Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

PHYSICS **0625/12**

Paper 1 Multiple Choice (Core) **May/June 2018**

45 minutes

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

0690604720

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.

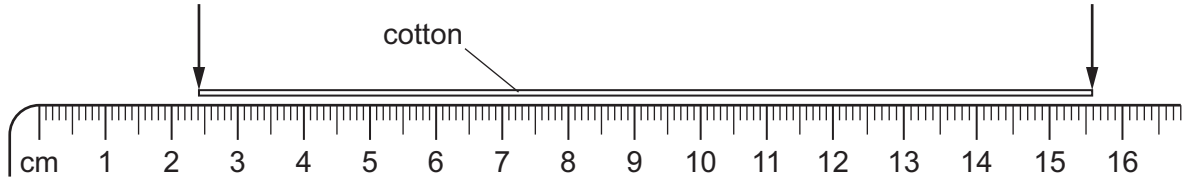
Each correct answer will score one mark. A mark will not be deducted for a wrong answer.
Any rough working should be done in this booklet.
Electronic calculators may be used.
Take the weight of 1.0 kg to be 10 N (acceleration of free fall = 10 m / s^2).

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

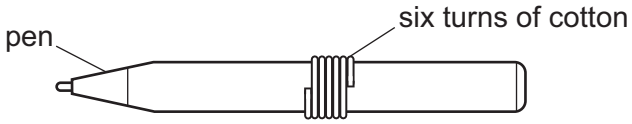
This document consists of **16** printed pages.

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1 A length of cotton is measured between two points on a ruler.



When the length of cotton is wound closely around a pen, it goes round six times.



What is the distance once round the pen?

A 2.2 cm **B** 2.6 cm **C** 13.2 cm **D** 15.6 cm

2 A ball is dropped in an evacuated tube. A series of photographs is taken at equal time intervals from the time of release. Another ball of the same size but twice the mass is also dropped in the same evacuated tube and photographed.

Which diagram shows the motion of the heavier ball?



3 A car takes 15 minutes to travel along a road that is 20 km long.

What is the average speed of the car?

A 0.75 km / h **B** 5.0 km / h **C** 80 km / h **D** 300 km / h

4 Which statement about the mass and the weight of an object is correct?

A They are both affected by changes in the acceleration of free fall.

B They are both forces.

C They have different units.

D Weight is calculated by dividing mass by the acceleration of free fall.

5 Two objects P and Q are placed in a beaker containing a liquid.

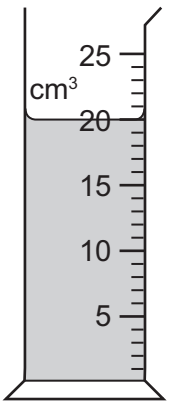
Object P floats in the liquid and object Q sinks.

Which row for the densities of object P, object Q and the liquid is possible?

	density of object P / g / cm^3	density of object Q / g / cm^3	density of liquid / g / cm^3
A	1.2	0.6	0.8
B	1.2	1.4	1.0
C	11.3	8.9	13.6
D	11.3	19.3	13.6

6 The diagram shows some liquid in a measuring cylinder.

The mass of the liquid is 16 g.



What is the density of the liquid?

A 0.80 g / cm^3 **B** 1.25 g / cm^3 **C** 36 g / cm^3 **D** 320 g / cm^3

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7 A spacecraft is travelling in space with no resultant force and no resultant moment acting on it.

Which statement about the spacecraft is correct?

A Its direction is changing.

B It is in equilibrium.

C Its speed is decreasing.

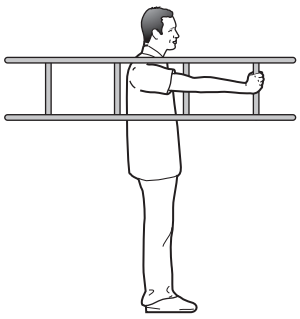
D Its speed is increasing.

8 A man holds a short ladder in four different positions.

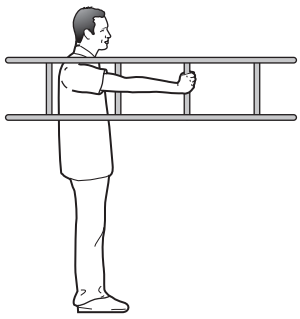
The weight of the ladder causes a moment about the man's shoulder.

In which position is the moment greatest?

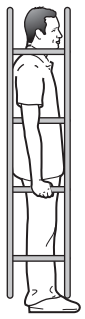
A



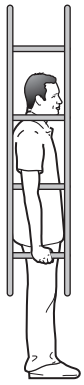
B



C

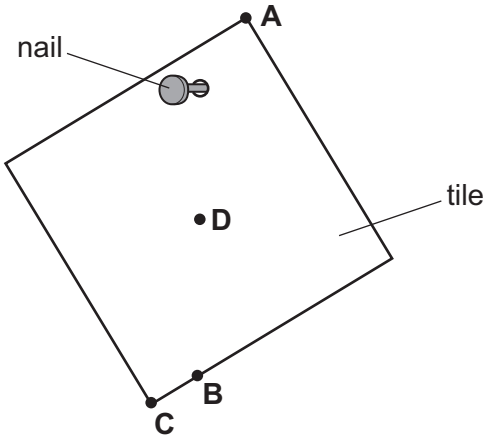


D



9 A hole is drilled in a square tile. The diagram shows the tile hanging freely on a nail.

Where is the centre of mass of the tile?



10 Which source of energy is renewable?

A coal

B natural gas

C oil

D wind

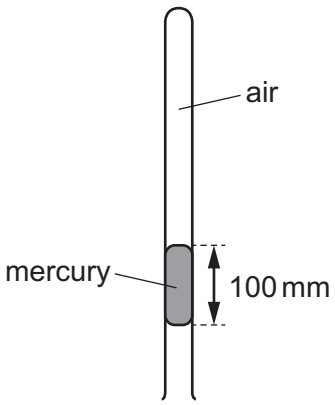
11 A student does work by pulling a box across a horizontal floor.

She now pulls a second box along the same floor.

Which row indicates that the student is now doing twice as much work?

	force used to pull box	distance the box is pulled
A	is doubled	is doubled
B	is doubled	is halved
C	stays the same	is doubled
D	stays the same	is halved

12 Air is trapped in a closed tube by a thread of mercury. The mercury thread is 100 mm long. The tube is held as shown.



Atmospheric pressure is 770 mm Hg.

What is the pressure of the trapped air?

A 100 mm Hg **B** 670 mm Hg **C** 770 mm Hg **D** 870 mm Hg

13 Brownian motion is the random motion of particles due to molecular bombardment.

In which states of matter is Brownian motion observed?

A gases, liquids and solids

B gases and liquids only

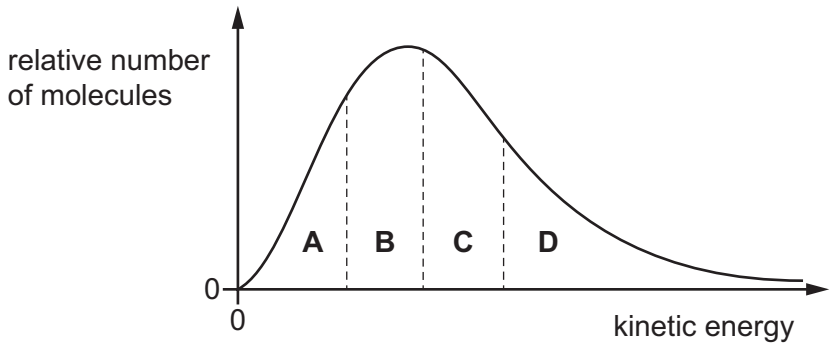
C gases and solids only

D liquids and solids only

14 The diagram shows the relative number of molecules in a liquid that have a given kinetic energy.

The graph is divided into sections so that each section contains the same number of molecules.

From which section does the greatest number of molecules escape from the liquid per unit time?



15 An electric kettle heats some water. The same kettle then heats a different liquid. The temperature of the liquid rises more rapidly than the temperature of the water.

What is a possible explanation of this difference?

A The liquid condenses on the cooler parts of the kettle less than the water does.

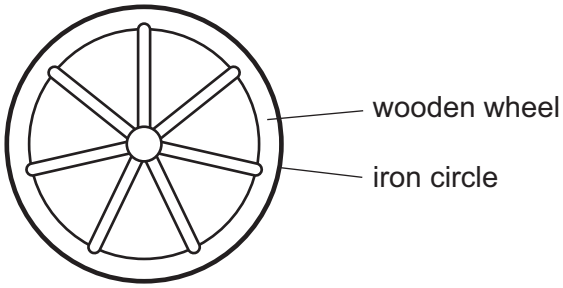
B The liquid expands more than the water as it heats up.

C The liquid has a lower boiling point than the water.

D The liquid has a smaller thermal capacity than the water.

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16 A wooden wheel can be strengthened by putting a tight circle of iron around it.



Which action would make it easier to fit the circle over the wood?

A cooling the iron circle

B heating the iron circle

C heating the wooden wheel and cooling the iron circle

D heating the wooden wheel but not heating or cooling the iron circle

17 A student wishes to calibrate a mercury-in-glass thermometer with a °C scale.

Which values should she use for the lower fixed point and for the upper fixed point?

	lower fixed point	upper fixed point
A	melting point of ice	boiling point of mercury
B	melting point of ice	boiling point of water
C	melting point of mercury	boiling point of mercury
D	melting point of mercury	boiling point of water

18 Four thermometers, with their bulbs painted different colours, are placed at equal distances from a radiant heater.

Which thermometer shows the slowest temperature rise when the heater is first switched on?

A matt black

B matt white

C shiny black

D shiny white

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19 A tank contains water. Ripples are produced on the surface of the water.

What causes the ripples to refract?

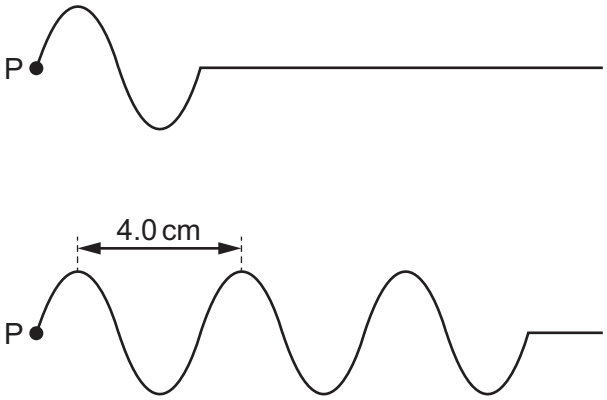
A The cold water in the tank is replaced by warm water.

B The ripples change speed as they move from deep to shallow water.

C The ripples hit the wall of the tank.

D The ripples pass through a narrow gap.

20 The diagrams show a wave on the surface of the water in a tank at times 1.0 s apart. The wave is produced at P and travels to the right.



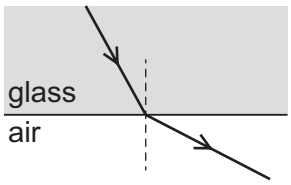
Which row gives the frequency and the speed of this water wave?

	frequency / Hz	speed cm / s
A	2.0	4.0
B	2.0	8.0
C	4.0	4.0
D	4.0	8.0

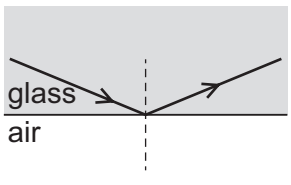
21 Light passes from glass into air.

Which diagram shows a ray of light incident at the critical angle on the air-glass boundary?

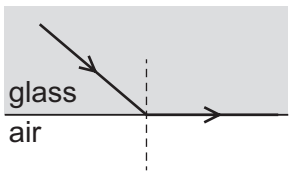
A



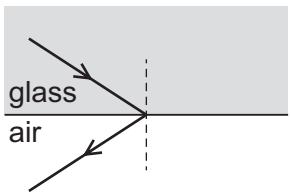
B



C

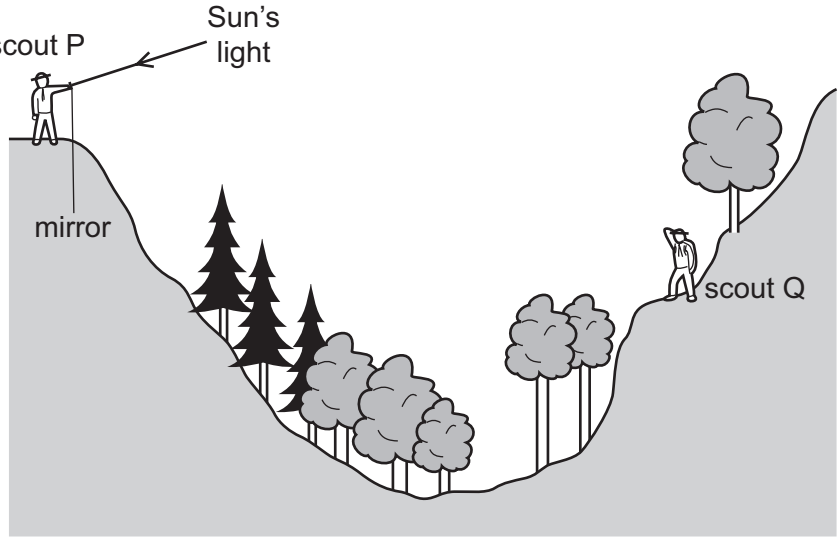


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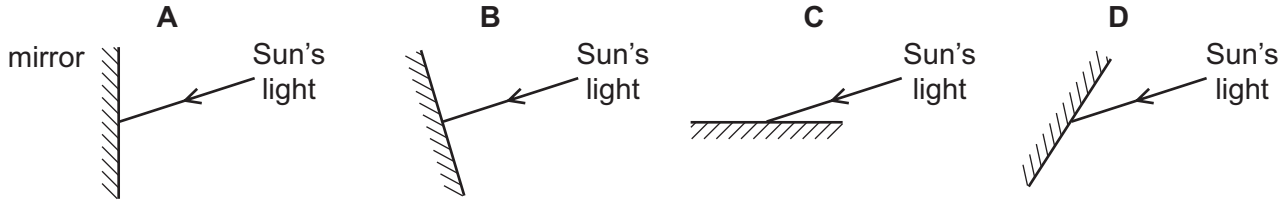


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22 Scout P signals to scout Q on the other side of a valley by using a mirror to reflect the Sun's light.



Which mirror position allows the Sun's light to be reflected to scout Q?



23 The table describes white light that passes through a prism and forms a spectrum.

Which row is correct?

	colour refracted the most	colour next to the red
A	red	orange
B	red	yellow
C	violet	orange
D	violet	yellow

24 Where do all types of electromagnetic waves travel at the same speed?

A air

B a vacuum

C glass

D water

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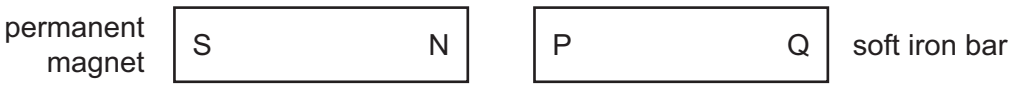
[Turn over

25 A siren is emitting a sound. As time passes, the sound becomes louder and higher pitched.

What is happening to the amplitude and to the frequency of the emitted sound wave?

	amplitude	frequency
A	decreasing	decreasing
B	decreasing	increasing
C	increasing	decreasing
D	increasing	increasing

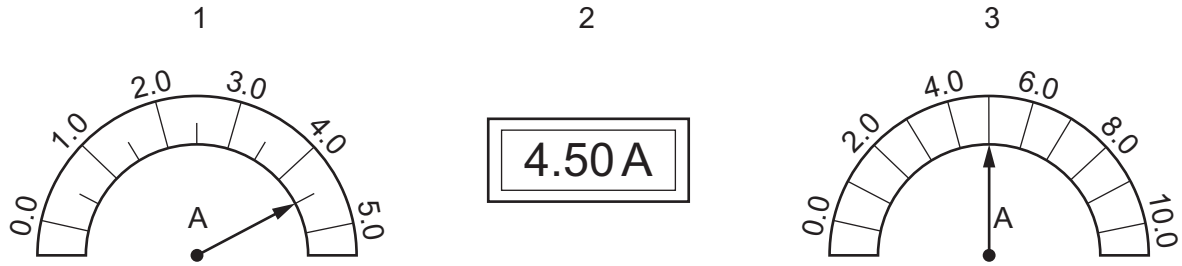
26 A permanent magnet is placed close to a bar of soft iron.



What are the polarities of end P and of end Q?

	end P	end Q
A	N	N
B	N	S
C	S	N
D	S	S

27 The diagrams show three ammeters.



Which ammeters show the same value of current?

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

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28 A student measures the potential difference across a device and the current in the device.

Which calculation gives the resistance of the device?

A current + potential difference

B current ÷ potential difference

C potential difference ÷ current

D potential difference × current

29 A lamp is connected across one cell, then across two cells. The potential difference (p.d.) across the lamp and the current in it are measured in each case.

The results are shown.

number of cells	p.d. / V	current / A
1	2.8	0.25
2	5.4	0.40

What is the change in the resistance of the lamp when the number of cells is increased from one to two?

A It decreases by 0.015 Ω.

B It increases by 1.5 Ω.

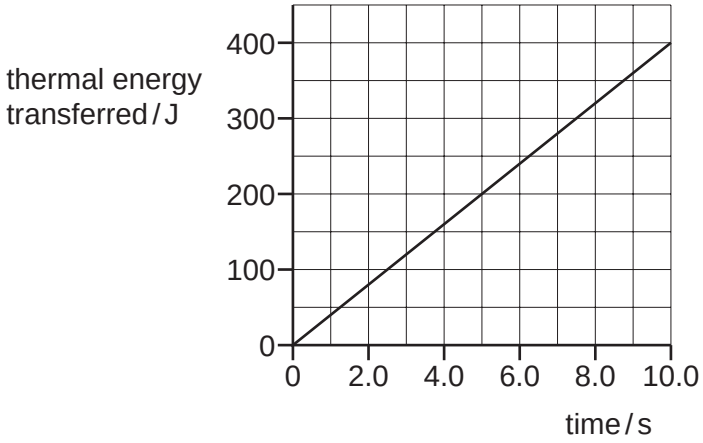
C It increases by 2.3 Ω.

D It increases by 17 Ω.

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30 An electrical heater transfers thermal energy to the surroundings.

The graph shows how the amount of thermal energy transferred varies with time.

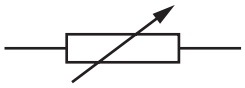


The heater continues to transfer energy at the same rate.

How much thermal energy is transferred by the heater in 5.0 minutes?

A 200 J **B** 400 J **C** 2000 J **D** 12 000 J

31 Which electrical component does the symbol represent?



A a fuse

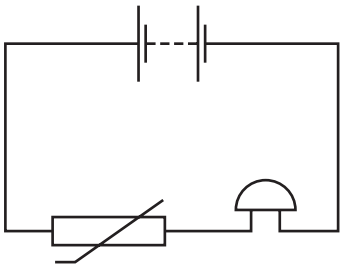
B a relay coil

C a thermistor

D a variable resistor

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32 A student sets up this circuit.



What is the purpose of the circuit?

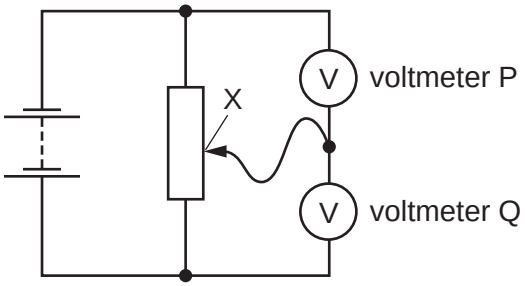
A to allow a lamp to be made dimmer or brighter as required

B to amplify the sound of a voice

C to light a lamp in the dark

D to sound a bell when the temperature rises

33 The diagram shows two voltmeters P and Q connected to a potential divider.



The sliding connection at point X is moved towards the top of the diagram.

What happens to the reading on P and to the reading on Q?

	reading on P	reading on Q
A	decreases	decreases
B	decreases	increases
C	increases	decreases
D	increases	increases

34 A simple electric generator induces an electromotive force (e.m.f.).

Which modification would increase the induced e.m.f.?

A Increase the number of turns in the coil of the generator.

B Increase the distance between the magnetic poles.

C Reduce the strength of the magnetic field around the coil.

D Reverse the direction of the magnetic field.

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[Turn over

35 A transformer has N_p turns in the primary coil and N_s turns in the secondary coil.

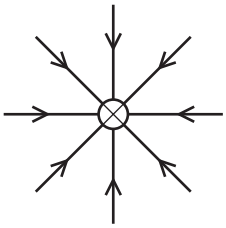
Which row gives the values of N_p and N_s for a transformer that steps up a voltage of 1200 V to 36 000 V?

	N_p	N_s
A	2 000	60 000
B	2 000	600 000
C	60 000	2 000
D	600 000	2 000

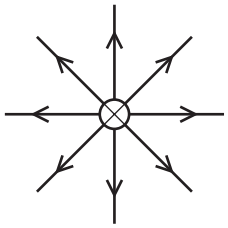
36 A straight wire is perpendicular to the paper. It carries a current into the paper.

What is the magnetic field pattern and its direction near the wire?

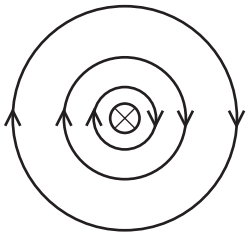
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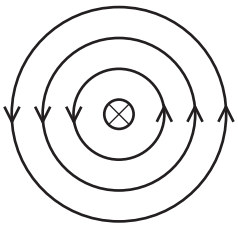
B



C



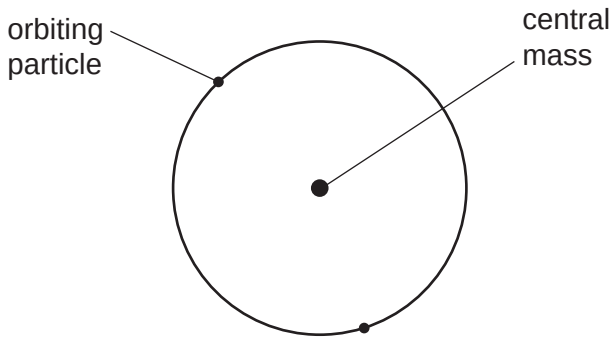
D



key

⊗ wire with current into the page

37 In the atomic model, an atom consists of a central mass, orbited by much smaller particles.



What is the name of the central mass and of the orbiting particles?

	central mass	orbiting particles
A	neutron	α-particles
B	neutron	electrons
C	nucleus	α-particles
D	nucleus	electrons

38 The table shows the composition of three different nuclei.

nucleus	number of protons	number of neutrons
X	3	3
Y	3	4
Z	4	3

Which nuclei are isotopes of the same element?

A X, Y and Z **B** X and Y only **C** X and Z only **D** Y and Z only

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39 The table compares the penetrating abilities and ionising effects of α-radiation and of γ-radiation.

Which row is correct?

	least penetrating	most ionising
A	α	α
B	α	γ
C	γ	α
D	γ	γ

40 Radioactive materials must be handled in a safe way.

What is **not** a safety procedure?

A Monitor exposure time to radioactive materials.

B Store radioactive materials in cardboard boxes.

C Use tongs to pick up the radioactive source.

D Wear protective clothing.

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