Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

PHYSICS **0625/11**

Paper 1 Multiple Choice (Core) **May/June 2017**

45 minutes

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

MODIFIED LANGUAGE

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 **19** printed pages and **1** blank page.

1 A stopwatch is used to time a runner in a race. The diagrams show the stopwatch at the start and at the end of the race.

start

end

How long did the runner take to run the race?

A 70.00 seconds

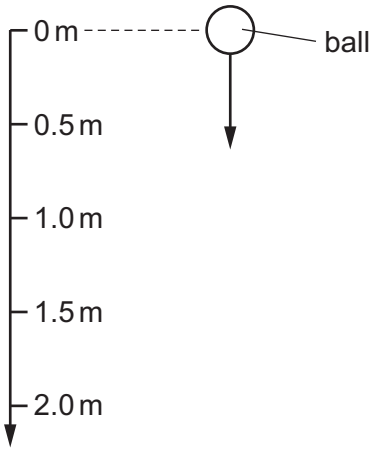
B 110.00 seconds

C 115.20 seconds

D 155.20 seconds

2 On Earth, a ball is dropped and falls 2.0 m in a vacuum.

The acceleration of the ball at 1.0 m is 10 m / s^2.

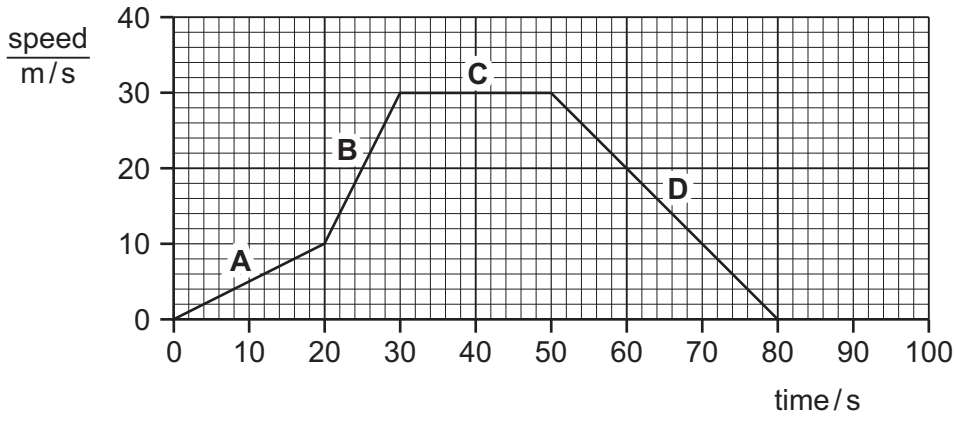


What is the acceleration of the ball at 0.5 m?

A 5.0 m / s^2 **B** 10 m / s^2 **C** 15 m / s^2 **D** 20 m / s^2

3 The speed-time graph represents a motorcycle journey.

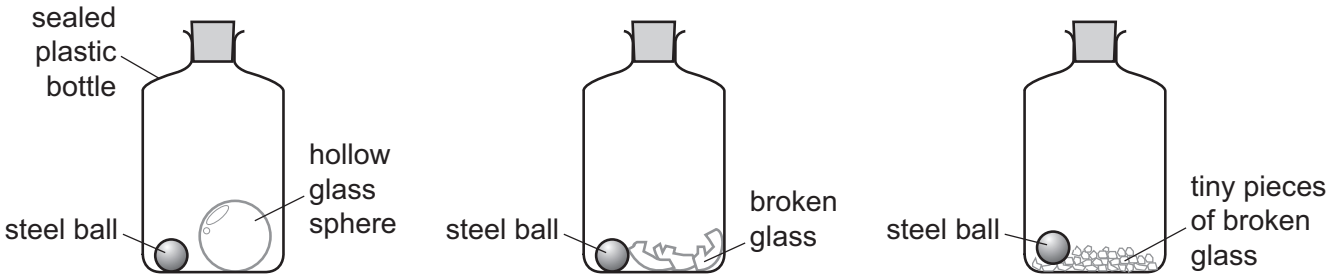
In which part of the graph is the acceleration equal to zero?



4 Diagram 1 shows a sealed plastic bottle containing a hollow glass sphere and a steel ball.

Diagram 2 shows the same bottle after it has been shaken.

Diagram 3 shows the same bottle after it has been shaken again until the broken glass is in tiny pieces.



The mass of the bottle and contents in diagram 1 is m_1.

The mass of the bottle and contents in diagram 2 is m_2.

The mass of the bottle and contents in diagram 3 is m_3.

Which statement gives the correct relation between m_1, m_2 and m_3?

A m_1 is equal to m_2 and m_2 is equal to m_3.

B m_1 is greater than m_2 and m_2 is greater than m_3.

C m_1 is less than m_2 and m_2 is greater than m_3.

D m_1 is less than m_2 and m_2 is less than m_3.

[Turn over

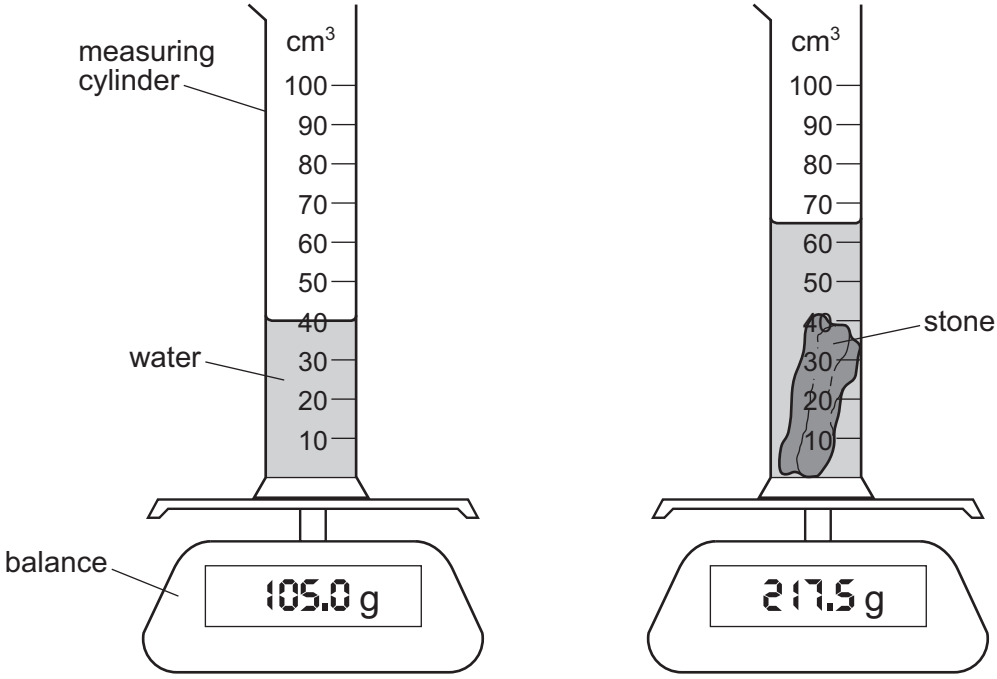
5 A student is weighed on laboratory scales.

Which row about weight and mass is correct?

	unit of weight	unit of mass
A	kg	kg
B	kg	N
C	N	kg
D	N	N

6 A measuring cylinder containing only water is placed on an electronic balance. A small, irregularly shaped stone is now completely immersed in the water.

The diagrams show the equipment before and after the stone is immersed.



What is the density of the material of the stone?

A $1.7\,g/cm^3$ **B** $3.3\,g/cm^3$ **C** $4.5\,g/cm^3$ **D** $8.7\,g/cm^3$

7 A boat is travelling at a steady speed in a straight line across the surface of a lake.

Which statement about the boat is correct?

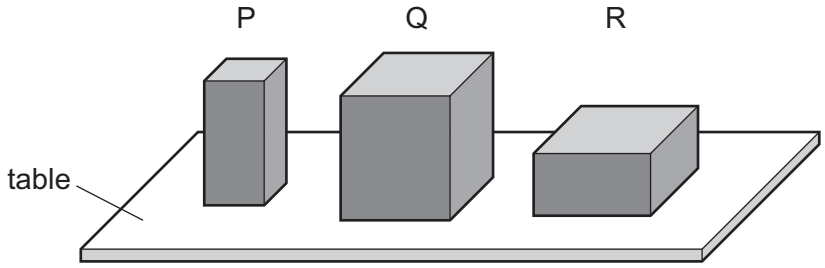
A The resultant force on the boat is in the direction of motion.

B The resultant force on the boat is in the opposite direction to its motion.

C The resultant force on the boat is vertically downwards.

D The resultant force on the boat is zero.

8 The diagram shows three uniform, solid wooden blocks with a square cross-sectional area resting on a horizontal table.



Which list puts the blocks in order from the **least** stable to the **most** stable?

A P → Q → R

B P → R → Q

C R → P → Q

D R → Q → P

9 Energy resources are used to generate electricity.

Which resource is renewable and does **not** release carbon dioxide when being used to produce electricity?

A biomass

B nuclear

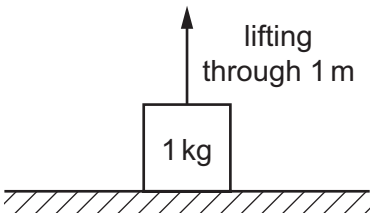
C oil

D wind

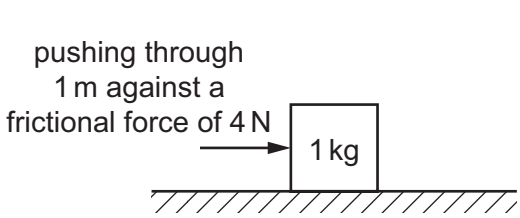
10 A student does some simple exercises.

In which exercise is the most work done?

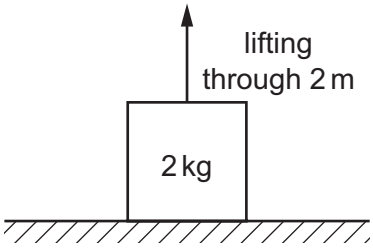
A



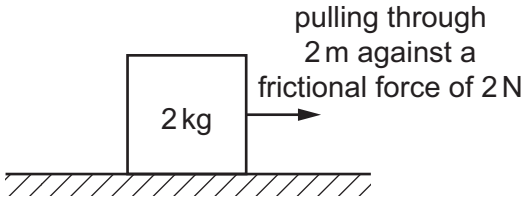
B



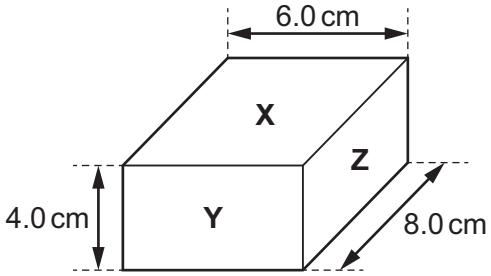
C



D



11 The diagram shows a box of dimensions 6.0 cm × 8.0 cm × 4.0 cm.



The box rests on a flat horizontal surface.

On which face must the box rest to exert the least pressure?

A face **X**

B face **Y**

C face **Z**

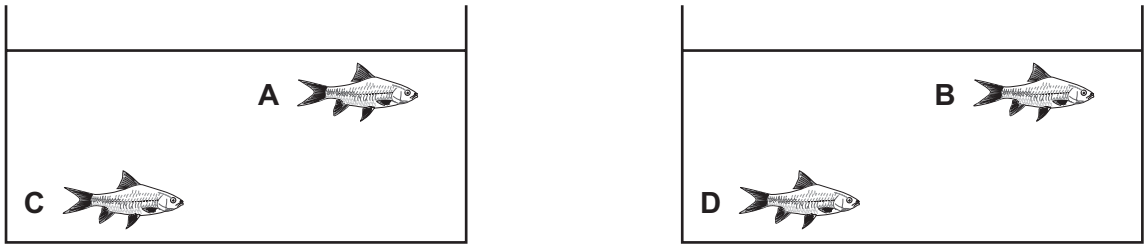
D The pressure is the same for all the faces.

12 Two identical fish tanks are filled to the same level with water.

One tank contains fresh water. The other tank contains sea-water.

Sea-water is more dense than fresh water.

Which fish experiences the greatest pressure?



fresh water sea-water

13 A student has a syringe which has its open end sealed. The syringe is completely filled with a certain substance, as shown in diagram 1. The student pushes the piston of the syringe in as far as possible, as shown in diagram 2.

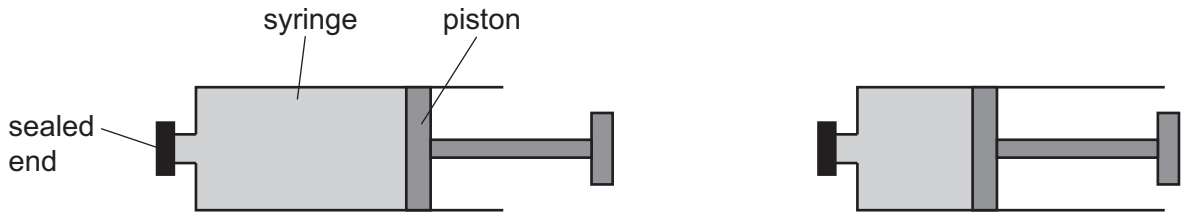


diagram 1 diagram 2

What is in the syringe?

A a gas and a liquid

B a solid and a liquid

C a liquid only

D a solid only

14 When a microscope is used to look at smoke particles in air, Brownian motion is observed.

What causes the smoke particles to move at random?

A Smoke particles are hit by air molecules.

B Smoke particles are moved by convection currents in the air.

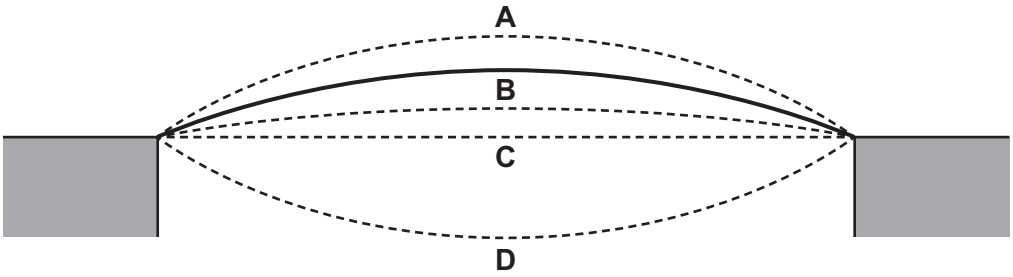
C Smoke particles have different weights and fall at different speeds.

D Smoke particles hit the walls of the container.

15 The diagram shows a metal foot bridge located in the Sahara desert where the temperature is much less at night than during the day. The ends of the bridge are firmly fixed to the sides of a narrow valley.

The solid line shows the bridge during the coldest part of the night.

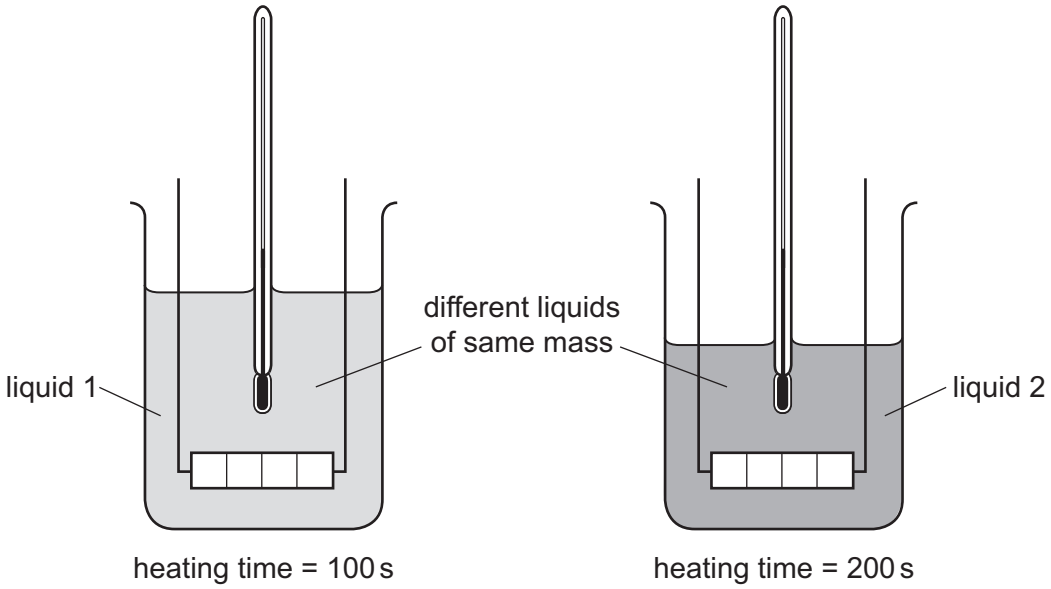
Which dotted line shows the bridge at the hottest part of the day?



16 Equal masses of two different liquids are put into identical beakers.

Liquid 1 is heated for 100 s and liquid 2 is heated for 200 s by heaters of the **same power**.

Each liquid has the same rise in temperature.



Which statement is correct?

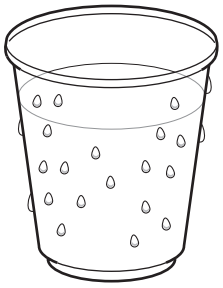
A Each beaker of liquid has the same thermal capacity.

B Each beaker of liquid receives the same energy.

C Liquid 1 receives more energy than liquid 2.

D The thermal capacity of liquid 1 is less than the thermal capacity of liquid 2.

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



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

A condensation

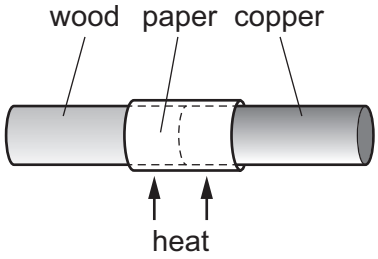
B conduction

C convection

D evaporation

18 A copper bar and a wooden bar are joined. A piece of paper is wrapped tightly around the join.

The bar is heated strongly at the centre for a short time, and the paper goes brown on one side only.



Which side goes brown, and what does this show about wood and copper?

	brown side	wood	copper
A	copper	conductor	insulator
B	copper	insulator	conductor
C	wood	conductor	insulator
D	wood	insulator	conductor

19 Four identical metal plates are painted either black or white and have either a dull or a shiny surface.

They are heated to the same temperature.

Which plate radiates thermal energy at the greatest rate?

A the plate that is dull and black

B the plate that is dull and white

C the plate that is shiny and black

D the plate that is shiny and white

20 What causes the change in direction when light travels from air into glass?

A The amplitude of the light changes.

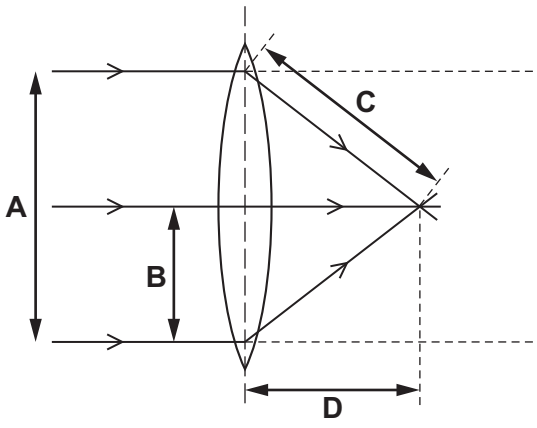
B The colour of the light changes.

C The frequency of the light changes.

D The speed of the light changes.

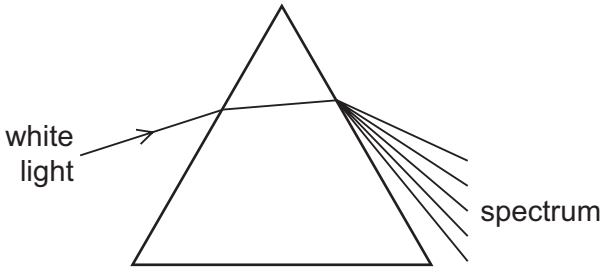
21 The diagram shows rays of light passing through a converging lens.

Which labelled arrow represents the focal length of the lens?

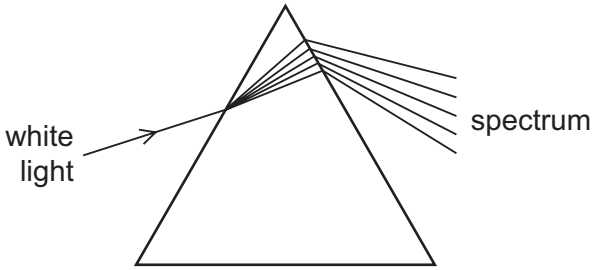


22 Which diagram shows what happens when a ray of white light passes through a prism?

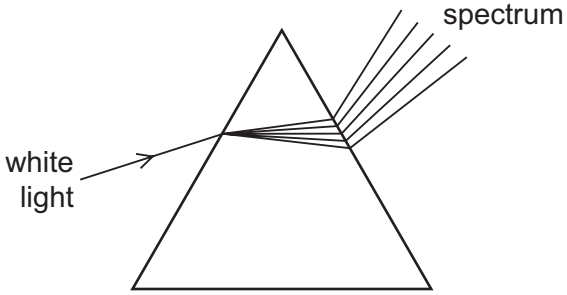
A



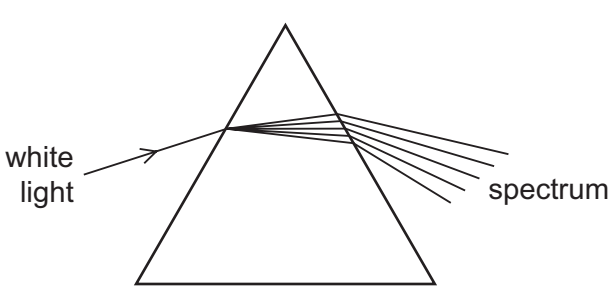
B



C



D



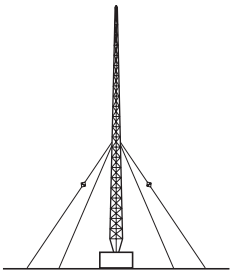
23 The diagrams show four sources of waves.

Which source produces longitudinal waves?

A

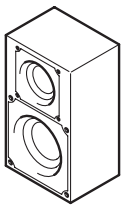
stick pushed up and down in water

B



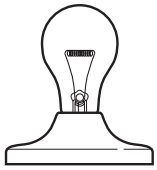
radio transmitter

C



loudspeaker

D



lamp

24 The table shows different types of wave in the electromagnetic spectrum.

radio waves	micro-waves	infra-red waves	visible light	ultraviolet waves	X-rays	gamma rays

Where do all the waves travel at the same speed?

A in a vacuum

B in diamond

C in glass

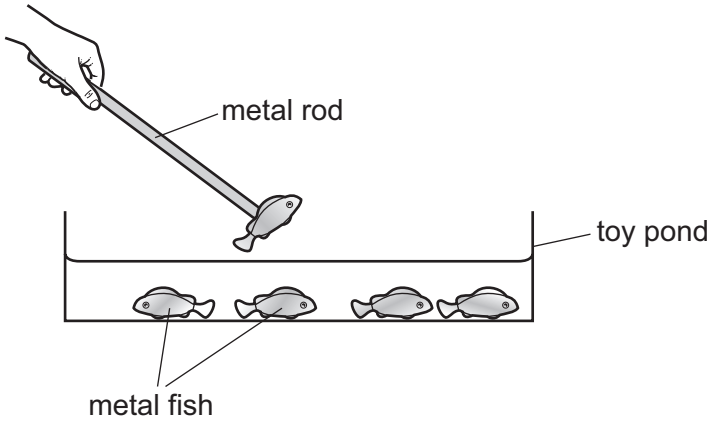
D in water

25 A fire alarm is not loud enough and the pitch is too low. An engineer adjusts the alarm so that it produces a louder note of a higher pitch.

What effect does this have on the amplitude and on the frequency of the sound?

	amplitude	frequency
A	larger	greater
B	larger	smaller
C	smaller	greater
D	smaller	smaller

26 In a child's toy, a metal rod is used to lift metal fish out of a toy pond. The fish are magnetically attracted to the end of the rod. There is no magnetic force between the fish.

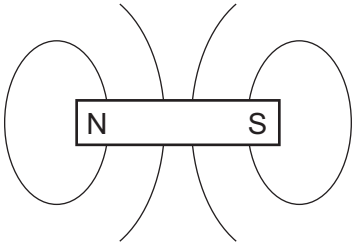


What are possible materials from which the fish and the rod are made?

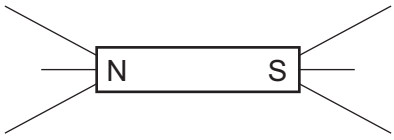
	fish	rod
A	aluminium	soft iron
B	aluminium	steel
C	soft iron	soft iron
D	soft iron	steel

27 Which diagram shows the pattern of magnetic field lines around a bar magnet?

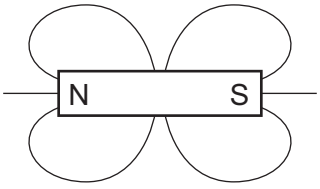
A



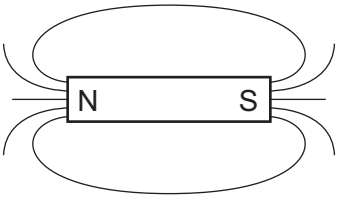
B



C



D



28 A student rubs a plastic rod with a cloth.

The rod becomes positively charged.

What has happened to the rod?

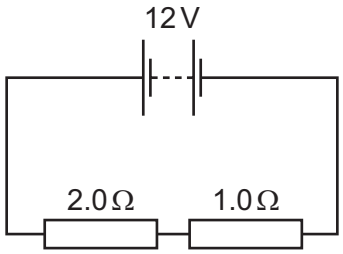
A It has gained electrons.

B It has gained protons.

C It has lost electrons.

D It has lost protons.

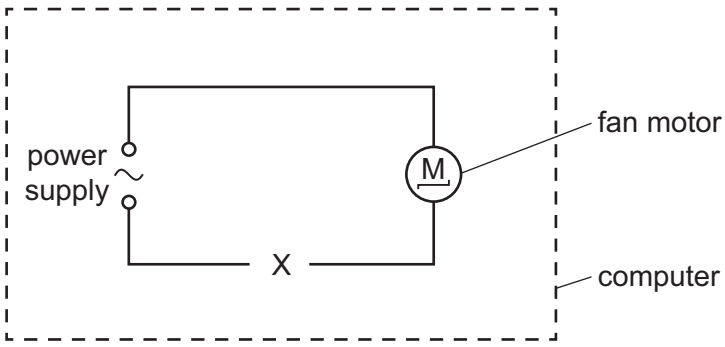
29 The circuit shows a 2.0 Ω resistor and a 1.0 Ω resistor connected to a 12 V battery.



What is the current in the 2.0 Ω resistor?

A 4.0 A **B** 6.0 A **C** 24 A **D** 36 A

30 A computer engineer wants the speed of a fan to increase automatically when the temperature inside a computer rises. The engineer knows that a larger current causes the fan to turn more quickly.



Which component should be placed at X to make this happen?

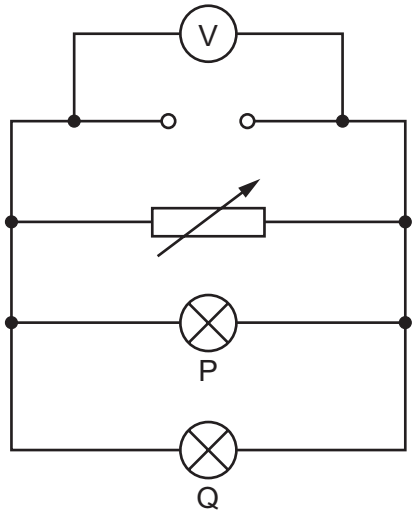
A a relay

B a thermistor

C a transformer

D a variable resistor

31 The diagram shows a power supply with a constant electromotive force (e.m.f.). It is connected to a voltmeter, a variable resistor and two identical lamps, P and Q. Both lamps are lit.

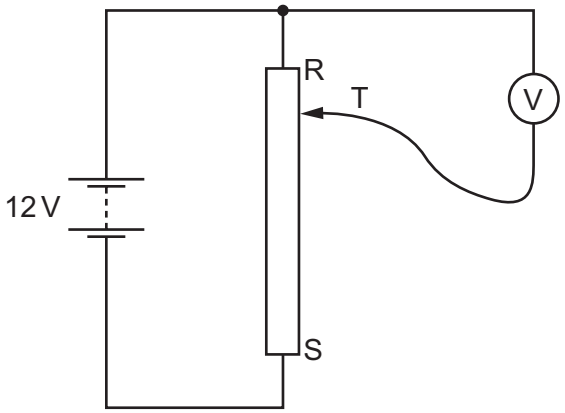


The resistance of the variable resistor is increased. The voltmeter reading remains unchanged.

What happens to the brightness of the lamps?

	lamp P	lamp Q
A	brighter	brighter
B	dimmer	dimmer
C	dimmer	unchanged
D	unchanged	unchanged

32 A student connects a variable potential divider (potentiometer) circuit.



As the sliding terminal T is moved from R to S, what happens to the reading on the voltmeter?

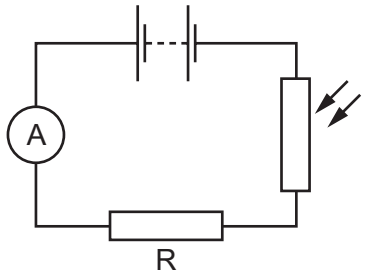
A It decreases from 12 V to 0 V.

B It increases from 0 V to 12 V.

C It remains at 0 V.

D It remains at 12 V.

33 A light-dependent resistor (LDR) and a resistor R are connected in a series circuit. Light falls on the LDR.



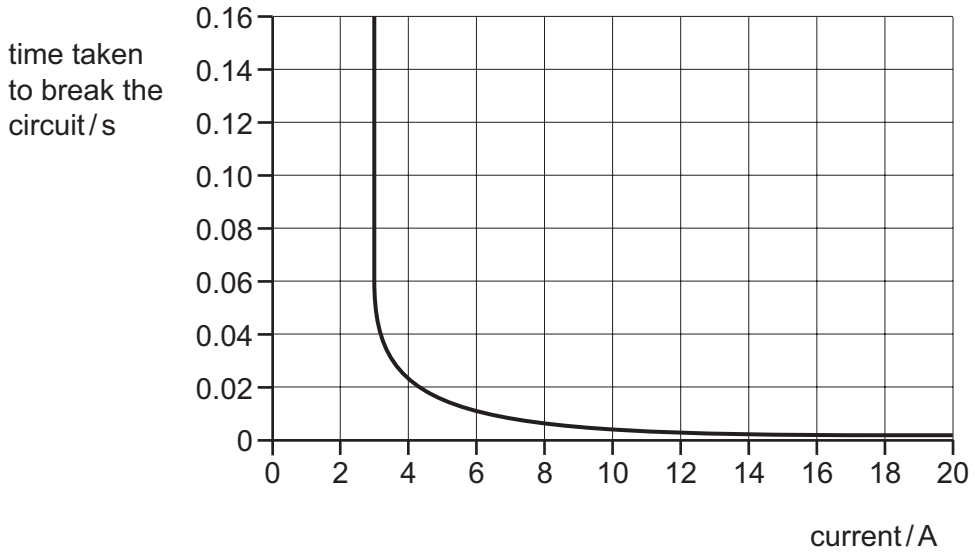
The brightness of the light falling on the LDR decreases.

What happens to the resistance of the LDR and what happens to the reading on the ammeter?

	resistance of LDR	reading on ammeter
A	decreases	decreases
B	decreases	increases
C	increases	decreases
D	increases	increases

34 A circuit-breaker is designed to protect a circuit which usually carries a current of 2 A.

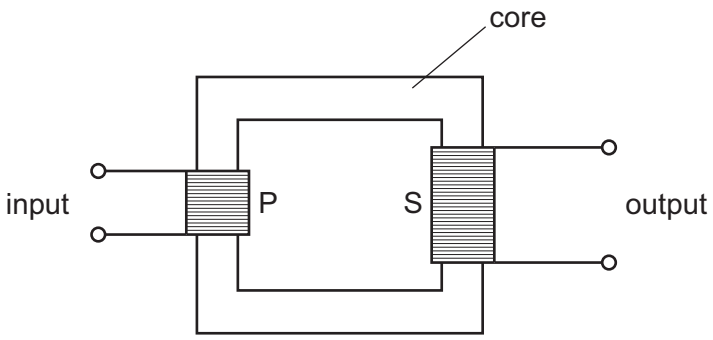
The time taken to break the circuit depends on the current, as shown in the graph.



What happens when the current in the circuit is 2 A and what happens when the current is 18 A?

	when the current is 2 A	when the current is 18 A
A	the circuit breaks in less than 0.01 s	the circuit breaks in less than 0.01 s
B	the circuit breaks in less than 0.01 s	the circuit does not break
C	the circuit does not break	the circuit breaks in less than 0.01 s
D	the circuit does not break	the circuit does not break

35 The diagram shows a transformer with primary coil P and secondary coil S. The input potential difference across coil P is V_P. The output potential difference across coil S is V_S. The number of turns in coil P is N_P. The number of turns in coil S is N_S.



Which equation relates the input and output voltages to the numbers of turns in P and in S?

A $\frac{V_P}{V_S} = \frac{N_P}{N_S}$

B $V_P \times V_S = N_P \times N_S$

C $\frac{V_P}{V_S} = \frac{N_S}{N_P}$

D $\frac{V_P}{V_S} = \frac{N_P}{(N_P + N_S)}$

36 What is the purpose of a relay?

A to change a large voltage into a small voltage

B to change a small voltage into a large voltage

C to use a large current to switch on a small current

D to use a small current to switch on a large current

37 Which row gives the relative charge of an electron, a neutron and a proton?

	electron	neutron	proton
A	–1	0	–1
B	–1	0	+1
C	+1	–1	0
D	+1	0	+1

38 An element has two isotopes.

Which row compares the numbers of particles in the nuclei of the atoms of these isotopes?

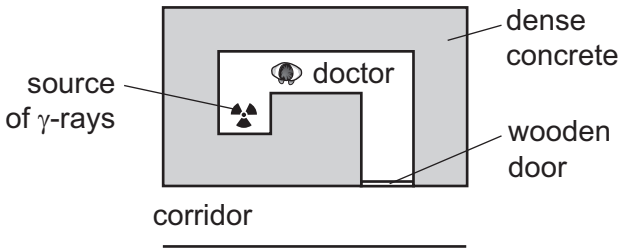
	number of neutrons	number of protons	number of nucleons
A	different	the same	different
B	different	the same	the same
C	the same	different	different
D	the same	different	the same

39 A hospital doctor is using a source of γ-rays for a medical treatment.

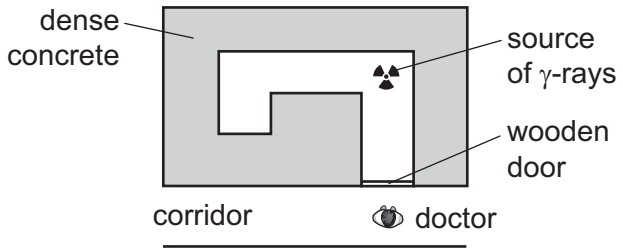
Each diagram shows a view from above of the treatment room.

Which diagram shows the best way to protect the doctor and staff in the corridor from the γ-rays?

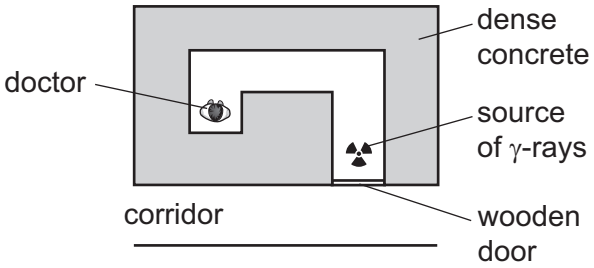
A



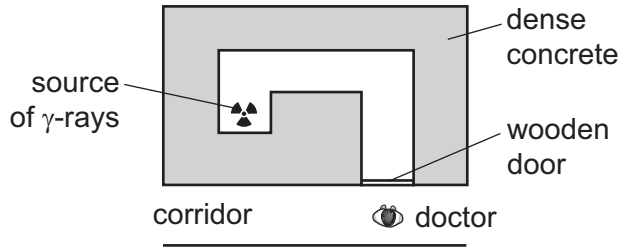
B



C



D



40 A sample of radioactive isotope is decaying.

The nuclei of which atoms will decay first?

A It is impossible to know because radioactive decay is random.

B It is impossible to know unless the age of the material is known.

C The atoms near the centre will decay first because they are surrounded by more atoms.

D The atoms near the surface will decay first because the radiation can escape more easily.

BLANK PAGE