Cambridge Assessment International Education

Cambridge IGCSE™

PHYSICS **0625/21**

Paper 2 Multiple Choice (Extended) **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.

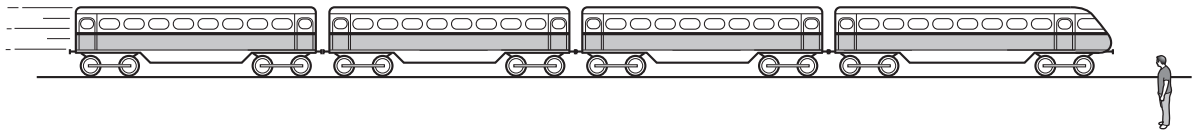
This document has **16** pages.

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1 Which measuring devices are most suitable for determining the length of a swimming pool and the thickness of aluminium foil?

	length of a swimming pool	thickness of aluminium foil
A	ruler	measuring cylinder
B	tape measure	micrometer screw gauge
C	tape measure	ruler
D	ruler	micrometer screw gauge

2 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

3 A speed–time graph is used to describe the motion of an object.

Which quantities are calculated from the gradient of the graph and from the area under the graph?

	gradient of the graph	area under the graph
A	acceleration	distance travelled
B	acceleration	total journey time
C	distance travelled	acceleration
D	total journey time	distance travelled

4 On the Moon, all objects fall with the same acceleration.

Which statement explains this?

A On the Moon, all objects have the same weight.

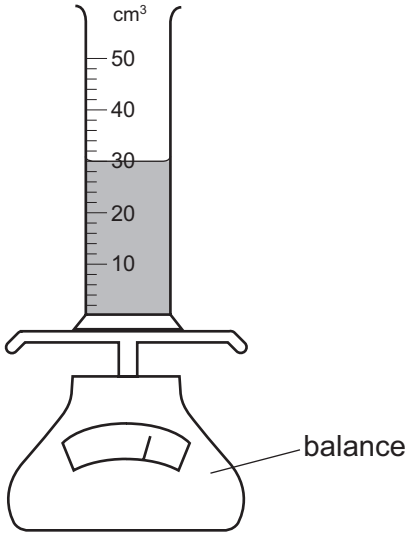
B The Moon has a smaller gravitational field strength than the Earth.

C The weight of an object is directly proportional to its mass.

D The weight of an object is inversely proportional to its mass.

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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.

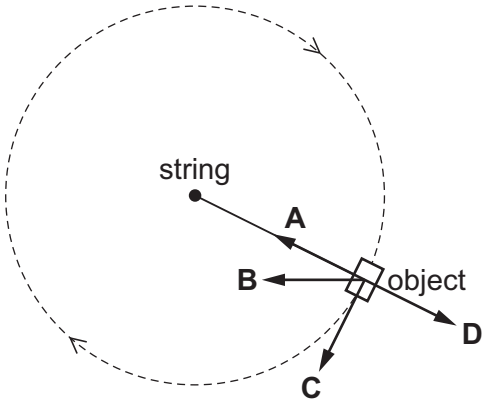
The reading on the balance increases by 30 g.

What is the density of the liquid?

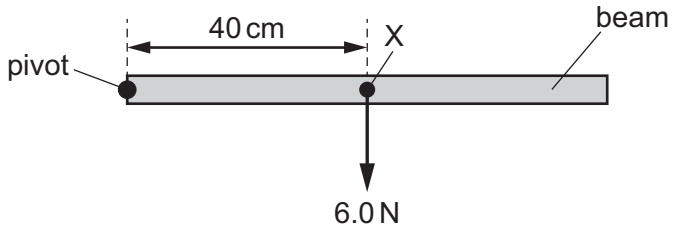
A 0.60 g / cm^3 **B** 0.67 g / cm^3 **C** 1.5 g / cm^3 **D** 1.7 g / cm^3

6 An object on the end of a string moves in a clockwise circular path at constant speed. The diagram shows the object as viewed from above.

What is the direction of the resultant force on the object when it is in the position shown?



7 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?

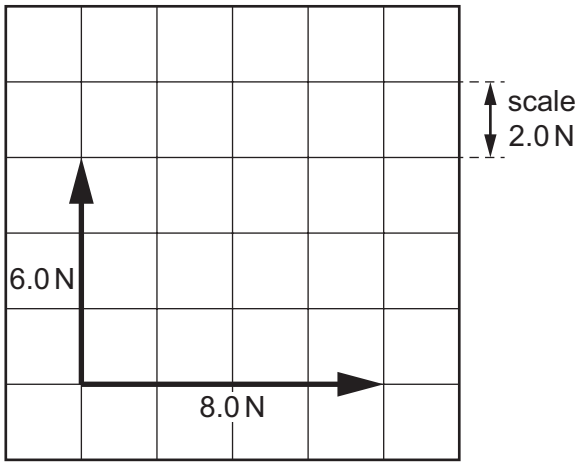
A vertically downwards at 20 cm to the left of X

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

8 On the diagram shown, what is the magnitude of the resultant force of the two vectors?



A 2.0 N **B** 7.0 N **C** 10 N **D** 14 N

9 Three situations are listed.

1 An object has a resultant force acting on it.

2 A moving object experiences an impulse.

3 An object is decelerating.

In which situations is the momentum of the object changing?

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

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10 A ball of mass 0.16 kg is moving forwards at a speed of 0.50 m / s. A second ball of mass 0.10 kg is stationary. The first ball strikes the second ball. The second ball moves forwards at a speed of 0.50 m / s.

What is the speed of the first ball after the collision?

A 0.0 m / s **B** 0.19 m / s **C** 0.31 m / s **D** 0.50 m / s

11 A mass hangs vertically from a spring.

The mass is raised to a point P and is then released.

The mass oscillates repeatedly between point P and a lower point Q.

Which energies alternately increase and decrease throughout the oscillations?

A gravitational potential energy, kinetic energy and elastic energy

B gravitational potential energy and kinetic energy only

C gravitational potential energy, kinetic energy and internal energy

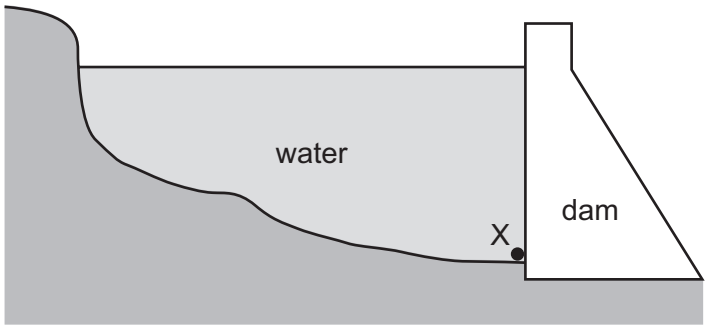
D internal energy and elastic energy

12 A car has 620 kJ of kinetic energy. The car brakes and stops in a distance of 91 m.

What is the average braking force acting on the car?

A 0.15 N **B** 6.8 N **C** 6800 N **D** 56 000 N

13 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

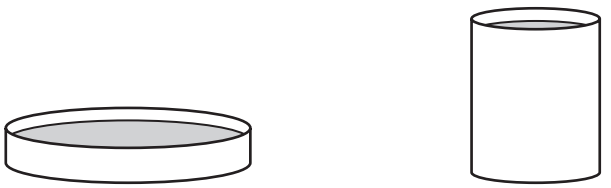
14 A sealed rigid container has a fixed volume. The container is filled with air.

The container is placed in a freezer cabinet and the temperature of the air in the container decreases.

Which row correctly describes what happens to the air in the container?

	average distance between air particles	average speed of air particles
A	decreases	increases
B	decreases	decreases
C	no change	increases
D	no change	decreases

15 Two open containers are filled with water at room temperature. The containers have different shapes.



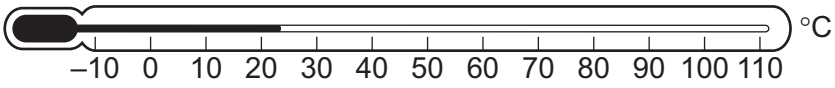
container 1 container 2

From which container does the water evaporate at the greater rate and how can the rate of evaporation be increased?

	container with the greater rate of evaporation	how the rate of evaporation can be increased
A	1	decrease the water temperature
B	1	increase the water temperature
C	2	decrease the water temperature
D	2	increase the water temperature

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16 The diagram shows a liquid-in-glass thermometer.



A student wishes to check the marking of the upper fixed point on this thermometer.

What should she do?

A Put the bulb in a beaker of boiling sea water.

B Put the bulb in a beaker of boiling pure water.

C Put the bulb in a beaker of ice and salt.

D Put the bulb in a beaker of pure melting ice.

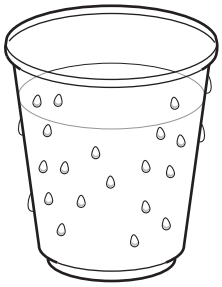
17 Water in a beaker gains thermal energy at a rate of 3000 W. The water is at its boiling point.

The specific latent heat of vaporisation of water is 2260 J / g.

How long does it take for 250 g of the water to vaporise?

A 12 s **B** 188 s **C** 332 s **D** 750 s

18 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

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19 One end of a copper bar is heated to a high temperature.

Which mechanism is responsible for the transfer of thermal energy to the other end of the copper bar?

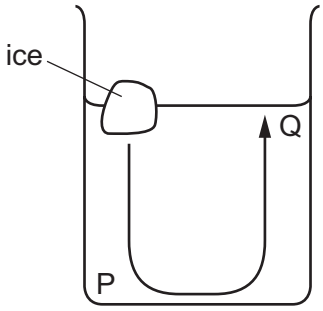
A the lattice vibrations of copper ions only

B the lattice vibrations of copper ions and the movement of high energy electrons along the bar

C the movement of high energy copper ions along the bar

D the movement of high energy electrons along the bar only

20 The diagram shows a convection current caused by a piece of ice placed in a beaker of water at room temperature.

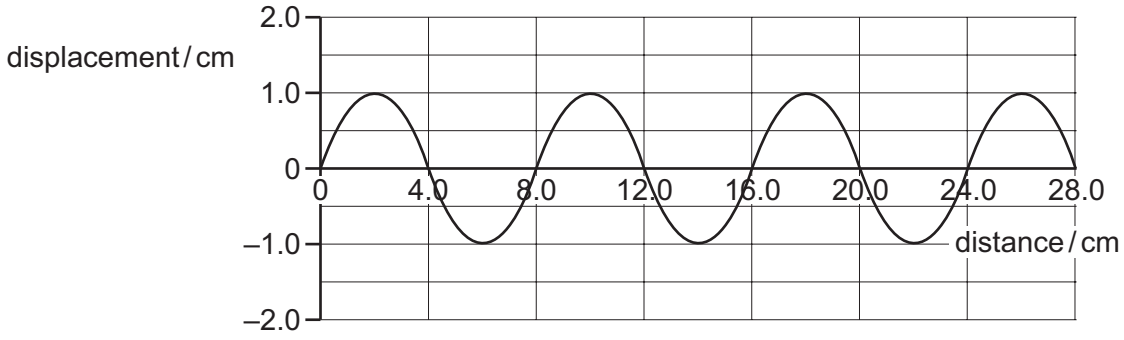


Which row correctly compares the temperatures and densities at water points P and Q?

	temperature at P	density at P
A	higher than at Q	higher than at Q
B	higher than at Q	lower than at Q
C	lower than at Q	higher than at Q
D	lower than at Q	lower than at Q

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21 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

22 A sound wave is created by a loudspeaker that vibrates backwards and forwards 96 000 times per minute.

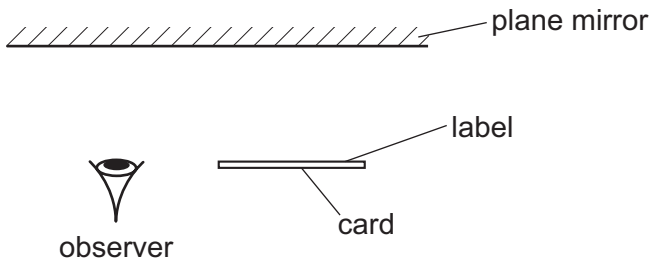
The speed of sound is 320 m / s.

What is the wavelength of the sound wave?

A 0.20 m **B** 5.0 m **C** 300 m **D** 18 000 m

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23 A card is placed in front of a plane mirror so that its label is facing the mirror, as shown.



The label is shown.



How does the image of the label formed by the mirror appear to the observer?

A



B



C



D



24 A thin converging lens can produce both real and virtual images.

Which row describes a real and a virtual image?

	real image	virtual image
A	rays converge to form the image	image can be projected onto a screen
B	rays converge to form the image	image cannot be projected onto a screen
C	rays diverge to form the image	image can be projected onto a screen
D	rays diverge to form the image	image cannot be projected onto a screen

25 The speed of light in air is $3.0 \times 10^8\,\text{m/s}$.

The critical angle for light in a transparent plastic material placed in air is 37°.

What is the speed of light in the plastic material?

A $1.8 \times 10^8\,\text{m/s}$

B $2.4 \times 10^8\,\text{m/s}$

C $3.8 \times 10^8\,\text{m/s}$

D $5.0 \times 10^8\,\text{m/s}$

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26 Which part of the electromagnetic spectrum is used by a remote controller for a television?

A infrared waves

B microwaves

C radio waves

D visible light

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

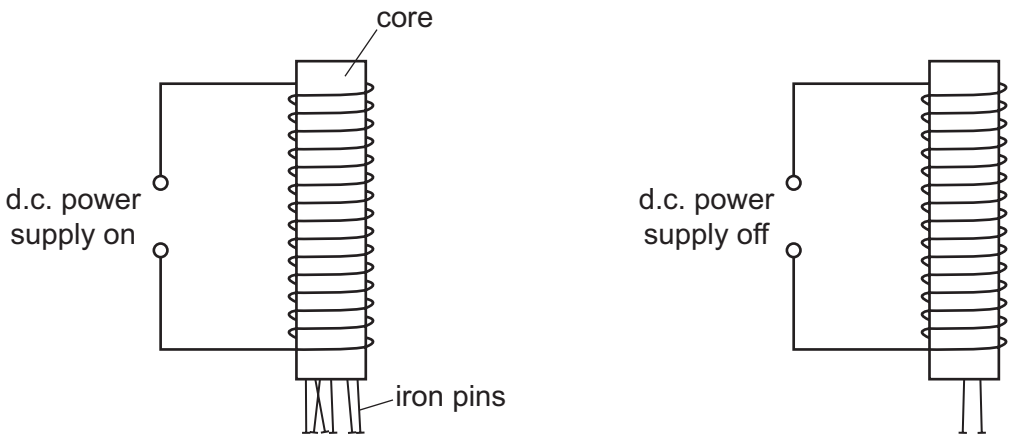
A Radio waves have a longer wavelength and a greater speed in a vacuum.

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.

28 A student counts how many iron pins an electromagnet picks up when its power supply is switched on. Then, she counts how many pins are picked up when the power supply is switched off.



She repeats the experiment using cores made of different materials. The results are shown.

Which core is made out of soft iron?

	pins picked up with the power supply on	pins picked up with the power supply off
A	0	0
B	2	7
C	8	5
D	12	0

29 A plastic rod is brought near to a small plastic sphere suspended from a stand. The sphere is repelled by the rod.

Why is this?

A The rod and the sphere have like charges.

B The rod and the sphere have unlike charges.

C The rod is charged and the sphere is uncharged.

D The rod is uncharged and the sphere is charged.

30 Which unit is equivalent to a volt (V)?

A A/Ω **B** J/C **C** J/s **D** W/C

31 A resistor converts 360 J of energy when there is a current of 3.0 A in it. The potential difference across the resistor is 6.0 V.

For how long is there this current in the resistor?

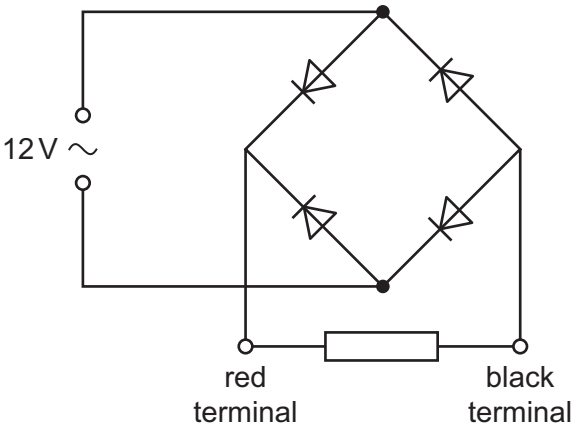
A 0.05 s **B** 20 s **C** 180 s **D** 720 s

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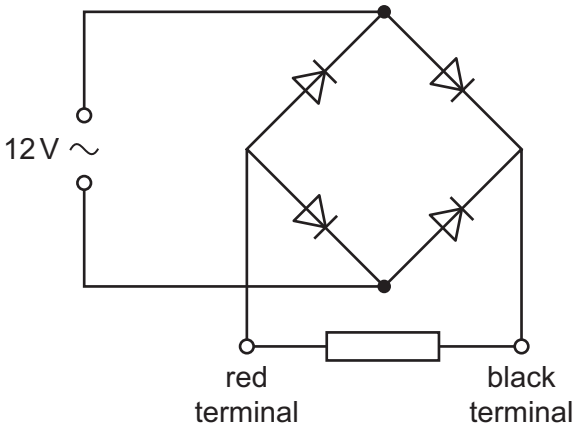
32 The four circuits shown each contain four diodes.

In which circuit is the direction of the current in the resistor always from the red terminal to the black terminal?

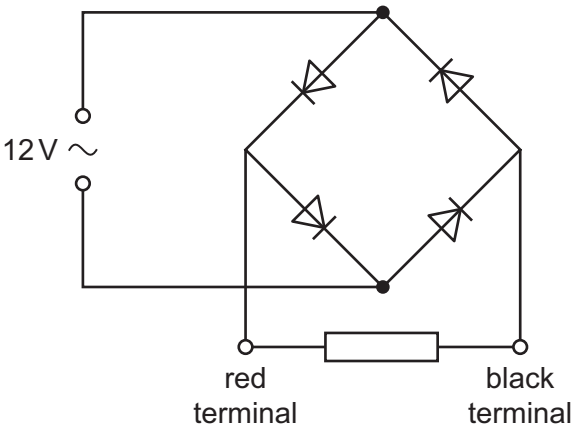
A



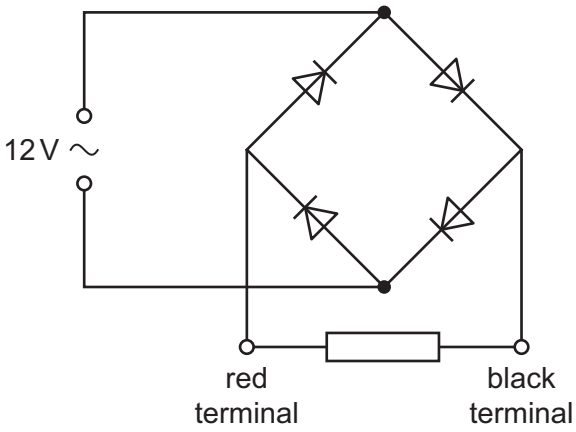
B



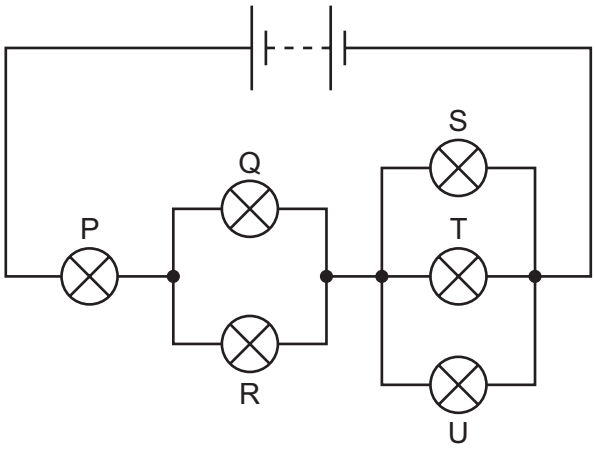
C



D



33 The diagram shows a circuit of six identical lamps connected to a battery.



Which lamps are brightest?

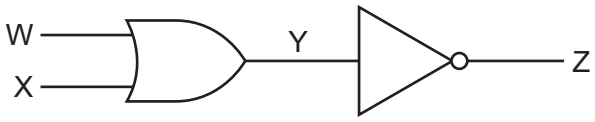
A P only

B Q and R only

C S, T and U only

D P, Q, R, S, T and U are equally bright

34 A digital circuit is made of two logic gates.



Which row is correct for this digital circuit?

	W	X	Y	Z
A	0	0	1	0
B	0	1	0	1
C	1	0	1	0
D	1	1	0	1

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35 A magnet is dropped vertically through a solenoid. This induces magnetic poles at both ends of the solenoid.

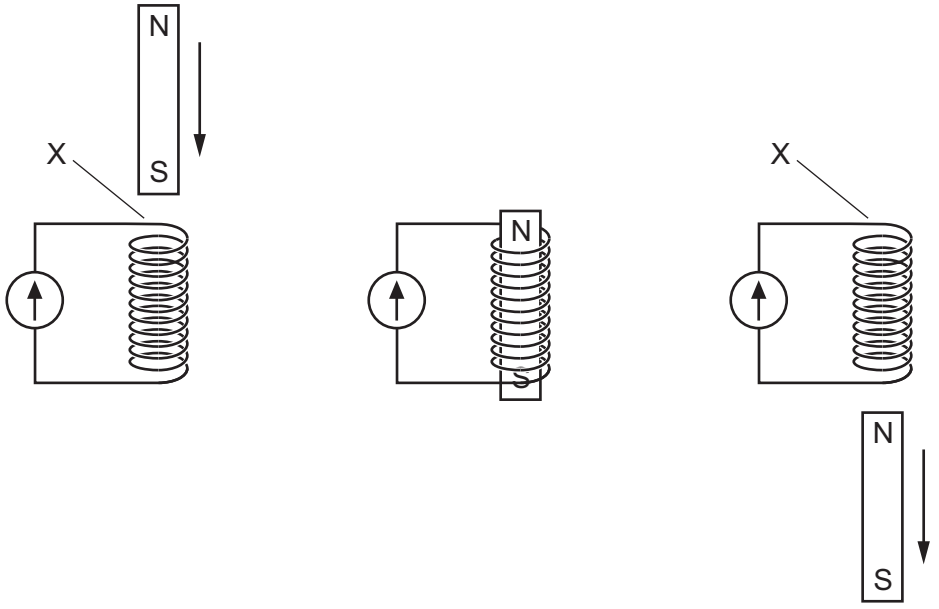


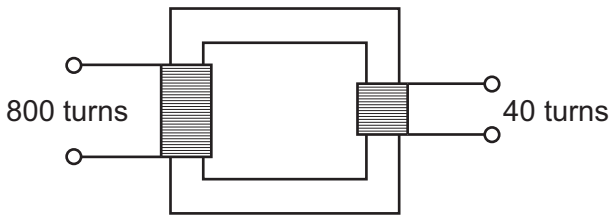
diagram 1 diagram 2 diagram 3

Which magnetic poles are induced at position X in diagram 1 and diagram 3?

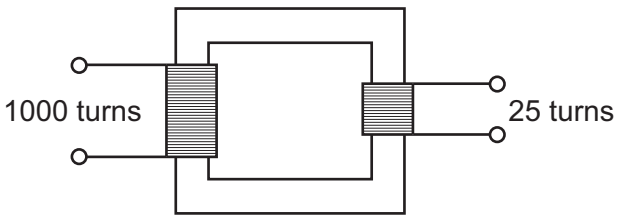
	diagram 1	diagram 3
A	N pole	N pole
B	N pole	S pole
C	S pole	N pole
D	S pole	S pole

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

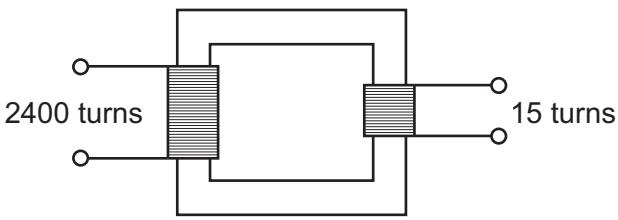
A



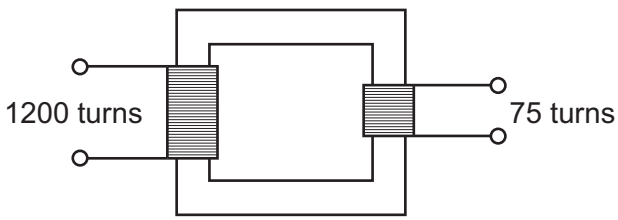
B



C



D



37 What is the purpose of the split-ring commutator in an electric motor?

A to ensure that the magnetic field in the motor changes direction every half rotation

B to ensure that the magnetic field in the motor stays in the same direction at all times

C to ensure that the turning effect on the motor changes direction every half rotation

D to ensure that the turning effect on the motor stays in the same direction at all times

38 How do the sizes of the two nuclei produced in a nuclear fission reaction compare to the size of the original nucleus?

A both larger than the original nucleus

B one larger and one smaller than the original nucleus

C both smaller than the original nucleus

D one smaller and one the same size as the original nucleus

39 Which statement about the radioactive decay of a substance is correct?

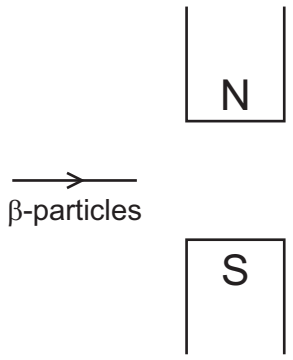
A It cannot be predicted when a particular nucleus will decay.

B Placing a radioactive substance inside a lead-lined box prevents it from decaying.

C The decay always produces poisonous gases.

D The rate of decay increases if the substance is dissolved in water.

40 The diagram shows a stream of β-particles travelling in a line that passes between the poles of a magnet.



In which direction will the β-particles be deflected by the magnet?

A towards the N pole

B towards the S pole

C into the page

D out of the page

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