Cambridge Assessment International Education

Cambridge IGCSE™

PHYSICS **0625/12**

Paper 1 Multiple Choice (Core) **October/November 2022**

45 minutes

You must answer on the multiple choice answer sheet.

You will need: Multiple choice answer sheet
Soft clean eraser
Soft pencil (type B or HB is recommended)

INSTRUCTIONS

- There are **forty** questions on this paper. Answer **all** questions.
- For each question there are four possible answers **A**, **B**, **C** and **D**. Choose the **one** you consider correct and record your choice in soft pencil on the multiple choice answer sheet.
- Follow the instructions on the multiple choice answer sheet.
- Write in soft pencil.
- Write your name, centre number and candidate number on the multiple choice answer sheet in the spaces provided unless this has been done for you.
- Do **not** use correction fluid.
- Do **not** write on any bar codes.
- You may use a calculator.
- Take the weight of 1.0 kg to be 10 N (acceleration of free fall = 10 m / s^2).

INFORMATION

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

IB22 11_0625_12/3RP
© UCLES 2022

[Turn over

1 Which measuring instrument can be used to find the volume of a small stone?

A measuring cylinder partly filled with water

B measuring tape

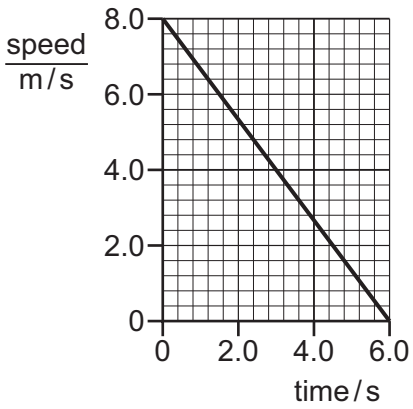
C metre rule

D protractor

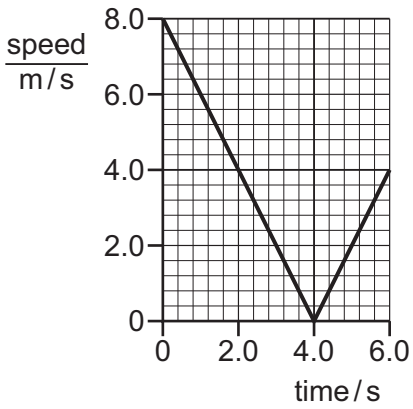
2 The diagrams show speed–time graphs for four different bodies moving for 6.0 s.

Which body travelled the least distance?

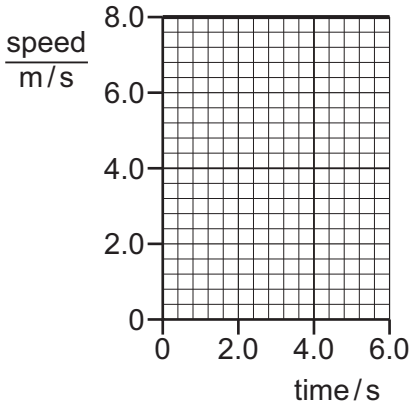
A



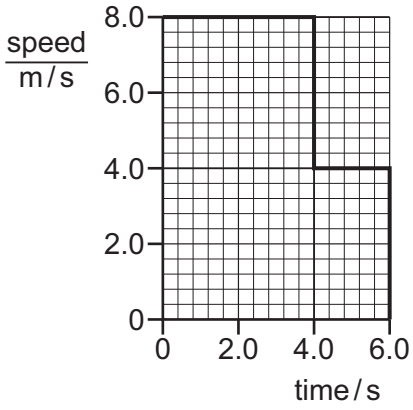
B



C



D

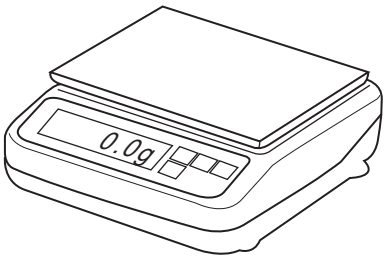


3 Which row shows the mass and the weight of an object near the Earth's surface?

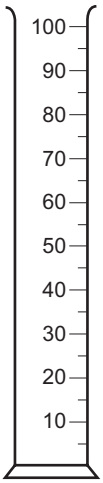
	mass / kg	weight / N
A	0.2	0.2
B	2	0.2
C	2	20
D	20	10

© UCLES 2022

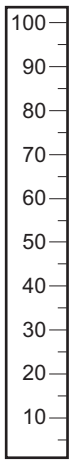
4 The diagram shows four pieces of laboratory apparatus.



balance



measuring cylinder



ruler



stop-watch

Which pieces of apparatus are used to find the density of a liquid?

A balance and stop-watch

B balance and measuring cylinder

C measuring cylinder and ruler

D stop-watch and ruler

5 What is the unit for the moment of a force about a point?

A W **B** Ns **C** N/m **D** Nm

6 On which ball is a non-zero resultant force acting?

A

a ball moving at constant speed on a smooth surface



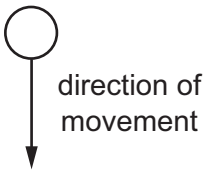
B

a ball at rest on a bench



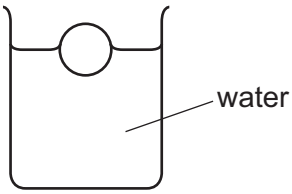
C

a free-falling ball which has just been released



D

a ball floating on water



7 Which statements **must** be correct for an object to be in equilibrium?

1 The object is moving in a straight line.

2 There is no resultant force on the object.

3 There is no resultant moment on the object.

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

8 An object falls towards the Earth's surface.

What happens to the gravitational potential energy and to the kinetic energy of the object?

	gravitational potential energy	kinetic energy
A	decreases	decreases
B	decreases	increases
C	increases	decreases
D	increases	increases

© UCLES 2022

9 Which source of energy is **not** currently used to generate electrical energy?

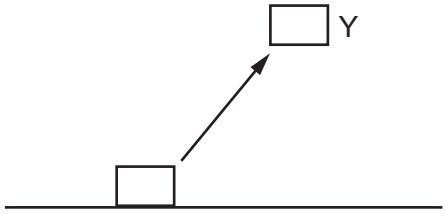
A nuclear fusion

B solar

C tidal

D waves

10 A mass is lifted from rest on the ground to Y. There is no air resistance.



P is the increase in gravitational energy of the mass.

Q is the kinetic energy of the mass at Y.

Which expression is equal to the mechanical work done on the mass?

A P + Q **B** P – Q **C** Q – P **D** P × Q

11 A pressure gauge is lowered into the sea. Measurements of the pressure and depth are taken as the pressure gauge is lowered.

Which statement describes how and why the pressure changes as the gauge is lowered?

A The density of the sea water decreases so the pressure increases.

B The depth of the gauge below the surface of the sea increases so the pressure increases.

C The height of the gauge above the sea bed decreases so the pressure decreases.

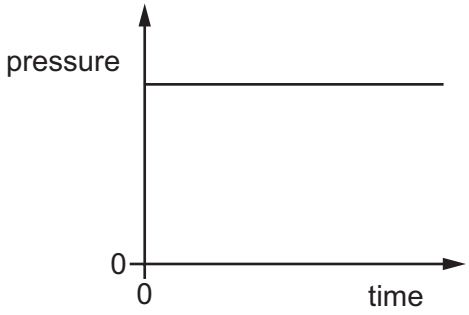
D The temperature of the sea water decreases so the pressure decreases.

© UCLES 2022

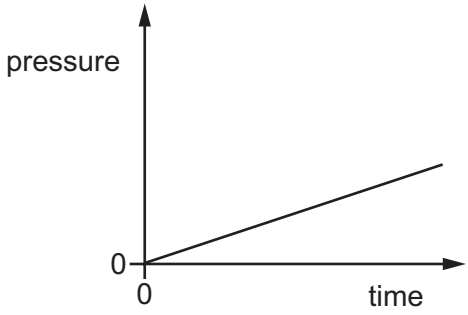
12 The pressure of a fixed mass of gas in a cylinder is measured. The volume of the gas in the cylinder is slowly decreased. The temperature of the gas does not change.

Which graph shows how the pressure of the gas changes during this process?

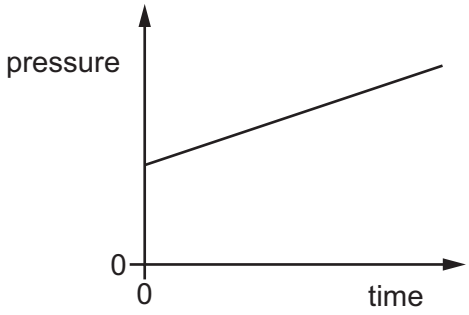
A



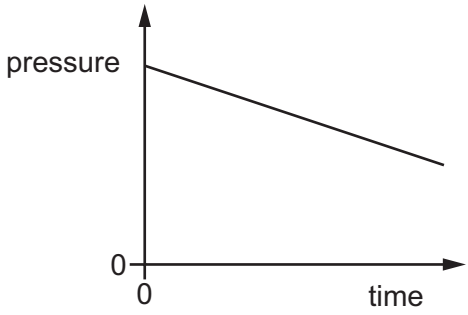
B



C



D



13 Which statement about the motion of molecules describes the process of evaporation?

A Molecules break free from their fixed positions.

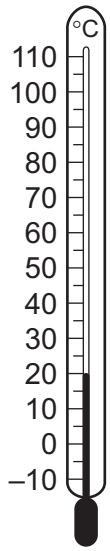
B Freely moving molecules collide and join together.

C Molecules escape from the surface of a liquid.

D Freely moving molecules gain energy and move further apart.

© UCLES 2022

14 The diagram shows a thermometer calibrated in degrees Celsius.



What are the values of the lower fixed point and of the upper fixed point on the Celsius scale?

	lower fixed point / °C	upper fixed point / °C
A	–10	110
B	0	20
C	0	100
D	20	100

15 What happens to a solid when its temperature increases?

A It contracts.

B Its density increases.

C Its internal energy increases.

D Its molecules move freely.

16 Which piece of equipment is designed to produce a type of electromagnetic wave?

A electric fire

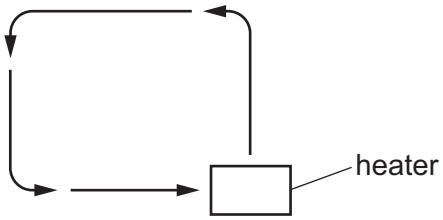
B electric generator

C electric motor

D electromagnet

© UCLES 2022

17 Particles can move, transferring thermal energy, as shown.



In which states of matter does this movement occur?

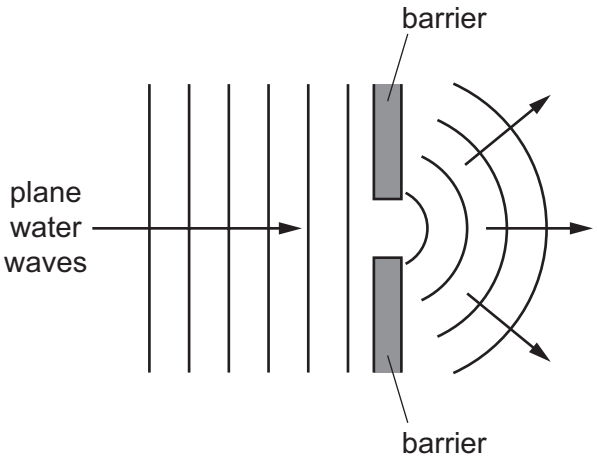
A gas and liquid only

B gas and solid only

C gas, liquid and solid

D liquid and solid only

18 The diagram shows plane water waves in a ripple tank passing through a gap between two barriers and spreading out.



Which name is given to this effect?

A diffraction

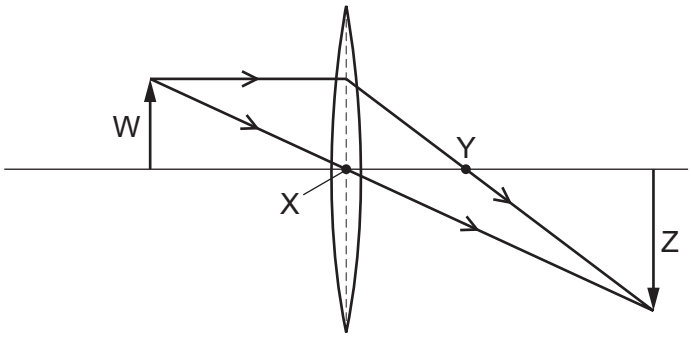
B reflection

C refraction

D total internal reflection

© UCLES 2022

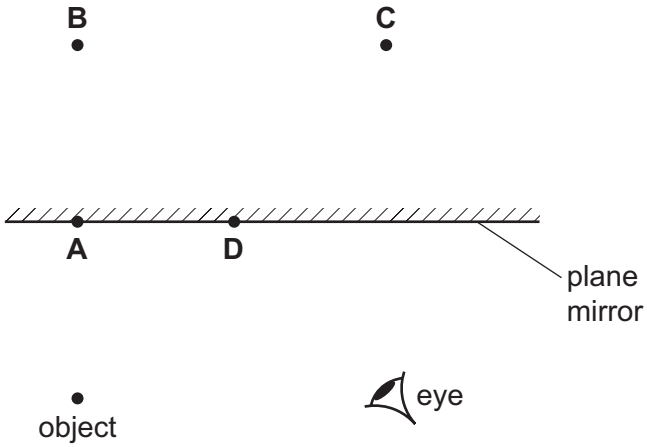
19 What are the correct labels for the ray diagram?



	object	image	principal focus
A	W	X	Y
B	W	Z	Y
C	X	Y	Z
D	X	Z	W

20 The diagram shows an object in front of a plane mirror.

At which labelled position is the image of the object formed?



21 The angle between an incident ray and the surface of a plane mirror reflecting the ray is 70°.

What is the angle of incidence?

A 20° **B** 40° **C** 70° **D** 140°

22 Visible light has a frequency of approximately 5.0×10^{14} Hz.

M and N are two other types of electromagnetic radiation.

The frequency of M is 5.0×10^{6} Hz.

The frequency of N is 5.0×10^{15} Hz.

Which types of radiation are M and N?

	M	N
A	radio waves	infrared
B	radio waves	ultraviolet
C	ultraviolet	X-rays
D	X-rays	infrared

23 Two students are describing different types of electromagnetic radiation.

student 1 This radiation is used in communications.

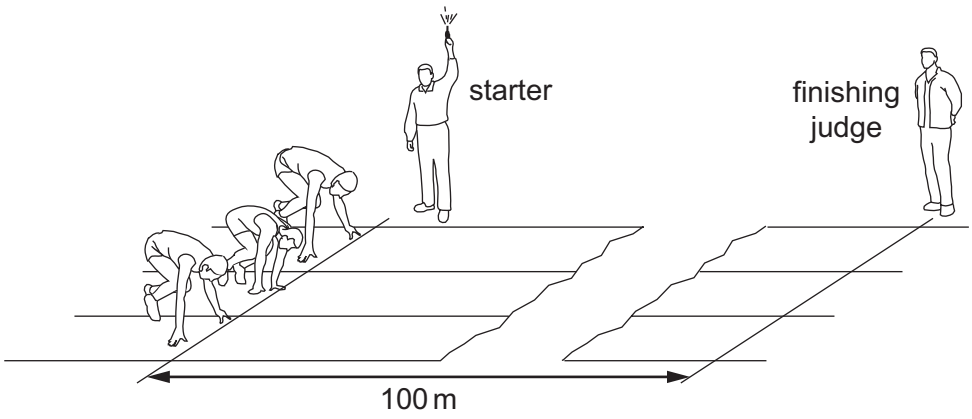
student 2 This radiation is used in remote controllers.

Which row shows the possible type of radiation that each student is describing?

	student 1	student 2
A	microwave	infrared
B	radio	ultraviolet
C	sound waves	visible light
D	X-rays	gamma rays

© UCLES 2022

24 A 100 m race is started by firing a gun. The gun makes a bang and a puff of smoke at the same time.



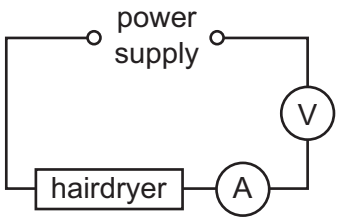
When does the finishing judge see the smoke and when does he hear the bang?

	sees the smoke	hears the bang
A	almost immediately	almost immediately
B	almost immediately	after about 0.3 s
C	after about 0.3 s	almost immediately
D	after about 0.3 s	after about 0.3 s

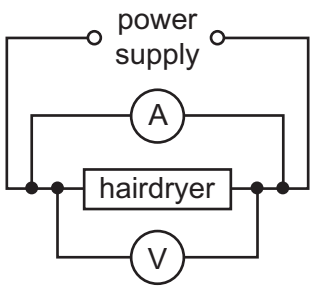
25 An electric hairdryer is rated 230 V, 2 A.

Which circuit could be used to check that these ratings are correct?

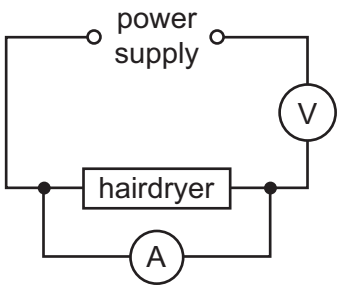
A



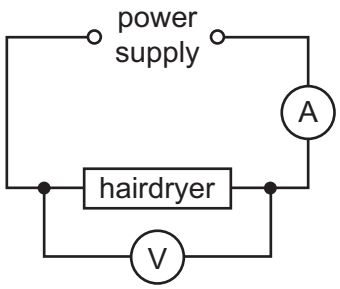
B



C



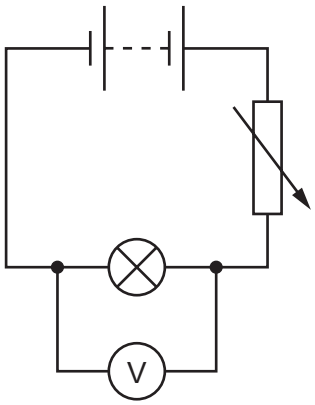
D



26 The diagram shows a circuit used to control the potential difference (p.d.) across a lamp.

The variable resistor is adjusted until the p.d. across the lamp is 6.0 V.

The current in the lamp is 0.5 A.



What is the resistance of the lamp?

A 0.083 Ω **B** 3.0 Ω **C** 6.5 Ω **D** 12.0 Ω

27 What are the units of electromotive force (e.m.f.)?

A amperes

B watts

C ohms

D volts

28 A plastic rod is rubbed with a dry woollen cloth. The rod becomes positively charged.

Which statement is correct?

A Electrons move from the cloth to the rod.

B Electrons move from the rod to the cloth.

C Protons move from the cloth to the rod.

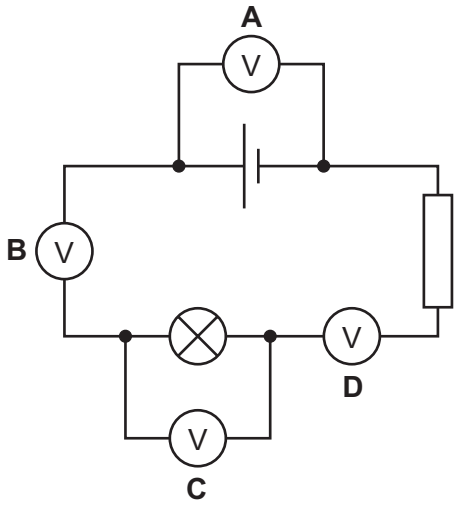
D Protons move from the rod to the cloth.

© UCLES 2022

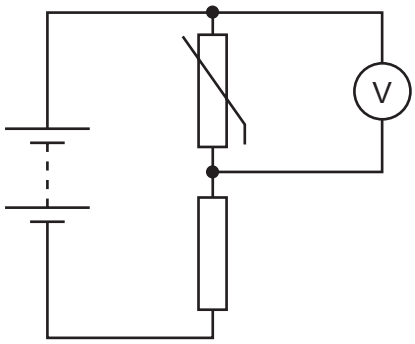
29 A circuit containing a cell, a resistor and a lamp is set up as shown.

A student connects a voltmeter to the circuit in one of the positions shown.

In which position does the voltmeter measure the potential difference (p.d.) across the lamp?



30 The diagram shows a potential divider circuit.



The temperature of the thermistor increases.

What happens to the resistance of the thermistor, and what happens to the reading on the voltmeter?

	resistance of thermistor	voltmeter reading
A	decreases	decreases
B	decreases	increases
C	increases	decreases
D	increases	increases

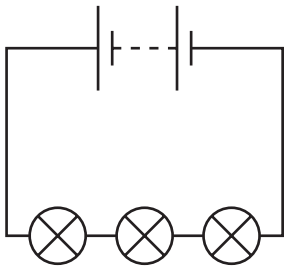
© UCLES 2022

[Turn over

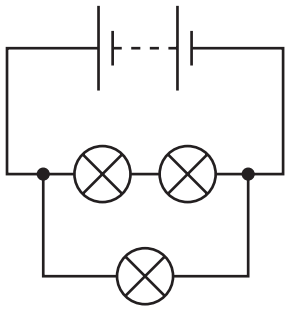
31 A student sets up four circuits using identical batteries and three identical lamps.

In which circuit will all the lamps be the brightest?

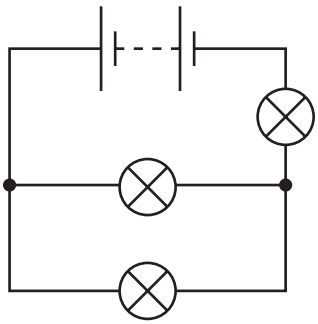
A



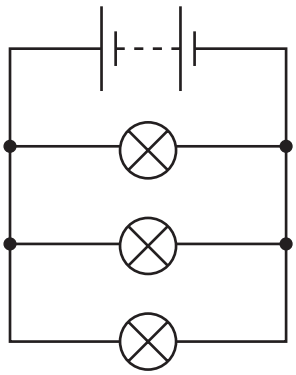
B



C



D

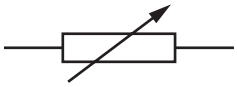


32 Which diagram shows the circuit symbol for a fuse?

A



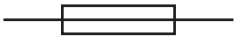
B



C



D



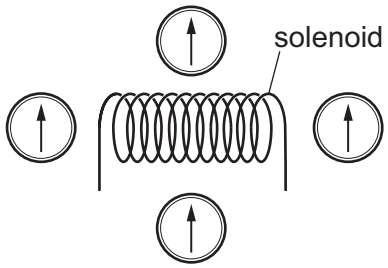
© UCLES 2022

33 If the insulation within a mains cable becomes damaged, two of the wires in it may touch and cause a short circuit.

Which row is correct?

	the danger when this happens	safety device which avoids this danger
A	a large current will overheat the wiring and lead to a fire	a fuse
B	a large current will overheat the wiring and lead to a fire	a relay
C	the appliance at the end of the cable will be damaged	a fuse
D	the appliance at the end of the cable will be damaged	a relay

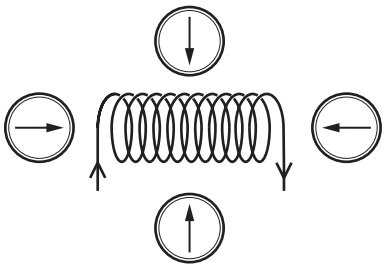
34 Four small compasses are placed around a solenoid.



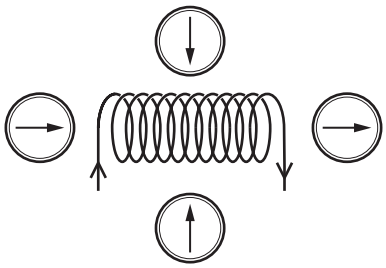
A current is now switched on in the solenoid.

Which diagram shows possible new directions of the compass needles?

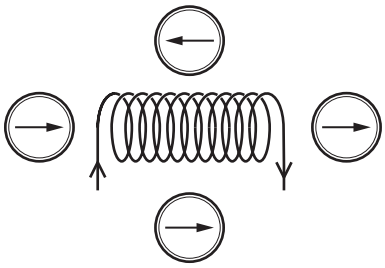
A



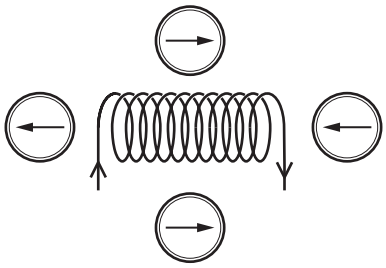
B



C



D



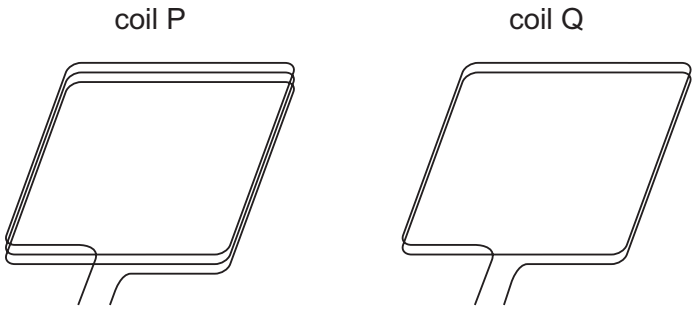
35 Transformers are used in the transmission of electrical power to houses.

Which type of transformer is used at the power station prior to connection to the power lines and which type is used prior to delivery to the houses?

	power station	before houses
A	step-down	step-down
B	step-down	step-up
C	step-up	step-down
D	step-up	step-up

© UCLES 2022

36 The diagrams show the coils of two simple direct current (d.c.) motors. Coil P has three turns of wire and coil Q has two turns. Coil P has the same dimensions as coil Q. The coils are in identical magnet fields.



What produces the greatest turning effect?

	coil	current / A
A	P	2
B	P	4
C	Q	2
D	Q	4

37 A nuclide of cobalt contains 27 protons and 32 neutrons.

Which symbol represents this nuclide?

A $^{27}_{59}\mathrm{Co}$ **B** $^{32}_{27}\mathrm{Co}$ **C** $^{32}_{59}\mathrm{Co}$ **D** $^{59}_{27}\mathrm{Co}$

38 Everyone is exposed to background radiation.

What are sources of background radiation?

A food and drink only

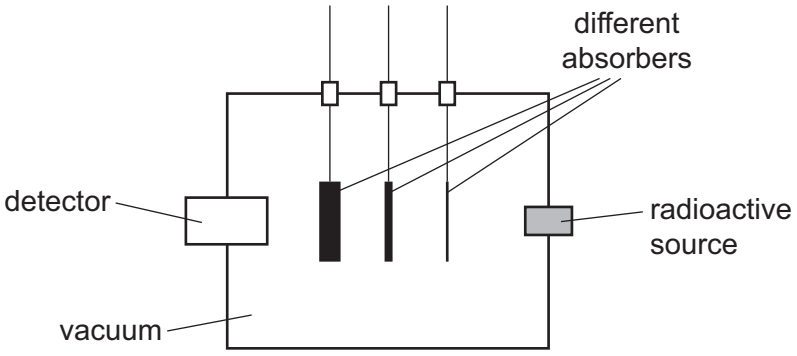
B rocks only

C cosmic rays only

D food and drink, rocks and cosmic rays

© UCLES 2022

39 The diagram shows a piece of apparatus used to determine the nature of the emissions from a radioactive source. The absorbers can be raised out of or lowered into the path of the radiation from the source to the detector. The apparatus is evacuated.



The table gives a set of results for a particular radioactive source.

absorber in use	count rate on detector (counts per second)
none	350
thin paper	350
1.0 mm aluminium	180
1.0 cm lead	23

Which types of radiation are being emitted by the radioactive source?

A α-particles and β-particles

B α-particles only

C β-particles and γ-rays

D β-particles only

40 The half-life of a sample of radioactive material is 400 years.

How long will it take until only $\frac{1}{4}$ of this sample remains undecayed?

A 100 years

B 400 years

C 800 years

D 1600 years

© UCLES 2022

BLANK PAGE

BLANK PAGE

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced online in the Cambridge Assessment International Education Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at www.cambridgeinternational.org after the live examination series.

Cambridge Assessment International Education is part of Cambridge Assessment. Cambridge Assessment is the brand name of the University of Cambridge Local Examinations Syndicate (UCLES), which is a department of the University of Cambridge.

© UCLES 2022