Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

PHYSICS **0625/12**

Paper 1 Multiple Choice (Core) **October/November 2016**

45 minutes

Additional Materials: Multiple Choice Answer Sheet
Soft clean eraser
Soft pencil (type B or HB recommended)

9107539250

READ THESE INSTRUCTIONS FIRST

Write in soft pencil.
Do not use staples, paper clips, glue or correction fluid.
Write your name, Centre number and candidate number on the Answer Sheet in the spaces provided unless this has been done for you.
DO **NOT** WRITE IN ANY BARCODES.

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 separate Answer Sheet.

Read the instructions on the Answer Sheet very carefully.

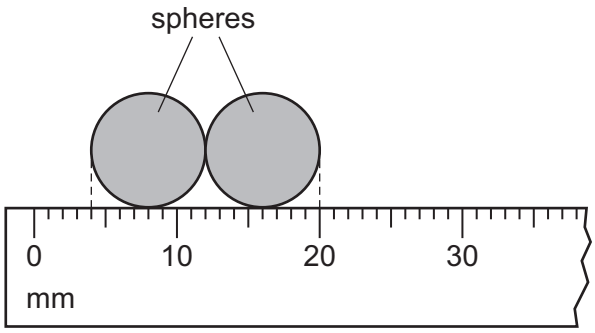
Each correct answer will score one mark. A mark will not be deducted for a wrong answer.
Any rough working should be done in this booklet.
Electronic calculators may be used.
Take the weight of 1.0 kg to be 10 N (acceleration of free fall = 10 m / s^2).

The syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **17** printed pages and **3** blank pages.

© UCLES 2016

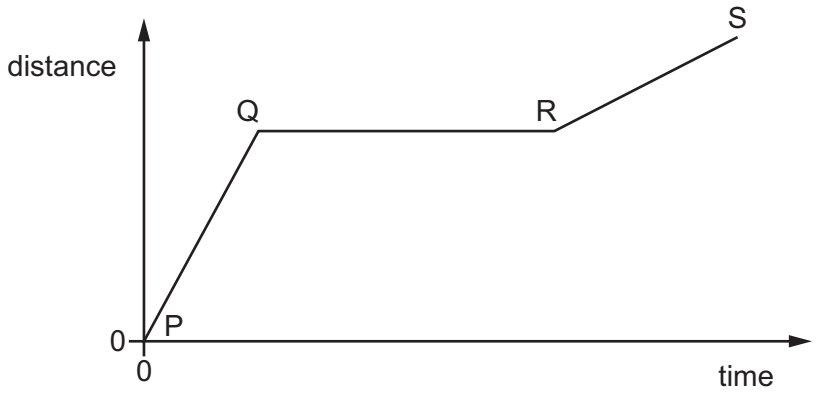
1 The diagram shows two identical spheres placed beside a ruler.



What is the radius of one sphere?

A 4.0 mm **B** 5.0 mm **C** 8.0 mm **D** 10 mm

2 The graph shows how the distance travelled by a vehicle changes with time.



Which row describes the speed of the vehicle in each section of the graph?

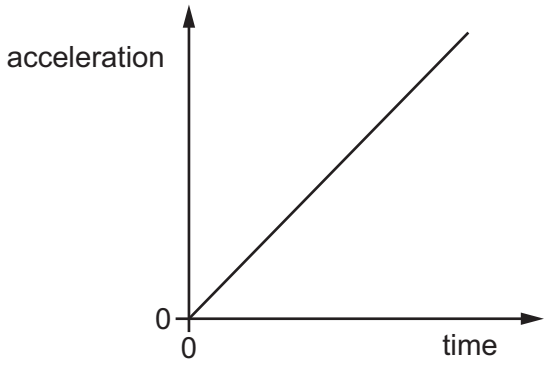
	P to Q	Q to R	R to S
A	constant	zero	constant
B	constant	zero	decreasing
C	increasing	constant	decreasing
D	increasing	zero	constant

© UCLES 2016

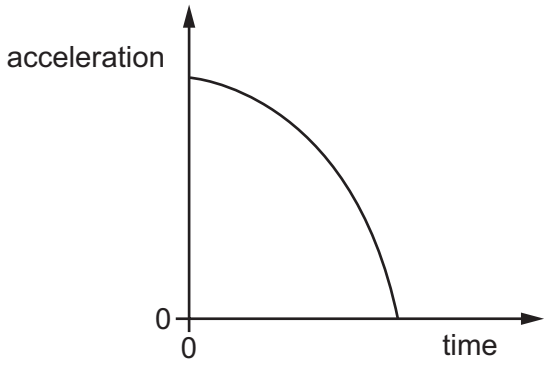
3 A stone falls freely from the top of a cliff. Air resistance may be ignored.

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

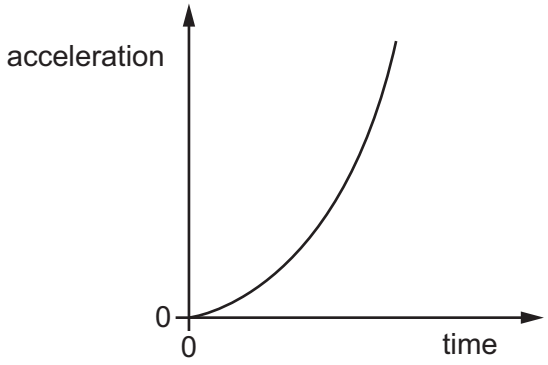
A



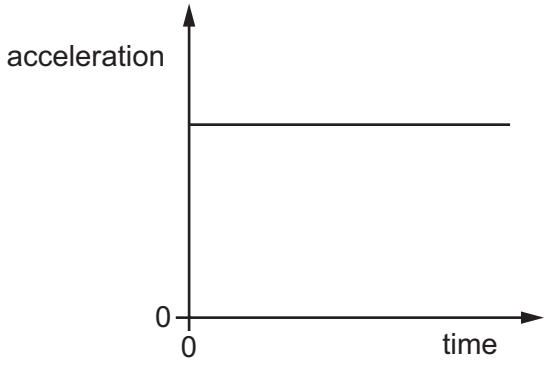
B



C



D



4 A student writes about mass and weight.

Which statement is correct?

A A ship which is floating has mass but no weight.

B Mass is a scientific word that means the same as weight.

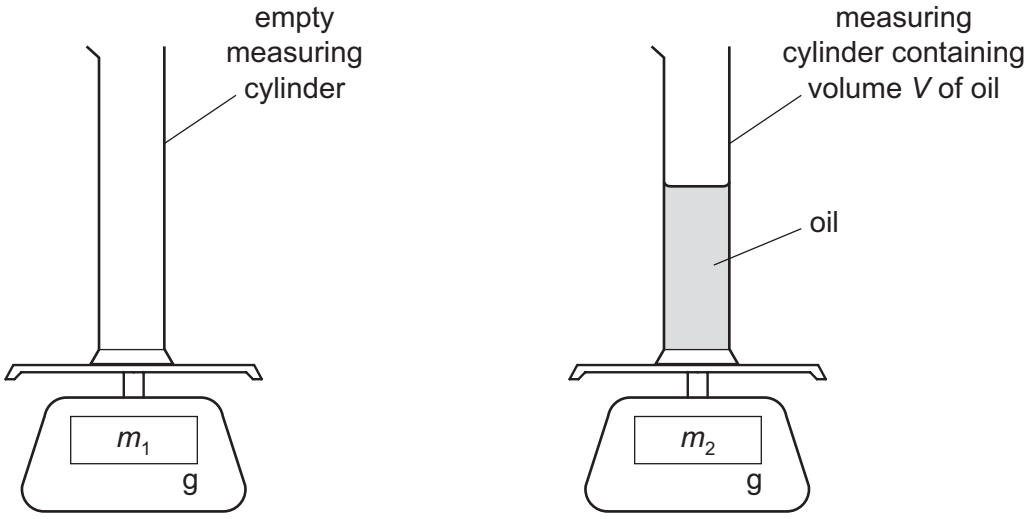
C Mass is measured in newtons.

D The mass of an astronaut is the same on the Moon as on the Earth.

© UCLES 2016

[Turn over

5 A student uses a measuring cylinder and a balance to find the density of oil. The diagram shows the arrangement used.



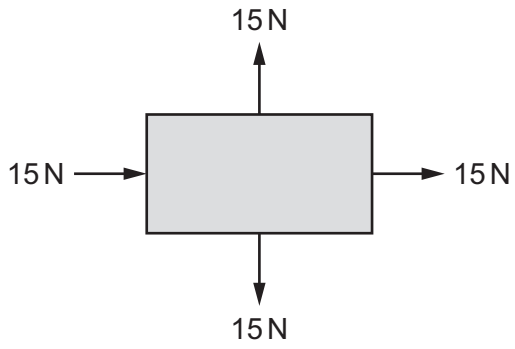
Which calculation gives the density of the oil?

A $\frac{V}{m_2}$ **B** $\frac{V}{(m_2 - m_1)}$ **C** $\frac{m_2}{V}$ **D** $\frac{(m_2 - m_1)}{V}$

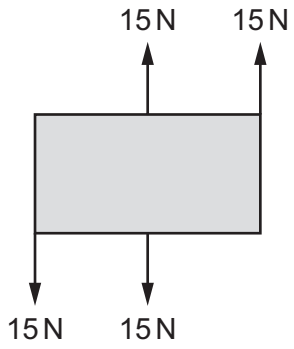
6 Each diagram shows all the forces acting on an object.

In which diagram is the object in equilibrium?

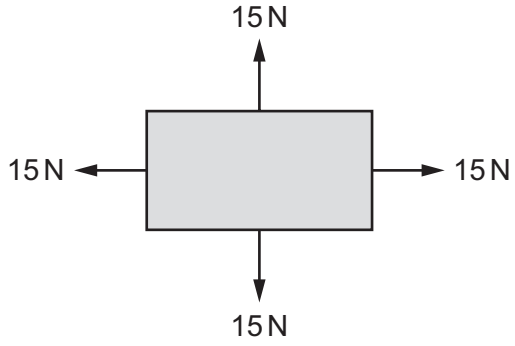
A



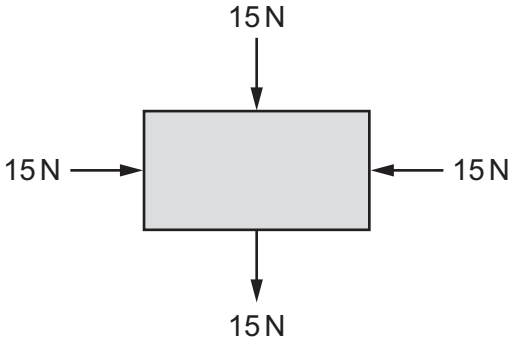
B



C

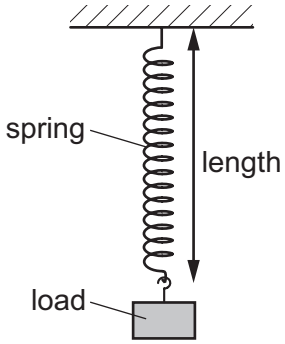


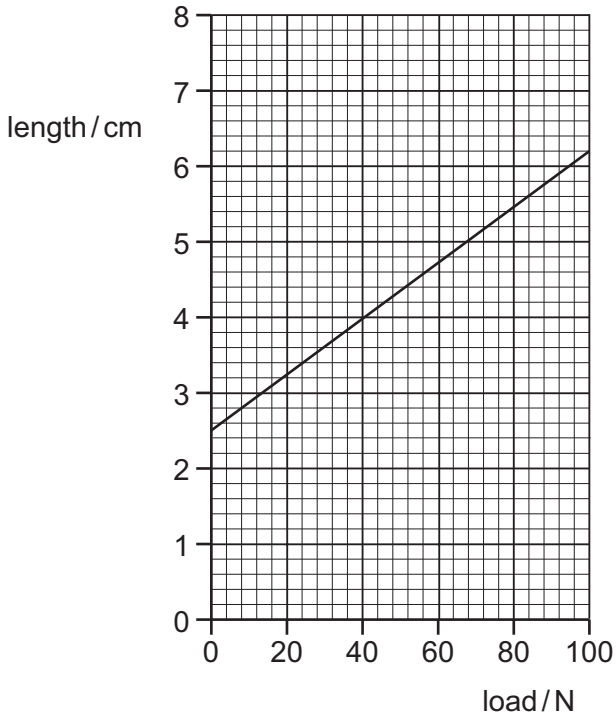
D



© UCLES 2016

7 The diagrams show a spring and a graph of the length of the spring against the load applied to it.



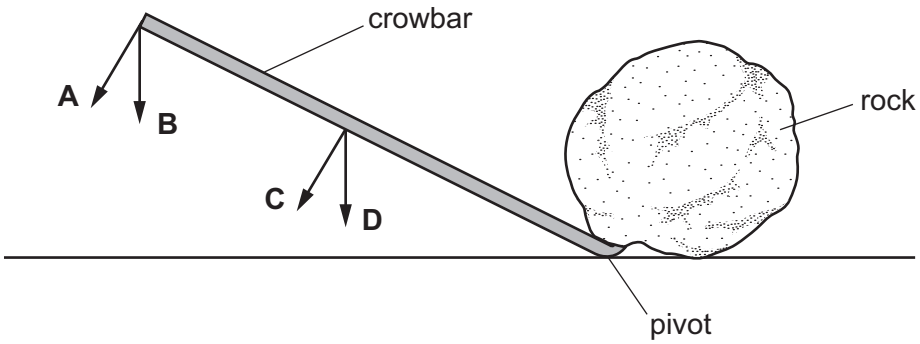


What is the extension of the spring when a load of 40 N is applied to it?

A 1.5 cm **B** 2.5 cm **C** 4.0 cm **D** 6.5 cm

8 A force is applied to a long crowbar so as to move a large rock.

Which labelled arrow represents the smallest force needed to move the rock?



9 What is the main energy change taking place in the battery of a mobile phone (cell phone) as it is being charged but not used?

A chemical energy increases

B elastic energy increases

C gravitational potential energy increases

D kinetic energy increases

10 Electricity can be generated using different energy resources.

Which energy resource is used to generate electricity without needing any moving parts?

A geothermal

B hydroelectric

C solar

D water waves

11 A child runs up a set of stairs four times. The time taken for each run is recorded.

Which time is measured when the child's useful power is greatest?

A 10 s **B** 20 s **C** 30 s **D** 40 s

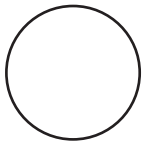
12 The diagrams show the actual sizes of the heels of four different shoes, as seen from underneath the shoe.

Which heel is **most** likely to cause damage to wooden floors?

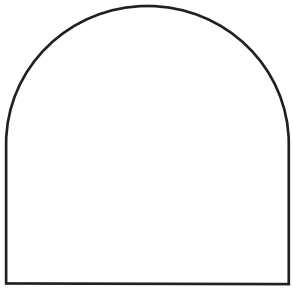
A

B

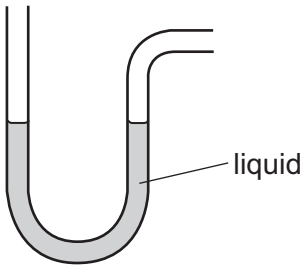
C



D



13 The diagram shows an instrument used to measure gas pressure.



What is the instrument called?

A ammeter

B barometer

C manometer

D thermometer

© UCLES 2016

14 Water can exist in three states: solid (ice), liquid and gas (steam).

In which state, or states, is the motion of the molecules **only** vibrational?

A ice only

B steam only

C liquid water only

D liquid water and ice only

15 Which statement about evaporation is correct?

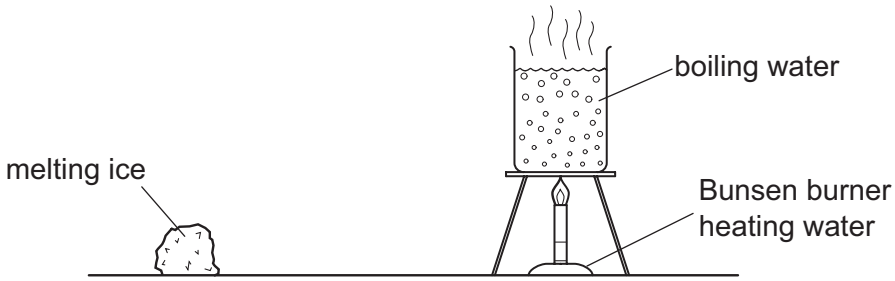
A Evaporation causes heating of the liquid.

B Evaporation only happens from liquids.

C Molecules escape from anywhere in the liquid.

D Only the least energetic molecules escape.

16 A piece of melting ice at 0 °C and a beaker of boiling water are both in a laboratory. The laboratory is at 20 °C.



What is happening to the temperature of the melting ice and what is happening to the temperature of the boiling water?

	temperature of melting ice	temperature of boiling water
A	constant	constant
B	constant	increasing
C	increasing	constant
D	increasing	increasing

17 A liquid-in-glass thermometer is to be calibrated in degrees Celsius.

Where should the bulb of the thermometer be placed to set a fixed point on the temperature scale?

A in a mixture of water and ice

B in a hot drink

C in a Bunsen burner flame

D in a refrigerator

18 Aluminium foil is attached to the walls of a warm room in a cold country. This reduces the rate of thermal energy loss from inside the warm room.

Which method or methods of thermal energy transfer are reduced by the foil?

A conduction and convection only

B conduction only

C convection and radiation only

D radiation only

19 On a very cold day, a boy puts one hand on the metal handlebars of his bicycle. He puts the other hand on the rubber hand grip.

The metal feels colder than the rubber hand grip, although they are both at the same temperature.

Why is this?

A The metal has a higher melting point than the rubber.

B The metal has a lower thermal capacity than the rubber.

C The metal is a better thermal conductor than the rubber.

D The metal radiates more infra-red radiation than the rubber.

20 The box contains a list of four types of wave.

γ-rays	sound	ultraviolet	X-rays

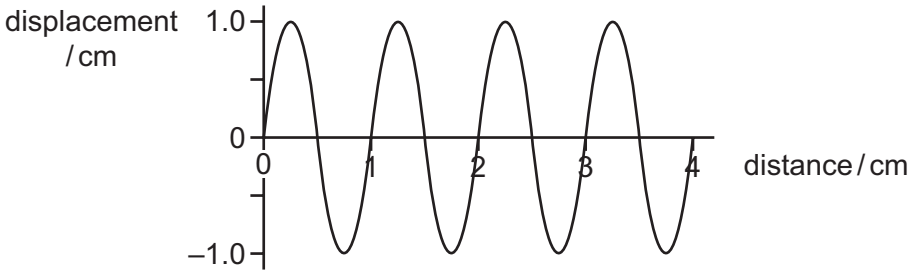
How many waves in the list are transverse waves?

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

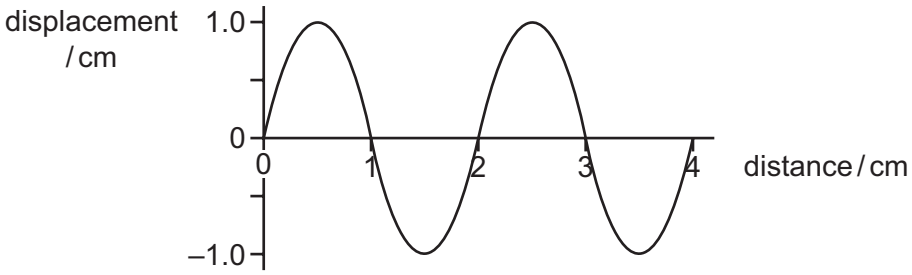
© UCLES 2016

21 Which wave has an amplitude equal to half its wavelength?

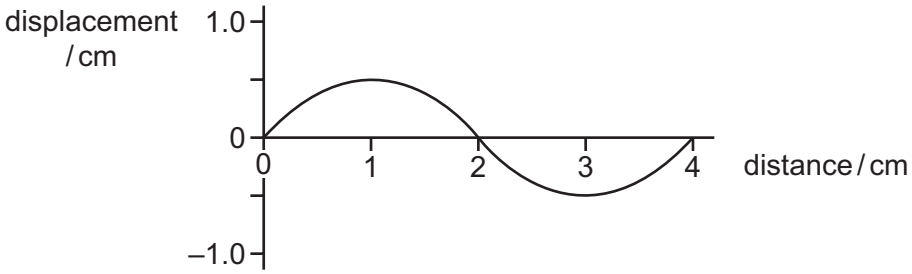
A



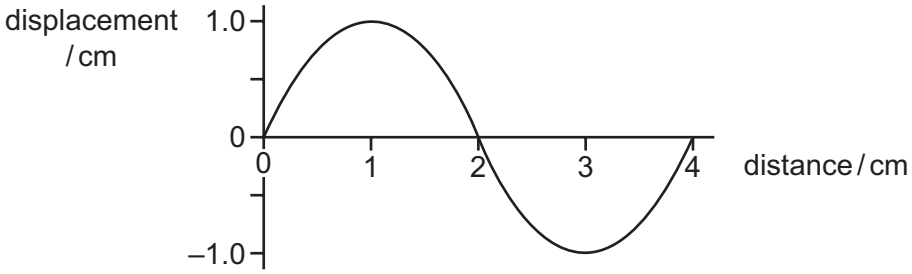
B



C

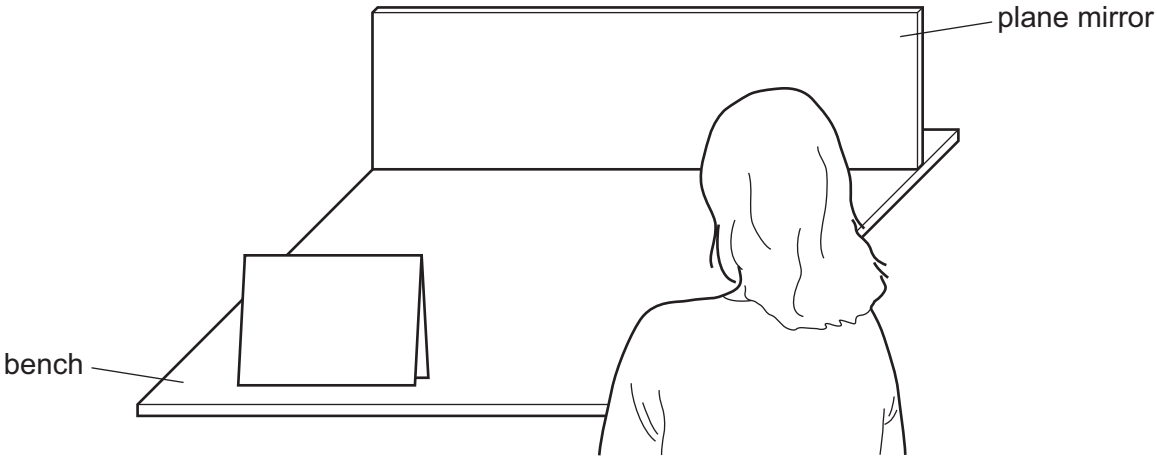


D



22 A card with the letter **R** is made by a student. The letter is drawn on **one side**, as shown.

A plane mirror is mounted vertically on a bench. The student places the card on the bench so that the letter is upright and **facing the mirror**.



How does the image formed by the mirror appear to the student?

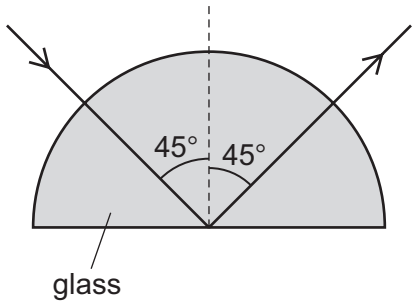
A **B** **C** **D**

23 A student draws four diagrams to represent light passing from air through a glass block and then back into the air.

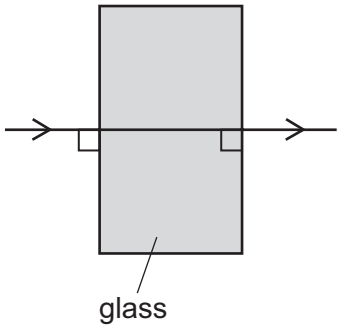
The critical angle for the glass is 42°.

In which diagram is the path of the light through the glass block **not** correct?

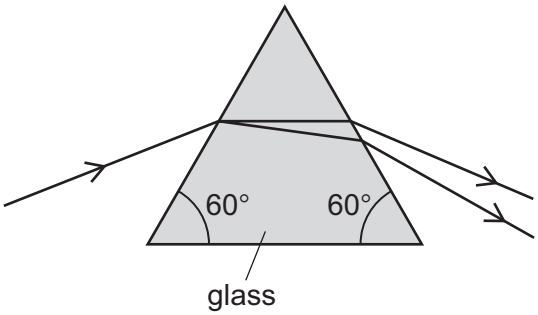
A



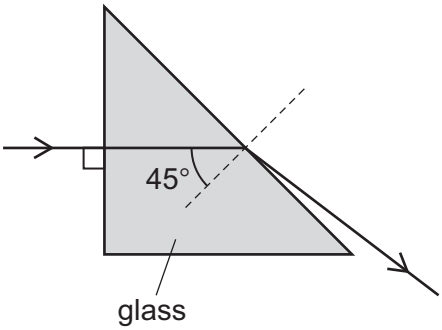
B



C



D



24 Which part of the electromagnetic spectrum is used to send television signals from a satellite to Earth?

A infra-red

B microwaves

C ultraviolet

D visible light

25 A girl notices that, when she shouts into a cave, she hears an echo.

Which wave property causes the echo?

A diffraction

B dispersion

C reflection

D refraction

26 Which property of a sound wave affects the loudness of the sound?

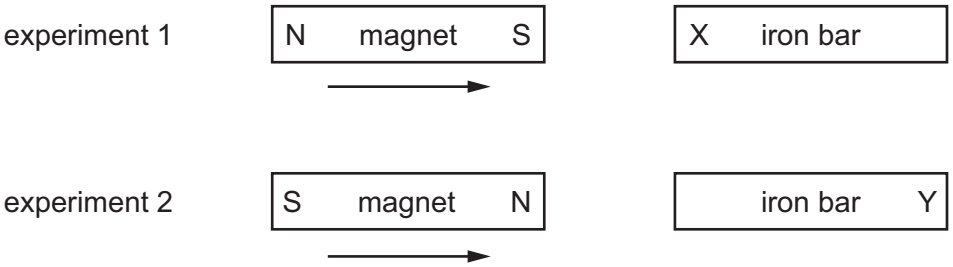
A amplitude

B frequency

C speed

D wavelength

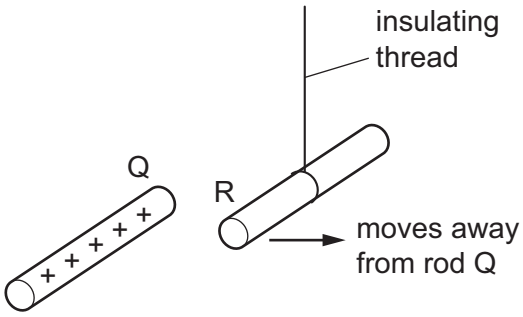
27 In two separate experiments, a magnet is brought near to an unmagnetised iron bar. This causes the bar to become magnetised.



Which magnetic pole is induced at X and at Y?

	pole induced at X	pole induced at Y
A	N	N
B	N	S
C	S	N
D	S	S

28 In the diagram, rod R hangs from an insulating thread.



When the positively charged rod Q is brought close to rod R, rod R moves away from rod Q.

Which conclusion can be made from this observation?

A Rod R is charged, but it is not possible to identify the sign of the charge.

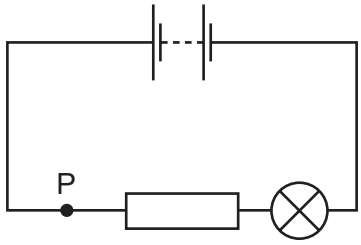
B Rod R must be positively charged.

C Rod R must be negatively charged.

D Rod R is uncharged.

© UCLES 2016

29 The diagram shows a lamp in a circuit.



Which change to the circuit would increase the current in the lamp?

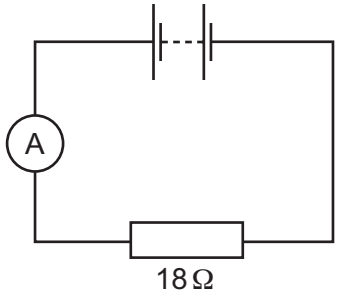
A adding another resistor in parallel with the one in the circuit

B adding another resistor in series with the one in the circuit

C decreasing the electromotive force (e.m.f.) of the battery in the circuit

D moving the lamp to point P in the circuit

30 An ammeter and an 18 Ω resistor are connected in series with a battery. The reading on the ammeter is 0.50 A.

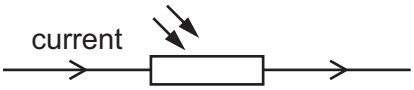


What is the electromotive force (e.m.f.) of the battery?

A 9.0 N **B** 9.0 V **C** 36 N **D** 36 V

31 A source of constant electromotive force (e.m.f.) is connected across a light-dependent resistor (LDR).

There is an electric current in the LDR.

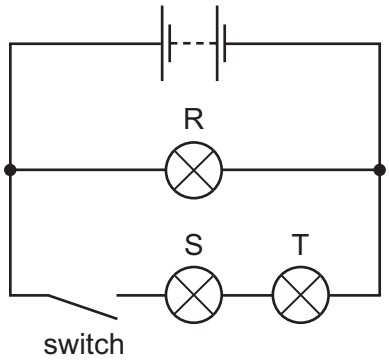


The brightness of the light falling on the LDR is reduced.

Which row shows what happens to the resistance of the LDR and what happens to the current?

	resistance	current
A	decreases	decreases
B	decreases	increases
C	increases	decreases
D	increases	increases

32 The diagram shows an electric circuit.



When the switch is open, which lamp or lamps are **not** lit?

A R only

B S only

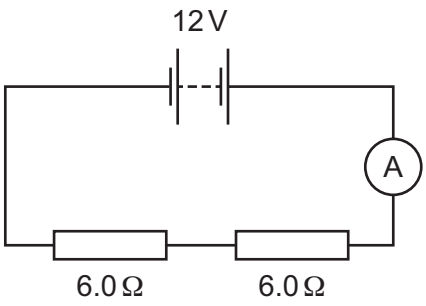
C R, S and T

D S and T only

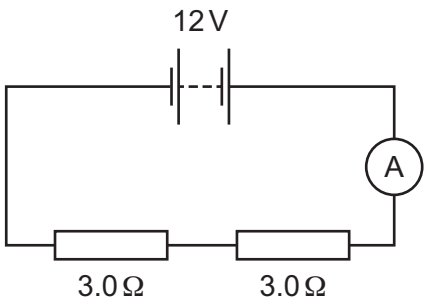
© UCLES 2016

33 In which circuit does the ammeter read 2.0 A?

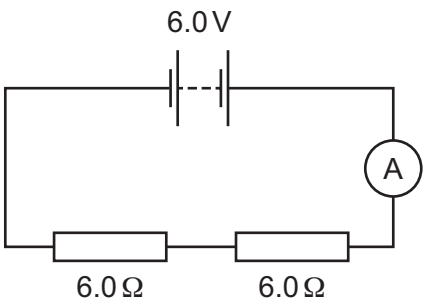
A



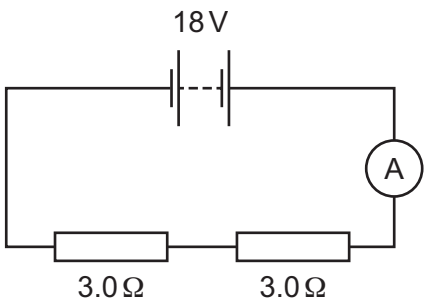
B



C



D



34 An electric kettle has a metal casing. The cable for the kettle contains a wire that is connected to the earth pin of the plug.

Which danger does this guard against?

A the cable to the kettle becoming too hot

B the casing of the kettle becoming live

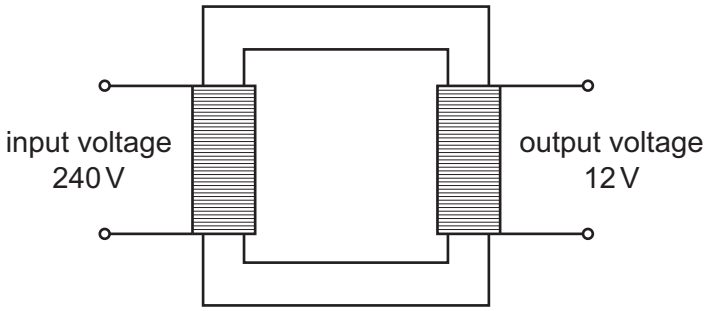
C the casing of the kettle becoming wet on the outside

D the casing of the kettle overheating

© UCLES 2016

[Turn over

35 A transformer has an input voltage of 240 V and an output voltage of 12 V.



What is a possible pair of values for the number of turns in the primary coil and the number of turns in the secondary coil?

	number of turns in primary coil	number of turns in secondary coil
A	12	4800
B	240	4800
C	4800	12
D	4800	240

36 An electric current can produce a heating effect and a magnetic effect.

Which row shows the effect that a relay uses and one application of a relay?

	effect used by a relay	one application of a relay
A	heating effect	allowing a small current to switch on a large current
B	heating effect	changing the voltage of an a.c. supply
C	magnetic effect	allowing a small current to switch on a large current
D	magnetic effect	changing the voltage of an a.c. supply

37 A nuclide of sodium can be represented by $^{23}_{11}Na$.

Which row gives the numbers of particles in a neutral sodium atom?

	number of electrons	number of protons	number of neutrons
A	11	11	12
B	12	11	23
C	12	12	11
D	23	23	11

© UCLES 2016

38 Which is the most effective precaution to reduce the risk when handling, storing or using a radioactive source that emits γ-rays?

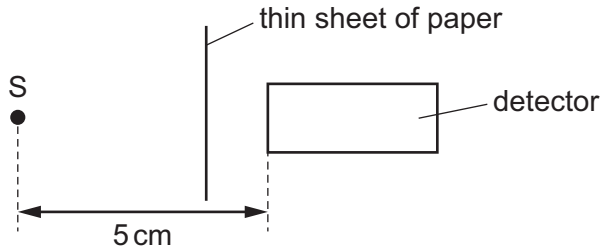
A Handle the source for the least possible time.

B Have a fire extinguisher nearby when using the source.

C Store the source at a low temperature.

D Wear plastic safety goggles when handling the source.

39 Radioactive source S emits α-particles, β-particles and γ-rays. A detector is placed 5 cm away from S. A thin sheet of paper is placed as shown in the diagram.



Which emissions from the source can be detected?

A α-particles and β-particles only

B α-particles and γ-rays only

C β-particles and γ-rays only

D α-particles, β-particles and γ-rays

40 A radioactive source has a half-life of 3.0 days. It emits radiation at a rate of 1200 particles per minute.

At what rate was it emitting radiation 6.0 days **earlier**?

A 300 particles per minute

B 2400 particles per minute

C 4800 particles per minute

D 7200 particles per minute

© UCLES 2016

BLANK PAGE

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 International Examinations Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at www.cie.org.uk after the live examination series.

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