Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

PHYSICS **0625/13**

Paper 1 Multiple Choice (Core) **October/November 2018**

45 minutes

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

* 6 0 6 9 7 5 8 6 4 9 *

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 **16** printed pages.

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1 A pendulum is set in motion and timed. The time measured for 20 complete swings is 30 s.

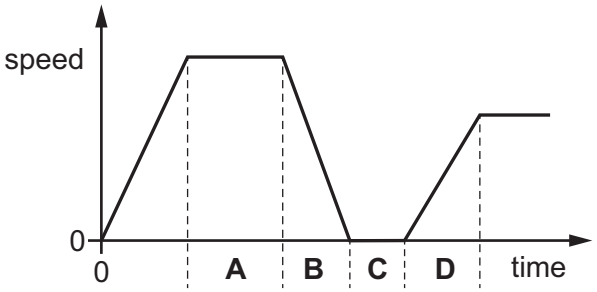
What is the time for one complete swing of the pendulum?

A 0.67 s **B** 0.75 s **C** 1.5 s **D** 3.0 s

2 A girl goes for a ride on her bicycle.

The diagram shows how her speed changes with time for part of her journey.

In which labelled section is she moving with constant speed?



3 A boy runs 400 m at an average speed of 4.0 m / s.

He runs the first 200 m in 40 s.

How long does he take to run the second 200 m?

A 60 s **B** 66.7 s **C** 80 s **D** 140 s

4 Which quantity is measured in newtons?

A energy

B mass

C weight

D work

5 The acceleration of free fall on Mars is 3.7 m / s^2.

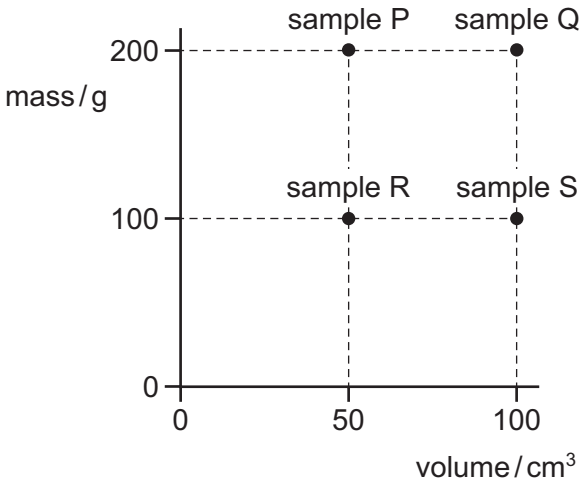
What is the weight of a 100 g mass on Mars?

A 0.037 N **B** 0.37 N **C** 37 N **D** 370 N

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6 A student carries out experiments to find the mass and the volume of four samples of rock.

The graph shows the results.

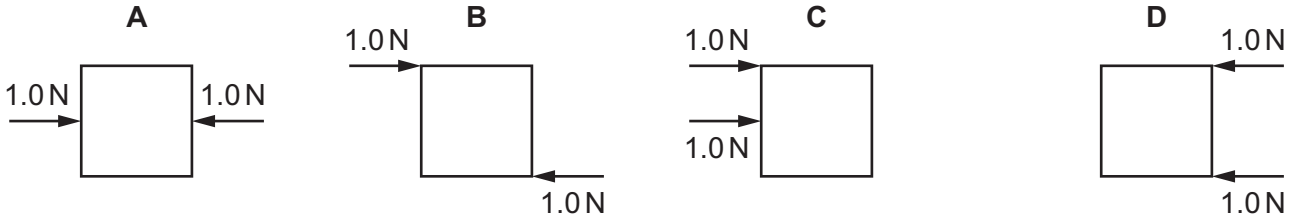


Which pair are samples of the same type of rock?

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

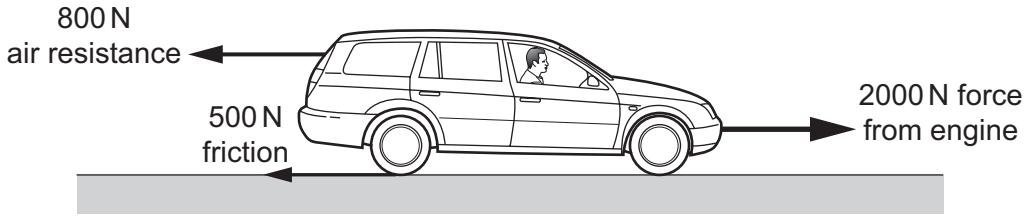
7 Four objects each have two forces acting on them.

Which object is in equilibrium?



8 A car moves along a level road.

The diagram shows all of the horizontal forces acting on the car.



Which statement is correct?

A The car is slowing down.

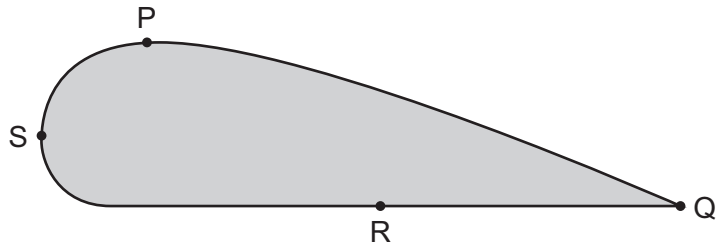
B The car is speeding up.

C The car is moving at a constant speed.

D The car is moving backwards.

9 The diagram shows an aluminium sheet of constant thickness.

Four significant points on the aluminium sheet are labelled P, Q, R and S.



How can the centre of mass be found?

A by finding where a line from P to R crosses a line from S to Q

B by suspending the sheet and a plumb-line from Q and finding where the plumb-line crosses a line from P to R

C by suspending the sheet and a plumb-line from P and then from S and finding where the plumb-lines cross

D by suspending the sheet and a plumb-line from P and finding where the plumb-line crosses a line from S to Q

10 Which device is designed to convert chemical energy into kinetic energy?

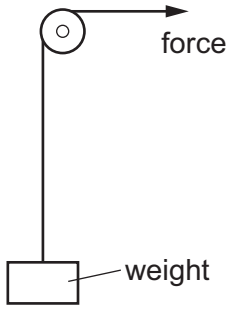
A an a.c. generator

B a battery-powered torch

C a car engine

D a wind-up mechanical clock

11 A weight hangs from a rope.



In which case does the force do the most work on the weight?

A The force raises the weight 1.0 m in 15 s.

B The force raises the weight 2.0 m in 45 s.

C The weight is held at the same level for 10 s.

D The weight is held at the same level for 60 s.

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12 Diagram 1 shows a conical flask containing water.

Diagram 2 shows a beaker with the same base area as the flask and containing water of the same depth *d*.

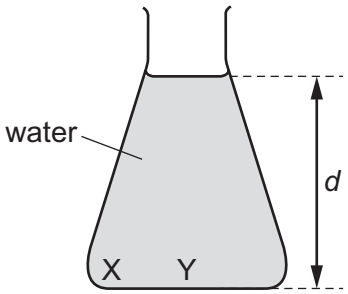


diagram 1

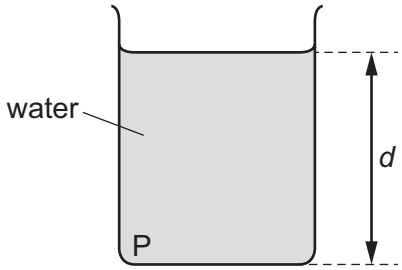


diagram 2

Which statement is correct?

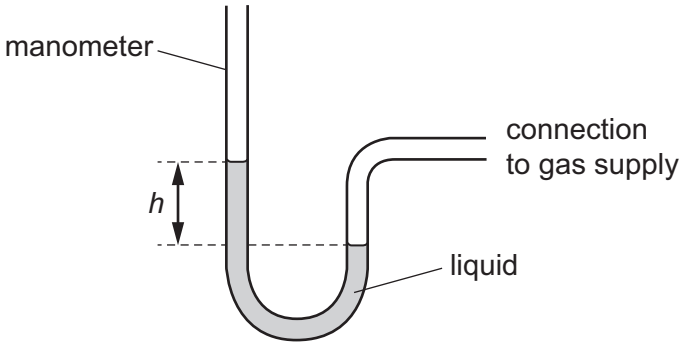
A The pressure at P is equal to the pressure at X.

B The pressure at P is greater than the pressure at Y.

C The pressure at P is greater than the pressure at X.

D The pressure at Y is greater than the pressure at X.

13 A manometer is used to measure the pressure of a gas supply.



Which change gives a greater value of height *h*?

A using a less dense liquid

B using a more dense liquid

C using a narrower tube

D using a wider tube

14 Liquid in a dish evaporates. This causes the temperature of the remaining liquid to change.

Which row is correct?

	change in temperature	reason for temperature change
A	increase	the most energetic molecules remain in the liquid
B	increase	the most energetic molecules escape from the liquid
C	decrease	the most energetic molecules remain in the liquid
D	decrease	the most energetic molecules escape from the liquid

15 Diagram 1 shows apparatus being used to observe smoke particles.

Diagram 2 shows how a smoke particle moves randomly.

diagram 1

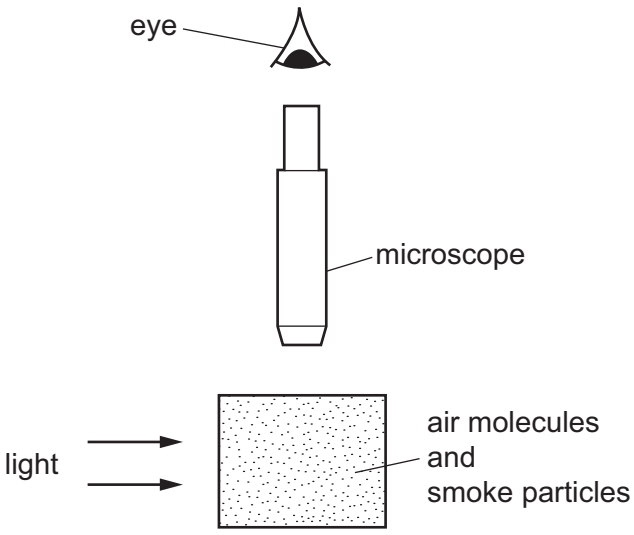
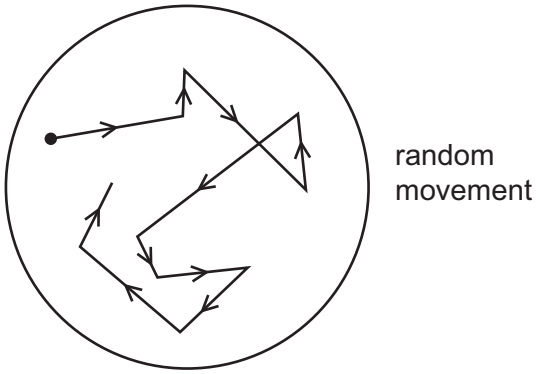


diagram 2



Why do the smoke particles move randomly?

A They are hit by air molecules.

B They are less dense than air.

C They are moved by convection currents.

D They gain energy from the light.

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16 Which row shows the relative order of thermal expansion of solids, liquids and gases?

	most expansion → least expansion		
A	solids	liquids	gases
B	solids	gases	liquids
C	gases	solids	liquids
D	gases	liquids	solids

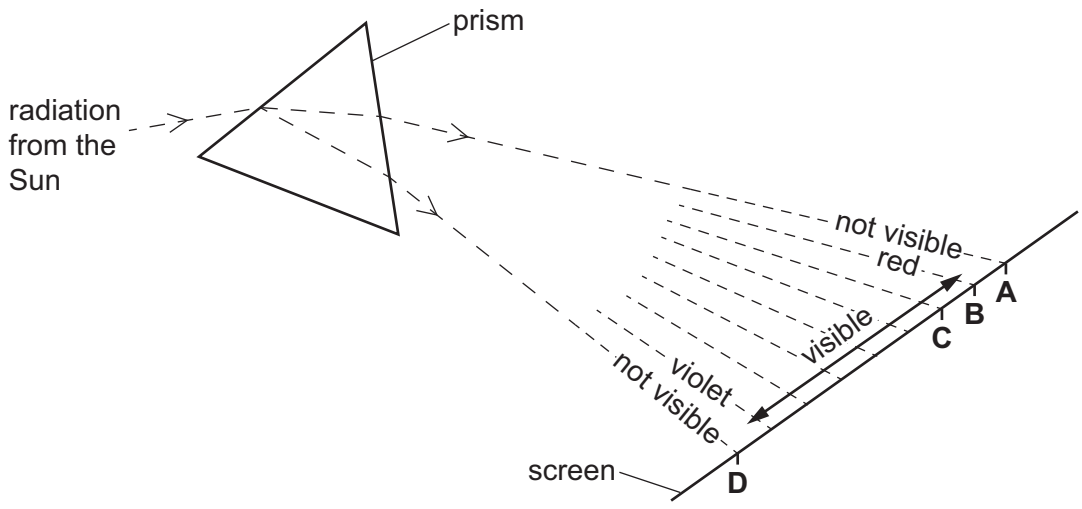
17 Steam at 100 °C condenses to form water at 100 °C.

What happens to the average separation and what happens to the average speed of the water molecules?

	separation	average speed
A	decreases	decreases
B	decreases	remains the same
C	increases	decreases
D	increases	remains the same

18 Some of the Sun's radiation passes through a prism. The diagram shows the spectrum of the radiation.

Which point on the screen does the infra-red radiation reach?



19 One end of a shiny metal rod is heated and the other end quickly gets hot.

Which statement describes why the other end quickly gets hot?

A Metals are good thermal conductors.

B Metals are poor thermal conductors.

C Shiny surfaces are good emitters of infra-red radiation.

D Shiny surfaces are poor emitters of infra-red radiation.

20 Which statement about waves is correct?

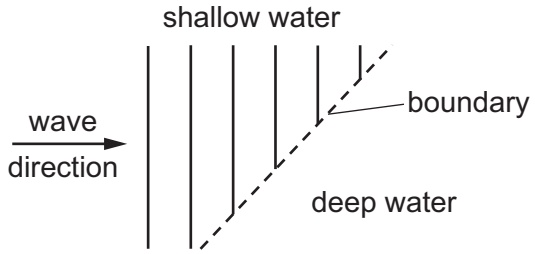
A Waves do not transfer either energy or matter.

B Waves transfer both energy and matter.

C Waves transfer energy without transferring matter.

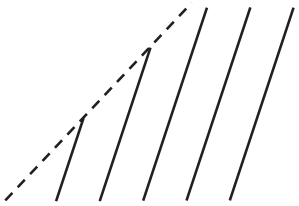
D Waves transfer matter without transferring energy.

21 Plane water waves travel from a shallow region into a deeper region. They travel more quickly in the deeper water.

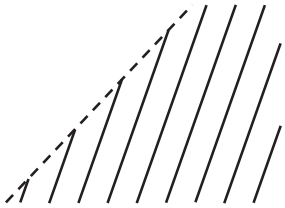


Which diagram shows the wave pattern in the deeper water?

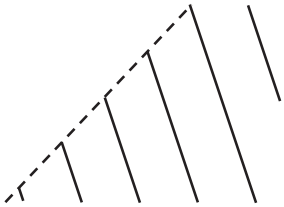
A



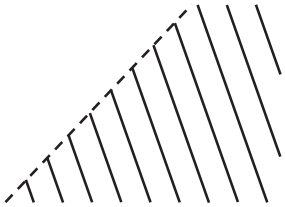
B



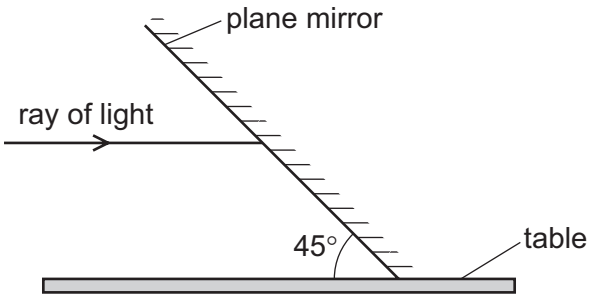
C



D



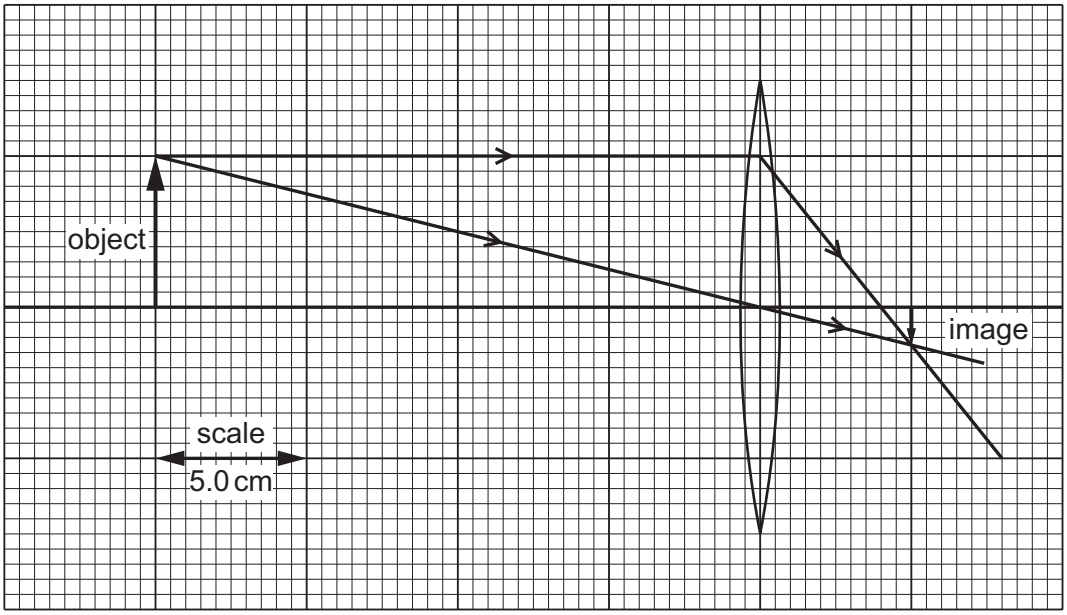
22 A plane mirror is fixed so that it is at an angle of 45° to a table. A ray of light, initially parallel to the table, is incident on the mirror.



Which angle does the reflected ray make with the table?

A 0° **B** 22.5° **C** 45° **D** 90°

23 An object is placed 20 cm in front of a thin converging lens. The scale drawing shows how the lens forms a real, inverted image.



Which row gives the focal length of the lens and the distance of the image from the lens?

	focal length of lens / cm	distance of image from lens / cm
A	4.0	5.0
B	5.0	4.0
C	8.0	10.0
D	10.0	8.0

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24 Different parts of the electromagnetic spectrum are used for different purposes. Below are four statements about parts of the spectrum.

statement 1: Infra-red waves are used in television remote controllers.

statement 2: Radio waves are used to transmit television pictures from satellites to Earth.

statement 3: Ultraviolet waves are used for intruder alarms.

statement 4: X-rays are used for security checks.

Which statements are correct?

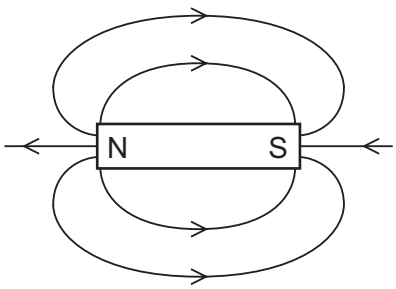
A 1 and 2 **B** 1 and 4 **C** 2 and 3 **D** 3 and 4

25 Which row gives the nature of sound waves and the name of the effect that causes an echo of a sound?

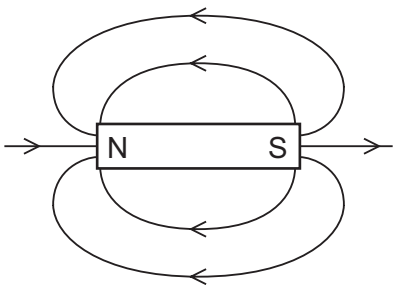
	nature of sound waves	effect causing an echo
A	longitudinal	reflection
B	longitudinal	refraction
C	transverse	reflection
D	transverse	refraction

26 Which diagram shows the pattern and the direction of the magnetic field lines around a bar magnet?

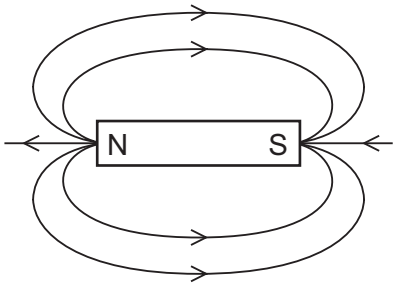
A



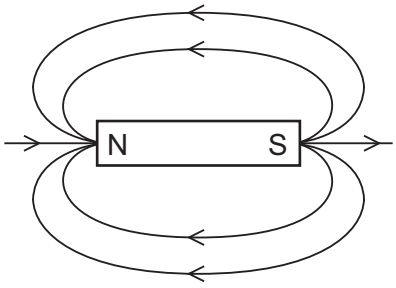
B



C

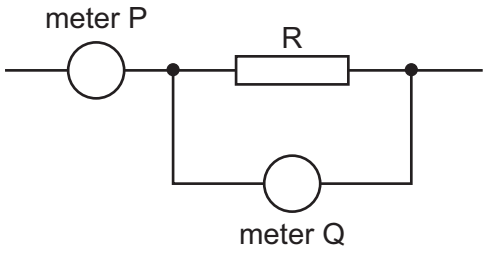


D



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27 The diagram shows part of a circuit which contains an ammeter, a voltmeter and a resistor R. The ammeter and the voltmeter are in the correct positions to determine the resistance of R.



Which expression gives the value of R?

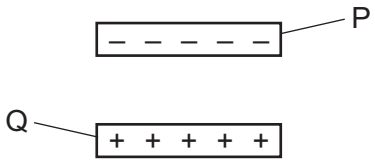
A reading of meter P ÷ reading of meter Q

B (reading of meter P)^2 × reading of meter Q

C reading of meter Q × reading of meter P

D reading of meter Q ÷ reading of meter P

28 A negatively charged plastic rod P is placed above a positively charged plastic rod Q.



What are the directions of the electrostatic forces on rod P and on rod Q?

	electrostatic force on rod P	electrostatic force on rod Q
A	downwards	downwards
B	downwards	upwards
C	upwards	downwards
D	upwards	upwards

29 Which row shows the meaning of the quantity e.m.f. and the unit in which it is measured?

	meaning	unit
A	electromagnetic force	N
B	electromagnetic force	V
C	electromotive force	N
D	electromotive force	V

30 Diagram 1 shows a voltmeter that is not connected to anything. It shows a small reading, called a zero error, because it is not correctly adjusted.

Diagram 2 shows the same meter used to measure the p.d. across a resistor in a circuit.

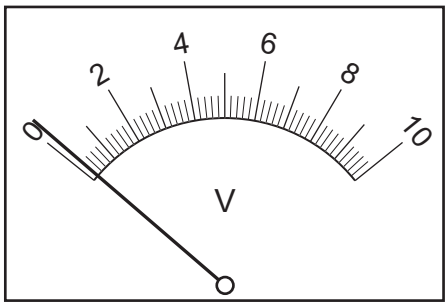


diagram 1

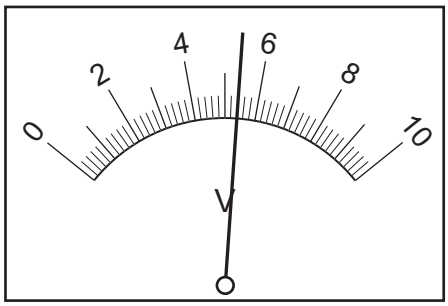
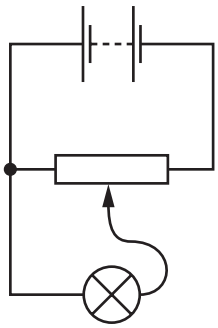


diagram 2

What is the p.d. across the resistor?

A 4.6 V **B** 4.7 V **C** 5.2 V **D** 5.4 V

31 The diagram shows a potential divider used to control the brightness of a lamp.



What happens as the slider on the potential divider is moved to the right?

A The potential difference across the lamp decreases and the lamp gets brighter.

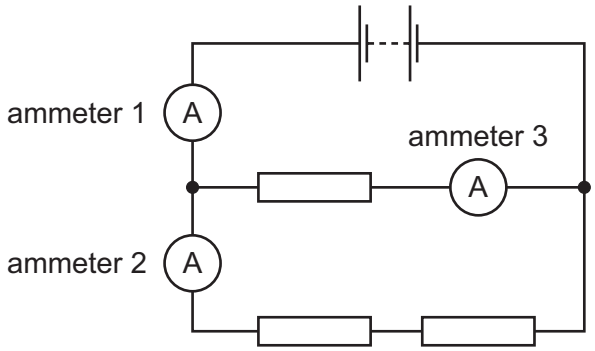
B The potential difference across the lamp decreases and the lamp gets dimmer.

C The potential difference across the lamp increases and the lamp gets brighter.

D The potential difference across the lamp increases and the lamp gets dimmer.

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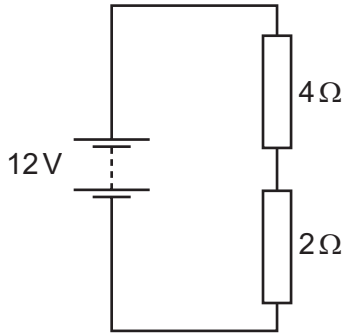
32 The diagram shows three identical resistors connected to a battery.



Which row gives the possible readings on the three ammeters?

	ammeter 1 / A	ammeter 2 / A	ammeter 3 / A
A	1.5	3.0	4.5
B	3.0	1.5	4.5
C	3.0	4.5	1.5
D	4.5	1.5	3.0

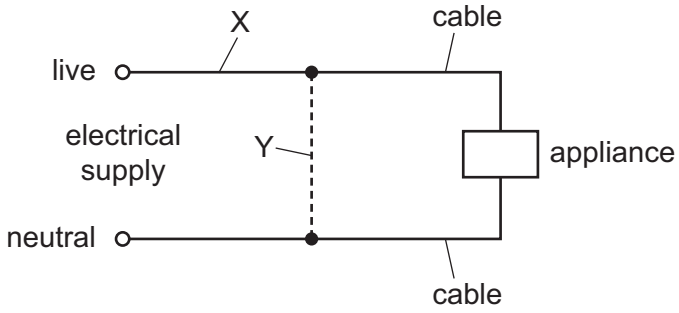
33 A 4 Ω resistor and a 2 Ω resistor are connected to a 12 V battery in a circuit.



What is the current in the 2 Ω resistor?

A 0.5 A **B** 2.0 A **C** 3.0 A **D** 6.0 A

34 Either a fuse or a circuit-breaker can be used to protect electrical cables from large currents that could cause overheating.



When a fuse is used, where should it be connected, and when a circuit-breaker is used, where should it be connected?

	position of fuse	position of circuit-breaker
A	X	X
B	X	Y
C	Y	X
D	Y	Y

35 There is an electric current in a wire. The wire is placed in a magnetic field. A force acts on the wire due to the current.

Which statement is correct?

A The magnetic field must be produced by a permanent magnet and not by an electromagnet.

B The wire must be made from a magnetic material.

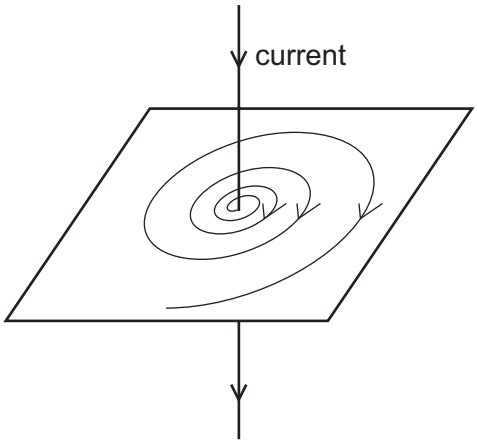
C When both the current and the magnetic field are reversed, the direction of the force is unchanged.

D When the current is reversed, but not the magnetic field, there will be no force on the wire.

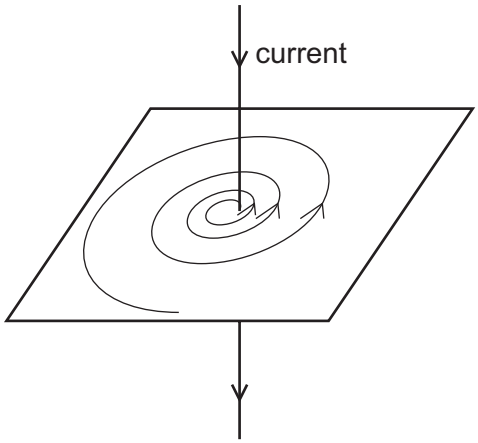
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36 Which diagram shows the pattern and direction of the magnetic field due to a current in a straight wire?

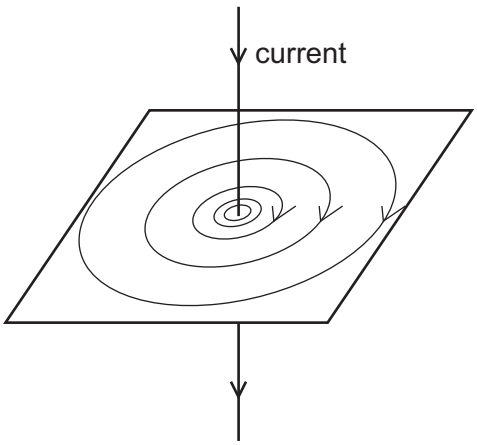
A



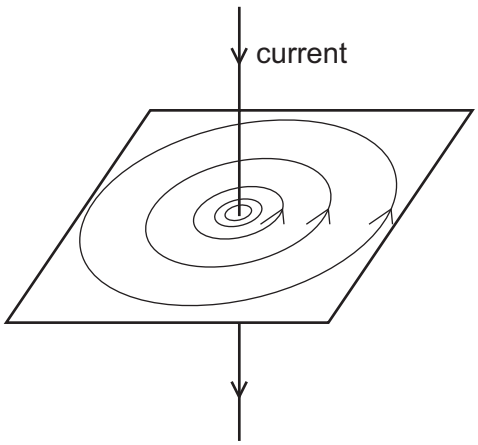
B



C

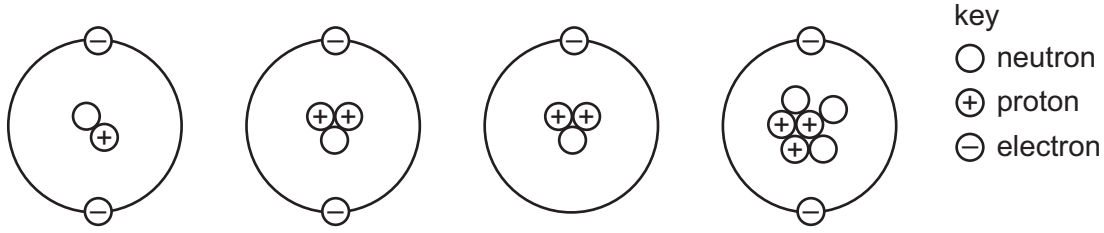


D



37 Which diagram represents the structure of a neutral atom?

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



38 What is a carbon nucleus, $^{12}_{6}C$, composed of?

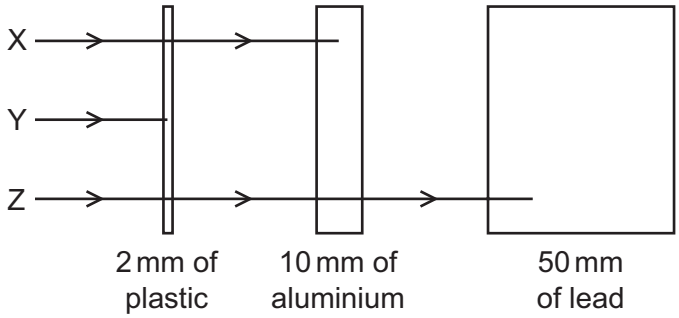
A 6 neutrons and 6 electrons

B 6 neutrons, 6 protons and 6 electrons

C 6 protons and 6 electrons

D 6 protons and 6 neutrons

39 The diagram shows the paths of three different types of radiation X, Y and Z.



Which row correctly identifies X, Y and Z?

	X	Y	Z
A	α-particles	β-particles	γ-rays
B	β-particles	α-particles	γ-rays
C	β-particles	γ-rays	α-particles
D	γ-rays	α-particles	β-particles

40 The count rate due to a sample of a radioactive isotope is measured for 80 minutes.

time / minutes	count rate / counts / second
0	480
20	380
40	300
60	240
80	190

What is the half-life of the isotope?

A 20 minutes **B** 40 minutes **C** 60 minutes **D** 80 minutes

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