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Cambridge Assessment International Education

Cambridge IGCSE™

PHYSICS **0625/11**

Paper 1 Multiple Choice (Core) **October/November 2020**

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. A mark will not be deducted for a wrong answer.
- Any rough working should be done on this question paper.

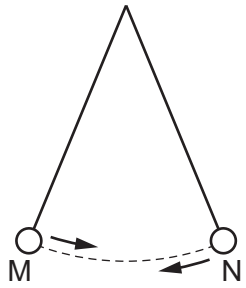
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1 The diagram shows a pendulum. The pendulum bob swings repeatedly between points M and N.



A student starts a stop-watch when the bob reaches point M.

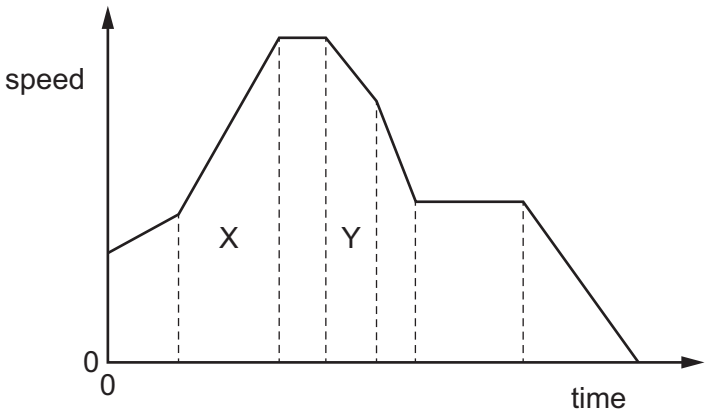
He counts each time the bob changes direction and stops the watch on the tenth change in direction.

The watch shows a time of 12.0 seconds.

What is the period of the pendulum?

A 0.60 s **B** 1.2 s **C** 2.4 s **D** 12.0 s

2 The speed–time graph represents a journey.



How does the graph show that the distance travelled in section X of the journey is greater than the distance travelled in section Y?

A The area below section X of the graph is greater than the area below section Y.

B The gradient of section X of the graph is greater than the gradient of section Y.

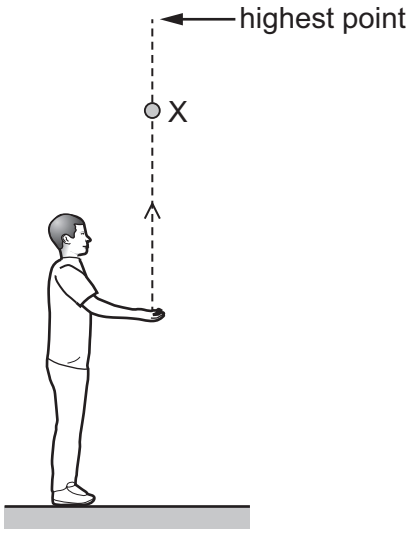
C The speed at the end of section X of the journey is greater than the speed at the end of section Y.

D The time for section X of the journey is greater than the time for section Y.

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3 A boy throws a ball vertically upwards with a speed *v*.



Which row describes the speed and the acceleration of the ball at point X on the way upwards?

	speed	acceleration
A	decreasing	upwards
B	decreasing	downwards
C	increasing	upwards
D	increasing	downwards

4 A student compares the weights of different objects.

Which apparatus does he use?

A balance

B measuring cylinder

C stop-watch

D thermometer

5 Which quantity is weight an example of?

A acceleration

B force

C mass

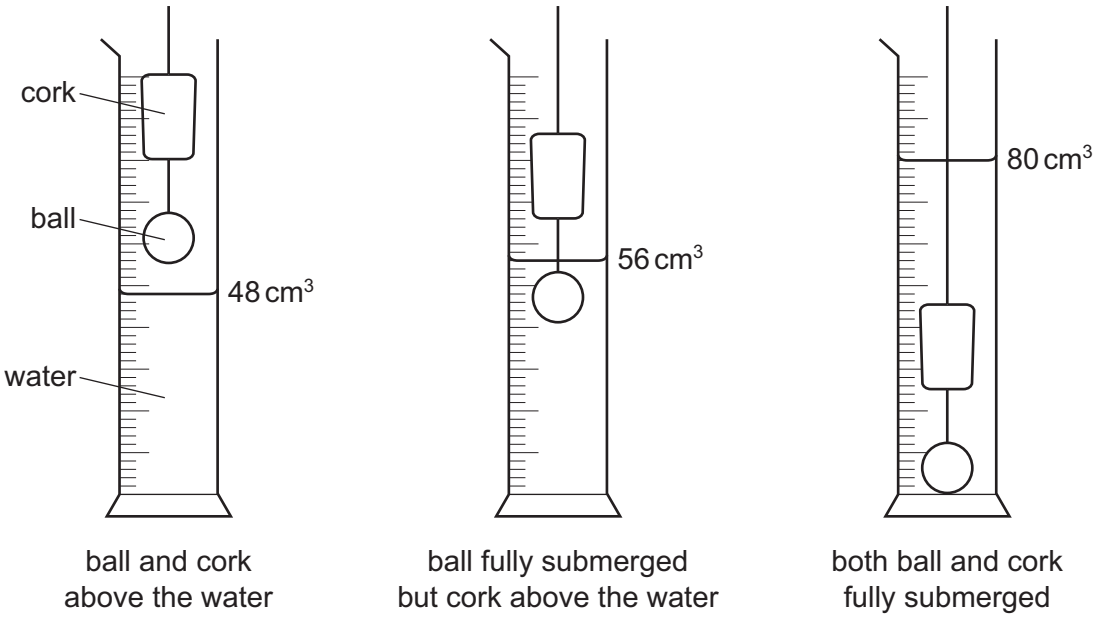
D pressure

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6 A metal ball is attached to a cork and is lowered into a measuring cylinder, pulling the cork into the water, as shown.



ball and cork above the water

ball fully submerged but cork above the water

both ball and cork fully submerged

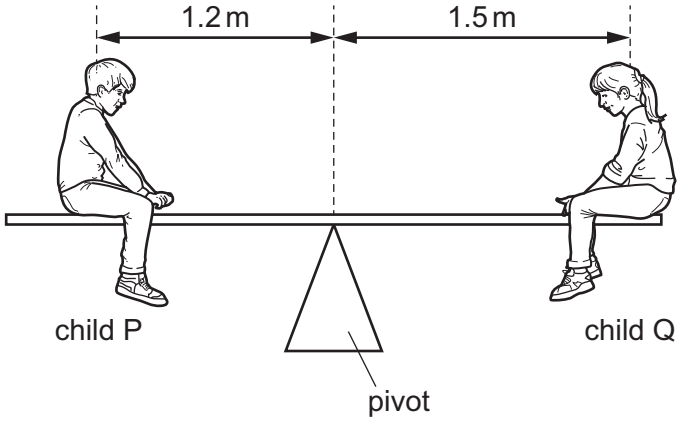
The mass of the cork is 4.8 g.

What is the density of the cork?

A 0.15 g / cm^3 **B** 0.20 g / cm^3 **C** 0.60 g / cm^3 **D** 5.0 g / cm^3

7 A uniform plank rests on a pivot at its centre.

Two children P and Q sit on the plank in the positions shown.



The mass of child P is 25 kg.

The plank is balanced.

What is the mass of child Q?

A 20 kg **B** 25 kg **C** 31 kg **D** 45 kg

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8 An object is in equilibrium on the Earth.

Which statement is correct?

A All the forces acting on the object are in the same direction.

B All the forces acting on the object have the same value.

C The object is weightless.

D The resultant force acting on the object is zero.

9 A man jumps from a stationary balloon. After falling several hundred metres, he opens his parachute.

At which position is his kinetic energy greatest?

A just after he jumps from the balloon

B just before he opens his parachute

C just after his parachute opens

D just before he lands

10 The arrows show an outline of the processes in an oil-fired power station.

oil is burnt → turns turbine → turns generator → output transformer

What are the processes for the transfer of energy between the turbine and the generator and between the generator and the output transformer?

	turbine to generator	generator to output transformer
A	electrical working	electrical working
B	mechanical working	electrical working
C	mechanical working	transfer of thermal energy
D	transfer of thermal energy	mechanical working

11 To calculate the power produced by a force, the size of the force must be known.

What else needs to be known to calculate the power?

	the distance that the force moves the object	the time for which the force acts on the object
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

key

✓ = needed

✗ = not needed

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12 A rectangular marble block has dimensions 1 m by 1 m by 5 m and weighs 125 000 N.

The marble block is stored with the long side resting on the ground, as in diagram 1.

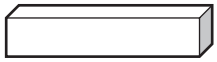


diagram 1



diagram 2

What is the change in the pressure on the ground due to the block when the block is stored as in diagram 2 rather than diagram 1?

A a decrease of 25 000 Pa

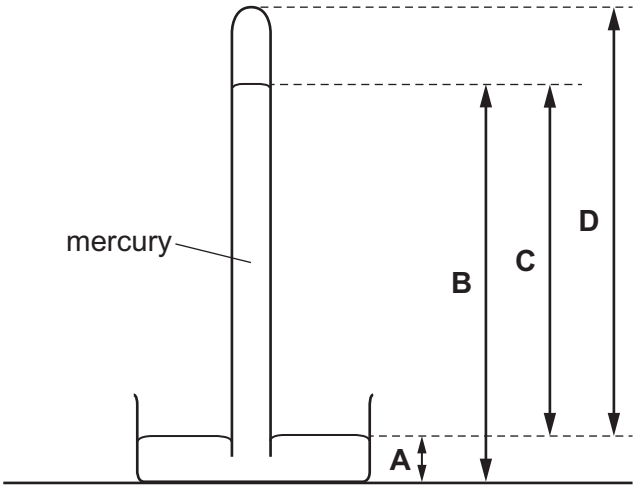
B an increase of 100 000 Pa

C an increase of 125 000 Pa

D no change

13 The diagram shows a mercury barometer.

Which height is used as a measurement of atmospheric pressure?



14 On a warm day, a driver checks the air pressure in a car tyre. At night, the temperature drops and the air pressure in the tyre decreases. There are no air leaks in the tyre.

Why does the pressure decrease?

A The air molecules in the tyre move more slowly.

B The air molecules in the tyre stop moving.

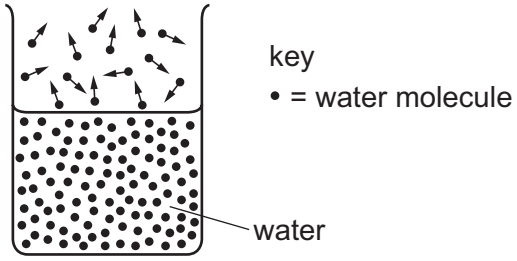
C The volume of the air in the tyre decreases.

D The volume of the air in the tyre increases.

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15 The diagram shows the more energetic water molecules escaping from the surface of liquid water.



What is this process called?

A Brownian motion

B condensation

C evaporation

D conduction

16 When a bridge is built, a gap is left between each concrete slab.

Why are these gaps left?

A Concrete expands on warm days.

B Concrete contracts on warm days.

C The gaps expand on warm days.

D The gaps contract on cold days.

17 The table shows the melting and boiling points of four different substances.

Which substance becomes a liquid when placed in a beaker of boiling water?

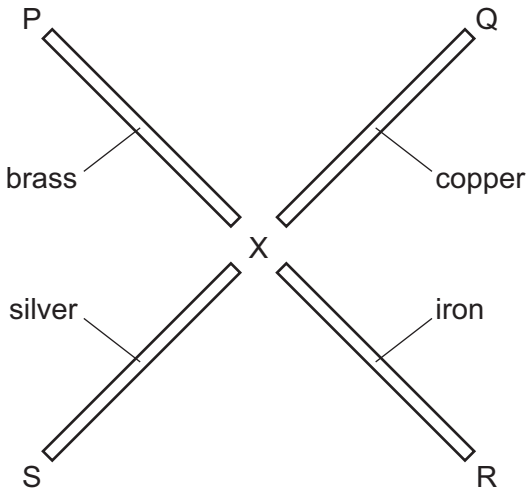
	melting point / °C	boiling point / °C
A	10	90
B	40	150
C	105	230
D	110	320

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18 The diagram shows four rods. Each rod is made of a different metal.



Wax is used to attach small metal balls at the rod ends P, Q, R and S.

Each rod is the same size. They are heated uniformly by a Bunsen burner at point X.

As the rods warm up, the wax melts and the balls fall off.

Why does the ball on the silver rod fall first?

A Silver is the best conductor of heat.

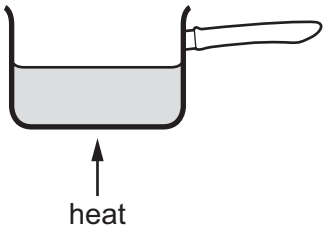
B Silver is the worst conductor of heat.

C Silver is the best radiator of heat.

D Silver is the worst radiator of heat.

19 The diagram shows a pan of water being heated.

After a short time, all the water in the pan begins to boil.



What is the main process by which thermal energy is transferred through the water?

A conduction

B convection

C evaporation

D radiation

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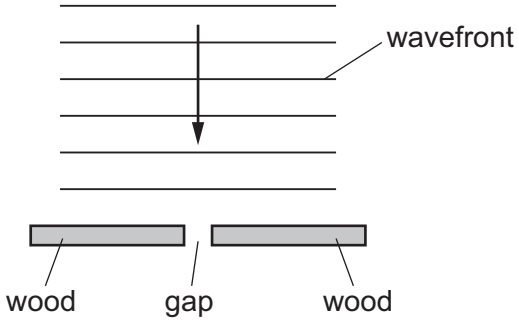
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20 Which row correctly describes light waves?

	wave type	direction of vibrations
A	longitudinal	parallel to direction of wave travel
B	longitudinal	perpendicular to direction of wave travel
C	transverse	parallel to direction of wave travel
D	transverse	perpendicular to direction of wave travel

21 The diagram shows two pieces of wood resting in shallow water of constant depth.

Straight, parallel wavefronts approach the pieces of wood as indicated.



The gap between the pieces of wood is 2.0 cm wide.

The wavefronts are 3.0 cm apart.

What is the appearance of the wavefronts after they pass through the gap?

A semicircular and 2.0 cm apart

B semicircular and 3.0 cm apart

C straight and 2.0 cm apart

D straight and 3.0 cm apart

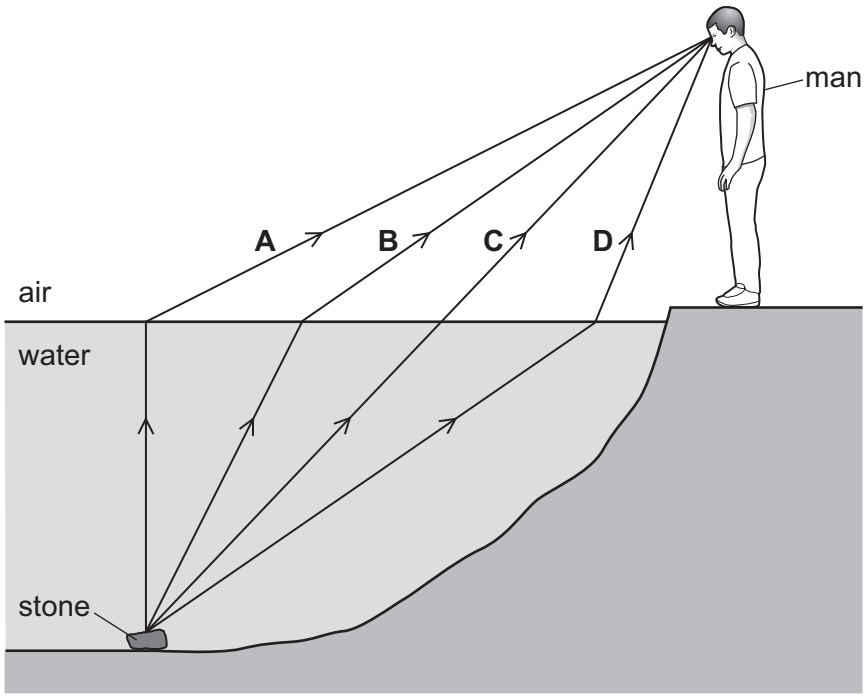
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22 A man sees a stone at the bottom of a pool of water.

Which path could be taken by light from the stone to the man?



23 Which statement about a thin converging lens is correct?

A All rays of light refracted by the lens pass through the principal focus.

B All rays initially parallel to the principal axis of the lens are refracted through the principal focus.

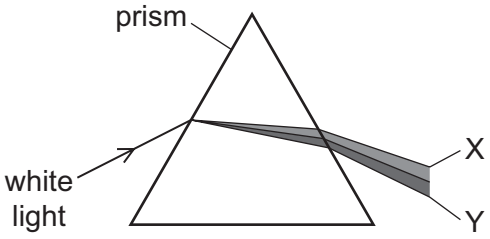
C The focal length of the lens is the distance between the image and the principal focus.

D The focal length of the lens is the distance between the object and the image.

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24 The diagram shows a beam of white light passing through a triangular prism. A spectrum is produced.



Which row correctly shows a wave property involved in producing the colours at X and Y?

	wave property	X	Y
A	diffraction	red	violet
B	dispersion	red	violet
C	reflection	violet	red
D	refraction	violet	red

25 The diagram shows the electromagnetic spectrum.

γ-rays	E	ultraviolet	F	infrared	microwaves	G

Which types of wave are E, F and G?

	E	F	G
A	radio	visible light	X-rays
B	radio	X-rays	ultrasound
C	X-rays	radio	ultrasound
D	X-rays	visible light	radio

26 A police car with its siren sounding is stationary in heavy traffic. A pedestrian notices that, although the loudness of the sound produced does not change, the pitch varies.

Which row describes the amplitude and the frequency of the sound?

	amplitude	frequency
A	constant	constant
B	constant	varying
C	varying	constant
D	varying	varying

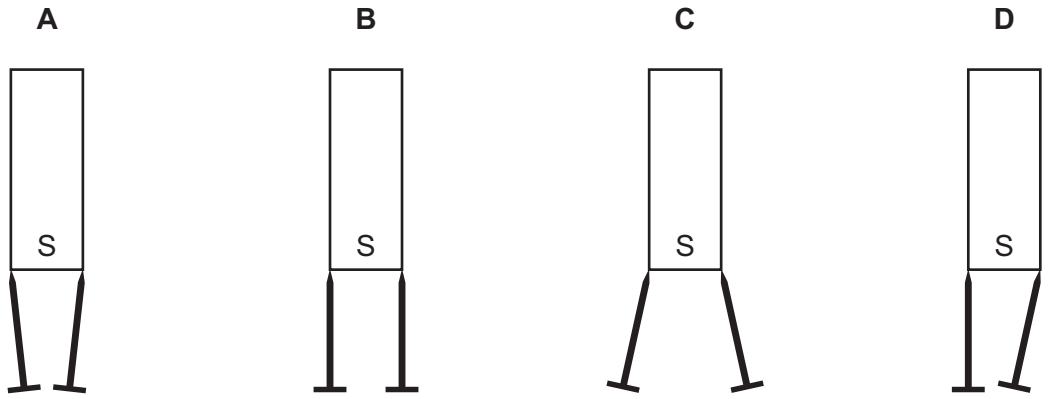
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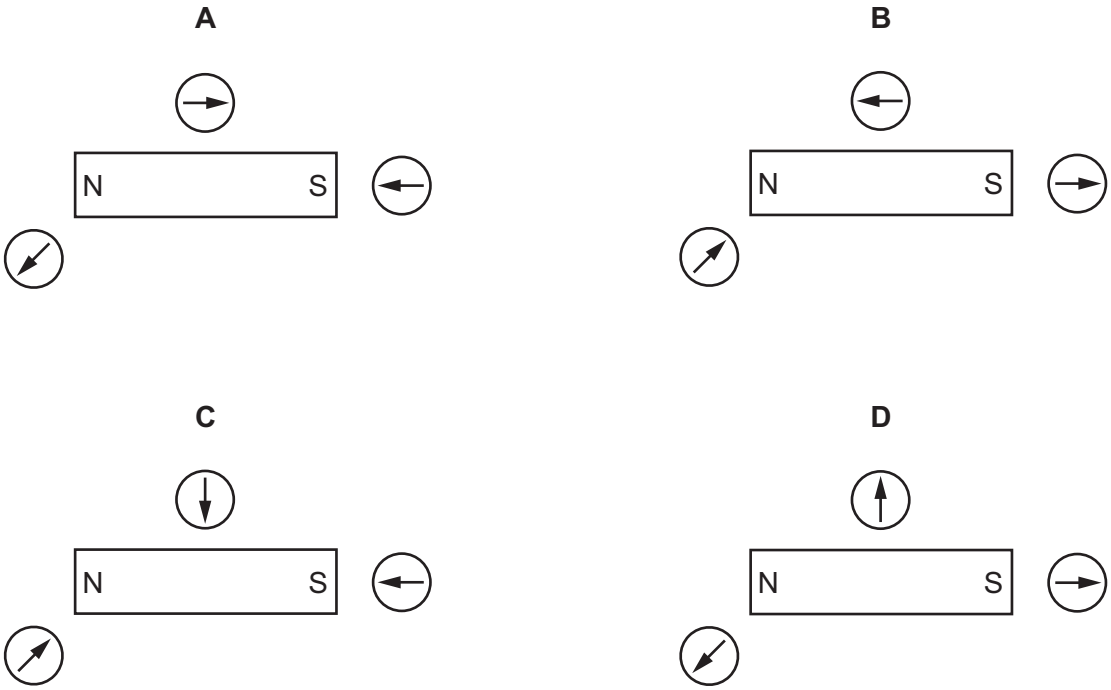
27 Two soft-iron pins are suspended from the S pole of a bar magnet.

Which diagram shows how the pins are deflected?



28 A student uses three small plotting compasses to investigate the magnetic field around a bar magnet.

Which diagram shows the directions in which the compass needles point?



29 What is an electric current in a metal wire?

A a flow of electrons

B a flow of neutrons

C a flow of nucleons

D a flow of protons

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30 Four wires are made of the same metal.

Which wire has the greatest resistance?

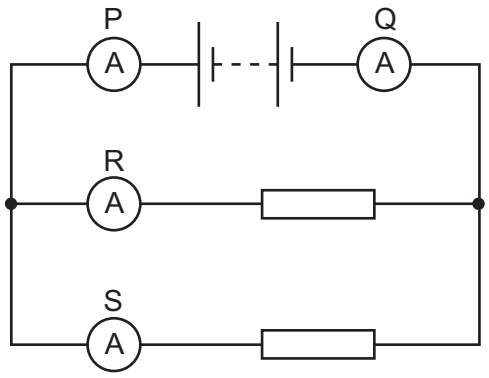
A a 100 cm long wire with a diameter of 3.0 mm

B a 100 cm long wire with a diameter of 6.0 mm

C a 10 cm long wire with a diameter of 3.0 mm

D a 10 cm long wire with a diameter of 6.0 mm

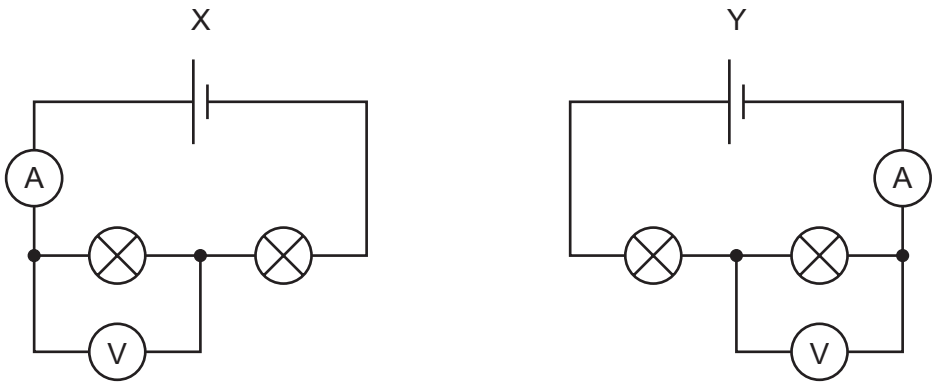
31 A student uses four ammeters P, Q, R and S to measure the current in different parts of the circuit shown.



Which two ammeters read the largest current?

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

32 A circuit X is set up with two identical lamps. Circuit Y is then set up, changing the positions of the meters.



On which meters do the readings change?

A both the ammeter and the voltmeter

B the ammeter only

C the voltmeter only

D neither the ammeter nor the voltmeter

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33 An electrical appliance is powered from a mains supply.

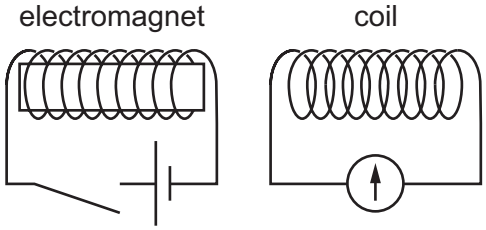
The appliance normally uses a current of 3 A, but the current briefly rises to 4 A at the instant the appliance is switched on. The cable to the appliance is designed for currents up to 6 A.

A fuse is used to protect the circuit.

What should be the rating of the fuse?

A 1 A **B** 3 A **C** 5 A **D** 13 A

34 An electromagnet is positioned close to a coil of wire.



The electromagnet is switched on, remains on for a short time, and is then switched off.

Three statements about the pointer on the galvanometer during this sequence are given.

1 The pointer kicks to one side as the electromagnet is switched on.

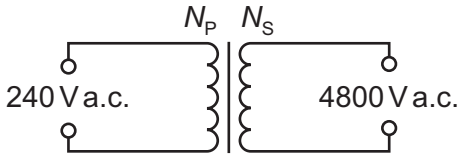
2 The pointer records a steady non-zero value while the electromagnet remains switched on.

3 The pointer kicks to the other side as the electromagnet is switched off.

Which statements are correct?

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

35 A transformer is needed to convert a supply of 240 V a.c. into 4800 V a.c..



Which pair of coils would be suitable for this transformer?

	number of turns on primary coil N_P	number of turns on secondary coil N_S
A	50	1 000
B	240	48 000
C	480	24
D	2000	100

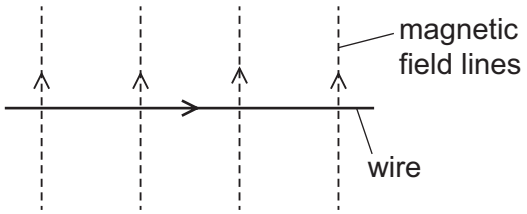
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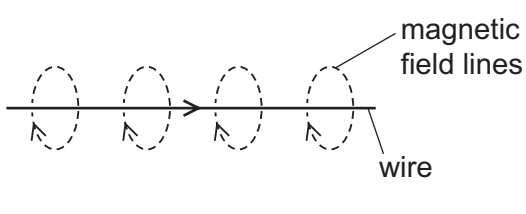
36 The diagrams show a current-carrying wire with an arrow in the direction of the current.

Which diagram shows the magnetic field produced by the current?

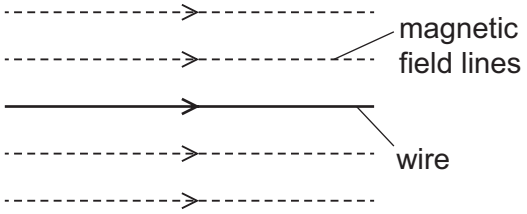
A



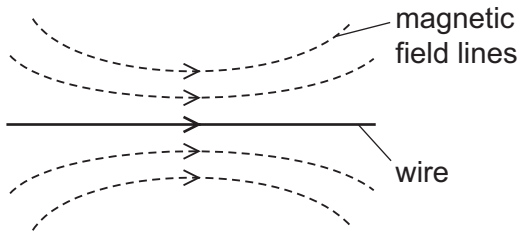
B



C



D



37 Which statement is correct for the nucleus of **any** atom?

A The nucleus contains electrons, neutrons and protons.

B The nucleus contains the same number of protons as neutrons.

C The nucleus has a total charge of zero.

D The nucleus is very small compared with the size of the atom.

38 The nucleus of an atom X is represented by the notation shown.

$$^{P}_{Q}X$$

How many protons and how many neutrons are in this nucleus?

	number of protons	number of neutrons
A	P	Q
B	P	Q – P
C	Q	P
D	Q	P – Q

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39 A radiation detector records a low reading even when no radioactive source is close. This is due to background radiation.

What does **not** contribute to this background radiation?

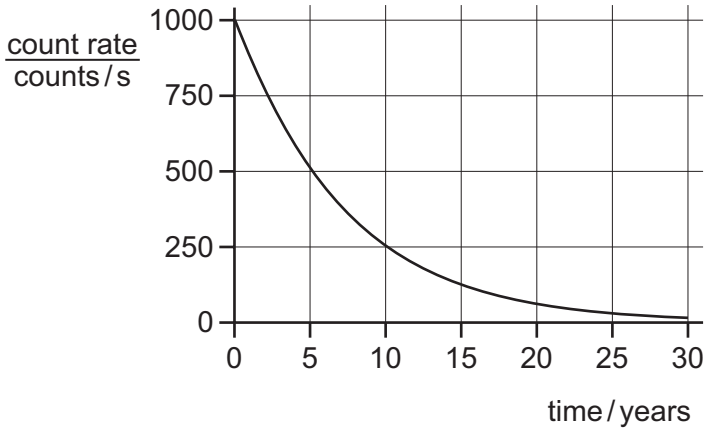
A rocks on Earth

B cosmic rays from the Sun

C satellite TV signals

D waste from nuclear power stations

40 The graph shows the radioactive decay curve of a substance.



What is the half-life of this substance?

A 0.5 years **B** 5 years **C** 15 years **D** 30 years

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