Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

PHYSICS **0625/12**

Paper 1 Multiple Choice (Core) **February/March 2016**

45 minutes

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

7917388689

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.

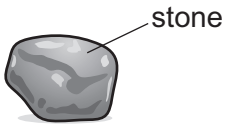
Each correct answer will score one mark. A mark will not be deducted for a wrong answer.
Any rough working should be done in this booklet.
Electronic calculators may be used.
Take the weight of 1.0 kg to be 10 N (acceleration of free fall = 10 m / s^2).

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 **17** printed pages and **3** blank pages.

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1 A student wishes to find the volume of a small, irregularly-shaped stone.



A ruler and a measuring cylinder containing some water are available.

Which apparatus is needed?

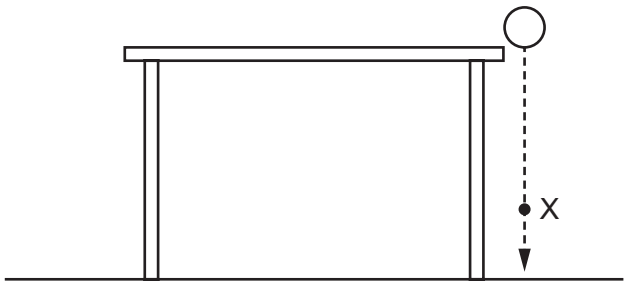
A neither the ruler nor the measuring cylinder

B the measuring cylinder only

C the ruler and the measuring cylinder

D the ruler only

2 A ball is dropped from a table-top. Air resistance may be ignored.

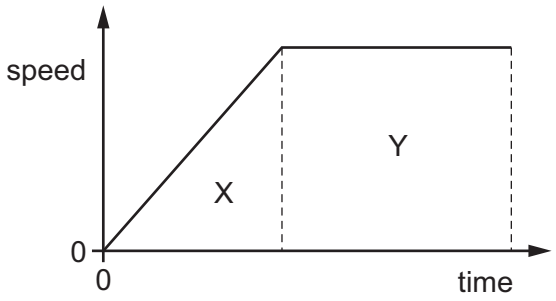


Which row describes the velocity and the acceleration of the ball at point X?

	acceleration	velocity
A	constant	constant
B	constant	increasing
C	increasing	constant
D	increasing	increasing

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3 The diagram shows the speed-time graph for a car.



Which area represents the distance travelled while the car is accelerating?

A X **B** X + Y **C** Y **D** Y – X

4 Which quantities are measured in the same unit?

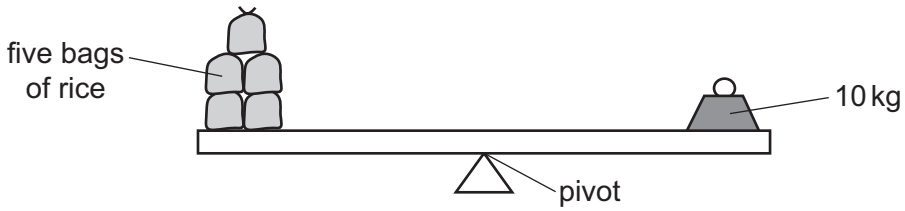
A energy, power and work

B energy and power, but not work

C energy and work, but not power

D power and work, but not energy

5 Five identical bags of rice are balanced on a uniform beam by an object of mass 10 kg.

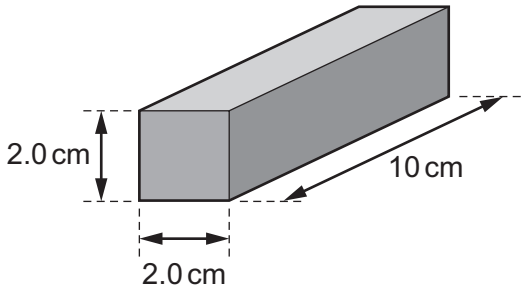


Two more identical bags of rice are added to the other five. The average position of the bags on the beam does not change.

What mass now balances the bags?

A 3.5 kg **B** 7.0 kg **C** 12 kg **D** 14 kg

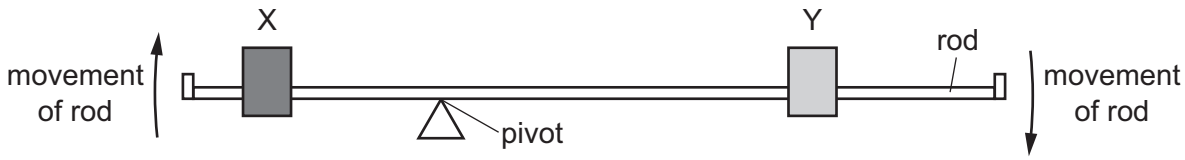
6 The diagram shows a cuboid block made from a metal of density 2.5 g / cm^3.



What is the mass of the block?

A 8.0 g **B** 16 g **C** 50 g **D** 100 g

7 The diagram shows an unbalanced rod. Two loads X and Y can be moved along the rod.



The rod turns in a clockwise direction as shown.

Which action could make the rod balance?

A moving X to the left

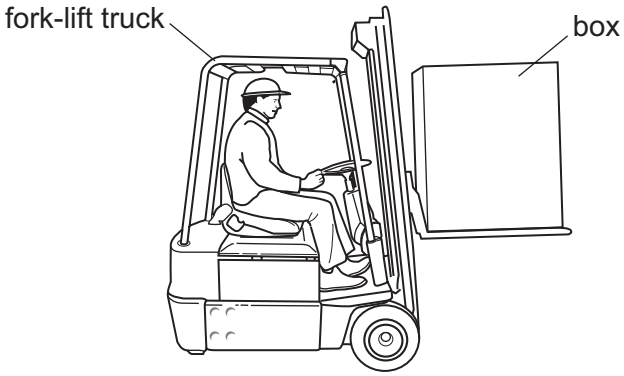
B moving X to the right

C moving Y to the right

D moving the pivot to the left

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8 A box is being lifted by a fork-lift truck.



The weight of the box is 3000 N.

The force exerted by the fork-lift truck on the box is 3500 N vertically upwards.

What is the resultant vertical force on the box?

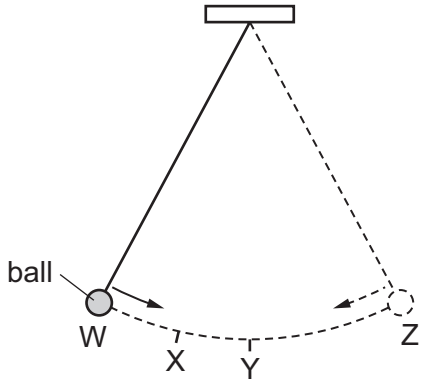
A 500 N downwards

B 500 N upwards

C 6500 N downwards

D 6500 N upwards

9 The diagram shows a ball hanging on a string. The ball swings from point W to point Z and back to point W.



Which statement about the ball is correct?

A The kinetic energy of the ball is greatest at point W.

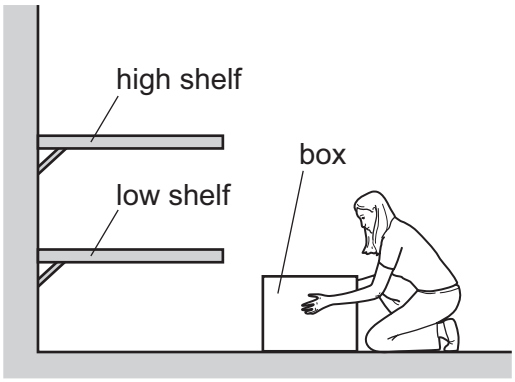
B The kinetic energy of the ball is greatest at point X.

C The kinetic energy of the ball is greatest at point Y.

D The kinetic energy of the ball is the same at all points of the swing.

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10 A person in a factory has to lift a box on to a shelf.



Which action involves the person doing the **least** amount of work?

A lifting the box quickly to the high shelf

B lifting the box slowly to the high shelf

C lifting the box to the low shelf first then lifting it to the high shelf

D lifting the box to the low shelf instead of to the high shelf

11 Which is a non-renewable energy resource?

A coal

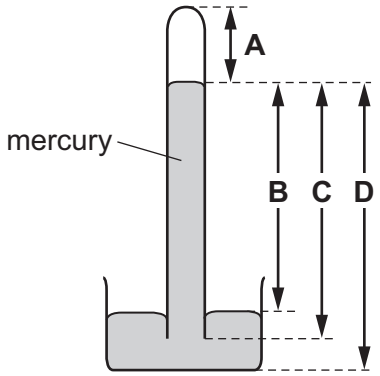
B solar

C tides

D wind

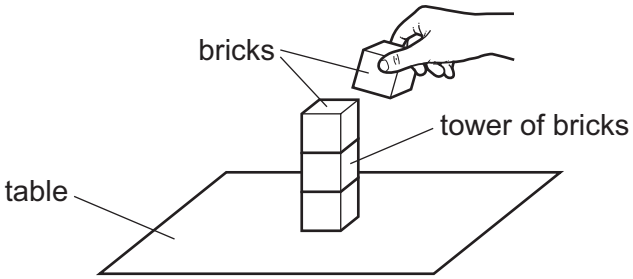
12 The diagram shows a simple mercury barometer.

Which labelled length is measured when finding atmospheric pressure?

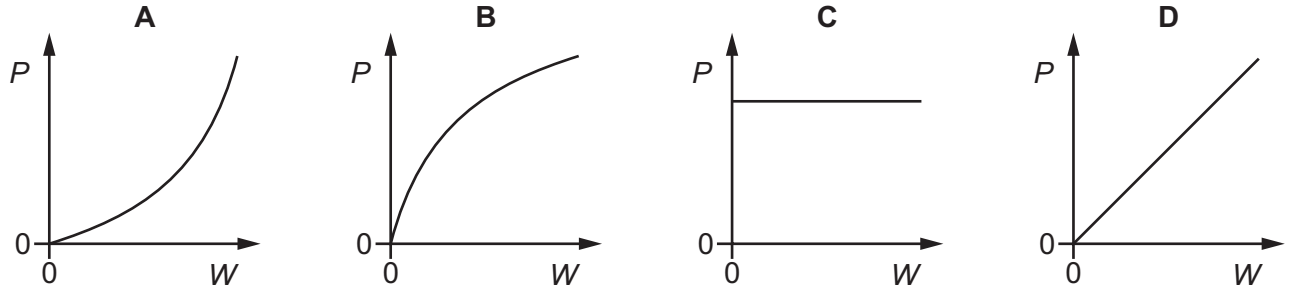


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13 Identical toy bricks are placed one on top of another to make a tower on a table.



Which graph shows the relationship between the pressure *P* that the tower exerts on the table and the weight *W* of the tower?



14 The table lists the melting points and the boiling points of four different substances.

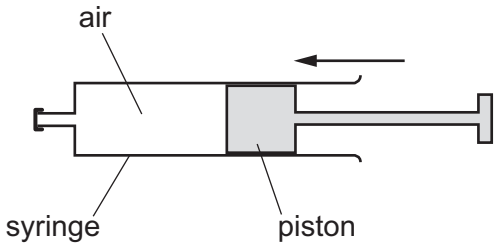
Which substance is a liquid at 0 °C?

	melting point / °C	boiling point / °C
A	–219	–183
B	–7	58
C	98	890
D	1083	2582

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[Turn over

15 Air in a sealed syringe is slowly compressed by moving the piston. The temperature of the air stays the same.



Which statement about the air is correct?

A The pressure of the air decreases because its molecules now travel more slowly.

B The pressure of the air decreases because the area of the syringe walls is now smaller.

C The pressure of the air increases because its molecules now hit the syringe walls more frequently.

D The pressure of the air increases because its molecules now travel more quickly.

16 Which quantity gives the *thermal capacity* of a solid object?

A the energy lost by radiation from the object in 1.0 s

B the energy needed to melt the object

C the energy needed to raise the temperature of the object by 1.0 °C

D the total amount of thermal energy in the object

17 To mark a temperature scale on a thermometer, standard temperatures known as fixed points are needed.

Which of these is a fixed point on the Celsius scale?

A room temperature

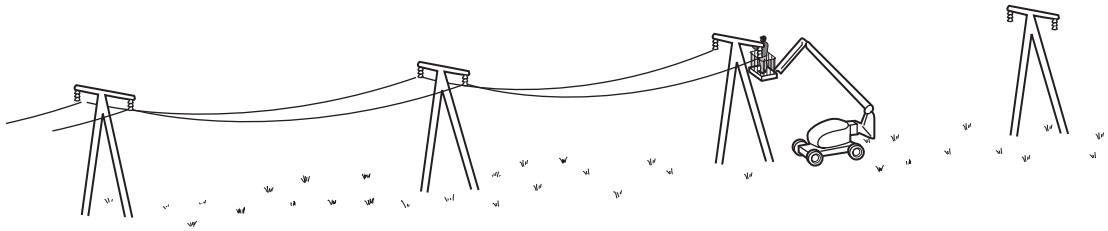
B the temperature inside a freezer

C the temperature of pure melting ice

D the temperature of pure warm water

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18 The diagram shows electricity cables being put up on a warm day. The cables are left loose between the poles, as shown in the diagram.



Why are the cables left loose?

A They will contract on cold days.

B They will contract on very warm days.

C They will expand on cold days.

D They will expand on very warm days.

19 A cotton sheet is ironed with a hot electric iron.

How is energy transferred through the metal base of the iron to the sheet?

A by conduction only

B by convection only

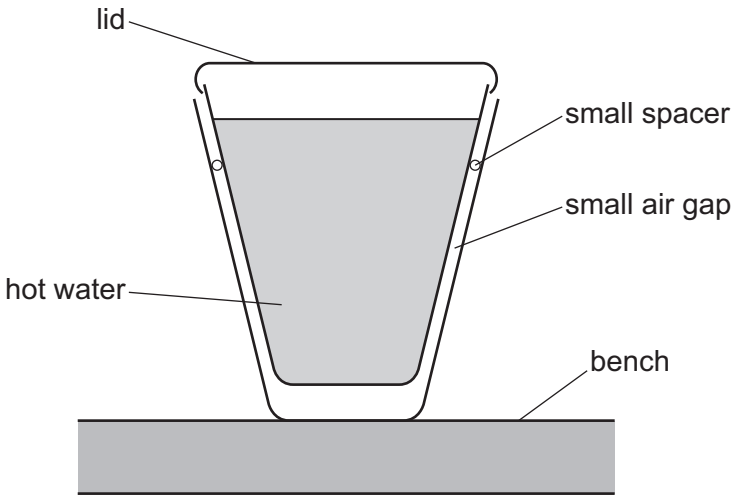
C by radiation only

D by convection and radiation only

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20 Two plastic cups are placed one inside the other. A small spacer keeps the two cups separated.

Hot water is poured into the inner cup and a lid is put on top, as shown.



Which statement is correct?

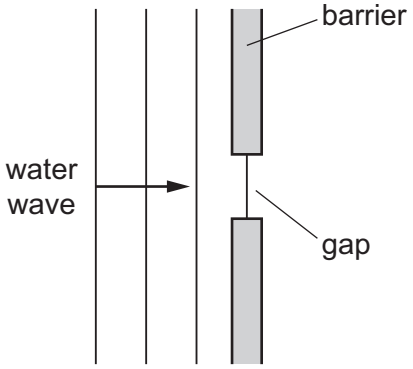
A The bench is heated by convection from the bottom of the outer cup.

B The lid reduces the energy lost by convection.

C There is no thermal conduction through the sides of either cup.

D Thermal radiation is prevented by the small air gap.

21 A water wave in a shallow tank passes through a gap in a barrier.



What happens to the speed and what happens to the wavelength of the wave as it passes through the gap?

	speed	wavelength
A	decreases	decreases
B	decreases	remains constant
C	remains constant	decreases
D	remains constant	remains constant

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22 Which is a unit of wavelength?

A hertz

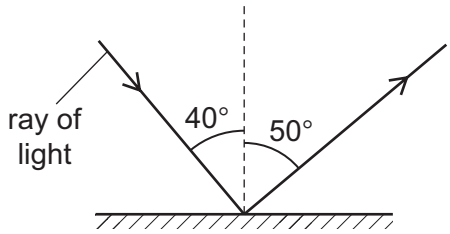
B metre

C metre per second

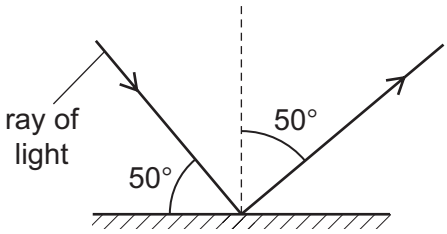
D second

23 Which diagram correctly shows a ray of light reflected by a plane mirror?

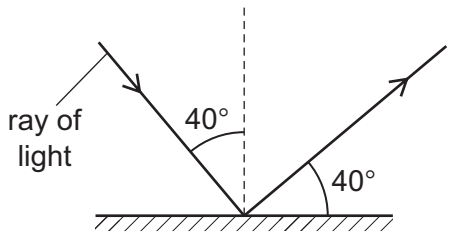
A



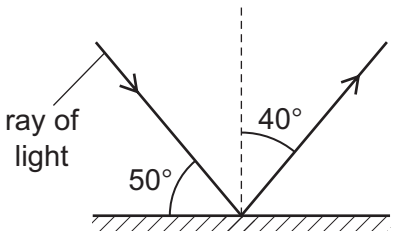
B



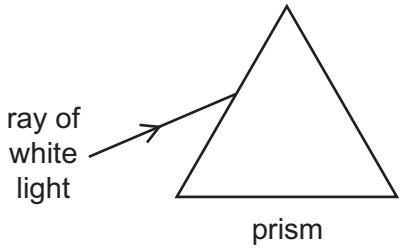
C



D

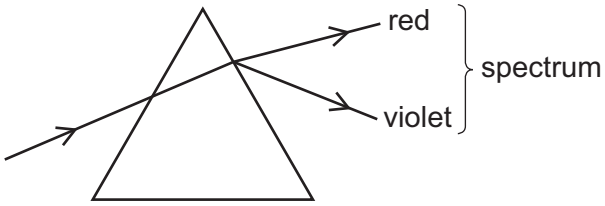


24 A ray of white light is incident on a glass prism.

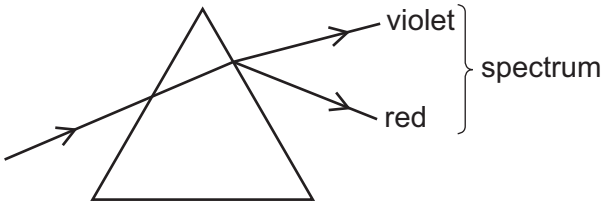


Which ray diagram shows the ray as it passes through the prism and emerges from the opposite side?

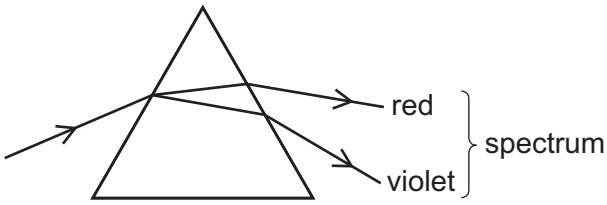
A



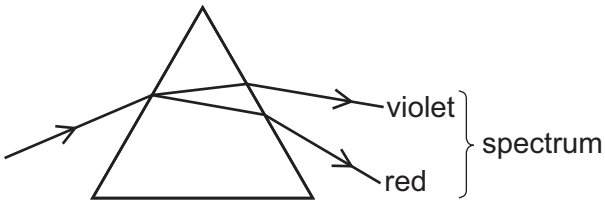
B



C



D



25 A sound wave travels from a point X to another point Y.



Which diagram represents the movement of the air molecules, due to the sound wave, in the region between X and Y?

A



B



C



D

26 Sound wave P has a greater amplitude and a larger wavelength in air than sound wave Q.

How do the loudness and pitch of P compare with the loudness and pitch of Q?

A P is louder and higher in pitch than Q.

B P is louder and lower in pitch than Q.

C P is quieter and higher in pitch than Q.

D P is quieter and lower in pitch than Q.

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27 In which pair are both materials magnetic?

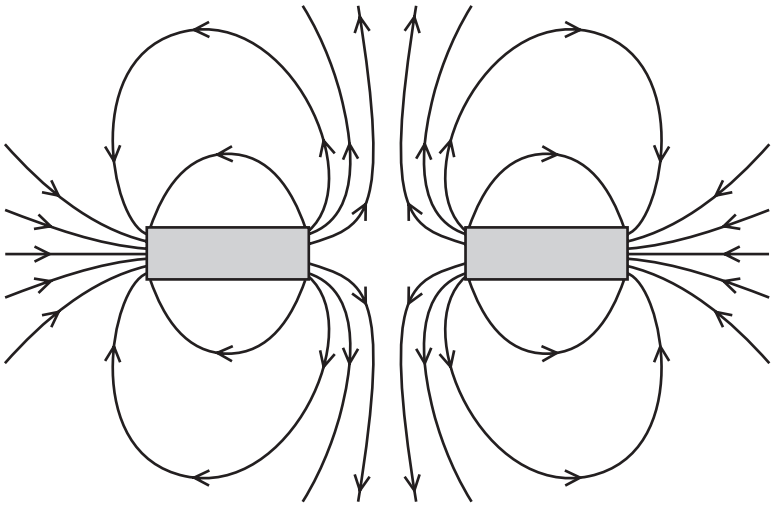
A aluminium and copper

B copper and iron

C iron and steel

D steel and aluminium

28 The diagram shows the magnetic field around two bar magnets.



Which diagram shows the poles of the magnets?

A



B



C



D



29 Which produces an electromotive force (e.m.f.)?

A a battery

B a filament lamp

C a resistor

D a spring balance

30 The table describes four different resistance wires. They are all made from the same metal.

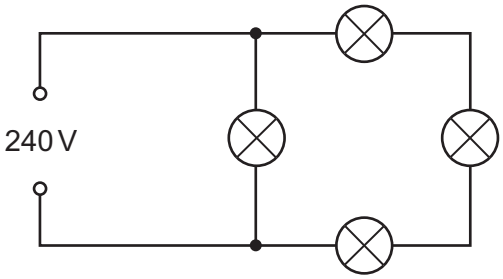
Which wire has the smallest resistance?

	length of wire / m	diameter of wire / mm
A	2.0	1.0
B	2.0	1.5
C	3.0	1.0
D	3.0	1.5

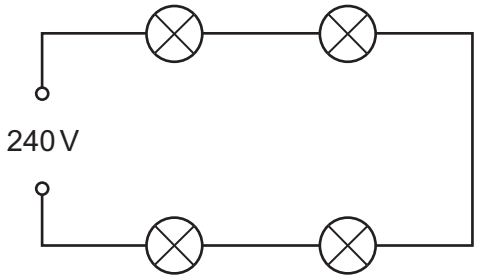
31 Four lamps are each labelled 240 V.

In which circuit do all four lamps have normal brightness?

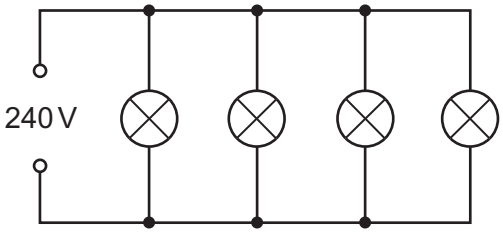
A



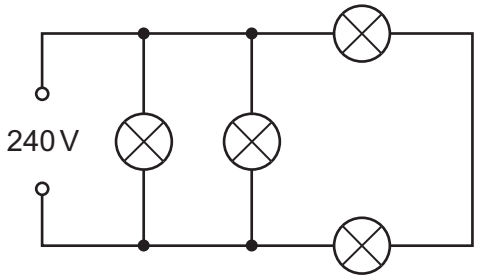
B



C

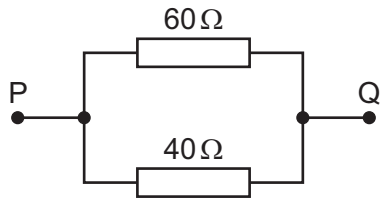


D



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32 The diagram shows a 40 Ω resistor and a 60 Ω resistor connected in parallel.



What is the total resistance between points P and Q?

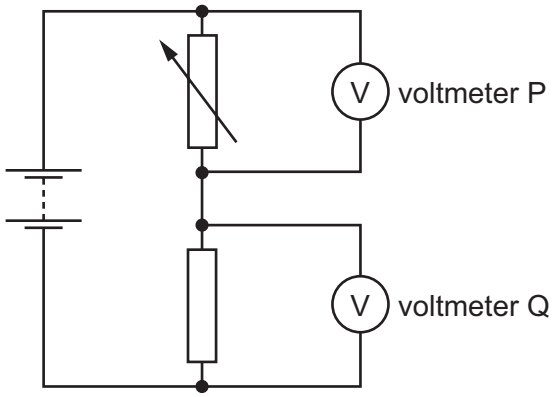
A less than 40 Ω

B 50 Ω

C between 60 Ω and 100 Ω

D 100 Ω

33 The diagram shows a potential divider connected to two voltmeters P and Q.



The resistance of the variable resistor is decreased.

Which row shows what happens to the reading on each voltmeter?

	reading on voltmeter P	reading on voltmeter Q
A	decreases	decreases
B	decreases	increases
C	increases	decreases
D	increases	increases

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[Turn over

34 After some building work in a house, a bare (uninsulated) live wire is left protruding from a wall.

What is the greatest hazard?

A a fire

B a fuse blows

C an electric shock

D no current flows

35 A coil carries a current in a magnetic field. The coil experiences a turning effect.

Which device uses this effect?

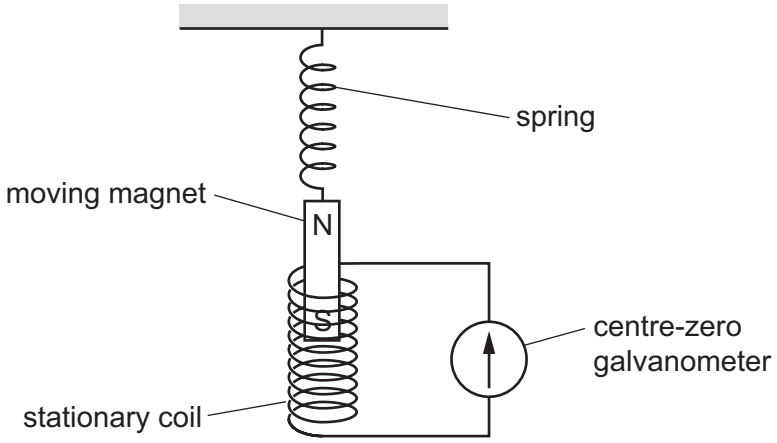
A a d.c. motor

B an electromagnet

C a relay

D a transformer

36 A magnet is suspended from a spring so that it can move freely inside a stationary coil. The coil is connected to a sensitive centre-zero galvanometer.



The magnet repeatedly moves slowly up and down.

What does the galvanometer show?

A a constantly changing reading

B a steady reading to the left

C a steady reading to the right

D a steady reading of zero

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37 A nucleus of element X is represented as $^{56}_{26}X$.

Which is an isotope of element X?

A $^{26}_{56}X$ **B** $^{54}_{26}X$ **C** $^{56}_{24}X$ **D** $^{54}_{28}X$

38 The charge on a proton is *e*.

What is the charge on an electron and what is the charge on a neutron?

	electron	neutron
A	*e*	*e*
B	*e*	0
C	–*e*	–*e*
D	–*e*	0

39 A scientist carries out an experiment using a sealed source which emits β-particles. The range of the β-particles in the air is about 30 cm.

Which precaution is the most effective to protect the scientist from the radiation?

A handling the source with long tongs

B keeping the temperature of the source low

C opening all windows in the laboratory

D washing his hands before leaving the laboratory

40 Which row describes the nature of α-particles and of γ-rays?

	α-particles	γ-rays
A	helium nuclei	electromagnetic radiation
B	helium nuclei	electrons
C	protons	electromagnetic radiation
D	protons	electrons

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