Cambridge
O Level

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.

IB19 06_5129_12/3RP

1 Which structure would you **not** expect to find in an animal cell?

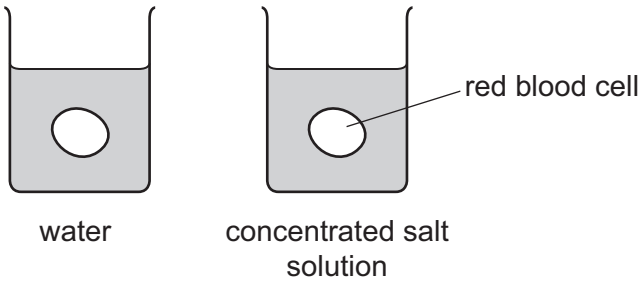
A cell membrane

B cytoplasm

C nucleus

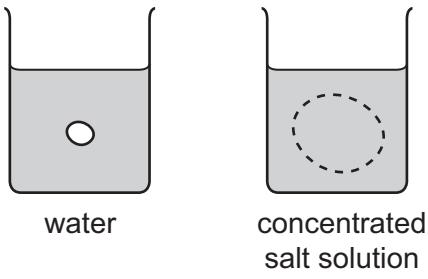
D sap vacuole

2 One beaker contains water. Another beaker contains a concentrated salt solution. A red blood cell is placed into each beaker.

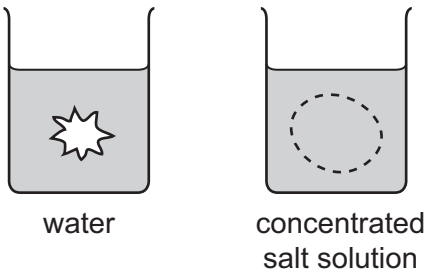


Which diagram shows the appearance of the cells after 15 minutes?

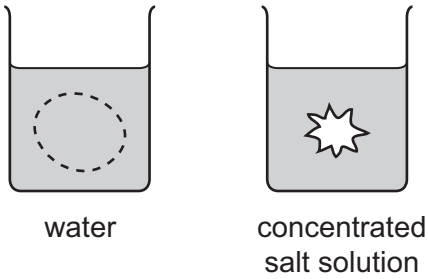
A



B



C



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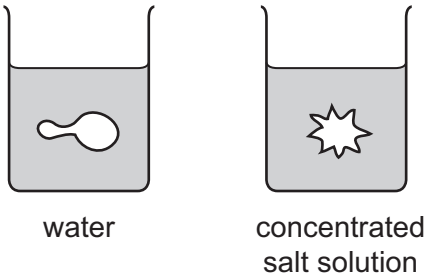
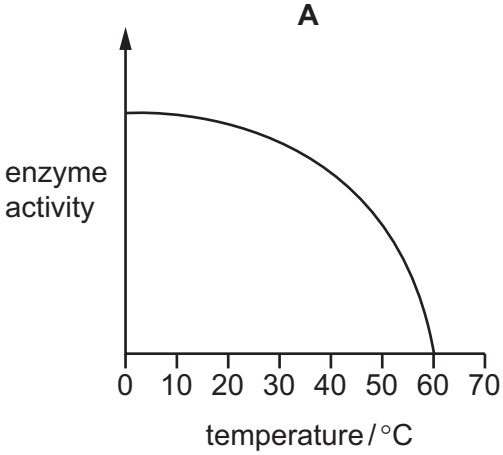
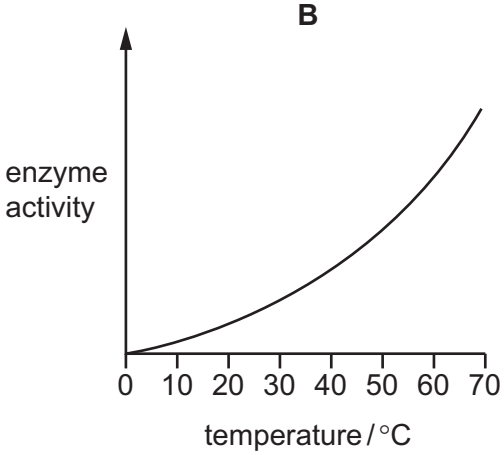


3 Which graph shows how the activity of an enzyme in the human alimentary canal varies with temperature?

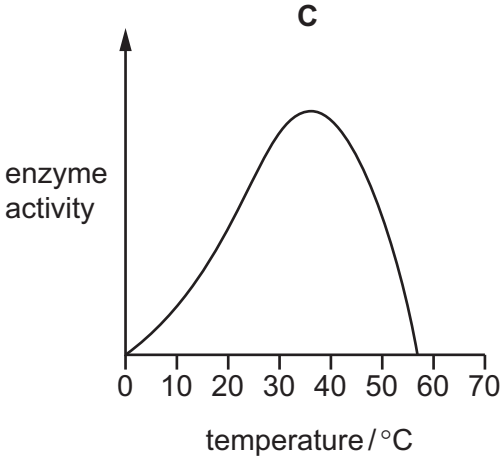
A



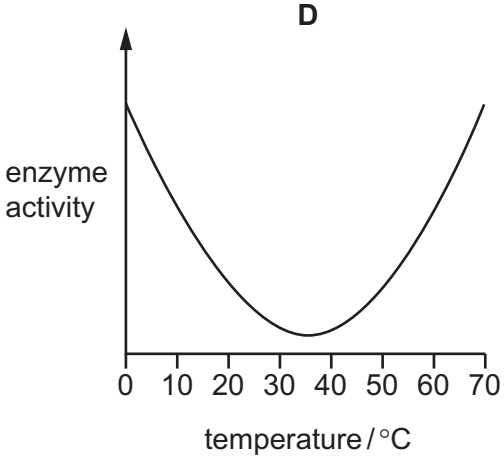
B



C



D



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

[Turn over

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

19 The table shows the pH value of 5 soil samples.

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

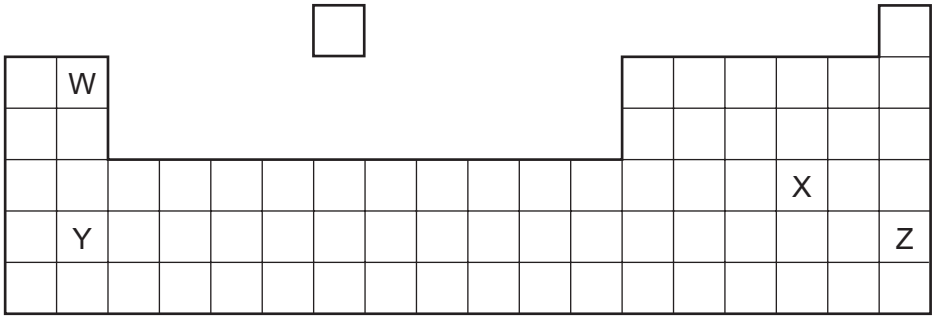
Cabbages grow best in alkaline soil.

In which soil samples should cabbage grow best?

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

20 Part of the Periodic Table is shown.

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



Which statement is correct?

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

21 What is **not** a property of a metal?

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.

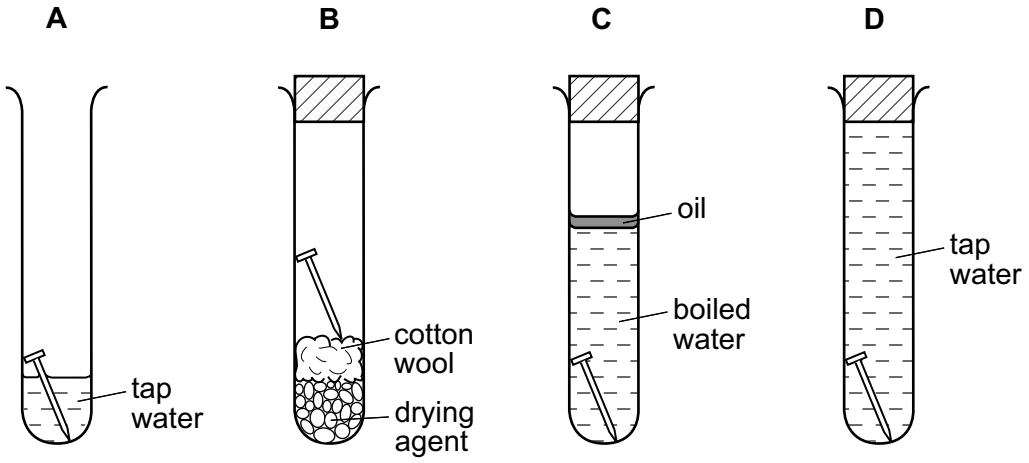
23 Aluminium is used for aircraft parts and food containers.

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.

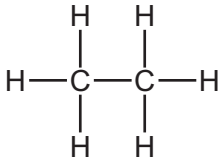
3 Their molecules all contain at least two carbon atoms.

4 They can be represented by the same general formula.

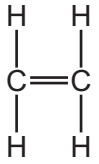
Which statements are correct?

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

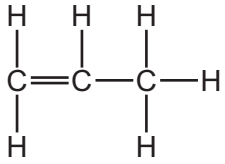
27 The molecular structures of four organic compounds are shown.



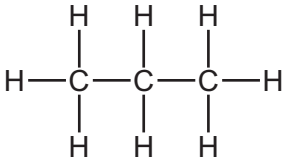
W



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?

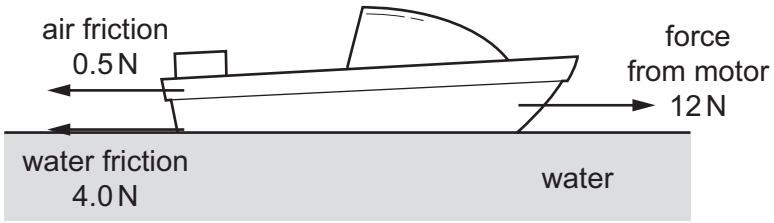
A It slows down.

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.

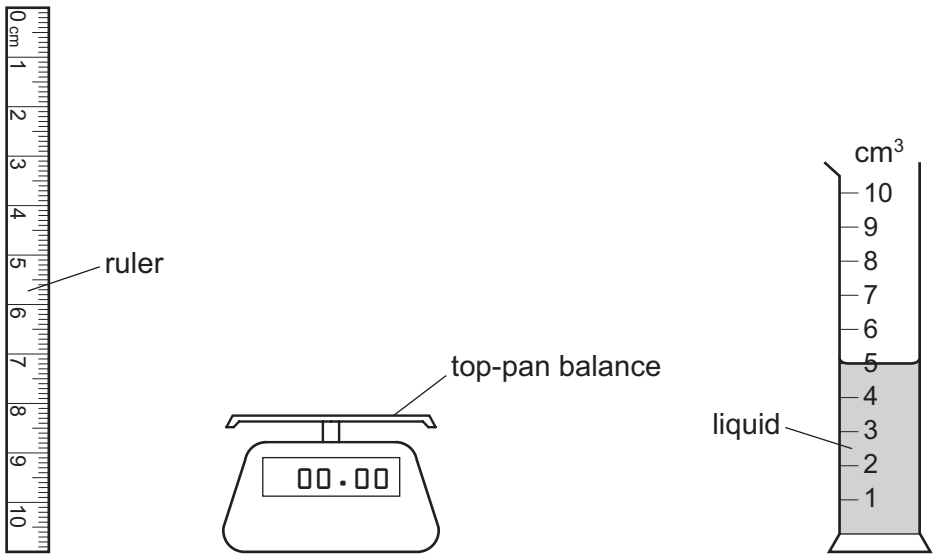


The mass of the boat is 1.4 kg.

What is the acceleration of the boat?

A 5.4 m / s^2 **B** 5.7 m / s^2 **C** 8.2 m / s^2 **D** 8.6 m / s^2

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?

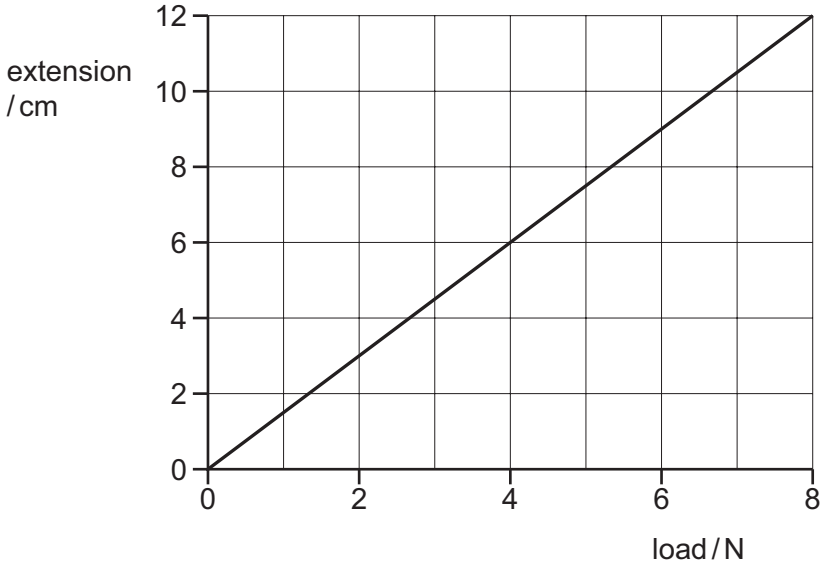
A balance and a measuring cylinder containing liquid

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.



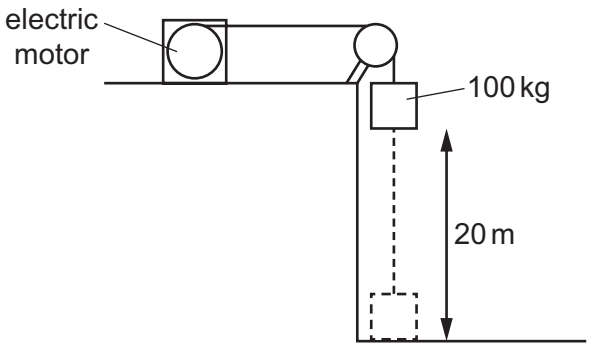
The length of the spring with no load is 3 cm.

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** 20 000 J

33 Which property **cannot** be used in a thermometer?

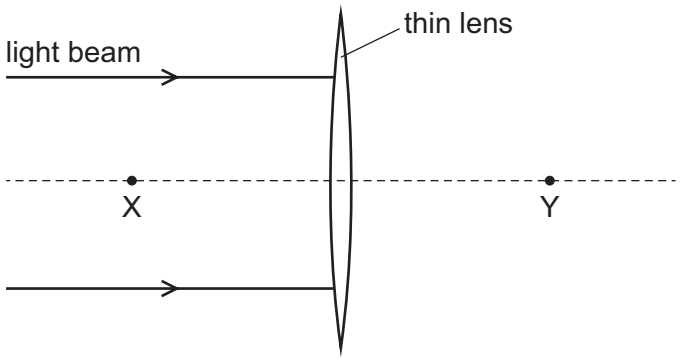
A half-life of a radioactive nuclide

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?

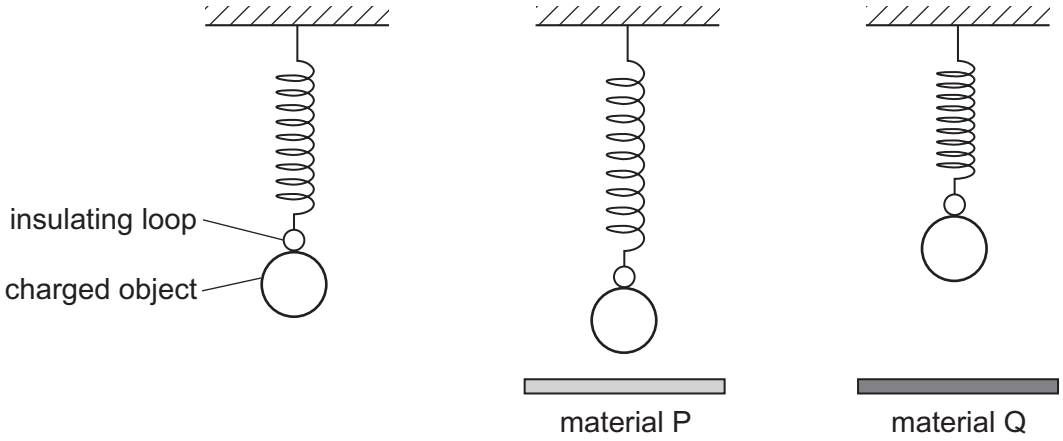
A It is reflected and converges to a point at X.

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.

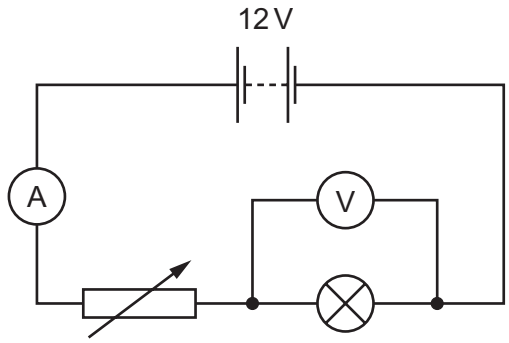
35 The diagram shows a charged object suspended from a spring by an insulating loop. Two charged materials P and Q are then held below the charged object, as shown in the diagram.



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.



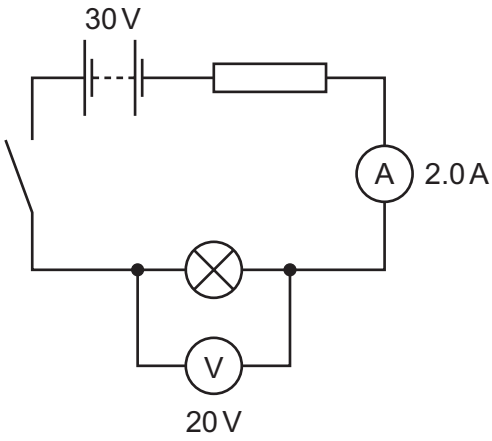
When the brightness of the lamp is low, the voltmeter reading is 2 V and the ammeter reading is 2 A.

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 Ω **B** 2 Ω **C** 3 Ω **D** 4 Ω

37 The diagram shows a simple circuit containing a lamp.

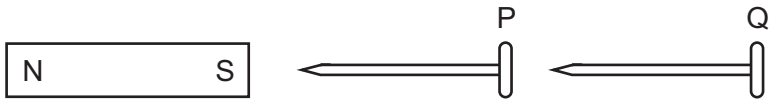


The switch is closed and the lamp is on for 2.0 hours.

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 ${}^{A}_{Z}X$, 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

Group																	
I	II											III	IV	V	VI	VII	VIII
							1 H hydrogen 1										2 He helium 4
3 Li lithium 7	4 Be beryllium 9											5 B boron 11	6 C carbon 12	7 N nitrogen 14	8 O oxygen 16	9 F fluorine 19	10 Ne neon 20
11 Na sodium 23	12 Mg magnesium 24											13 Al aluminium 27	14 Si silicon 28	15 P phosphorus 31	16 S sulfur 32	17 Cl chlorine 35.5	18 Ar argon 40
19 K potassium 39	20 Ca calcium 40	21 Sc scandium 45	22 Ti titanium 48	23 V vanadium 51	24 Cr chromium 52	25 Mn manganese 55	26 Fe iron 56	27 Co cobalt 59	28 Ni nickel 59	29 Cu copper 64	30 Zn zinc 65	31 Ga gallium 70	32 Ge germanium 73	33 As arsenic 75	34 Se selenium 79	35 Br bromine 80	36 Kr krypton 84
37 Rb rubidium 85	38 Sr strontium 88	39 Y yttrium 89	40 Zr zirconium 91	41 Nb niobium 93	42 Mo molybdenum 96	43 Tc technetium –	44 Ru ruthenium 101	45 Rh rhodium 103	46 Pd palladium 106	47 Ag silver 108	48 Cd cadmium 112	49 In indium 115	50 Sn tin 119	51 Sb antimony 122	52 Te tellurium 128	53 I iodine 127	54 Xe xenon 131
55 Cs caesium 133	56 Ba barium 137	57–71 lanthanoids	72 Hf hafnium 178	73 Ta tantalum 181	74 W tungsten 184	75 Re rhenium 186	76 Os osmium 190	77 Ir iridium 192	78 Pt platinum 195	79 Au gold 197	80 Hg mercury 201	81 Tl thallium 204	82 Pb lead 207	83 Bi bismuth 209	84 Po polonium –	85 At astatine –	86 Rn radon –
87 Fr francium –	88 Ra radium –	89–103 actinoids	104 Rf rutherfordium –	105 Db dubnium –	106 Sg seaborgium –	107 Bh bohrium –	108 Hs hassium –	109 Mt meitnerium –	110 Ds darmstadtium –	111 Rg roentgenium –	112 Cn copernicium –		114 Fl flerovium –		116 Lv livermorium –		

Key

atomic number
atomic symbol
name
relative atomic mass

lanthanoids	57 La lanthanum 139	58 Ce cerium 140	59 Pr praseodymium 141	60 Nd neodymium 144	61 Pm promethium –	62 Sm samarium 150	63 Eu europium 152	64 Gd gadolinium 157	65 Tb terbium 159	66 Dy dysprosium 163	67 Ho holmium 165	68 Er erbium 167	69 Tm thulium 169	70 Yb ytterbium 173	71 Lu lutetium 175
actinoids	89 Ac actinium –	90 Th thorium 232	91 Pa protactinium 231	92 U uranium 238	93 Np neptunium –	94 Pu plutonium –	95 Am americium –	96 Cm curium –	97 Bk berkelium –	98 Cf californium –	99 Es einsteinium –	100 Fm fermium –	101 Md mendelevium –	102 No nobelium –	103 Lr lawrencium –

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