



Cambridge Assessment International Education
Cambridge Ordinary Level

COMBINED SCIENCE

5129/12

Paper 1 Multiple Choice

May/June 2019

1 hour

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



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.

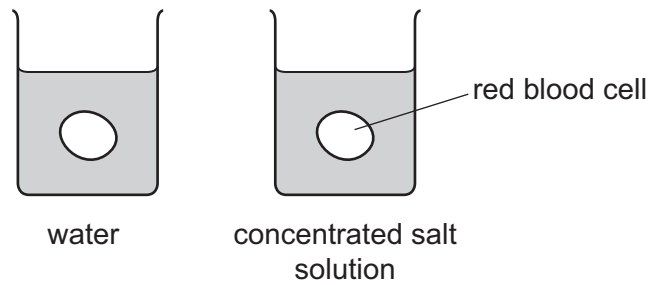
Any rough working should be done in this booklet.

A copy of the Periodic Table is printed on page 16.

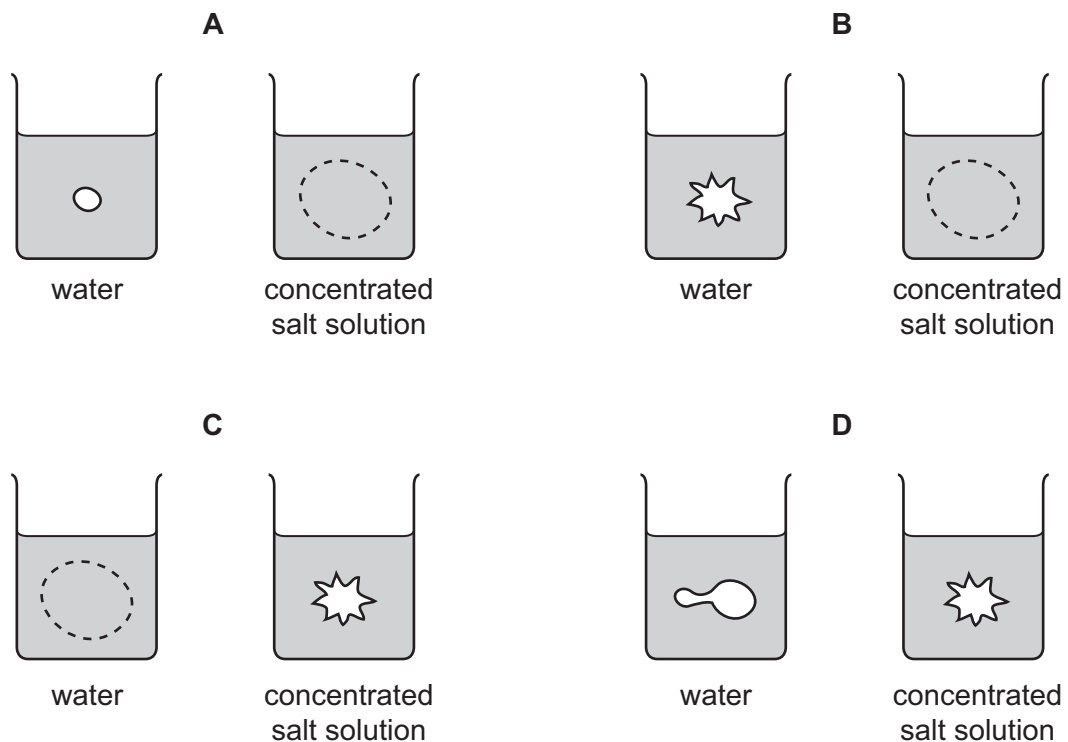
Electronic calculators may be used.

This document consists of **15** printed pages and **1** blank page.

- Which structure would you **not** expect to find in an animal cell?
 - cell membrane
 - cytoplasm
 - nucleus
 - sap vacuole
- One beaker contains water. Another beaker contains a concentrated salt solution. A red blood cell is placed into each beaker.

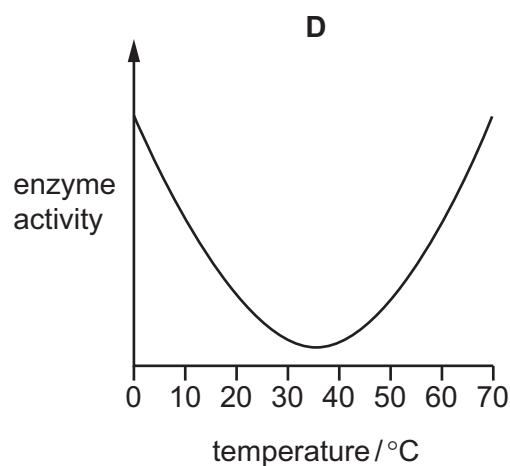
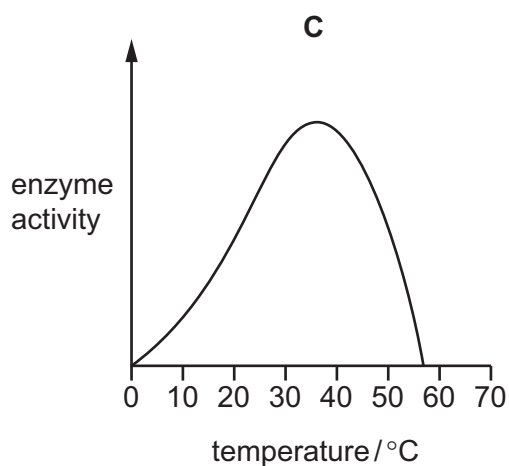
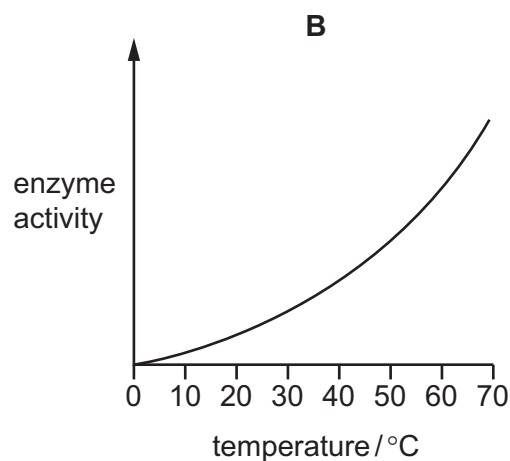
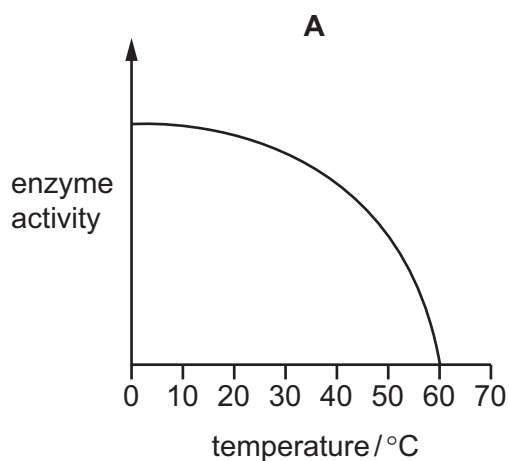


Which diagram shows the appearance of the cells after 15 minutes?



3

- 3 Which graph shows how the activity of an enzyme in the human alimentary canal varies with temperature?



- 4 Which two substances are required for photosynthesis?

- 1 carbon dioxide
- 2 glucose
- 3 oxygen
- 4 water

A 1 and 2 **B** 1 and 4 **C** 2 and 3 **D** 3 and 4

- 5 Which organ is responsible for the breakdown of alcohol in the body?

- A** kidney
B liver
C small intestine
D stomach

- 6 Xylem and phloem are two transport tissues found in plants.

Which statement is correct?

- A Carbon dioxide moves by osmosis through the root cells until it reaches the phloem.
- B Mineral ions are transported through phloem vessels up the stem to the leaves.
- C Products of photosynthesis are transported through xylem vessels up the stem to the leaves.
- D Water moves by osmosis through the root cells until it reaches the xylem.

- 7 Which statement describes a vein?

- A It has thick walls, no valves and carries oxygenated blood to the heart.
- B It has thick walls, valves and carries blood under pressure.
- C It has thin walls, no valves and carries blood under pressure.
- D It has thin walls, valves and carries deoxygenated blood to the heart.

- 8 Which statement explains why, even when athletes have finished a race, they carry on breathing more quickly and deeply than normal?

- A to remove carbon dioxide produced during anaerobic respiration
- B to remove urea produced by the breakdown of amino acids
- C to replace stored glycogen in muscles
- D to take in extra oxygen to break-down lactic acid

- 9 Which substances are removed from the blood by the kidneys?

- A carbon dioxide and water
- B lactic acid and urea
- C urea and water
- D water and lactic acid

- 10 In bright light, the pupils in our eyes get smaller.

Which part of the eye causes this change?

- A ciliary muscles
- B muscles in the iris
- C muscles in the pupil
- D suspensory ligaments

- 11 A can be defined as an externally administered substance which modifies or affects chemical reactions in the body.

Which word correctly completes the sentence?

- A drug
- B enzyme
- C hormone
- D platelet

- 12 What is not a result of clearing forests for cattle farming?

- A acid rain
- B flooding
- C global warming
- D soil erosion

- 13 Which row shows an example of each type of birth control?

	chemical	hormonal	surgical
A	condom	spermicide	vasectomy
B	pill	vasectomy	condom
C	spermicide	pill	vasectomy
D	vasectomy	condom	pill

- 14 Which row describes the particles in a solid?

	arrangement	movement	packing
A	random	move in straight lines	close together
B	random	random	far apart
C	regular	vibrate about a fixed point	close together
D	regular	vibrate about a fixed point	far apart

15 Which row describes an electron and a neutron?

	electron	neutron
A	relative charge is 0	relative mass is negligible
B	relative charge is -1	relative mass is 1
C	relative mass is negligible	relative charge is $+1$
D	relative mass is 1	relative charge is 0

16 The table gives the electronic structure of four elements.

The letters in the table are not the usual symbols of the elements.

element	electronic structure
W	2,7
X	2,8,5
Y	2,8,6
Z	2,8,8,2

Which two elements form an ionic compound?

- A** W and X **B** W and Y **C** W and Z **D** X and Y

17 A compound P conducts electricity when molten, but compound Q does not.

Compound R is a gas at room temperature. Compound S melts at 1566°C .

Which compounds are covalent?

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

18 The formula of aluminium chloride is AlCl_3 .

What are the charges on the aluminium and chloride ions?

	aluminium ion	chloride ion
A	$+1$	-3
B	$+1$	-1
C	$+3$	-3
D	$+3$	-1

soil sample	pH value
P	8.0
Q	7.5
R	7.0
S	6.5
T	6.0

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

A simplified periodic table diagram with the following structure:

- Period 1: 2 cells. The right cell contains 'W'.
- Period 2: 8 cells. The first cell is empty. The last cell contains 'X'.
- Period 3: 8 cells. The first cell contains 'Y'. The last cell contains 'Z'.
- Period 4: 18 cells. All cells are empty.

There is an additional empty square box located above the 9th cell of Period 2.

A W is a metal and X is a non-metal

B X has more electrons than Y

C Y and Z are both non-metals

D Z has fewer electron shells than W

A malleable

B good conductor of electricity

C forms alloys

D good heat insulator

22 Aluminium is more reactive than iron.

When a piece of aluminium is added to dilute sulfuric acid, bubbles of gas are produced after a few minutes.

Which statement explains this observation?

- A** Aluminium does not make a gas when it reacts with acids.
- B** Aluminium has a coating of aluminium oxide.
- C** Aluminium is less reactive than hydrogen.
- D** Aluminium only reacts with dilute sulfuric acid when heated.

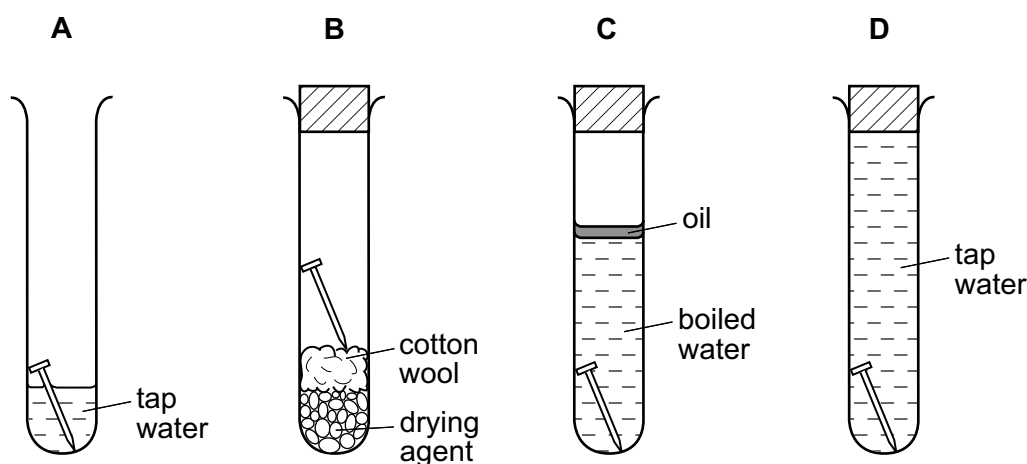
23 Aluminium is used for aircraft parts and food containers.

Which of the uses of aluminium is **not** correctly linked to a property of aluminium?

	use of aluminium	property on which the use depends
A	aircraft bodies	high strength
B	aircraft bodies	low density
C	food containers	resists corrosion
D	food containers	good conductor of electricity

24 A student set up an experiment using iron nails as shown. The tubes are left for one week.

In which tube does most rusting take place?



25 Which row describes a method for making hydrogen, a use of hydrogen, and a test for hydrogen?

	method	use	test
A	calcium + water	manufacture of margarine	relights a glowing splint
B	copper + dilute hydrochloric acid	manufacture of ammonia	burns with a pop
C	magnesium + dilute hydrochloric acid	rocket fuel	burns with a pop
D	zinc + dilute sulfuric acid	used in fire extinguishers	puts out a burning splint

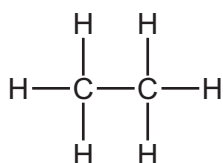
26 A student suggests the following four statements about the members of a homologous series.

- 1 They have similar chemical properties.
- 2 They have the same melting points.
- 3 Their molecules all contain at least two carbon atoms.
- 4 They can be represented by the same general formula.

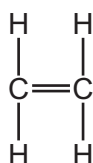
Which statements are correct?

- A** 1 and 3 **B** 1 and 4 **C** 2 and 3 **D** 3 and 4

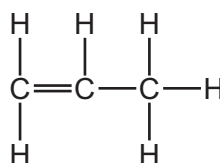
27 The molecular structures of four organic compounds are shown.



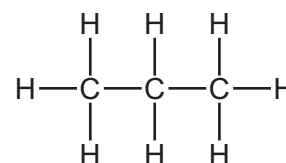
W



X



Y



Z

Which compounds change bromine water from orange to colourless?

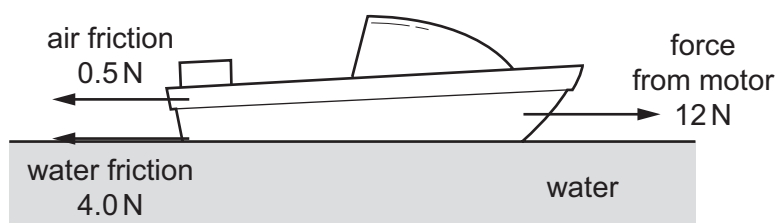
- A** W and Z **B** X and Y **C** X only **D** Y only

28 A force is applied to an object moving at constant velocity.

Which effect **cannot** occur?

- A** It slows down.
B It speeds up.
C Its direction changes.
D Its velocity remains constant.

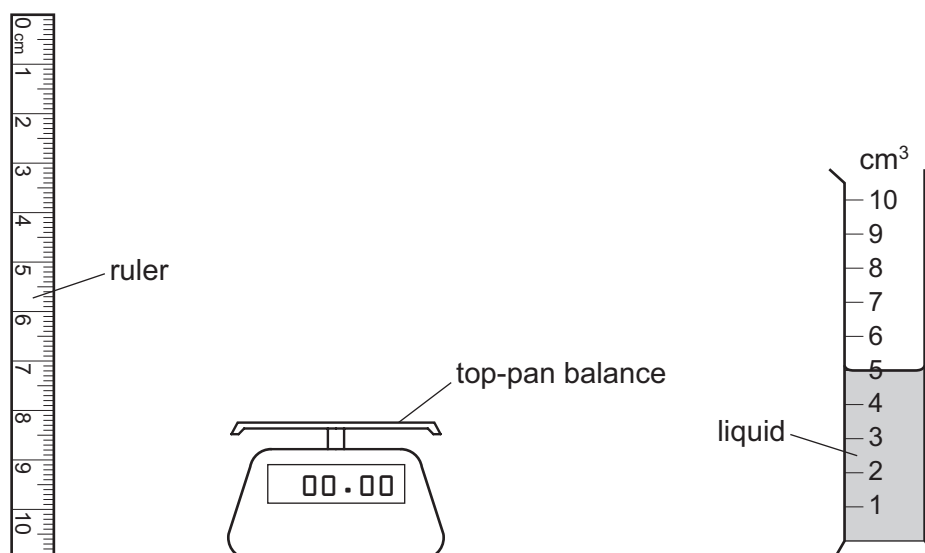
- 29 A toy boat is moving in water with a force of 12 N from its motor. Air friction of 0.5 N and water friction of 4.0 N act on the boat as shown.



The mass of the boat is 1.4 kg.

What is the acceleration of the boat?

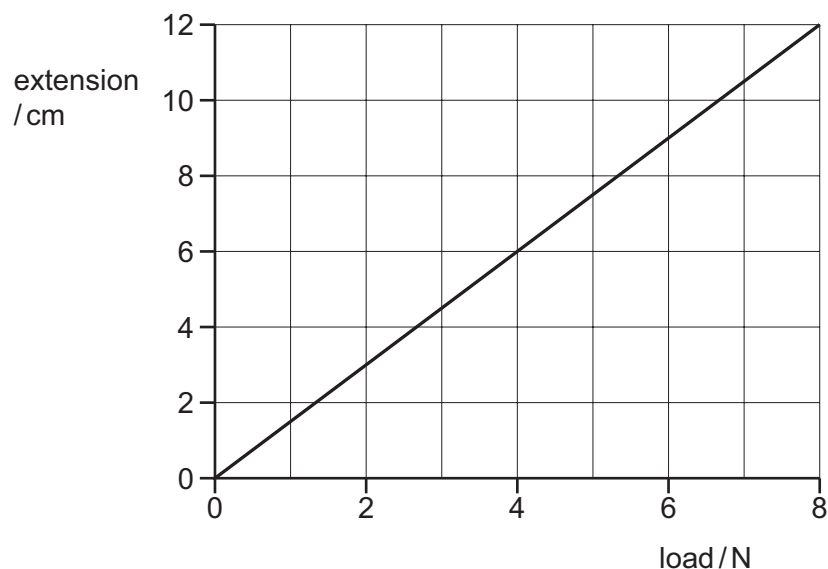
- A 5.4 m/s² B 5.7 m/s² C 8.2 m/s² D 8.6 m/s²
- 30 A student wants to find the density of an irregularly-shaped stone. A ruler, a top-pan balance and a measuring cylinder containing liquid are available.



What is used to find the density of the stone?

- A balance and a measuring cylinder containing liquid
 B balance and a ruler
 C balance only
 D ruler and a measuring cylinder containing liquid

- 31 The diagram shows an extension-load graph for a spring.

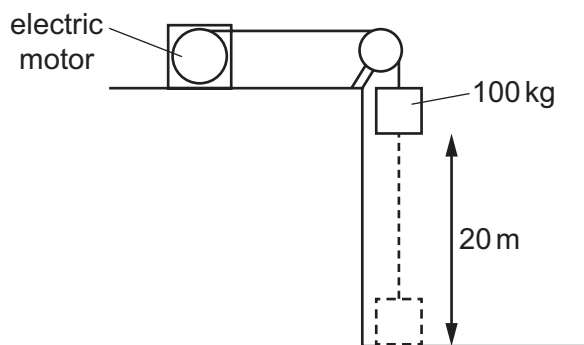


The length of the spring with no load is 3 cm.

Which load gives the spring a length of 9 cm?

- A** 2 N **B** 4 N **C** 6 N **D** 8 N
- 32 An electric motor lifts a mass of 100 kg through a vertical distance of 20 m.

Gravitational field strength is 10 N/kg.

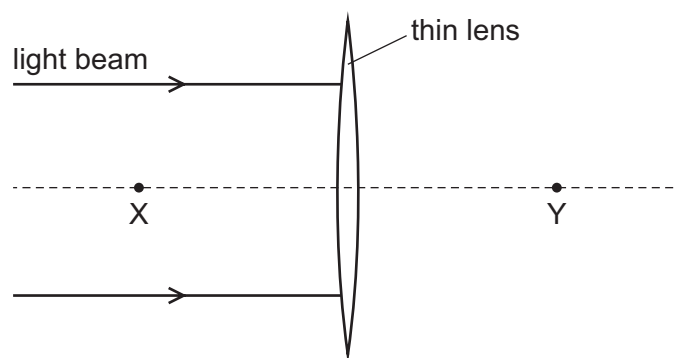


What is the useful work done by the motor?

- A** 5 J **B** 50 J **C** 2000 J **D** 20000 J
- 33 Which property **cannot** be used in a thermometer?

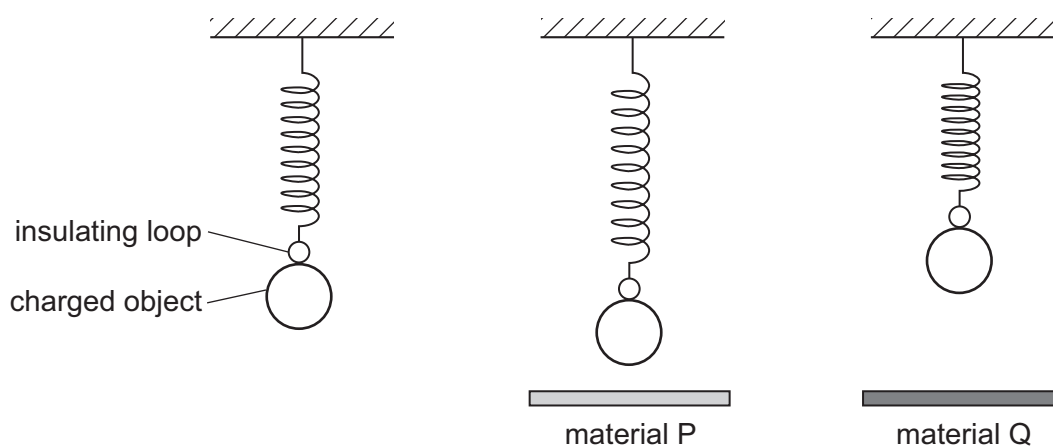
- A** half-life of a radioactive nuclide
B resistance of a metallic conductor
C volume of a gas
D volume of a liquid

- 34 A parallel beam of light is incident on a thin lens.



What could happen to the beam of light?

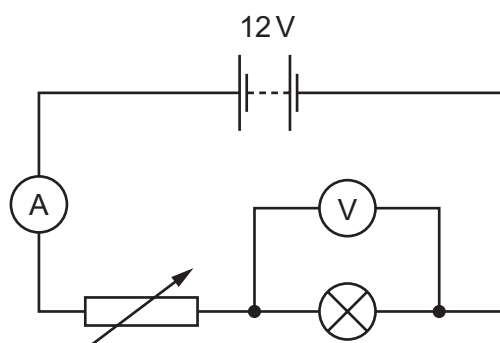
- A It is reflected and converges to a point at X.
 - B It is refracted and converges to a point at Y.
 - C It is refracted and spreads out as it leaves the lens.
 - D It passes straight through without changing direction.
- 35 The diagram shows a charged object suspended from a spring by an insulating loop. Two charged materials P and Q are then held below the charged object, as shown in the diagram.



Which row gives possible charges on the suspended object and on materials P and Q?

	charge on the suspended object	charge on material P	charge on material Q
A	negative	negative	positive
B	negative	positive	positive
C	positive	negative	negative
D	positive	negative	positive

- 36** The circuit shown is used to determine the resistance of a lamp for two different brightness settings.



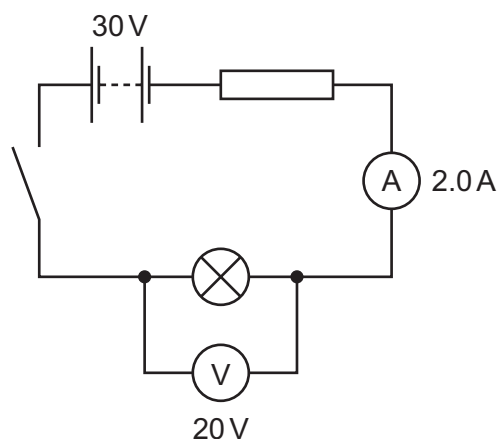
When the brightness of the lamp is low, the voltmeter reading is 2 V and the ammeter reading is 2 A.

When the brightness of the lamp is normal, the readings are 12 V and 4 A.

What is the increase in filament resistance?

- A** $1\ \Omega$ **B** $2\ \Omega$ **C** $3\ \Omega$ **D** $4\ \Omega$

- 37** The diagram shows a simple circuit containing a lamp.

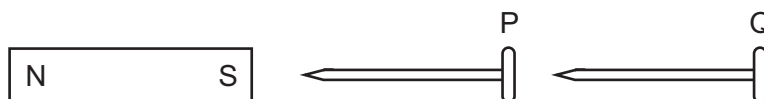


The switch is closed and the lamp is on for 2.0 hours.

How much energy is transformed in the lamp?

- A** 80 J **B** 4800 J **C** 288 000 J **D** 432 000 J

- 38 Two iron nails are placed close to the S-pole of a magnet.



The magnet induces magnetism in the nails.

Which magnetic poles are formed at ends P and Q?

	at P	at Q
A	N-pole	N-pole
B	N-pole	S-pole
C	S-pole	N-pole
D	S-pole	S-pole

- 39 In the nuclide notation A_ZX , what is represented by the letter Z?

- A** the number of neutrons in the nuclide
- B** the number of protons in the nuclide
- C** the total number of neutrons and protons in the nuclide
- D** the total number of protons and electrons in the nuclide

- 40 The radioactive nuclide thallium-208 decays into the stable nuclide lead-208.

The half-life for thallium-208 is 3.1 minutes.

What is the composition of a 100 g sample of thallium-208 after 9.3 minutes?

	thallium / g	lead / g
A	12.5	87.5
B	25.0	75.0
C	75.0	25.0
D	87.5	12.5

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The Periodic Table of Elements

lanthanoids

57	La	58	Ce	59	Pr	60	Nd	61	Pm	62	Sm	63	Eu	64	Gd	65	Tb	66	Dy	67	Ho	68	Er	69	Tm	70	Yb	71	Lu
lanthanum	139	cerium	140	praseodymium	141	neodymium	144	—	promethium	150	samarium	152	euroium	157	gadolinium	159	terbium	163	dysprosium	165	holmium	167	erbium	169	thulium	173	ytterbium	175	lutetium

actinoids

89	Ac	90	Th	91	Pa	92	U	93	Np	94	Pu	95	Am	96	Cm	97	Bk	98	Cf	99	Es	100	Fm	101	Md	102	No	103	Lr
actinium	231	thorium	232	protactinium	231	uranium	238	—	neptunium	239	plutonium	239	americium	237	curium	237	berkelium	237	californium	237	einsteinium	237	femium	237	merendeium	237	nobelium	—	lawrencium

The volume of one mole of any gas is 24 dm^3 at room temperature and pressure (r.t.p.).