Cambridge Assessment International Education

Cambridge IGCSE™

PHYSICS **0625/23**

Paper 2 Multiple Choice (Extended) **October/November 2025**

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.

IB25 11_0625_23/3RP

[Turn over

1 When a pendulum passes a marker, a timer displays 1 minute 30 seconds.

The pendulum passes the marker 12 more times from the same direction.

On the final pass, the timer displays a time of 2 minutes 18 seconds.

What is the time period of oscillation of the pendulum?

A 4.0 s **B** 4.4 s **C** 7.5 s **D** 12 s

2 A car driver applies the brakes to bring a car to rest with a constant deceleration of $4.0\,m/s^2$ in a time of 8.0 s.

What is the average speed of the car during this time?

A 4.0 m/s **B** 8.0 m/s **C** 16 m/s **D** 32 m/s

3 An object is falling in a uniform gravitational field.

After a certain time, it reaches terminal velocity.

Which row is correct?

	velocity of object	acceleration of object
A	increases then decreases	positive then negative
B	increases then decreases	positive then zero
C	increases then constant	positive then negative
D	increases then constant	positive then zero

4 Which measuring instrument is used to compare masses?

A balance

B protractor

C stop-watch

D voltmeter

5 Three different liquids are poured into a tall beaker. The liquids do **not** mix.

The liquid densities are shown in the table.

liquid	density / g/cm^3
P	1.8
Q	2.4
R	1.2

What is the correct order of the liquids from the top of the beaker to the bottom?

A P → Q → R **B** Q → P → R **C** Q → R → P **D** R → P → Q

6 A car is moving in a straight line on a level road. Its engine provides a forward force on the car. A second force of equal size acts on the car in the opposite direction.

Which statement describes what happens?

A The car changes direction.

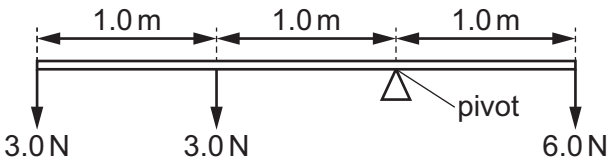
B The car moves at a constant speed.

C The car slows down.

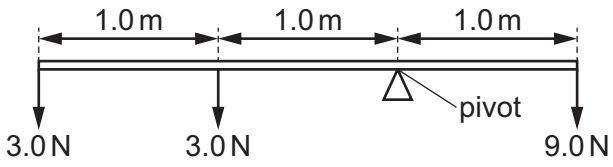
D The car speeds up.

7 Which beam is balanced? (Ignore the weight of the beam.)

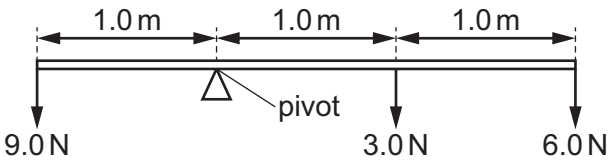
A



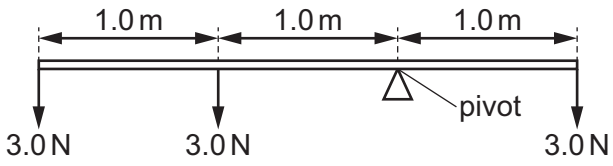
B



C



D



8 A ball is at rest on the ground. A boy kicks the ball. The boy's boot is in contact with the ball for a time of 0.040 s.

The average force on the ball is 200 N. The ball leaves the boy's boot with a speed of 20 m / s.

Which row gives the impulse of the boot on the ball and the average acceleration of the ball during the time of 0.040 s?

	impulse on ball / Ns	average acceleration of ball / m/s^2
A	8	0.8
B	8	500
C	5000	0.8
D	5000	500

9 Which device transfers energy from a chemical energy store to a kinetic energy store?

A an a.c. generator

B a battery-powered torch

C a car engine

D a wind-up mechanical clock

10 For which energy resource is the Sun the main source?

A geothermal

B nuclear

C tidal

D wind

11 A football is inflated in a warm room and then taken outside where the temperature is much lower. The pressure and temperature inside the ball both decrease. The volume of the ball is unchanged.

Which row explains the decrease in pressure in terms of the movement of air particles?

	kinetic energy of air particles	frequency of collisions between air particles and inside surface of ball
A	decreased	decreased
B	decreased	unchanged
C	unchanged	decreased
D	unchanged	unchanged

12 A fixed mass of gas has a volume of 25 cm^3. The pressure of the gas is 100 kPa.

The volume of the gas is slowly decreased by 15 cm^3 at constant temperature.

What is the change in pressure of the gas?

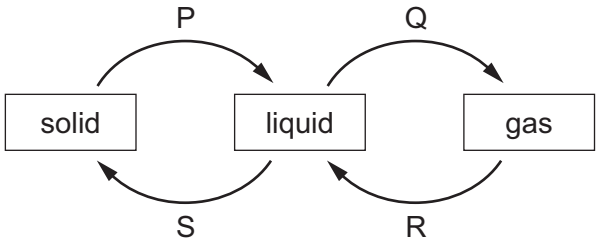
A 67 kPa **B** 150 kPa **C** 170 kPa **D** 250 kPa

13 The specific heat capacity of ice is 2000 J / kg °C.

Which thermal energy is required to raise the temperature of 100 g of ice by 5 °C?

A 40 J **B** 100 J **C** 1000 J **D** 4000 J

14 The diagram shows four labelled changes of state, P, Q, R and S, between solid, liquid and gas.



Which changes need an energy input?

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

15 Which row about the movement of electrons and ions during conduction of thermal energy through a metal is correct?

	electrons	ions
A	move through metal	vibrate about fixed points
B	vibrate about fixed points	move through metal
C	vibrate about fixed points	vibrate about fixed points
D	move through metal	move through metal

16 A scientist measures the air temperature at different heights from the floor in a cave. The results are recorded in the table.

height / m	temperature / °C
0	10
10	11
20	13
30	14
40	16

Why does altering the height affect the temperature of the air?

A The particles in warm air have less energy than the particles in cool air.

B The particles in cool air are further apart than the particles in warm air.

C Warm air is less dense than cool air.

D Cool air rises above warm air.

17 Star X has a larger diameter than star Y but they both emit radiation with the same power.

Which statement is correct?

A The surface temperature of X is less than the surface temperature of Y.

B The surface temperatures of X and Y are the same.

C The surface temperature of X is greater than the surface temperature of Y.

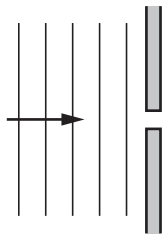
D The surface areas of X and Y are the same.

18 When water waves pass through a gap, they diffract.

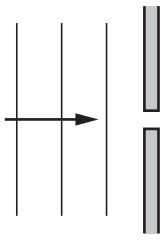
The diagrams show wavefronts approaching a gap.

In which diagram will the diffraction be least?

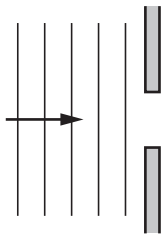
A



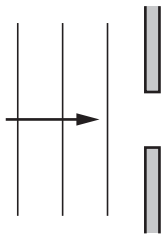
B



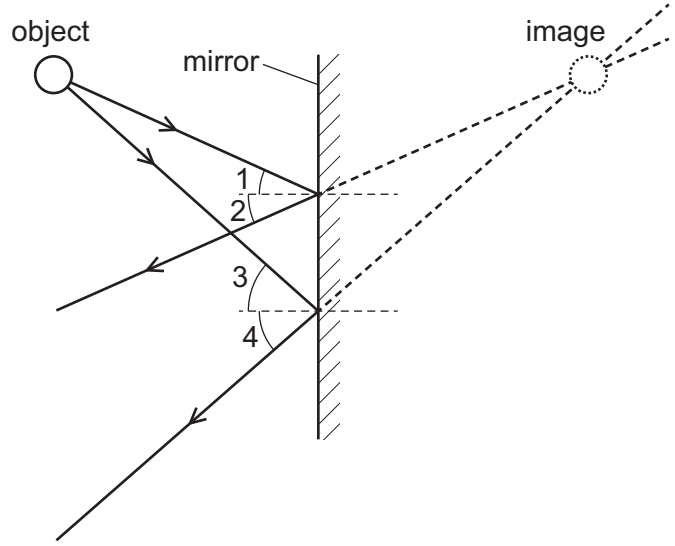
C



D



19 The diagram shows a scale drawing of the formation of an image by the reflection of light from a plane mirror.



What are the relationships between the labelled angles?

A angle 1 = angle 2, and angle 3 = angle 4

B angle 1 = angle 3, and angle 2 = angle 4

C angle 1 = angle 4, and angle 3 = angle 2

D angle 1 = angle 2 = angle 3 = angle 4

20 The speed of light in a vacuum is 3.0×10^8 m/s.

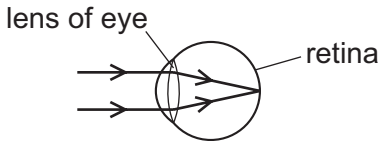
The speed of light in glass is 2.2×10^8 m/s.

A light ray in a vacuum enters glass with an angle of incidence of 40°.

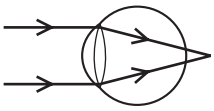
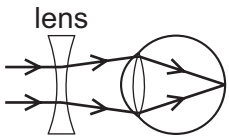
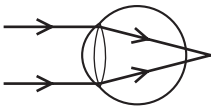
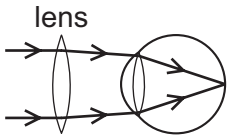
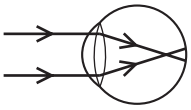
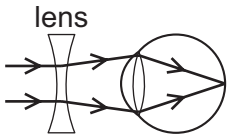
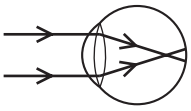
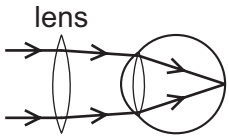
What is the angle of refraction within the glass?

A 28° **B** 29° **C** 55° **D** 61°

21 The diagram shows a human eye that correctly focuses the light on the retina.



Which row shows a short-sighted eye and use of the correct lens to focus the image?

	ray diagram for short-sighted eye	corrected vision
A		
B		
C		
D		

22 Visible light, X-rays and microwaves are all components of the electromagnetic spectrum.

Which statement about the waves is correct?

A In a vacuum, microwaves travel faster than visible light and have a shorter wavelength than visible light.

B In a vacuum, microwaves travel at the same speed as visible light and have a shorter wavelength than visible light.

C In a vacuum, X-rays travel faster than visible light and have a shorter wavelength than visible light.

D In a vacuum, X-rays travel at the same speed as visible light and have a shorter wavelength than visible light.

23 Both the amplitude and the frequency of a sound wave decrease.

What happens to the sound that is heard?

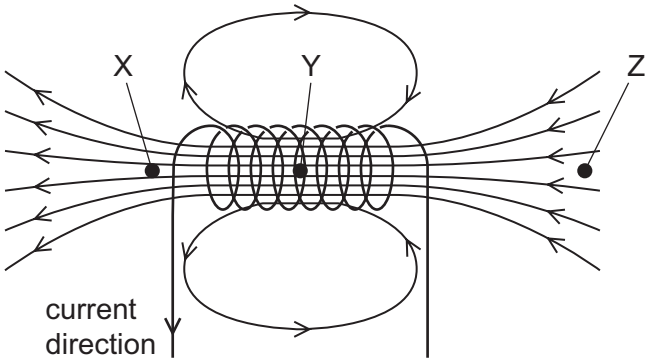
A The sound is louder and has a higher pitch.

B The sound is louder and has a lower pitch.

C The sound is quieter and has a higher pitch.

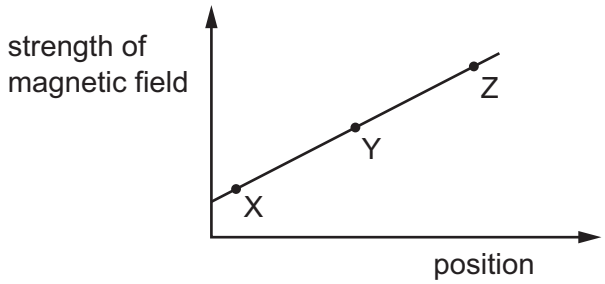
D The sound is quieter and has a lower pitch.

24 The diagram shows the magnetic field due to a current in a solenoid.

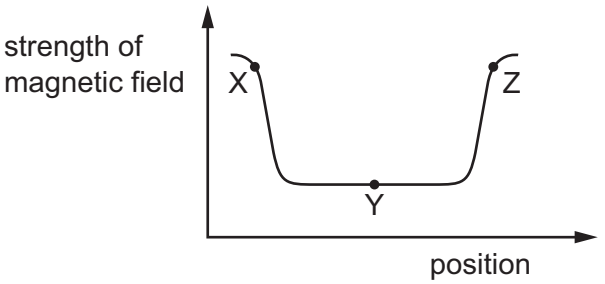


Which graph represents the strength of the magnetic field at positions X, Y and Z?

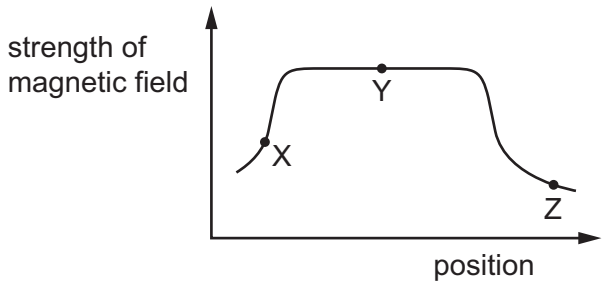
A



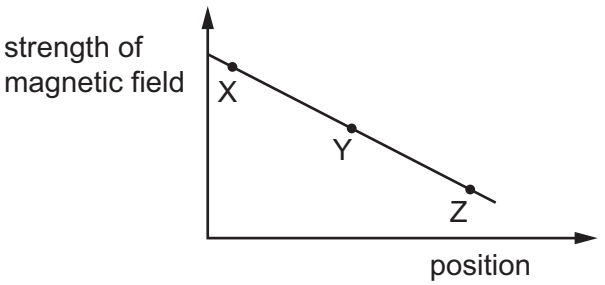
B



C



D



25 Why does a plastic rod become negatively charged when it is rubbed with a cloth?

A The rod gains electrons.

B The rod gains protons.

C The rod loses electrons.

D The rod loses protons.

26 There is an electric current in a circuit with a battery. This question refers to the positive and negative terminals of the battery.

Which row correctly describes the directions of the conventional current and the electron flow in the circuit?

	direction of conventional current	direction of electron flow
A	from the negative to the positive terminal	from the negative to the positive terminal
B	from the negative to the positive terminal	from the positive to the negative terminal
C	from the positive to the negative terminal	from the negative to the positive terminal
D	from the positive to the negative terminal	from the positive to the negative terminal

27 Which electrical quantity is defined in terms of the energy supplied by a source in driving charge round a complete circuit?

A current

B electromotive force

C potential difference

D power

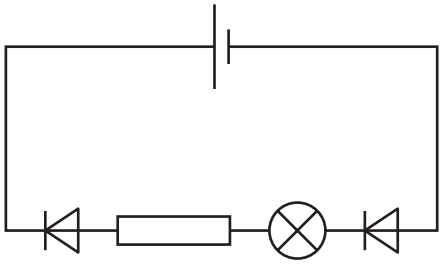
28 A torch has a simple circuit with a 3.0 V battery and a lamp. There is a 20 mA current in the lamp.

How much energy is transferred to the lamp in 5.0 minutes?

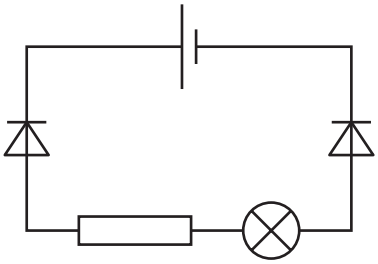
A 0.30 J **B** 18 J **C** 60 J **D** 0.30 kJ

29 In which circuit does the lamp light?

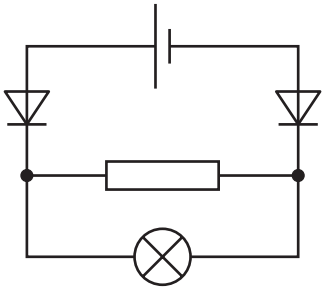
A



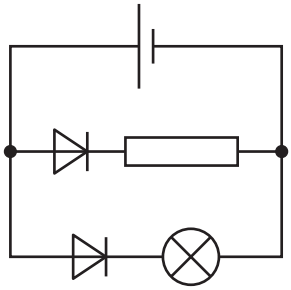
B



C

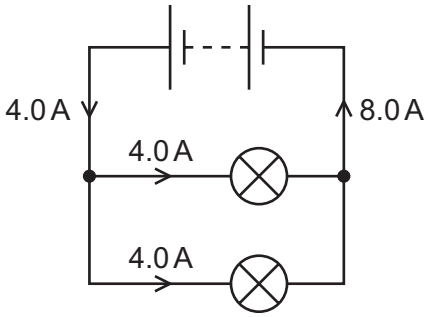


D

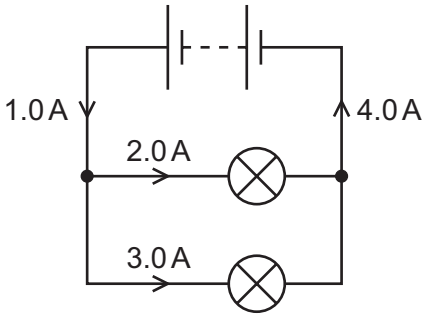


30 Which circuit shows possible correct values for the currents?

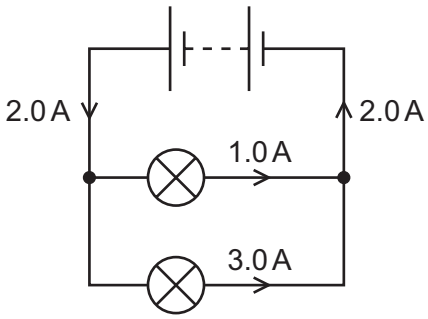
A



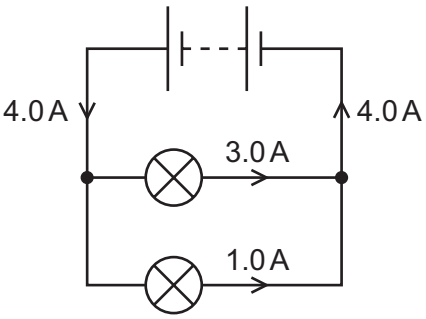
B



C



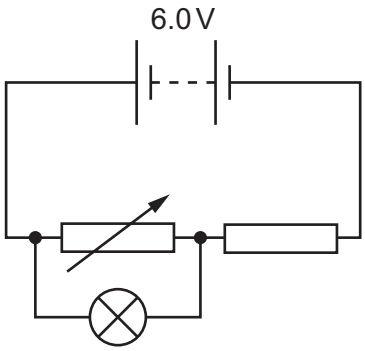
D



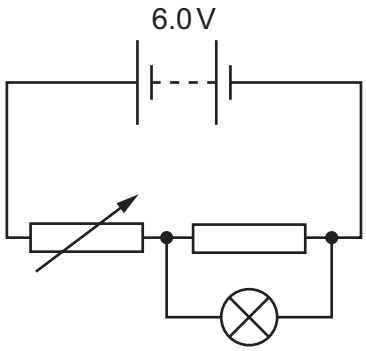
31 The circuit diagrams show circuits that can control the potential difference (p.d.) across a lamp.

Which circuit allows the p.d. across the lamp to be varied from 0 V to 6.0 V?

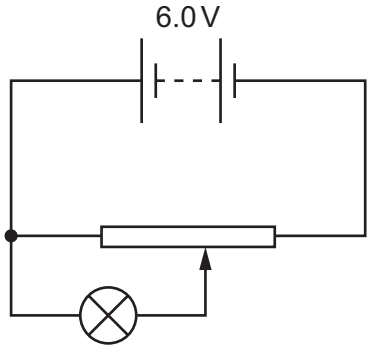
A



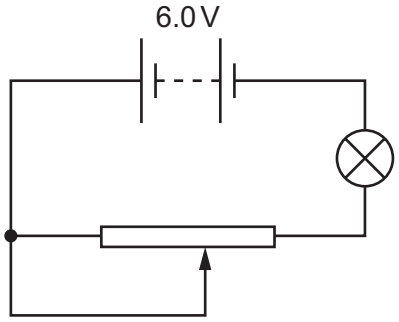
B



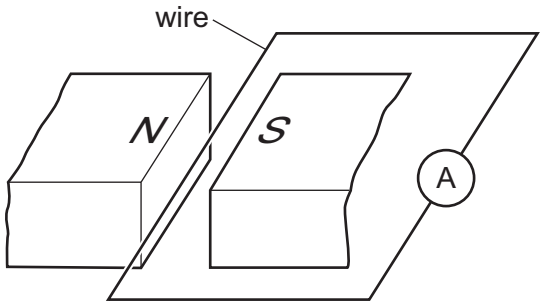
C



D



32 The diagram shows a wire between two magnetic poles. The wire is connected in a circuit with an ammeter.



The wire is moved downwards, towards the bottom of the page. A current is induced in the wire.

In which direction is the force on the wire caused by this current?

A towards the bottom of the page

B towards the left of the page

C towards the right of the page

D towards the top of the page

33 Some students set up an experiment to measure the count rate for a radioactive source.

First, they measure the radioactive background count rate in the laboratory by taking three measurements. Each measurement is taken over a 10-minute period.

The table shows their results.

number of counts in 10 minutes		
first measurement	second measurement	third measurement
170	164	185

Next, the students measure the counts near the radioactive source. This count rate is measured as 949 counts per minute.

What is the corrected count rate for the source?

A 932 counts per minute

B 776 counts per minute

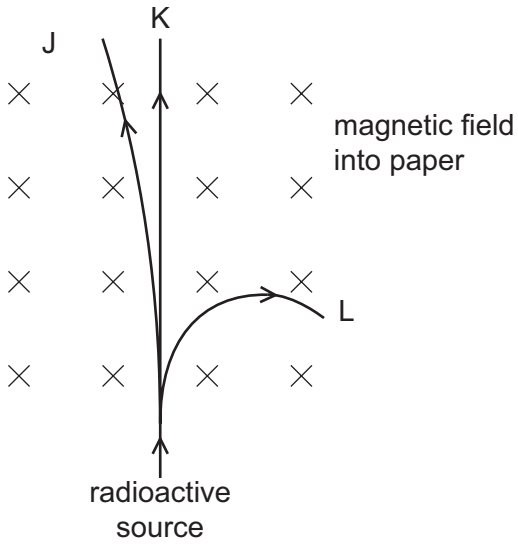
C 430 counts per minute

D 78 counts per minute

34 A radioactive source emits α-particles, β-particles and γ-rays into a vacuum where there is a magnetic field.

The magnetic field acts perpendicularly into the plane of the paper.

The paths J, K and L of the three types of radiation through the magnetic field are shown.



Which radiation follows path J, path K and path L?

	J	K	L
A	α-particles	β-particles	γ-rays
B	α-particles	γ-rays	β-particles
C	β-particles	α-particles	γ-rays
D	β-particles	γ-rays	α-particles

35 Radioactive decay is a change in an unstable nucleus which may result in emission of alpha-particles or beta-particles.

Which statement describes how these emissions happen?

A Alpha emission is a spontaneous and random process but beta emission is **not**.

B Alpha emission and beta emission are both spontaneous and random processes.

C Beta emission is a spontaneous and random process but alpha emission is **not**.

D Neither alpha emission nor beta emission are spontaneous and random processes.

36 Which change occurs in the nucleus of a radioactive atom when a beta-particle is emitted?

A neutron → alpha-particle

B neutron → proton + electron

C proton → neutron

D proton → neutron + electron

37 A radioactive source that emits α-particles, β-particles and γ-radiation is stored safely in a container.

From which material should the container be made?

A alumimium

B copper

C paper

D lead

38 An artificial satellite orbits planet X at a distance $r = 7.0 \times 10^6$ m from the centre of planet X.

The average orbital speed v of the satellite is 3500 m / s.

What is the orbital period?

A 21 minutes

B 52 minutes

C 1 hour and 45 minutes

D 3 hours and 29 minutes

39 The table lists data about four different stars.

Which star is the Sun?

	main elements in the star	regions of electromagnetic spectrum where most energy is radiated by the star
A	helium, hydrogen, carbon, nitrogen, oxygen	blue, ultraviolet, X-ray
B	helium, hydrogen, carbon, nitrogen, magnesium	red, infrared
C	helium, hydrogen	infrared, ultraviolet, visible
D	helium, hydrogen	red, infrared

40 What can be formed directly following a supernova?

A a nebula and a neutron star

B a nebula and a white dwarf

C a red supergiant and a neutron star

D a red supergiant and a protostar

Answer Sheet_____

	A	B	C	D		A	B	C	D
1	◯	◯	◯	◯	21	◯	◯	◯	◯
2	◯	◯	◯	◯	22	◯	◯	◯	◯
3	◯	◯	◯	◯	23	◯	◯	◯	◯
4	◯	◯	◯	◯	24	◯	◯	◯	◯
5	◯	◯	◯	◯	25	◯	◯	◯	◯
6	◯	◯	◯	◯	26	◯	◯	◯	◯
7	◯	◯	◯	◯	27	◯	◯	◯	◯
8	◯	◯	◯	◯	28	◯	◯	◯	◯
9	◯	◯	◯	◯	29	◯	◯	◯	◯
10	◯	◯	◯	◯	30	◯	◯	◯	◯
11	◯	◯	◯	◯	31	◯	◯	◯	◯
12	◯	◯	◯	◯	32	◯	◯	◯	◯
13	◯	◯	◯	◯	33	◯	◯	◯	◯
14	◯	◯	◯	◯	34	◯	◯	◯	◯
15	◯	◯	◯	◯	35	◯	◯	◯	◯
16	◯	◯	◯	◯	36	◯	◯	◯	◯
17	◯	◯	◯	◯	37	◯	◯	◯	◯
18	◯	◯	◯	◯	38	◯	◯	◯	◯
19	◯	◯	◯	◯	39	◯	◯	◯	◯
20	◯	◯	◯	◯	40	◯	◯	◯	◯

CAMBRIDGE
International Education

Cambridge IGCSE™

PHYSICS **0625/22**

Paper 2 Multiple Choice (Extended) **February/March 2026**

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

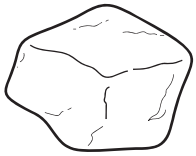
- There are **forty** questions on this paper. Answer **all** questions.
- For each question there are four possible answers **A**, **B**, **C** and **D**. Choose the **one** you consider correct and record your choice in soft pencil on the multiple choice answer sheet.
- Follow the instructions on the 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 or tape.
- 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.

1 The diagram shows a stone of irregular shape.



Which property of the stone can be found by lowering it into a measuring cylinder half-filled with water?

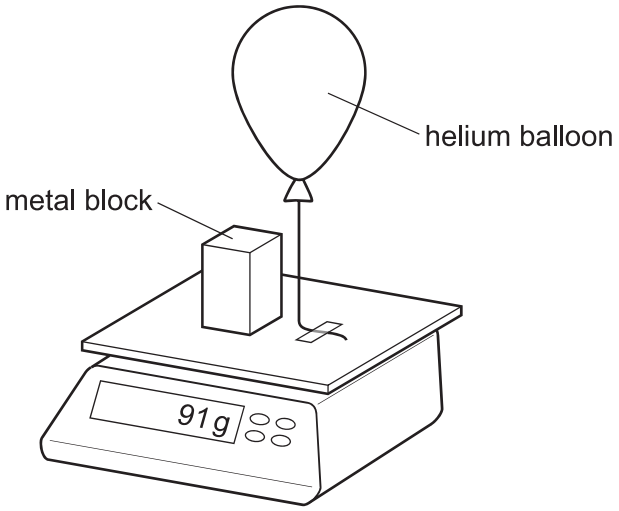
A length

B mass

C volume

D weight

2 A helium balloon is taped to a top-pan balance. A metal block of mass 100 g is placed on the balance. The reading on the balance is 91 g.



Which statement can be deduced from this experiment?

A The balloon exerts a downward force of 0.09 N on the top-pan balance.

B The helium has a mass of –9 g.

C The helium has a mass of +9 g.

D The resultant downward force on the top-pan balance is 0.89 N.

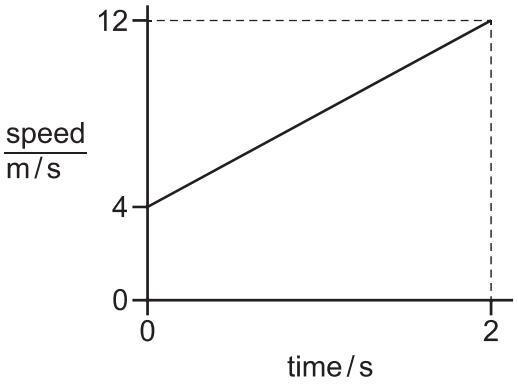
3 An athlete runs 300 m up a hill in 100 s.

She then runs down the same hill in 50 s.

What is her average speed for the whole run?

A 2.0 m/s **B** 4.0 m/s **C** 8.0 m/s **D** 9.0 m/s

4 The diagram shows the speed–time graph for a car.



What is the acceleration of the car?

A $4.0\,m/s^2$ **B** $6.0\,m/s^2$ **C** $16\,m/s^2$ **D** $24\,m/s^2$

5 What is a weight?

A a frictional force

B a magnetic force

C a gravitational force

D an electromagnetic force

6 What is the relationship between the force F on an object, its mass m and its acceleration a?

A $a = \frac{m}{F}$ **B** $a = F \times m$ **C** $m = \frac{F}{a}$ **D** $m = F \times a$

7 Which statement about the resultant force acting on a moving object must be correct?

A It is the change in the momentum of the object per unit time.

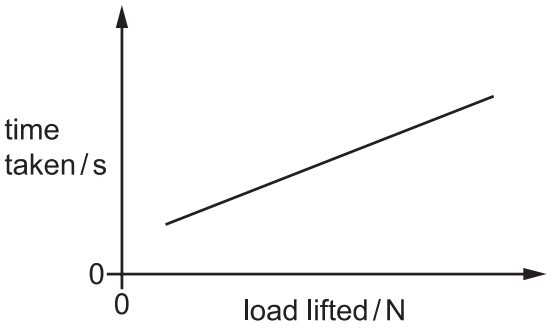
B It is the force needed to keep the object moving at constant speed.

C It is the impulse acting on the object to keep the object moving.

D It is the largest forward force acting on the object.

8 A motor is used to lift different sized loads through the same vertical height.

The power input to the motor is kept constant. The graph of time taken against load lifted is shown.



Which statement about the efficiency of the motor is correct?

A It decreases as the load increases.

B It increases as the load increases.

C It stays the same as the load increases.

D More information is needed to determine this.

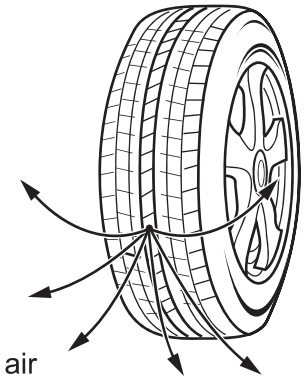
9 An object is at a depth h below the surface of a liquid.

The density of the liquid is ρ and the gravitational field strength is g.

What is the total liquid pressure at depth h?

A $\frac{h\rho}{g}$ **B** $\frac{hg}{\rho}$ **C** $\frac{1}{h\rho g}$ **D** $h\rho g$

10 A car tyre runs over a nail that makes a hole in it. The air in the tyre leaks out.



Why does the air leave the tyre?

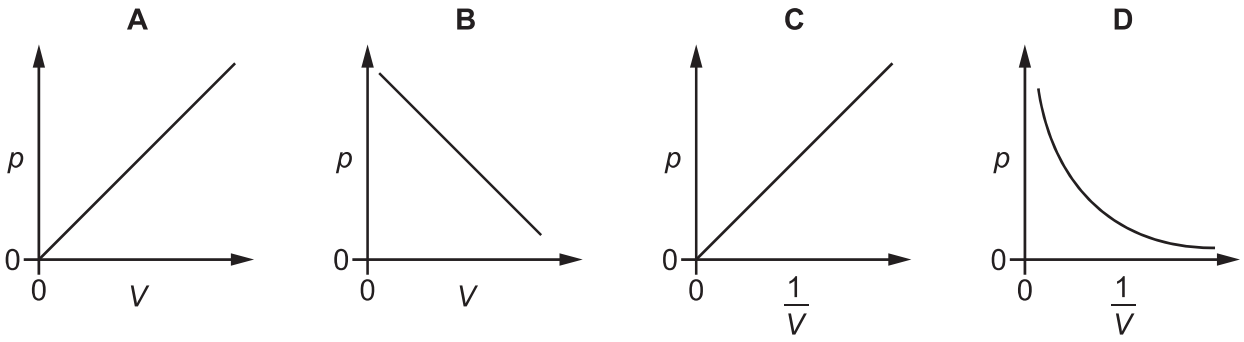
A The pressure inside the tyre is greater than the pressure outside.

B The pressure inside the tyre is less than the pressure outside.

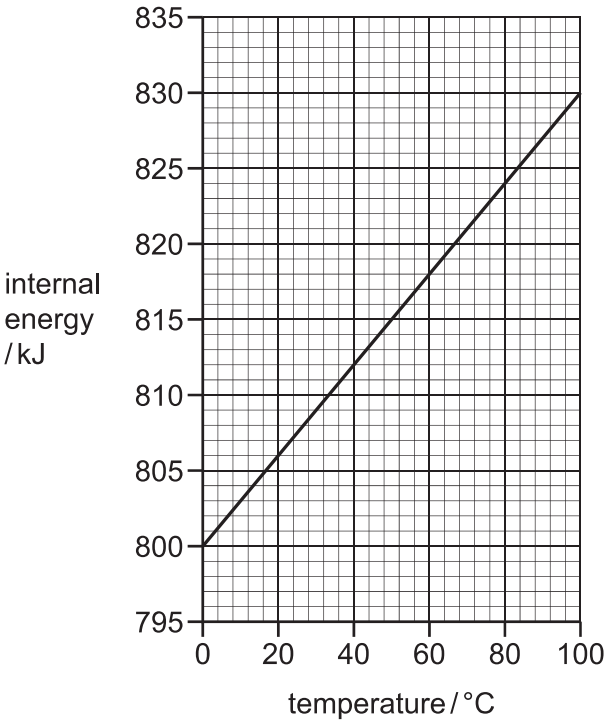
C The temperature inside the tyre is greater than the temperature outside.

D The temperature inside the tyre is less than the temperature outside

11 Which graph shows the relationship between pressure p and volume V for a fixed mass of gas at constant temperature?



12 The graph shows how the internal energy of 1.0 kg of a metal changes with temperature.



What is the increase in the internal energy of a block of the same metal of mass 0.125 kg when its temperature rises from 40 °C to 80 °C?

A 60 J **B** 600 J **C** 1500 J **D** 2400 J

13 Both melting and boiling of water require an input of energy.

What happens to the temperature of water during melting and boiling?

A Temperature rises during both melting and boiling.

B Temperature does **not** change during melting, but rises during boiling.

C Temperature rises during melting, but does **not** change during boiling.

D Temperature remains unchanged during melting and during boiling.

14 A beaker contains a liquid.

As the liquid evaporates, particles escape from the surface of the liquid and the temperature of the beaker changes.

Which statement is correct?

A The beaker cools down because the less-energetic particles escape from the surface of the liquid.

B The beaker cools down because the more-energetic particles escape from the surface of the liquid.

C The beaker heats up because the less-energetic particles escape from the surface of the liquid.

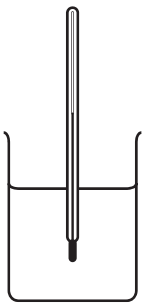
D The beaker heats up because the more-energetic particles escape from the surface of the liquid.

15 Equal volumes of water at 100 °C are put in four containers. Two containers have matt black sides and two containers have shiny white sides. One of each type of container has a lid.

The containers are left for two minutes.

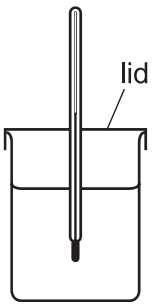
Which container of water has the highest temperature?

A



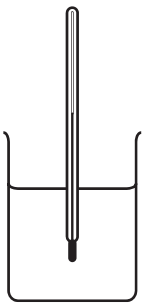
matt black sides

B



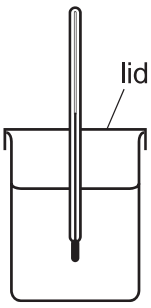
matt black sides

C



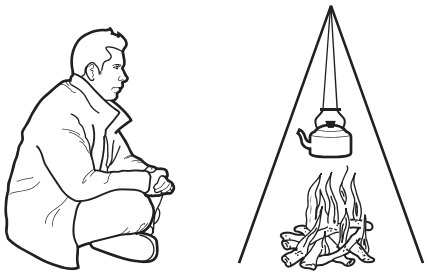
shiny white sides

D



shiny white sides

16 The diagram shows a person keeping warm while water in a metal kettle boils over a wood fire.



Which thermal energy transfers are taking place in this situation?

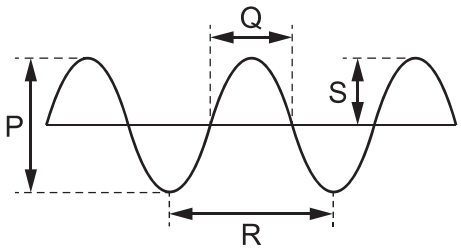
A conduction, convection and radiation

B conduction and convection only

C convection and radiation only

D conduction and radiation only

17 The diagram shows a wave.



Which letter represents the amplitude and which letter represents the wavelength of the wave?

	amplitude	wavelength
A	P	Q
B	P	R
C	S	Q
D	S	R

18 Which statement about the image of an object formed in a plane mirror is correct?

A It is smaller than the object.

B It is the same size as the object.

C It is larger than the object.

D It is inverted.

19 A ray of light travels from air into a glass block.

	in air	in glass
speed of ray	v_a	v_g
wavelength of ray	λ_a	λ_g
frequency of ray	f_a	f_g

Three suggestions as to how the refractive index of glass n may be calculated are listed.

1 $n = \frac{v_a}{v_g}$

2 $n = \frac{\lambda_a}{\lambda_g}$

3 $n = \frac{f_a}{f_g}$

Which suggestions are correct?

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

20 A light ray travels from air into glass.

The angle of incidence is 32.0° and the angle of refraction is 21.1°.

What is the refractive index of the glass?

A 0.679 **B** 0.709 **C** 1.47 **D** 1.52

21 A real image of an object is formed by a converging lens.

Which statement is correct?

A The rays from the tip of the object meet at a point and the image can be viewed on a screen.

B The rays from the tip of the object meet at a point and the image **cannot** be viewed on a screen.

C The rays from the tip of the object do **not** meet at a point and the image can be viewed on a screen.

D The rays from the tip of the object do **not** meet at a point and the image **cannot** be viewed on a screen.

22 Intruder alarms, mobile phones and security scanners are practical uses of electromagnetic radiation.

Which list places the devices in the correct order of increasing wavelength of the electromagnetic radiation used?

A intruder alarms → mobile phones → security scanners

B mobile phones → intruder alarms → security scanners

C security scanners → intruder alarms → mobile phones

D security scanners → mobile phones → intruder alarms

23 A student wants to explain why the sound from a train gets louder when it gets closer.

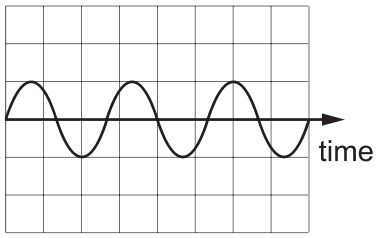
What is the type of wave and which property of the sound causes it to be louder?

	type of wave	property
A	longitudinal	wave is moving faster
B	longitudinal	wave has a larger amplitude
C	transverse	the wavelength of the wave is increasing
D	transverse	the frequency of the wave is increasing

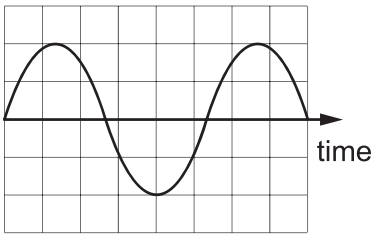
24 The diagrams show four different sound waves as represented by an oscilloscope. The scales are the same in all the diagrams.

Which sound has the lowest pitch?

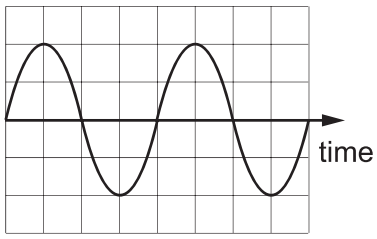
A



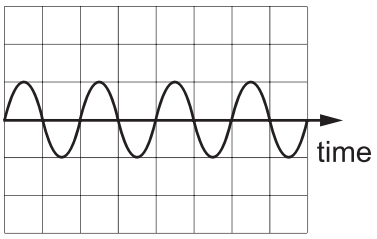
B



C



D



25 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

26 Which quantity is defined as the energy transferred by a cell in driving unit charge around a complete circuit?

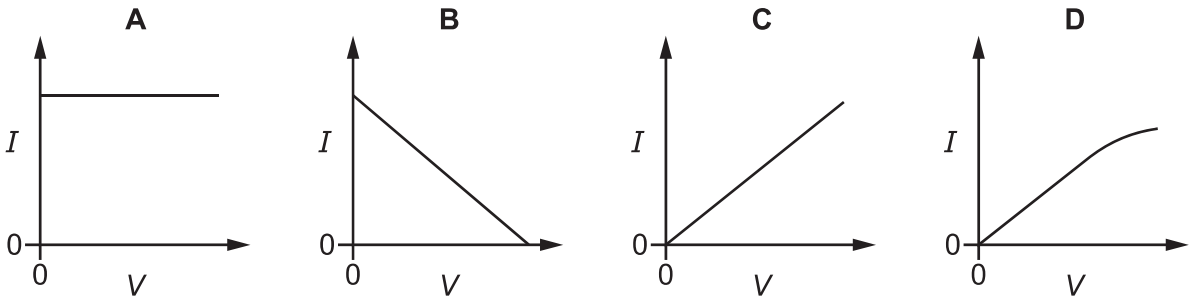
A current

B electromotive force (e.m.f.)

C power

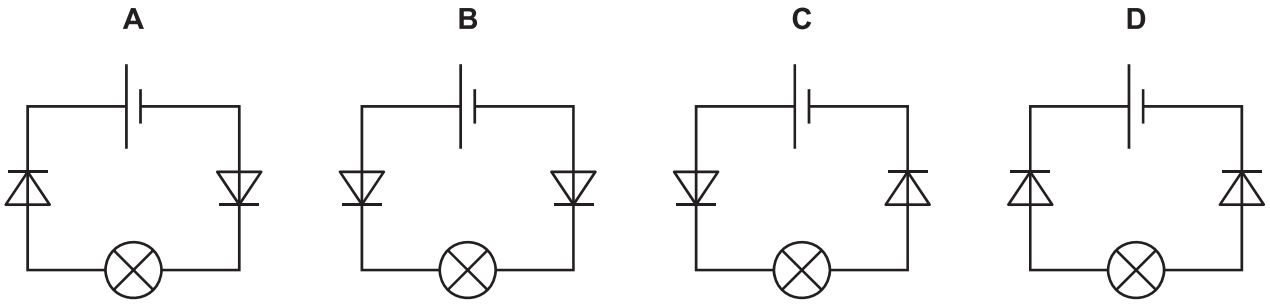
D resistance

27 Which graph shows the relationship between current I and voltage V for a metal wire at constant temperature?



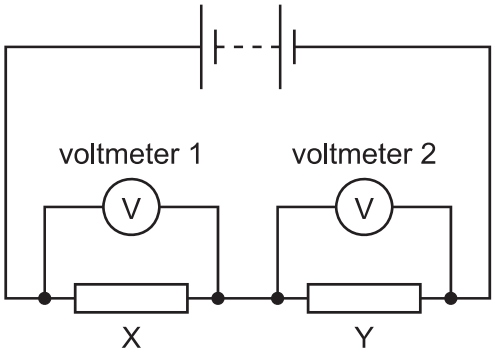
28 The circuit diagrams show a cell connected to two diodes and a lamp in series.

In which circuit does the lamp light up?



29 The diagram shows a battery connected to two resistors, X and Y.

Two voltmeters are connected into the circuit.



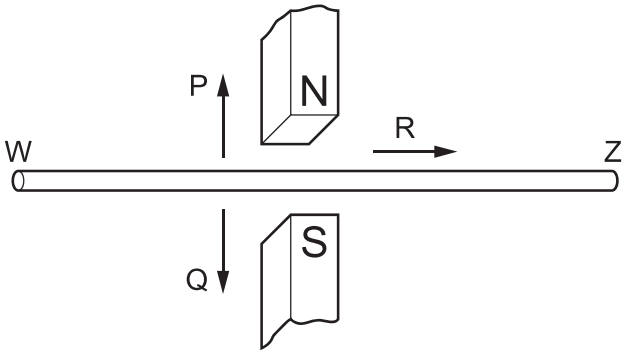
The reading on voltmeter 1 is greater than the reading on voltmeter 2.

Which row about the current in the two resistors and the resistance of the two resistors is correct?

	current	size of resistors
A	current is the same in both resistors	both resistors have the same resistance
B	current is the same in both resistors	resistance of X is greater than resistance of Y
C	current in X is greater than current in Y	both resistors have the same resistance
D	current in X is greater than current in Y	resistance of X is greater than resistance of Y

30 The diagram shows a conductor WZ.

Part of the conductor lies between the magnetic poles N and S.



When the conductor is moved, electrons flow along the conductor from Z to W.

In which direction is the conductor moved?

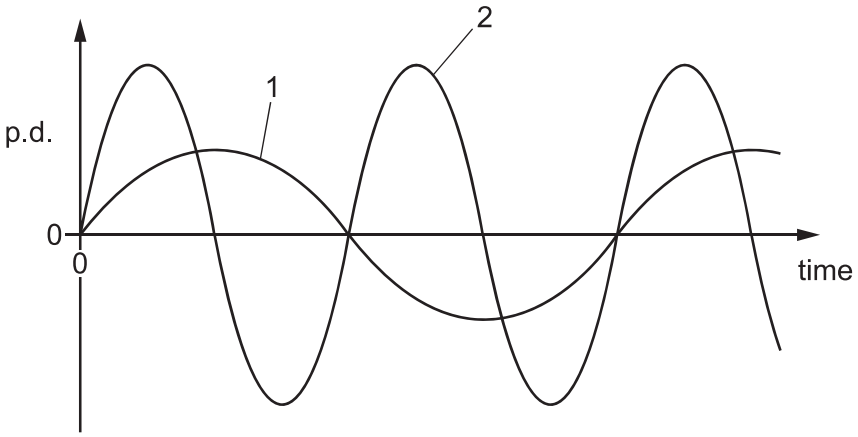
A in the direction of arrow P

B in the direction of arrow Q

C in the direction of arrow R

D out of the paper towards the viewer

31 Graph 1 shows the output from an a.c. generator.



Which changes can be made so that the generator produces graph 2?

A decreasing the magnetic field strength and decreasing the speed of rotation only

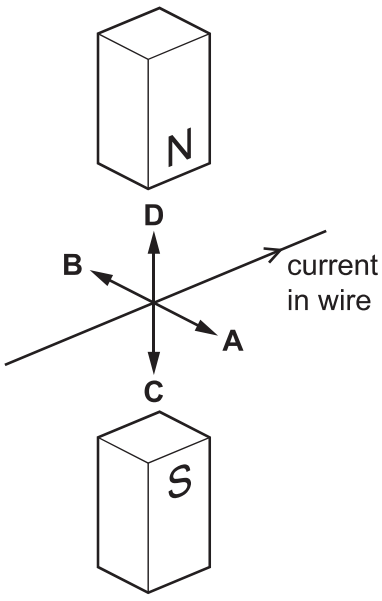
B increasing the magnetic field strength and decreasing the number of coils only

C increasing the number of coils only

D increasing the speed of rotation only

32 The diagram shows a current-carrying wire in a magnetic field.

What is the direction of the magnetic force on the wire?



33 A transformer has a primary coil with 2000 turns and a secondary coil with 10 000 turns.

The transformer is 100% efficient.

V_p is the voltage across the primary coil.

V_s is the voltage across the secondary coil.

I_p is the current in the primary coil.

I_s is the current in the secondary coil.

Which statement about this transformer is correct?

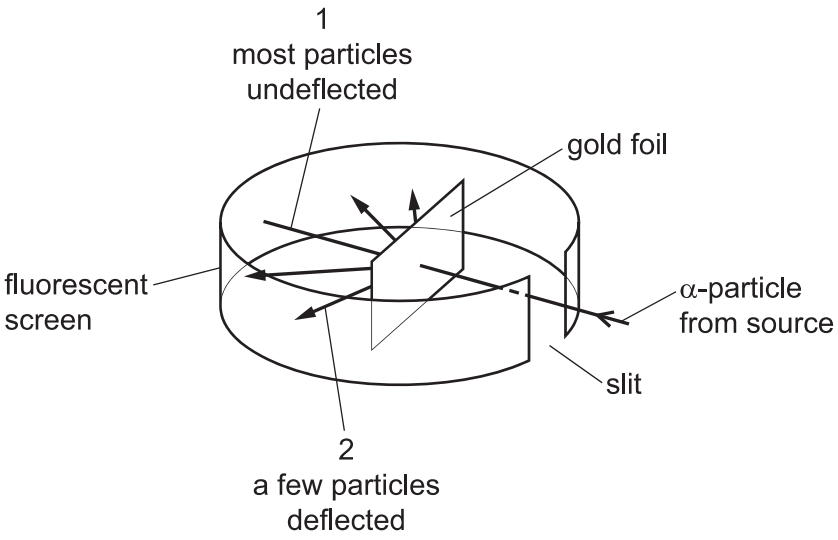
A $V_s = V_p \times 5$ and $I_s = I_p \times 5$

B $V_s = V_p \times 5$ and $I_s = I_p \times 0.2$

C $V_s = V_p \times 0.2$ and $I_s = I_p \times 5$

D $V_s = V_p \times 0.2$ and $I_s = I_p \times 0.2$

34 The diagram shows the scattering of α-particles by gold foil.



Two observations from the experiment are labelled 1 and 2. They are evidence for the structure of the atom.

Which conclusion is correct?

A The atom has no overall charge.

B The atom has an overall positive charge.

C The atom is mostly empty space.

D The atom has an overall negative charge.

35 A nuclide has the symbol $^{23}_{11}Na$.

Which statement about all atoms of this nuclide is correct?

A There are 11 protons in the nucleus.

B There are 23 neutrons in the nucleus.

C There are 11 electrons in the nucleus.

D There are 34 nucleons in the nucleus.

36 A student measures the count rate from a radioactive source.

Which method should the student use to remove the contribution made by background radiation?

A Take the measurement in an empty room.

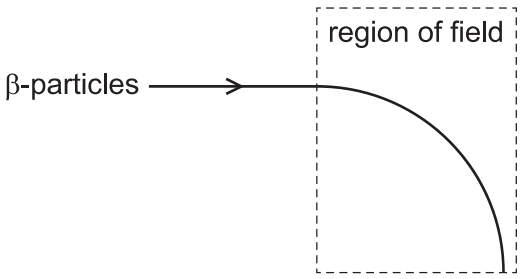
B Measure the count rate due to the background radiation on its own and add it to the measurement from the source.

C Measure the count rate due to the background radiation on its own and subtract it from the measurement from the source.

D Reduce the measurement time.

37 A beam of β-particles travels in a straight line.

It enters a region where there is a field that deflects the particles in a circular path, as shown.



What is the type of field and its direction on the diagram?

A an electric field into the page

B an electric field towards the bottom of the page

C a magnetic field into the page

D a magnetic field towards the bottom of the page

38 Uranium-235 can undergo nuclear fission in many ways.

Which equation correctly shows a possible fission reaction for uranium-235?

A $^{1}_{0}n + {}^{235}_{92}U \rightarrow {}^{141}_{56}Ba + {}^{92}_{36}Kr + 3{}^{1}_{0}n$

B $^{1}_{0}n + {}^{235}_{92}U \rightarrow {}^{91}_{38}Sr + {}^{144}_{54}Xe + 2{}^{1}_{0}n$

C $^{1}_{0}n + {}^{235}_{92}U \rightarrow {}^{95}_{37}Rb + {}^{136}_{55}Cs + 3{}^{1}_{0}n$

D $^{1}_{0}n + {}^{235}_{92}U \rightarrow {}^{87}_{35}Br + {}^{146}_{57}La + 4{}^{1}_{0}n$

39 A satellite is orbiting above the Earth's equator. It completes one orbit of the Earth every 24 hours.

The satellite is 36 000 km above the surface of the Earth and the radius of the Earth is 6400 km.

What is the orbital speed of the satellite?

A 2.6 m/s **B** 3.1 km/s **C** 74 km/s **D** 470 km/s

40 One nuclear reaction that occurs in the Sun is responsible for most of the energy released in the Sun.

What is this nuclear reaction?

A fission of helium to form hydrogen

B fission of hydrogen to form helium

C fusion of helium to form hydrogen

D fusion of hydrogen to form helium

Answer Sheet_____

	A	B	C	D		A	B	C	D
1	◯	◯	◯	◯	21	◯	◯	◯	◯
2	◯	◯	◯	◯	22	◯	◯	◯	◯
3	◯	◯	◯	◯	23	◯	◯	◯	◯
4	◯	◯	◯	◯	24	◯	◯	◯	◯
5	◯	◯	◯	◯	25	◯	◯	◯	◯
6	◯	◯	◯	◯	26	◯	◯	◯	◯
7	◯	◯	◯	◯	27	◯	◯	◯	◯
8	◯	◯	◯	◯	28	◯	◯	◯	◯
9	◯	◯	◯	◯	29	◯	◯	◯	◯
10	◯	◯	◯	◯	30	◯	◯	◯	◯
11	◯	◯	◯	◯	31	◯	◯	◯	◯
12	◯	◯	◯	◯	32	◯	◯	◯	◯
13	◯	◯	◯	◯	33	◯	◯	◯	◯
14	◯	◯	◯	◯	34	◯	◯	◯	◯
15	◯	◯	◯	◯	35	◯	◯	◯	◯
16	◯	◯	◯	◯	36	◯	◯	◯	◯
17	◯	◯	◯	◯	37	◯	◯	◯	◯
18	◯	◯	◯	◯	38	◯	◯	◯	◯
19	◯	◯	◯	◯	39	◯	◯	◯	◯
20	◯	◯	◯	◯	40	◯	◯	◯	◯