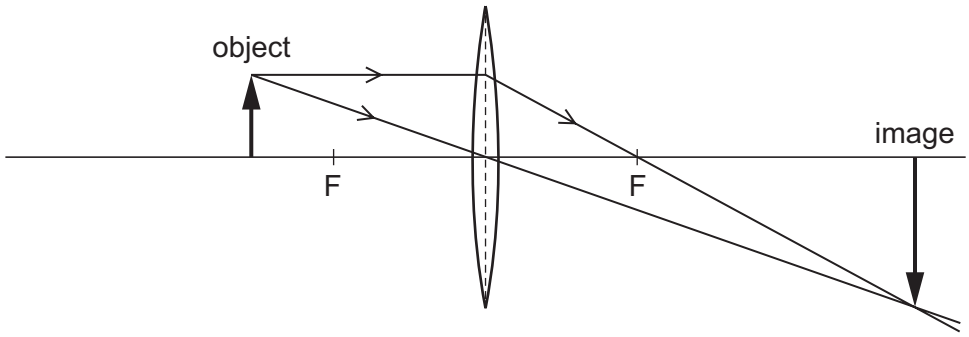
C the angle between the reflected ray and the normal

D the angle between the reflected ray and the surface

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[Turn over

20 A thin converging lens forms an image.

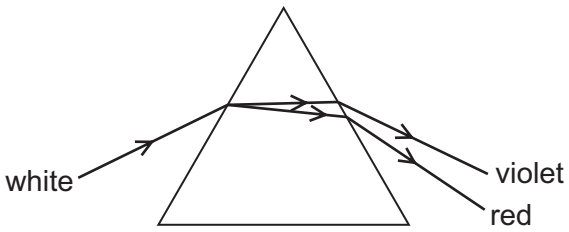


What is the nature of this image and can it be formed on a screen?

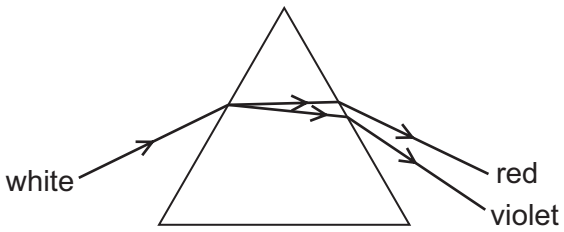
	nature of image	can be formed on a screen
A	virtual	no
B	virtual	yes
C	real	no
D	real	yes

21 Which diagram shows the dispersion of white light by a prism?

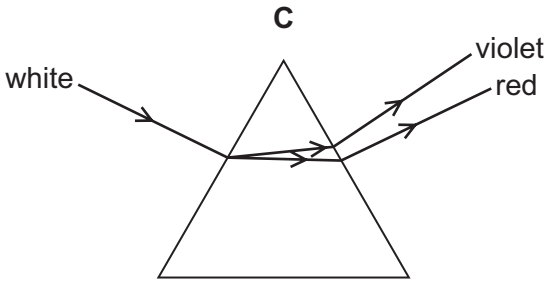
A



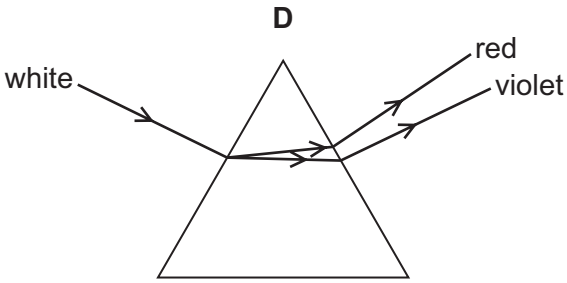
B



C



D

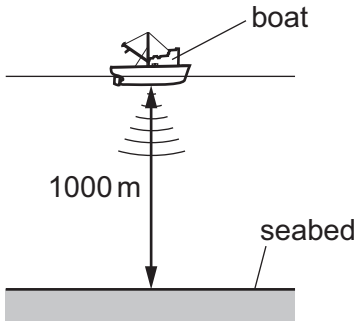


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22 Which row correctly compares microwaves and ultraviolet?

	frequency of microwaves compared to ultraviolet	uses
A	higher	microwaves are used to heat water and ultraviolet is used to sterilise water
B	higher	microwaves are used to sterilise water and ultraviolet is used to heat water
C	lower	microwaves are used to heat water and ultraviolet is used to sterilise water
D	lower	microwaves are used to sterilise water and ultraviolet is used to heat water

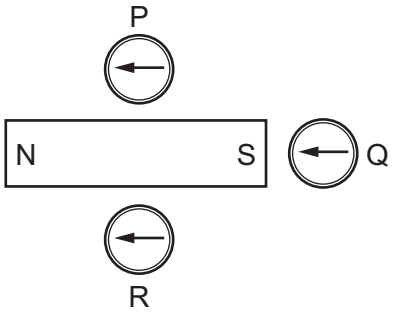
23 A pulse of sound is produced at the bottom of a boat. The sound travels through the water and is reflected from the seabed. The reflected sound reaches the boat 1.3 s after the sound was produced. The seabed is 1000 m below the boat.



Using this information, what is the speed of sound in the water?

A 770 m / s **B** 1300 m / s **C** 1500 m / s **D** 2600 m / s

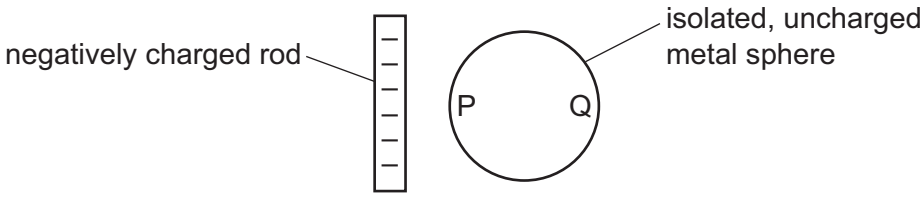
24 The diagram shows three small compasses near to a bar magnet.



Which compasses show the direction of the magnetic field due to the bar magnet?

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

25 A negatively charged rod is brought close to an isolated, uncharged metal sphere.



What are the charges on sides P and Q of the sphere?

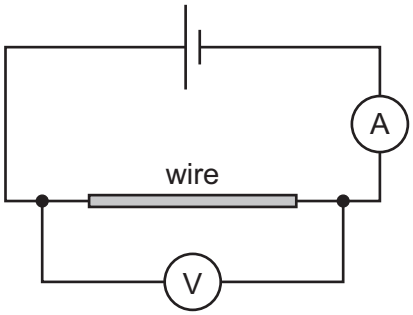
A P and Q are both negatively charged.

B P and Q are both positively charged.

C P is negatively charged and Q is positively charged.

D P is positively charged and Q is negatively charged.

26 The diagram shows a simple circuit.



The ammeter reading is 2.0 A and the voltmeter reading is 6.0 V.

What is the resistance of the wire?

A 0.33 Ω **B** 3.0 Ω **C** 8.0 Ω **D** 12 Ω

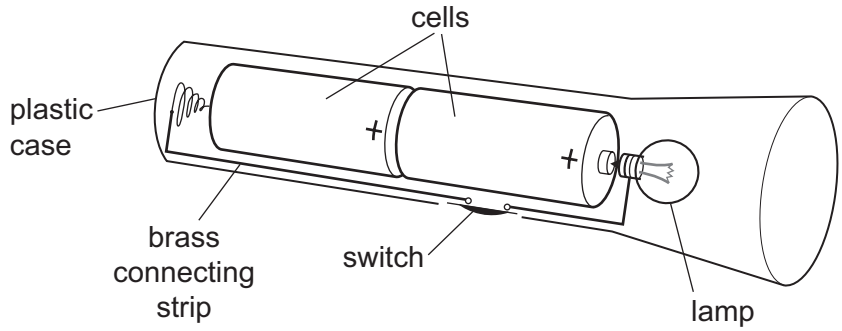
27 A lamp is rated 240 V, 0.40 A. The lamp operates at normal brightness for 1.0 min.

How much energy does the lamp transfer?

A 60 J **B** 96 J **C** 600 J **D** 5800 J

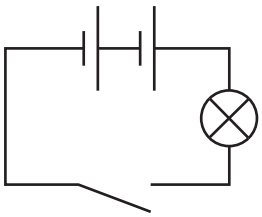
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28 The diagram shows a torch containing two cells, a switch and a lamp.

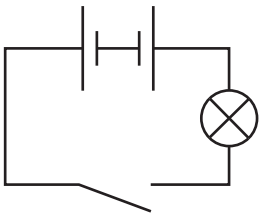


Which circuit diagram is correct for the torch?

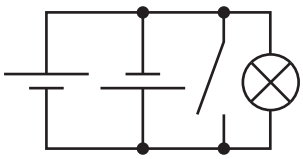
A



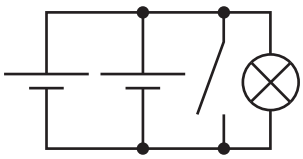
B



C

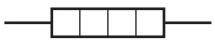


D



29 Which symbol represents a device that contains a current-carrying coil in a magnetic field?

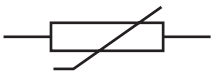
A



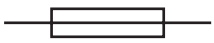
B



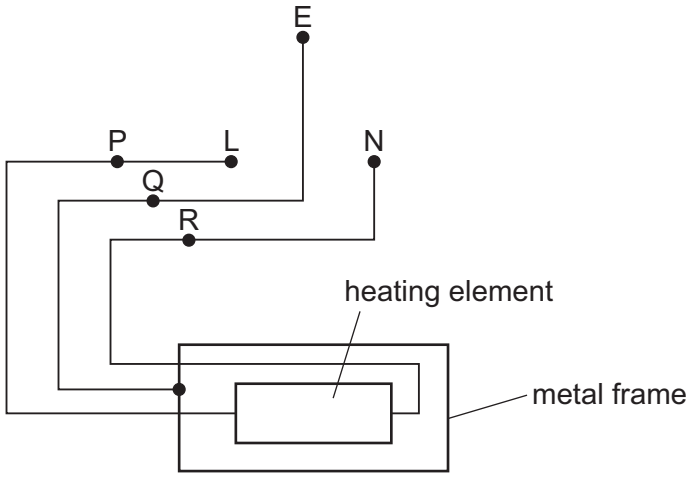
C



D



30 The diagram shows a three-core cable connecting a three-pin socket to an electric fire with a metal frame.



The earth, live and neutral connections of the socket are labelled E, L and N respectively.

A switch is connected into the circuit.

Where is a switch connected?

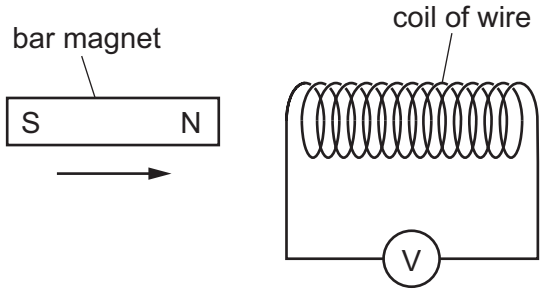
A at either of P or R

B at P only

C at Q only

D at R only

31 A student investigates electromagnetic induction. She moves the N pole of a magnet quickly towards a coil of wire. There is a reading on the sensitive voltmeter.



What can she do to get a greater reading on the sensitive voltmeter?

A Hold the bar magnet stationary inside the coil.

B Move the bar magnet slowly away from the coil.

C Use a coil of wire with fewer turns on it.

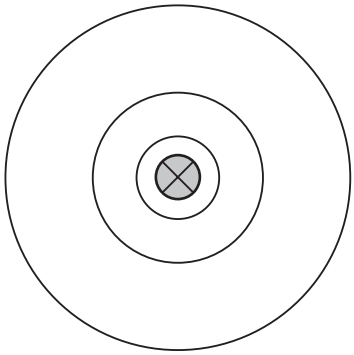
D Use a stronger bar magnet.

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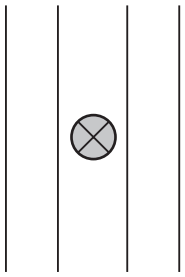
32 The direction of the current in a straight wire X is into the paper.

Which diagram shows the shape of the magnetic field pattern around the wire?

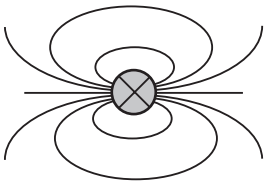
A



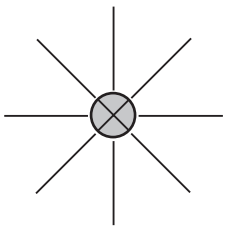
B



C



D



33 What does a step-up transformer increase?

A current

B energy

C power

D voltage

34 When measuring the emissions from a radioactive rock brought into the laboratory, a teacher mentions that background radiation must be taken into account.

What is this background radiation?

A ionising radiation in the laboratory when the radioactive rock is not present

B ionising radiation from the radioactive rock brought into the laboratory

C infrared radiation from the Sun

D infrared radiation from warm objects in the laboratory

35 How do the ionising effect and the penetrating ability of α-particles compare with those of β-particles and γ-rays?

	ionising effect	penetrating ability
A	higher	lower
B	higher	higher
C	lower	lower
D	lower	higher

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[Turn over

36 Half-life is .....1..... for the .....2..... a sample of a radioactive isotope to halve.

Which words correctly complete gaps 1 and 2?

	1	2
A	half of the time taken	nucleon number of
B	half of the time taken	number of nuclei in
C	the time taken	nucleon number of
D	the time taken	number of nuclei in

37 Radioactive materials must be handled in a safe way.

What is **not** a safety procedure?

A storing radioactive materials in cardboard boxes

B monitoring exposure time to radioactive materials

C using tongs to pick up the radioactive source

D wearing protective clothing

38 The Solar System contains eight major planets.

What is the correct order of three of the major planets, starting with the planet furthest from the Sun?

A Mercury → Venus → Earth

B Neptune → Jupiter → Saturn

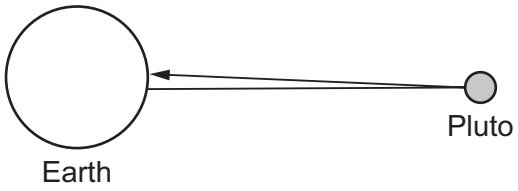
C Neptune → Mars → Earth

D Jupiter → Saturn → Uranus

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39 The diagram shows a radio signal from the Earth being reflected by Pluto and returning to the Earth.

The distance between the Earth and Pluto is 0.00050 light-years.



What is the time taken for the radio signal to return to the Earth after being sent?

A 2000 years

B 1000 years

C 0.0010 years

D 0.00050 years

40 The Milky Way is a .....1..... made up of about a hundred .....2..... stars.

Which words correctly complete gaps 1 and 2?

	1	2
A	galaxy	billion
B	universe	billion
C	galaxy	thousand
D	universe	thousand

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