UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

PHYSICS **0625/12**

Paper 1 Multiple Choice **May/June 2012**

45 minutes

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

* 8 6 8 3 7 6 9 7 6 9 *

READ THESE INSTRUCTIONS FIRST

Write in soft pencil.
Do not use staples, paper clips, highlighters, 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.

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.

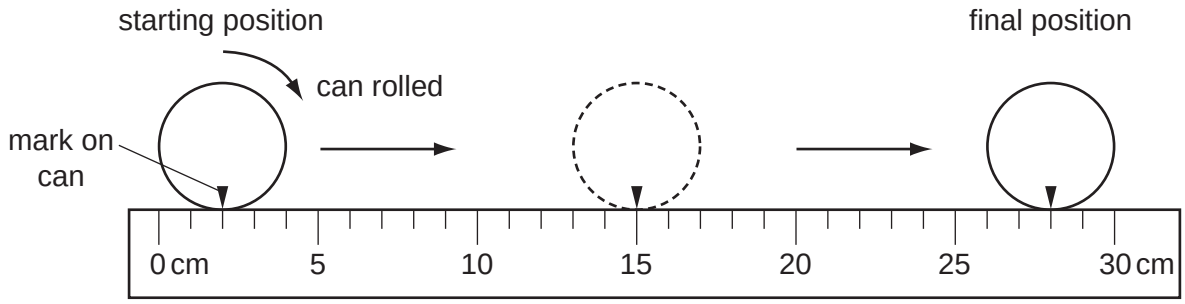
Read the instructions on the Answer Sheet very carefully.

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.

This document consists of **17** printed pages and **3** blank pages.

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1 A cylindrical can is rolled along the ruler shown in the diagram.

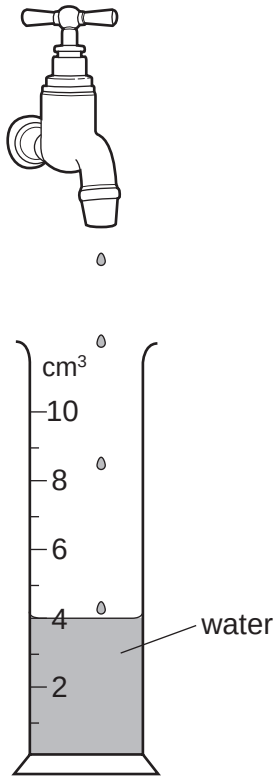


The can rolls over twice.

What is the circumference (distance all round) of the can?

A 13 cm **B** 14 cm **C** 26 cm **D** 28 cm

2 Drops of water are dripping steadily from a tap (faucet). The diagram shows a measuring cylinder which has collected 120 drops of water.



How many drops in total will have been collected when the measuring cylinder reads 10 cm^3?

A 48 **B** 60 **C** 180 **D** 300

3 In a race, a car travels 60 times around a 3.6 km track. This takes 2.4 hours.

What is the average speed of the car?

A 1.5 km / h **B** 90 km / h **C** 144 km / h **D** 216 km / h

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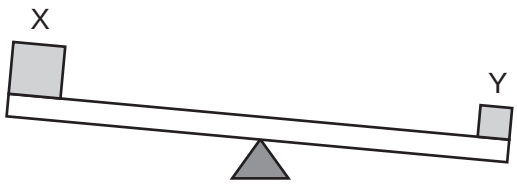
4 A metal block is heated until it is completely melted. It is then allowed to solidify.

What happens to the mass of the metal during the changes of state?

	mass during melting	mass during solidification
A	decreases	increases
B	increases	decreases
C	increases	stays constant
D	stays constant	stays constant

5 Two objects X and Y are placed on a balance.

The balance tilts as shown.



What does this show about the masses and weights of objects X and Y?

	masses	weights
A	X has less mass than Y	X has less weight than Y
B	X has less mass than Y	X has more weight than Y
C	X has the same mass as Y	X has less weight than Y
D	X has the same mass as Y	X has more weight than Y

6 A stone has a volume of $0.50\,cm^3$ and a mass of $2.0\,g$.

What is the density of the stone?

A $0.25\,g/cm^3$

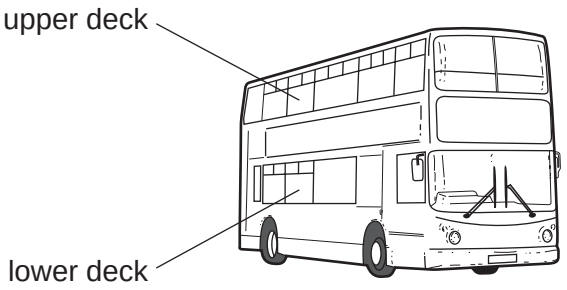
B $1.5\,g/cm^3$

C $2.5\,g/cm^3$

D $4.0\,g/cm^3$

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7 Passengers are **not** allowed to stand on the upper deck of double-decker buses.



Why is this?

A They would cause the bus to become less stable.

B They would cause the bus to slow down.

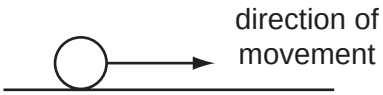
C They would increase the kinetic energy of the bus.

D They would lower the centre of mass of the bus.

8 On which ball is a non-zero resultant force acting?

A

a ball moving at constant speed on a smooth surface



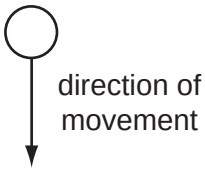
B

a ball at rest on a bench



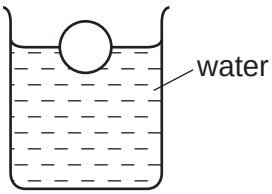
C

a free-falling ball which has just been released



D

a ball floating on water



9 Electricity can be obtained from different energy resources.

Which energy resource is used to obtain electricity without producing heat to boil water?

A coal

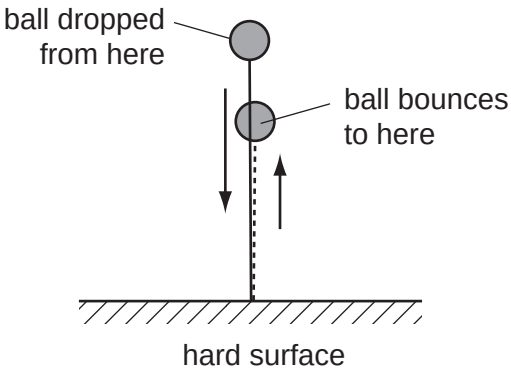
B gas

C hydroelectric

D nuclear

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10 A ball is dropped on to a hard surface and bounces. It does not bounce all the way back to where it started, so it has less gravitational potential energy than when it started.



What happens to the 'lost' energy?

A It is converted into chemical and strain energy.

B It is converted into internal (heat) energy and sound.

C It is destroyed as the ball rises upwards after hitting the ground.

D It is destroyed when the ball hits the ground.

11 What does a barometer measure?

A atmospheric density

B atmospheric pressure

C liquid density

D liquid pressure

12 In which position would a boy exert the **most** pressure on the ground?

A lying on his back

B sitting down

C standing on one foot

D standing on two feet

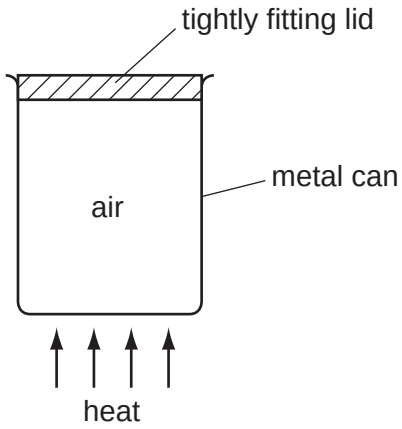
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13 On a warm day, a swimmer climbs out of a swimming pool into the open air and water evaporates from his skin.

As the water evaporates, which molecules escape into the air first and what happens to the average speed of the remaining water molecules?

	first molecules to escape	average speed of the remaining molecules
A	least energetic	decreases
B	least energetic	increases
C	most energetic	decreases
D	most energetic	increases

14 Some air is trapped inside a metal can with a tightly fitting lid.



When the can is heated strongly behind a safety screen, the lid is blown off by the increased pressure inside the can.

What causes the increase in pressure of the air inside the can?

A The air molecules expand and take up more room.

B The air molecules move more quickly.

C The number of molecules inside the can increases.

D The volume occupied by the molecules decreases.

15 A solid object has a very large thermal capacity.

What does this mean?

A A large amount of energy is needed to make the object become hot.

B A large amount of energy is needed to make the object melt.

C A small amount of energy is needed to make the object become hot.

D A small amount of energy is needed to make the object melt.

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16 A hot drink is left in a room that is at a temperature of 20 °C.

What has happened to the drink after ten minutes?

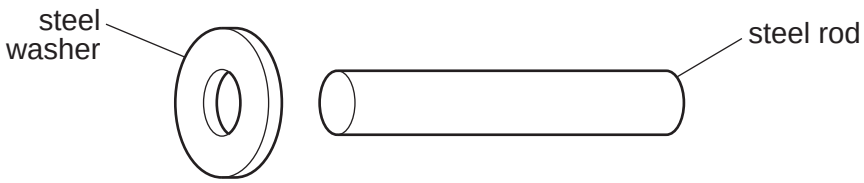
A Its density is lower.

B Its internal energy is lower.

C Its particles have equal energies.

D Its particles move more quickly.

17 An engineer wants to fix a steel washer on to a steel rod. The rod is just too big to fit into the hole of the washer.



How can the engineer fit the washer on to the rod?

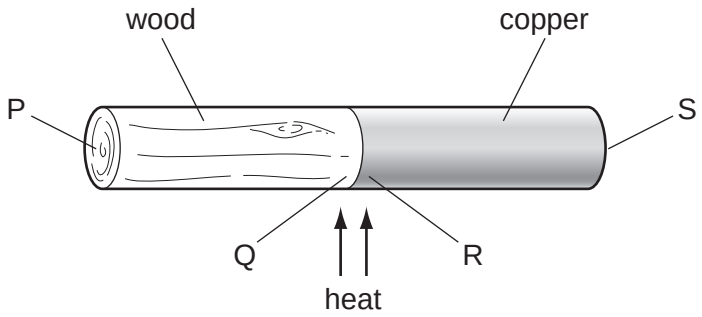
A Cool the washer and put it over the rod.

B Cool the washer and rod to the same temperature and push them together.

C Heat the rod and then place it in the hole.

D Heat the washer and then place it over the rod.

18 A rod is made of copper and wood joined together.

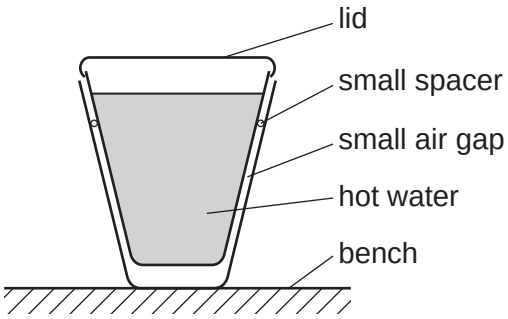


The rod is heated at the join in the centre for about a minute.

At which labelled point will the temperature be lowest, and at which point will it be highest?

	lowest temperature	highest temperature
A	P	Q
B	P	R
C	S	P
D	S	R

19 Two plastic cups are placed one inside the other. Hot water is poured into the inner cup and a lid is put on top, as shown.



Which statement is correct?

A Heat loss by radiation is prevented by the small air gap.

B No heat passes through the sides of either cup.

C The bench is heated by convection from the bottom of the outer cup.

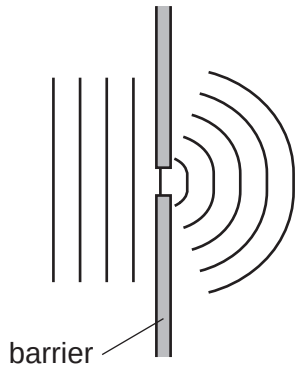
D The lid is used to reduce heat loss by convection.

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20 Which row shows the nature of light waves, sound waves and X-rays?

	light waves	sound waves	X-rays
A	longitudinal	longitudinal	transverse
B	longitudinal	transverse	longitudinal
C	transverse	longitudinal	transverse
D	transverse	transverse	longitudinal

21 The diagram shows plane water waves passing through a narrow gap in a barrier.



The waves spread out on the far side of the barrier.

Which property of waves does this illustrate?

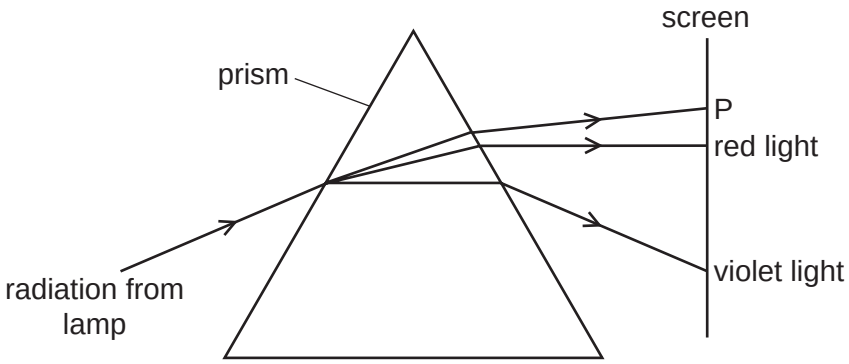
A diffraction

B reflection

C refraction

D vibration

22 The diagram shows radiation from a lamp passing through a prism.



Which type of radiation is found at P?

A γ-rays

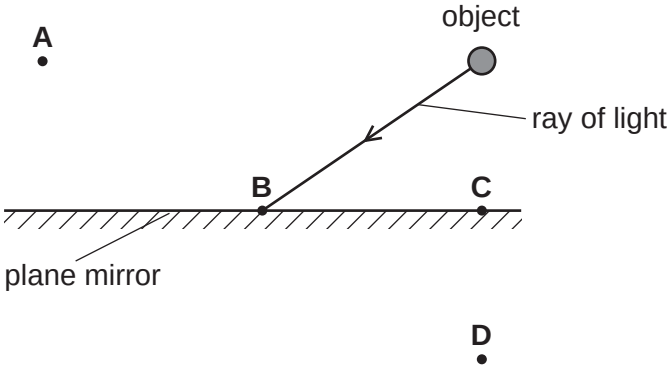
B infra-red

C ultraviolet

D X-rays

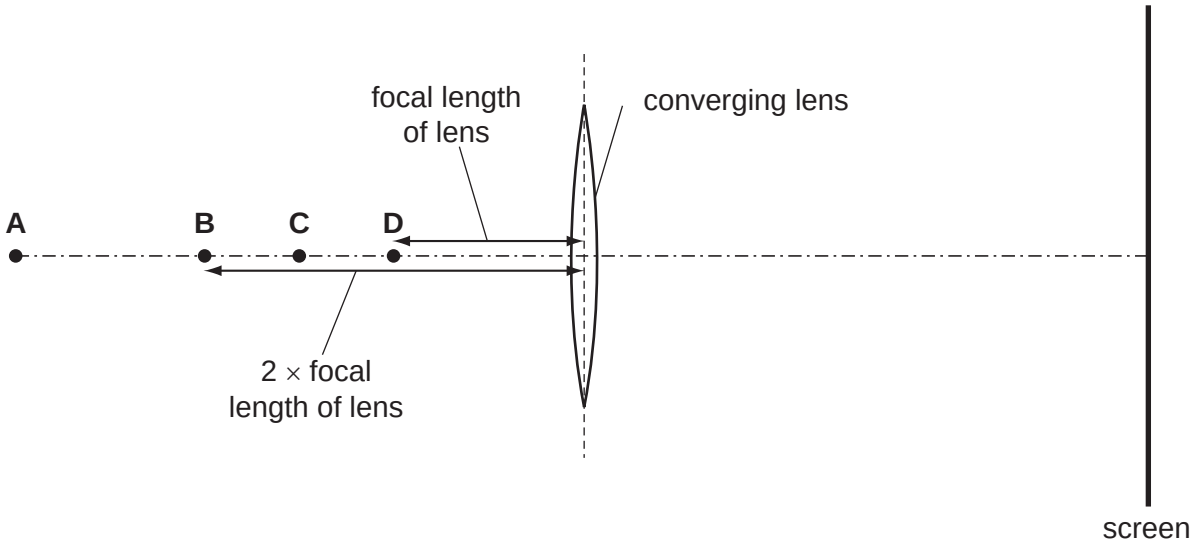
23 A plane mirror is used to form an image of an object.

At which labelled point is the image formed?



24 A converging lens in a projector is used to make an **enlarged** image of a small piece of film on a screen.

At which labelled point could the piece of film be placed so that the lens produces this image?



25 A girl stands at a distance from a large building. She claps her hands and a short time later hears an echo.

Why is an echo produced when the sound waves hit the building?

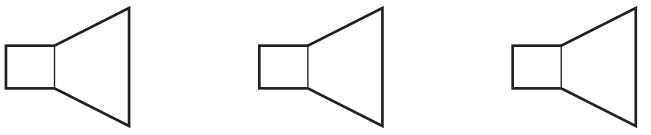
A The sound waves are absorbed.

B The sound waves are diffracted.

C The sound waves are reflected.

D The sound waves are refracted.

26 Three loudspeakers vibrate at different frequencies of 5 hertz, 25 kilohertz and 50 kilohertz.



Which row shows whether the vibrations from each loudspeaker can be heard by a human?

	5 hertz	25 kilohertz	50 kilohertz
A	no	no	no
B	no	yes	no
C	yes	no	yes
D	yes	yes	yes

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27 The diagram shows a magnet being brought near to an unmagnetised iron bar. This causes the iron bar to become magnetised.



Which magnetic pole is induced at X and how is the iron bar affected?

	pole induced	effect on iron bar
A	north	attracted
B	north	repelled
C	south	attracted
D	south	repelled

28 A student wishes to make a permanent magnet. She has an iron rod and a steel rod.

Which rod should she use to make the permanent magnet, and is this rod a hard magnetic material or a soft magnetic material?

	rod	type of magnetic material
A	iron	hard
B	iron	soft
C	steel	hard
D	steel	soft

29 In which unit is potential difference measured?

A ampere

B ohm

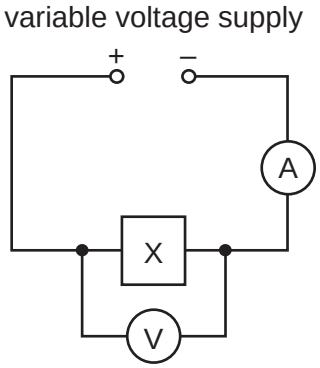
C volt

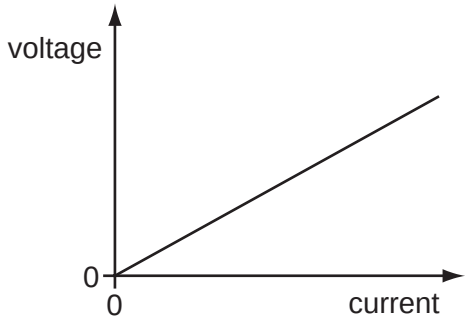
D watt

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30 The circuit shown in the diagram contains an unknown component X, hidden in a box.

The voltage-current graph for X is as shown.





What is the component X?

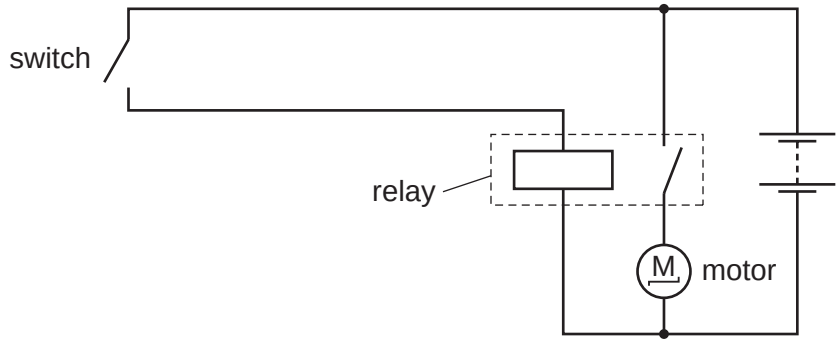
A a capacitor

B a closed switch

C an open switch

D a resistor of constant resistance

31 A relay is used to operate a large electric motor using a switch some distance from the motor.



What is the purpose of the relay?

A to allow a large current in the relay coil to control a smaller current in the motor

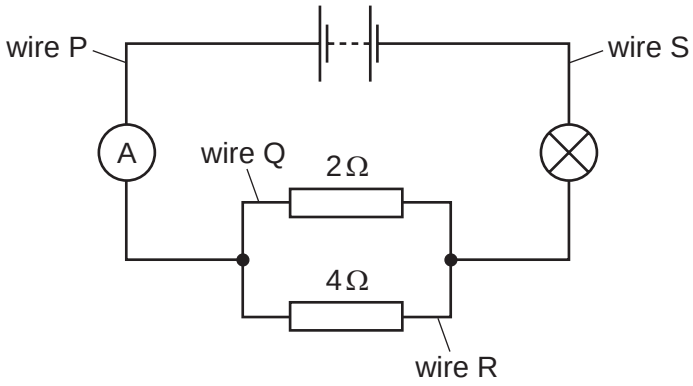
B to allow a small current in the relay coil to control a larger current in the motor

C to allow the current in the relay coil to pass to the motor

D to disconnect the battery from the motor automatically if too much current flows

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32 The circuit diagram includes two resistors connected in parallel.



Which statement is correct?

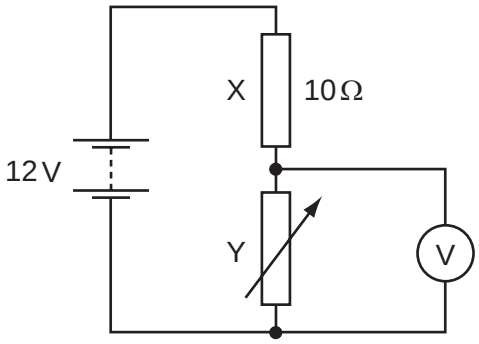
A The current in wire P is equal to the current in wire Q.

B The current in wire Q is equal to the current in wire R.

C The current in wire R is equal to the current in wire S.

D The current in wire S is equal to the current in wire P.

33 A circuit is connected for use as a potential divider.



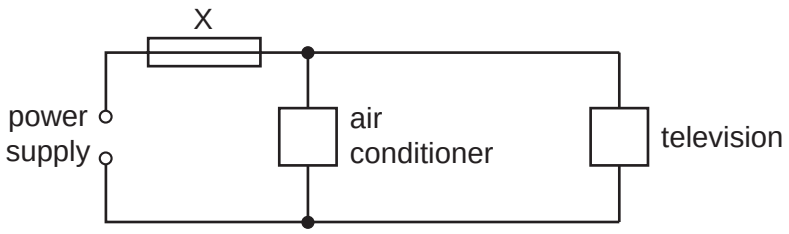
The resistance of resistor X is 10Ω.

When the resistance of the variable resistor Y is 20Ω, what is the reading on the voltmeter?

A 4.0V **B** 6.0V **C** 8.0V **D** 12V

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34 An air conditioner and a television are both connected to the same electrical circuit.



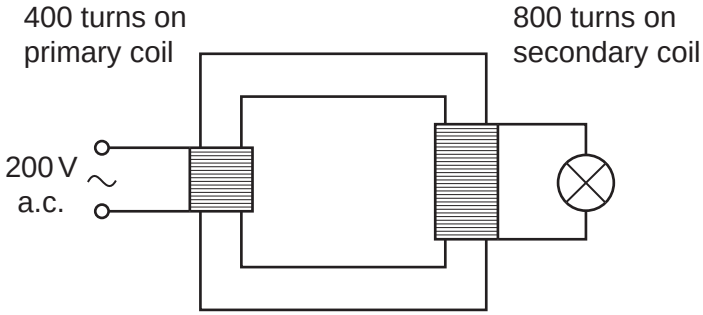
The current in the air conditioner is 4.0 A and the current in the television is 6.0 A.

Several different fuses are available.

Which fuse should be connected at X?

A 3 A **B** 5 A **C** 10 A **D** 13 A

35 The diagram shows a transformer. The input voltage and the number of turns on each coil are shown.



What is the output voltage?

A 100 V **B** 200 V **C** 400 V **D** 800 V

36 Which device uses slip rings?

A a cathode-ray tube

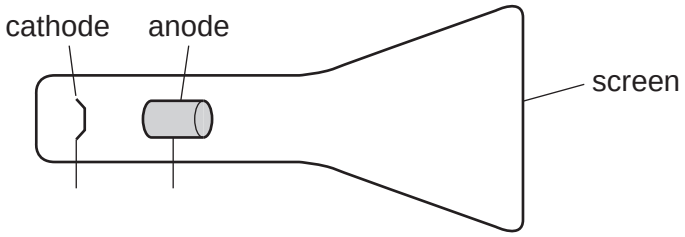
B a d.c. motor

C an a.c. generator

D a solenoid

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37 The diagram shows some parts of a cathode-ray tube which is producing cathode rays.



Which is a correct description of the cathode?

A negative and cool

B negative and hot

C positive and cool

D positive and hot

38 When measuring the emissions from a radioactive rock brought into the laboratory, a teacher mentions that background radiation must be taken into account.

What is this background radiation?

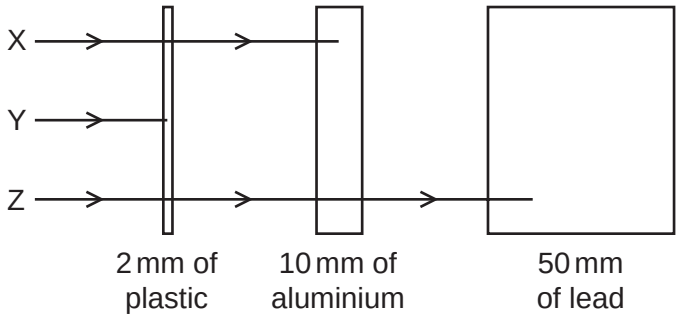
A infra-red radiation from warm objects in the laboratory

B infra-red radiation from the Sun

C ionising radiation from the radioactive rock brought into the laboratory

D ionising radiation in the laboratory when the radioactive rock is not present

39 The diagram shows the paths of three different types of radiation, X, Y and Z.



Which row in the table correctly identifies X, Y and Z?

	X	Y	Z
A	α-particles	β-particles	γ-rays
B	β-particles	α-particles	γ-rays
C	β-particles	γ-rays	α-particles
D	γ-rays	α-particles	β-particles

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40 Which statement about a neutral atom of $^{226}_{88}Ra$ is correct?

A It has an equal number of neutrons and protons.

B It has more electrons than neutrons.

C It has more electrons than protons.

D It has more neutrons than protons.

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