Cambridge Assessment International Education

Cambridge IGCSE™

PHYSICS **0625/13**

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

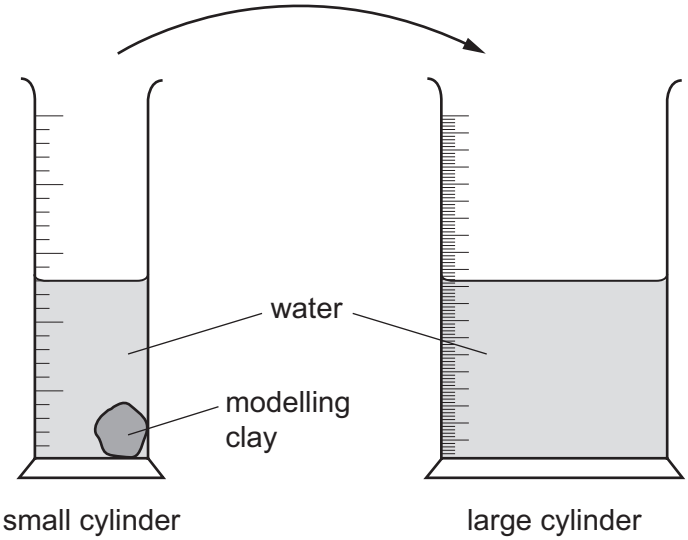
INFORMATION

- 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.

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1 A lump of modelling clay is moved from a small measuring cylinder to a large measuring cylinder that has twice the diameter.

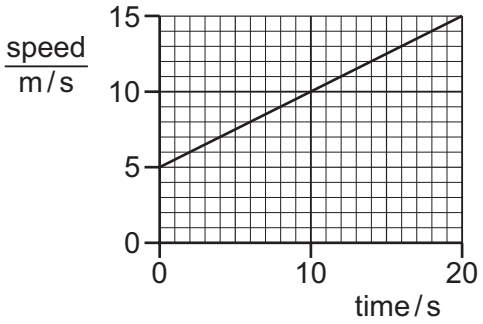


The reading on the small measuring cylinder goes down by 20 cm^3.

By how much does the reading on the large cylinder go up?

A 10 cm^3 **B** 20 cm^3 **C** 40 cm^3 **D** 80 cm^3

2 The graph shows the motion of a car.

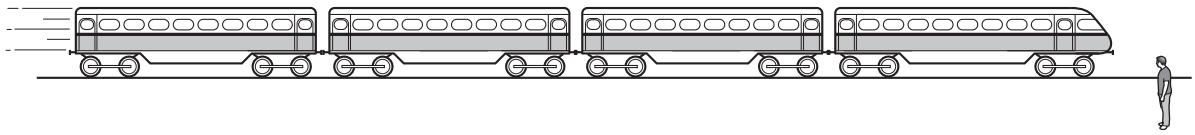


Which row correctly describes this motion?

	acceleration	distance travelled / m
A	constant	200
B	constant	300
C	increasing at a constant rate	200
D	increasing at a constant rate	300

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3 A man stands next to a railway track.



A train travelling at 40 m / s takes 2.0 s to pass the man.

What is the length of the train?

A 20 m **B** 38 m **C** 40 m **D** 80 m

4 Four students are given two different objects, P and Q.

Each student measures the mass of P and the weight of Q.

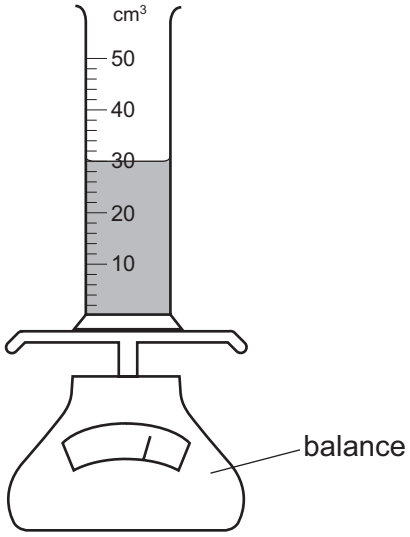
The results are shown in the table.

Which row gives a possible result?

	mass of object P	weight of object Q
A	10 kg	10 kg
B	10 kg	10 N
C	10 N	10 kg
D	10 N	10 N

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5 A measuring cylinder contains 30 cm^3 of a liquid.



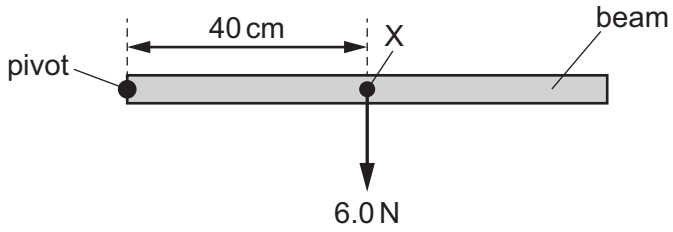
Some more of the liquid is added until the liquid level reaches the 50 cm^3 mark.

The reading on the balance increases by 30 g.

What is the density of the liquid?

A 0.60 g / cm^3 **B** 0.67 g / cm^3 **C** 1.5 g / cm^3 **D** 1.7 g / cm^3

6 A beam is pivoted at one end, as shown.



The beam weighs 6.0 N and its weight acts at a point X 40 cm from the pivot.

A force of 4.0 N is applied to the beam causing it to balance horizontally.

In which direction and where is the 4.0 N force applied?

A vertically downwards at 20 cm to the left of X

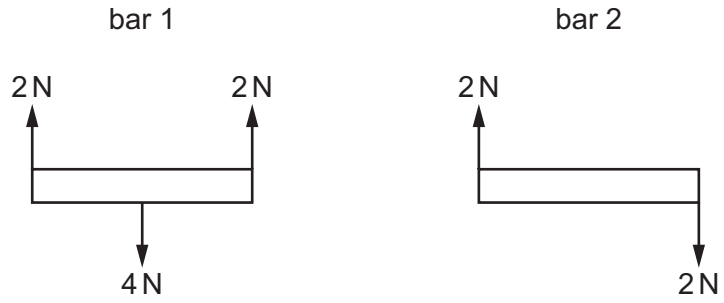
B vertically downwards at 20 cm to the right of X

C vertically upwards at 20 cm to the left of X

D vertically upwards at 20 cm to the right of X

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7 The diagram shows two identical bars of negligible weight. All the forces acting on each bar are marked.



Which bars are in equilibrium?

A bar 1 and bar 2

B bar 1 only

C bar 2 only

D neither bar 1 nor bar 2

8 Four objects have different base areas and their centres of mass are in different positions.

Which object is most stable?

	base area	position of centre of mass
A	large	high
B	large	low
C	small	high
D	small	low

9 In which form is energy stored by stretching a spring?

A chemical energy

B elastic potential energy

C gravitational potential energy

D thermal energy

10 What is meant by the power of an engine?

A the energy that the engine transfers per unit time

B the maximum force that the engine can exert

C the maximum weight that the engine can lift

D the total energy that the engine transfers

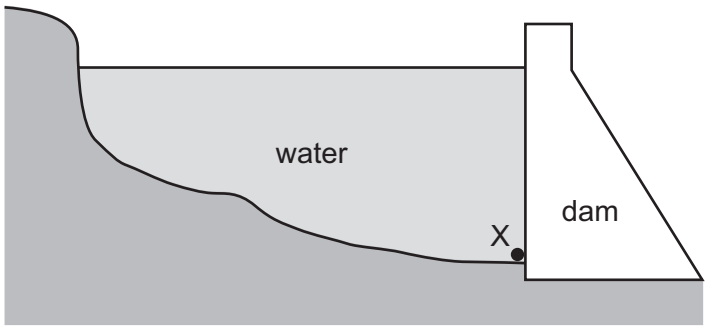
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11 A force of 14 N is applied to the head of a nail. This causes a pressure of 25 N / mm^2 at the tip of the nail.

What is the cross-sectional area of the tip of the nail?

A 0.56 mm^2 **B** 11 mm^2 **C** 39 mm^2 **D** 350 mm^2

12 The diagram shows a deep reservoir formed by a dam.



On what does the pressure at X depend?

A the depth of the water at X

B the length of the reservoir

C the surface area of the water

D the thickness of the dam wall

13 The properties of two states of matter are listed.

state 1 The molecules move quickly and randomly. There is a large distance between the molecules.

state 2 The molecules vibrate about fixed positions. The molecules are closely packed together.

What are states 1 and 2?

	state 1	state 2
A	gas	liquid
B	liquid	solid
C	solid	liquid
D	gas	solid

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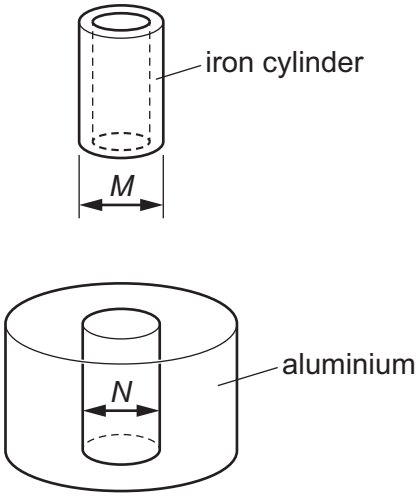
14 A gas in a container is cooled but the volume of the gas does not change.

Which row describes the changes in the pressure of the gas and the average kinetic energy of the gas particles?

	pressure of gas	average kinetic energy of gas particles
A	decreases	decreases
B	decreases	increases
C	increases	decreases
D	increases	increases

15 The iron cylinder of an engine is to be fitted into a piece of aluminium.

The outside diameter *M* of the iron cylinder is slightly larger than the diameter *N* of the hole in the aluminium.



What is the best action to fit the cylinder into the aluminium?

A Cool the aluminium and cool the iron.

B Cool the aluminium and heat the iron.

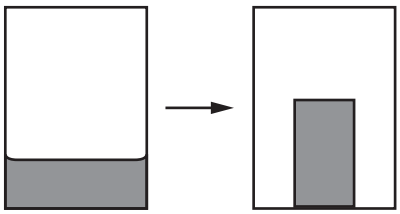
C Heat the aluminium and cool the iron.

D Heat the aluminium and heat the iron.

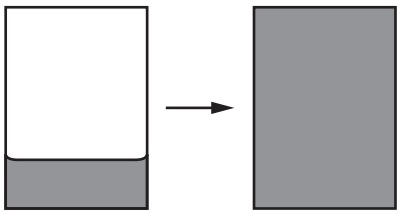
16 A solid in a closed container is heated until it completely melts.

Which diagram shows the shape and the volume of the solid before and after heating.

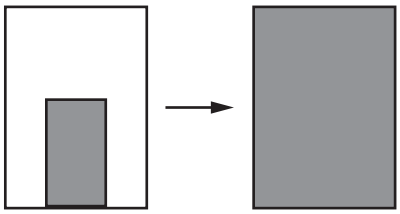
A



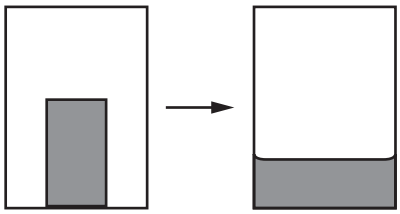
B



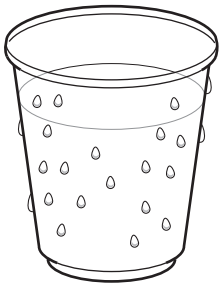
C



D



17 A glass contains an iced drink on a warm and humid day. Water starts to form on the outside of the glass.



What is the name of the effect by which the water forms?

A condensation

B conduction

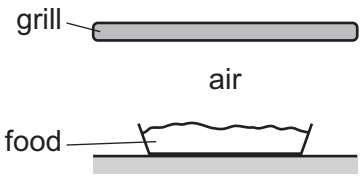
C convection

D evaporation

18 In which situation is the main transfer of thermal energy by convection?

A

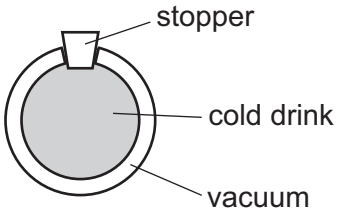
food cooked under a grill



transfer from grill to food

B

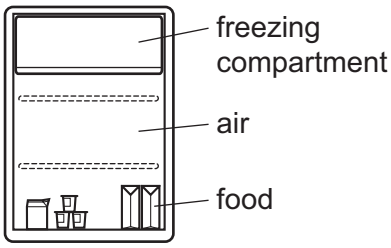
a cold drink stored in a vacuum flask



transfer from air to drink

C

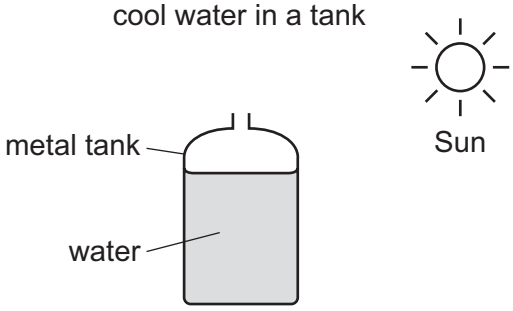
food cooled in a freezer



transfer from food
to freezing compartment

D

cool water in a tank

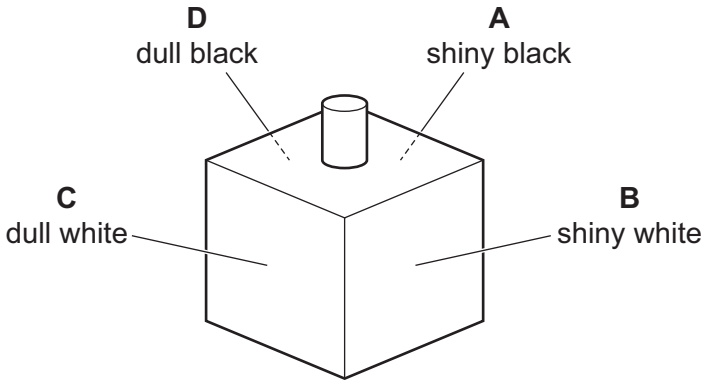


transfer from the Sun to water

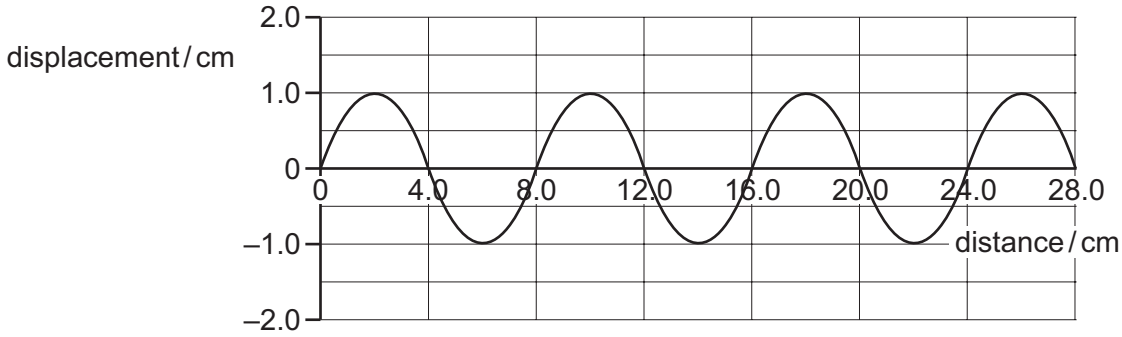
19 A metal container is the shape of a hollow cube.

The four sides of the container have different surface finishes.

Which side is the best emitter of radiation?



20 The diagram shows a wave.



Which row is correct?

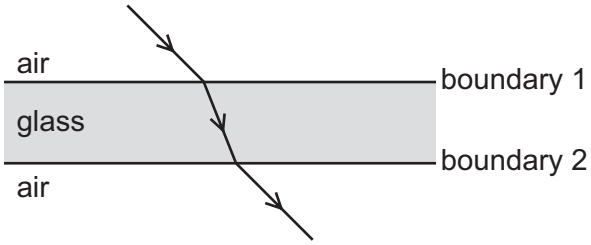
	amplitude of the wave / cm	wavelength of the wave / cm
A	1.0	4.0
B	1.0	8.0
C	2.0	4.0
D	2.0	8.0

21 A girl is sitting on a rock in the sea looking at passing waves. She notices that five complete wavelengths pass her in 20 s.

What is the frequency of this wave?

A 0.25 Hz **B** 4.0 Hz **C** 15 Hz **D** 100 Hz

22 A ray of light passes from air through a sheet of glass and out the other side, as shown.



Which two angles are equal to each other?

A angle of incidence at boundary 1 and angle of incidence at boundary 2

B angle of incidence at boundary 1 and angle of refraction at boundary 1

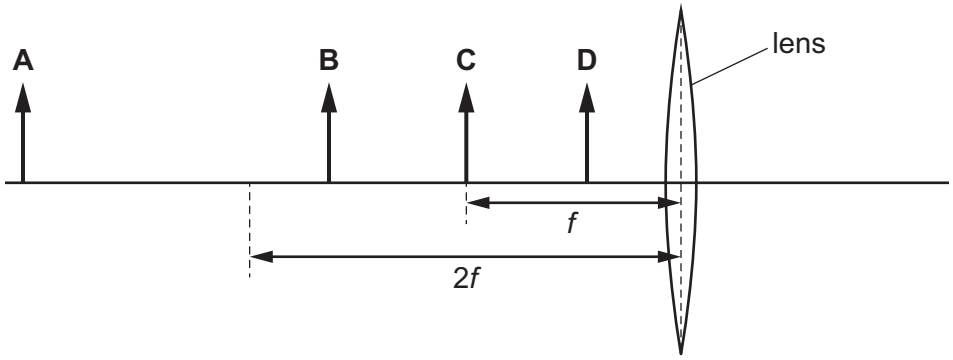
C angle of incidence at boundary 1 and angle of refraction at boundary 2

D angle of refraction at boundary 1 and angle of refraction at boundary 2

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23 An object is placed in front of a converging lens. The lens has a focal length *f*.

In which labelled position should the object be placed in order to produce a real image that is smaller than the object?



24 Which statement correctly compares radio waves and X-rays?

A Radio waves have a longer wavelength and a greater speed in a vacuum.

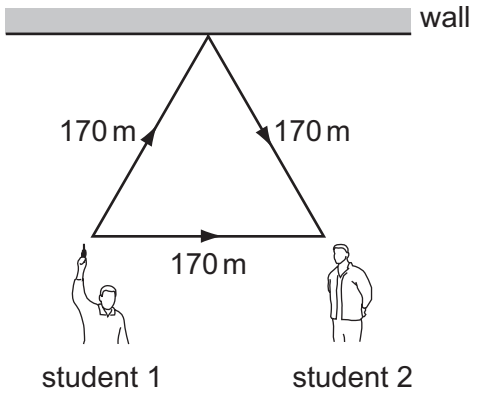
B Radio waves have a longer wavelength and the same speed in a vacuum.

C Radio waves have a shorter wavelength and a greater speed in a vacuum.

D Radio waves have a shorter wavelength and the same speed in a vacuum.

25 Student 1 and student 2 stand 170 m apart as shown.

Student 1 fires a starting pistol. Student 2 hears the sound twice, once by the direct route and once from the reflection from the wall.



The speed of sound in air is 340 m / s.

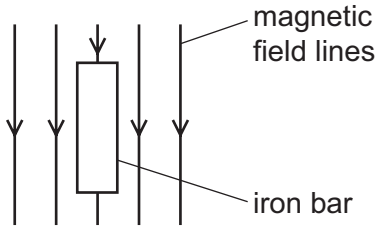
What is the interval between hearing the two sounds?

A 0.25 s **B** 0.50 s **C** 1.0 s **D** 2.0 s

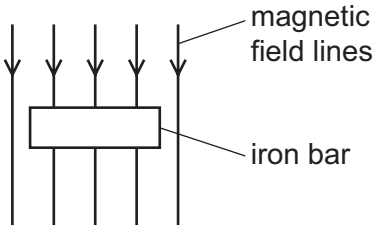
26 A student attempts to make a permanent magnet by hammering metal bars of the same size in the same magnetic field.

In which case is the strongest permanent magnet produced?

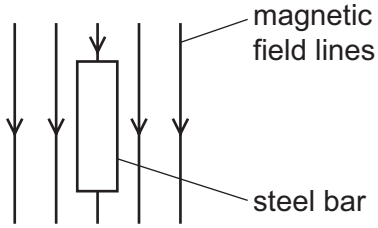
A



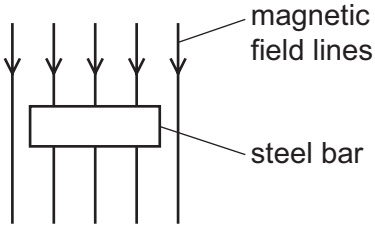
B



C

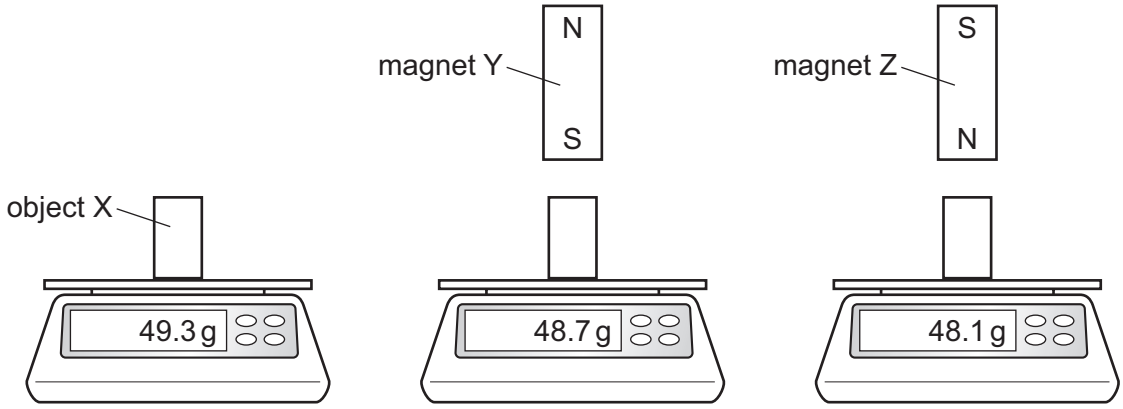


D



27 A student places object X on a balance. The student first brings magnet Y and then magnet Z close to object X and observes the readings on the balance. The distance between Y and X is the same as the distance between Z and X.

The diagram shows the results of the experiment.



Which statement explains the results?

A Object X is an iron block and magnet Y is stronger than magnet Z.

B Object X is an iron block and magnet Y is weaker than magnet Z.

C Object X is a permanent magnet and magnet Y is stronger than magnet Z.

D Object X is a permanent magnet and magnet Y is weaker than magnet Z.

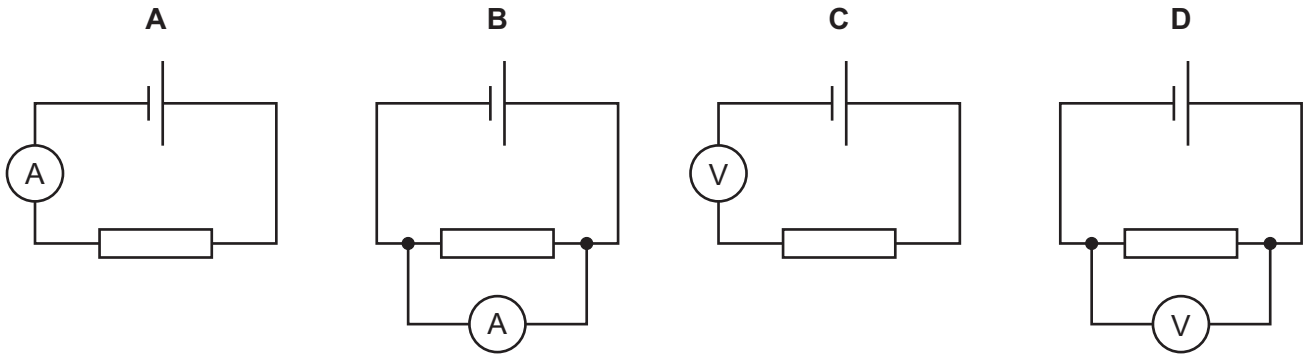
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28 A girl rubs a plastic rod with a cloth. The plastic rod then repels a positively charged object.

Which row is correct?

	the state of the plastic rod	what happened when the rod was rubbed
A	negatively charged	it gained some electrons
B	negatively charged	it lost some protons
C	positively charged	it lost some electrons
D	positively charged	it gained some protons

29 Which circuit shows a meter being used correctly to measure the current in a resistor?



30 A resistor and a battery are connected in series.

The value of the resistor is 20 Ω.

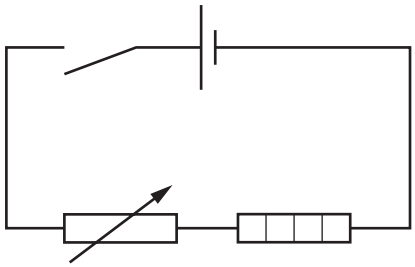
The potential difference (p.d.) of the battery is 4.0 V.

What is the current in the resistor?

A 0.20 A **B** 4.0 A **C** 5.0 A **D** 80 A

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31 The circuit shown includes a cell.



Which other components does the circuit contain?

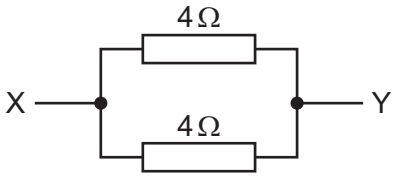
A lamp, voltmeter and switch

B resistor, thermistor and bell

C switch, variable resistor and heater

D switch, heater and fuse

32 Two 4 Ω resistors are connected in parallel.



What is the combined resistance between X and Y?

A less than 4 Ω

B 4 Ω

C 8 Ω

D more than 8 Ω

33 Which statement about identical lamps in a parallel circuit is **not** correct?

A If one lamp blows, the others remain switched on.

B The current in each lamp is different.

C The lamps can be switched on and off separately.

D The lamps have the same voltage across each of them.

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34 Why is a fuse used in an electrical circuit?

A so that the current can have only one value

B to prevent the current becoming too large

C to provide a path to earth if a fault occurs

D to save electrical energy

35 The information describes the currents in three different circuits.

Circuit P has a steady current of 0.52 A in one direction.

Circuit Q has a current that continually changes between 0.25 A and 0.35 A but is always in the same one direction.

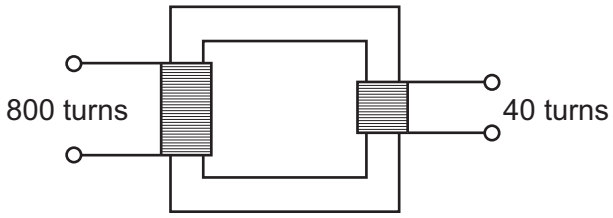
Circuit R has a peak current of 0.52 A that changes direction periodically.

Which circuits contain a direct current?

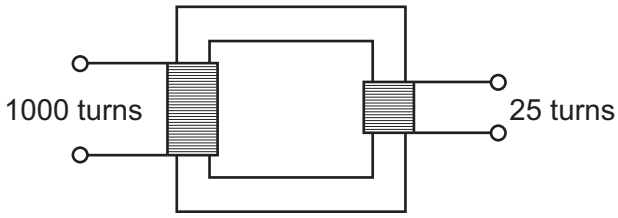
A P only **B** P and Q **C** Q and R **D** R only

36 Which transformer can change a 240 V a.c. input into a 15 V a.c. output?

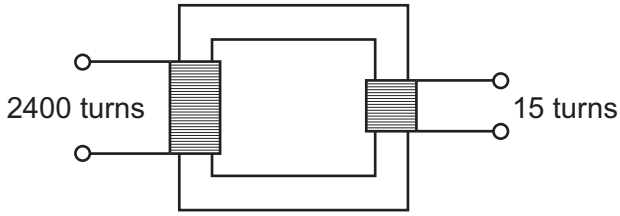
A



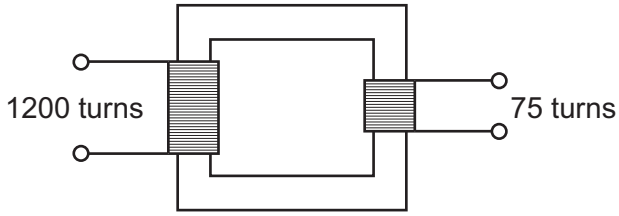
B



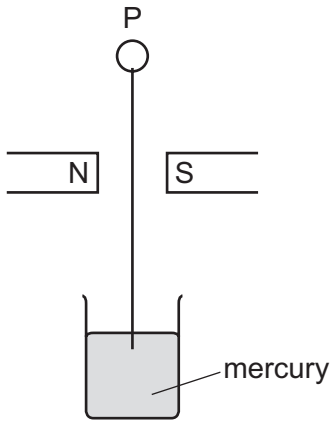
C



D



37 The diagram shows a wire hanging from a metal loop P and dipping into a bath of mercury.



The wire is hanging vertically between the N and S poles of a magnet.

The loop P is then connected to the positive terminal of a battery and the mercury is connected to the negative terminal.

The wire swings out of the page.

In which direction does the wire move when P is connected to the negative terminal of the battery and the mercury is connected to the positive terminal?

A The wire swings into the page.

B The wire swings out of the page.

C The wire swings to the left.

D The wire swings to the right.

38 The atoms of an element can exist as different isotopes.

What is the difference between atoms of different isotopes of the same element?

A They have different numbers of electrons.

B They have different numbers of protons and different numbers of neutrons.

C They have different numbers of protons only.

D They have different numbers of neutrons only.

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39 A radioactive source has a half-life of 0.5 hours.

A detector near the source shows a reading of 6000 counts per second.

Background radiation can be ignored.

What is the reading on the detector 1.5 hours later?

A 750 counts per second

B 1500 counts per second

C 2000 counts per second

D 3000 counts per second

40 Which statement explains why radioactive materials need to be handled carefully?

A γ-rays are part of the electromagnetic spectrum.

B Radioactive decay is a random process.

C Radioactive materials have a half-life.

D The radiation given out is ionising.

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