



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).

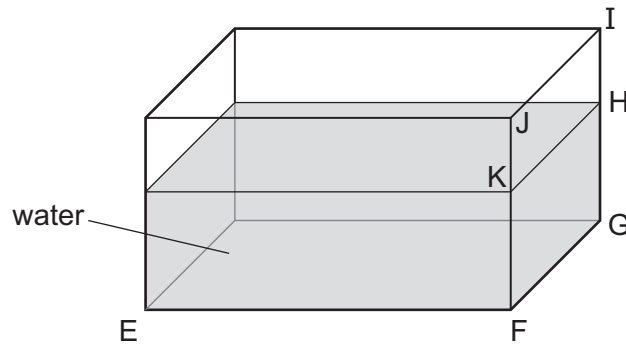
INFORMATION

- 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.



- 1 A student uses a ruler to find the volume of water in a tank.
She measures the lengths EF and FG.

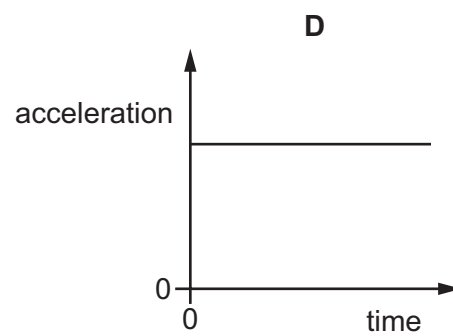
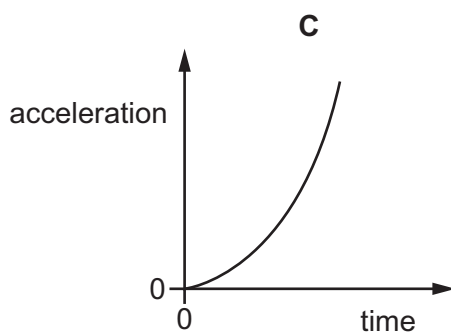
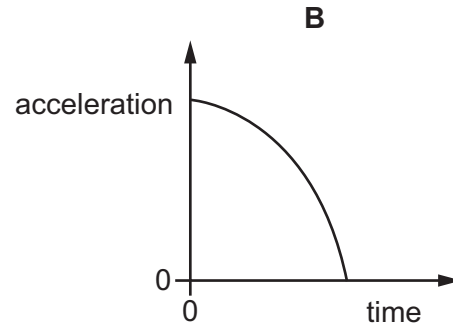
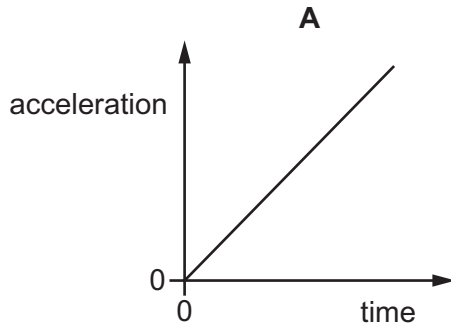


What other length does she need to measure?

- A** FJ **B** FK **C** HI **D** IJ
- 2 Which statement is correct?
- A** speed = distance travelled $\times$ time taken
- B** speed = velocity in a given direction
- C** 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?

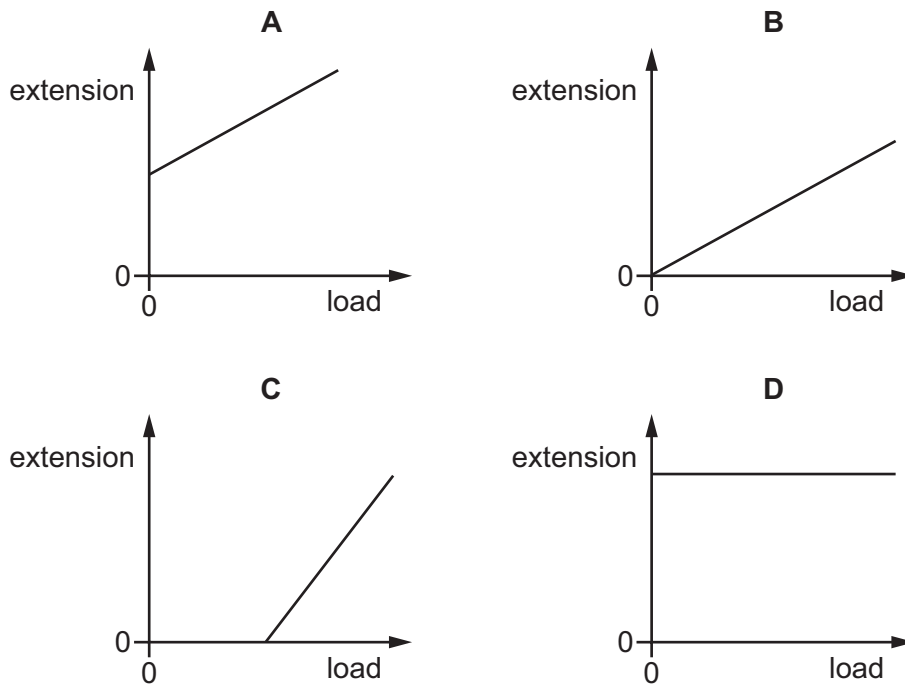
	ρ	m	V
A	density	mass	velocity
B	density	mass	volume
C	pressure	mass	volume
D	pressure	moment	velocity

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

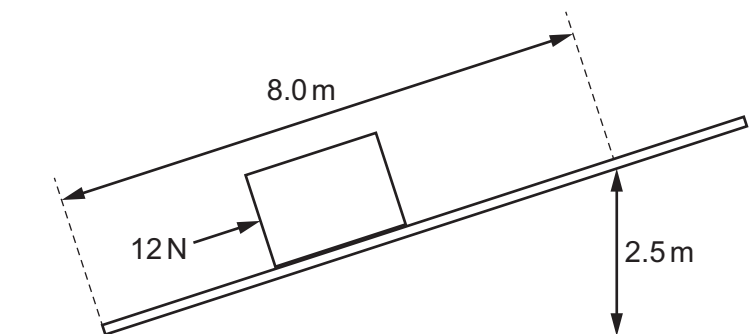
- A the centre of gravity of the object
- B the density of the object
- C the moment of a force about a point
- D the pressure on the object due to its depth

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

- 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 $\text{power} = \frac{\text{distance moved} \times \text{time taken}}{\text{force}}$
 - B $\text{power} = \text{force} \times \text{distance moved} \times \text{time taken}$
 - C $\text{power} = \frac{\text{force} \times \text{time taken}}{\text{distance moved}}$
 - D $\text{power} = \frac{\text{force} \times \text{distance moved}}{\text{time taken}}$
- 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?

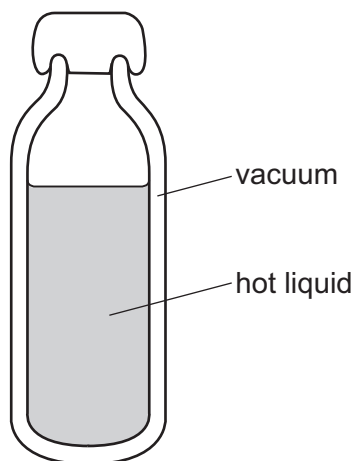
- A convection currents in air
- B expansion of a bubble rising through a fizzy drink
- C expansion of a liquid in a thermometer
- D lengthening of overhead power lines in the summer

- 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.

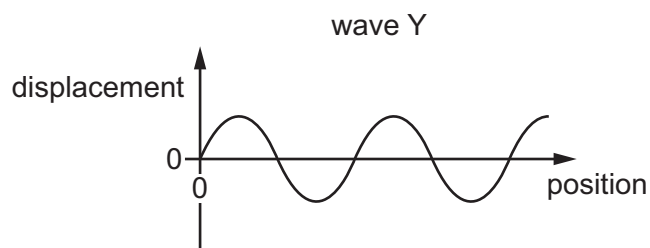
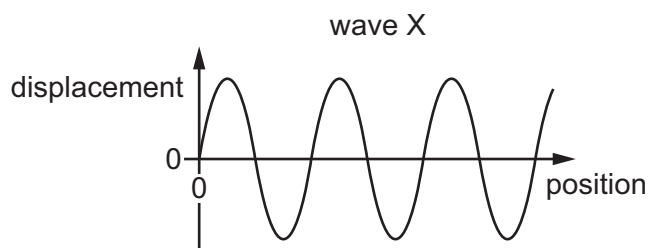
- 16 The diagram shows a vacuum flask used to keep liquid hot.



How does thermal energy pass through the vacuum?

- A conduction and convection only
- B conduction only
- C convection only
- D radiation only

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?

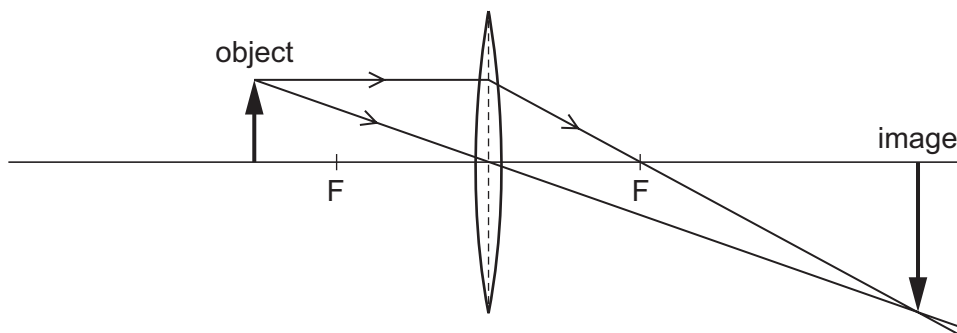
	transverse	longitudinal
A	light	radio
B	radio	sound
C	sound	water
D	water	light

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

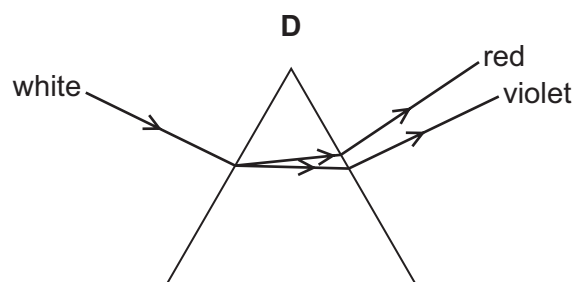
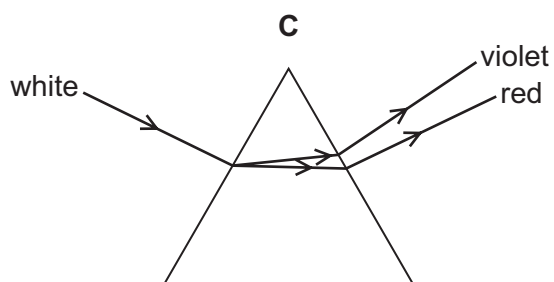
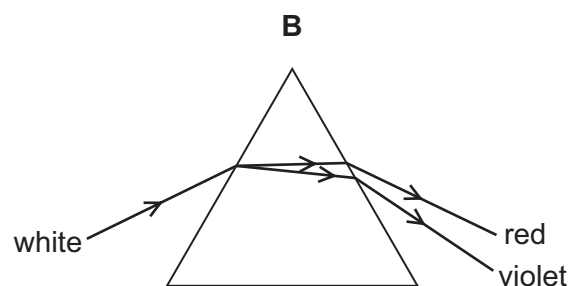
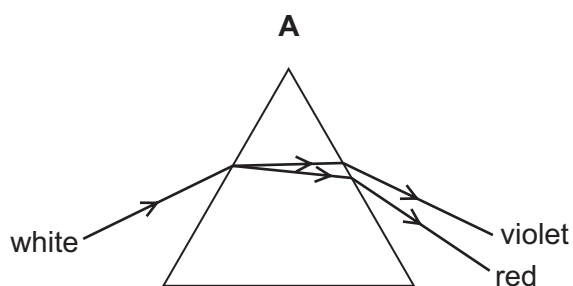
20 A thin converging lens forms an image.



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

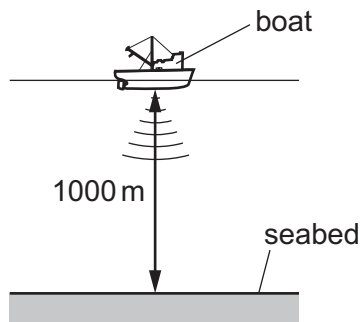
21 Which diagram shows the dispersion of white light by a prism?



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

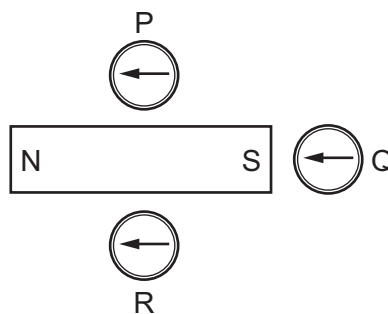
23 A pulse of sound is produced at the bottom of a boat. The sound travels through the water and is reflected from the seabed. The reflected sound reaches the boat 1.3s after the sound was produced. The seabed is 1000 m below the boat.



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

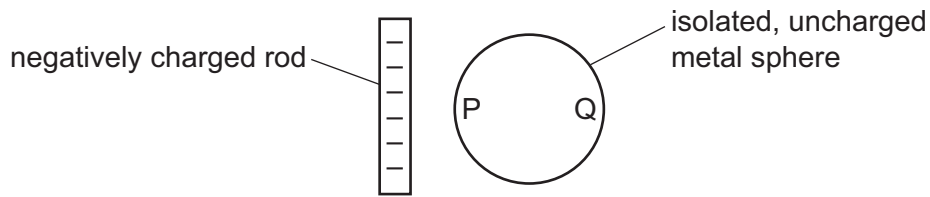
24 The diagram shows three small compasses near to a bar magnet.



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

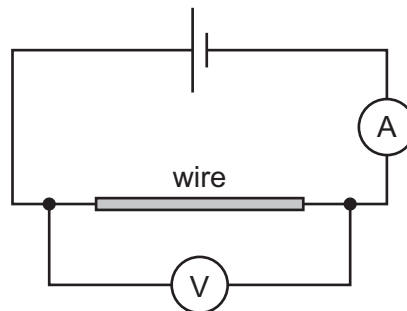
- 25** A negatively charged rod is brought close to an isolated, uncharged metal sphere.



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.

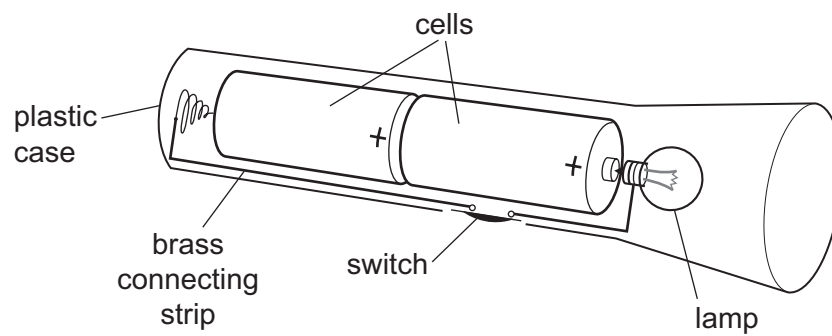


The ammeter reading is 2.0 A and the voltmeter reading is 6.0 V .

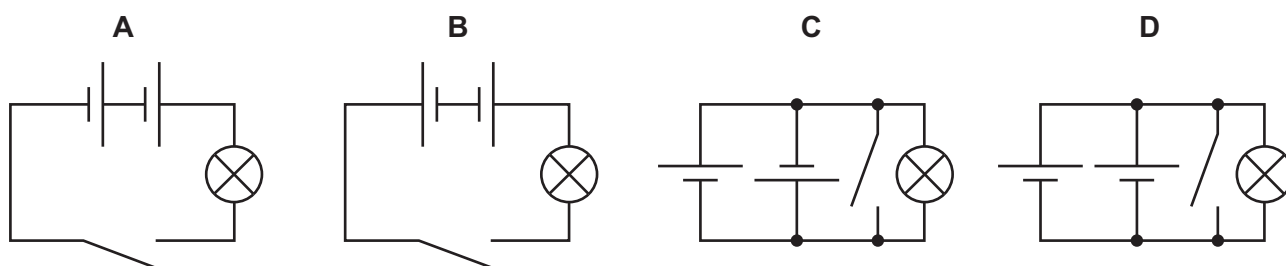
What is the resistance of the wire?

- A** $0.33\ \Omega$
 - B** $3.0\ \Omega$
 - C** $8.0\ \Omega$
 - D** $12\ \Omega$
- 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

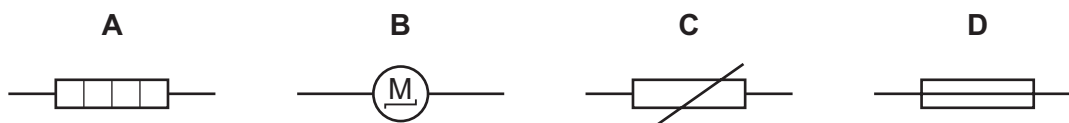
28 The diagram shows a torch containing two cells, a switch and a lamp.



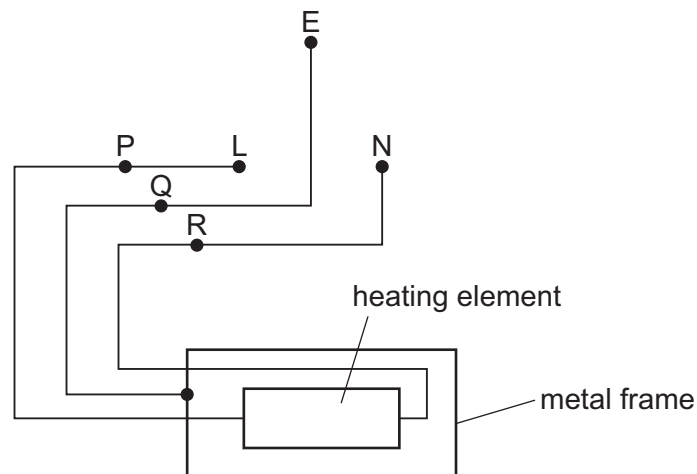
Which circuit diagram is correct for the torch?



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



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

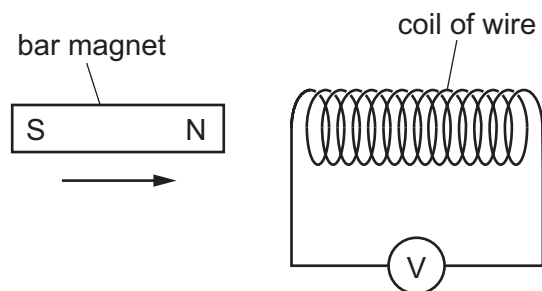


The earth, live and neutral connections of the socket are labelled E, L and N respectively.

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.

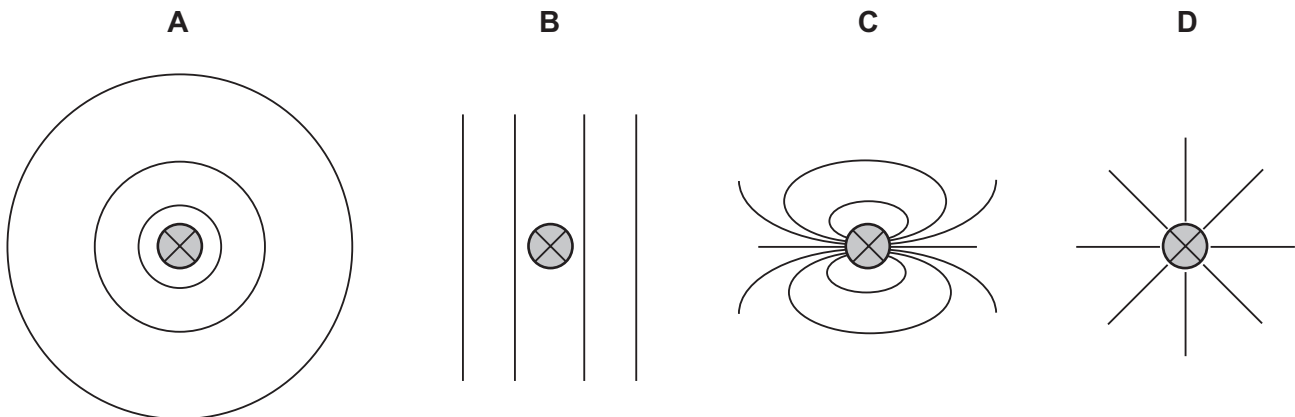


What can she do to get a greater reading on the sensitive voltmeter?

- 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.

- 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?



- 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

- 36** Half-life is1..... for the2..... 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

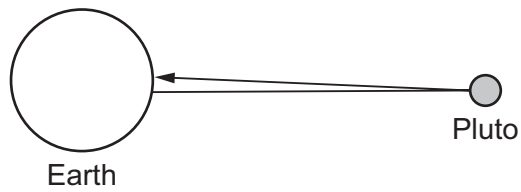
- 38** The Solar System contains eight major planets.

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

- 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 a1..... made up of about a hundred2..... 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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