



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CO-ORDINATED SCIENCES

0654/01

Paper 1 Multiple Choice

May/June 2007

45 minutes

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

* 2 5 2 6 5 6 0 1 0 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.
A copy of the Periodic Table is printed on page 20.

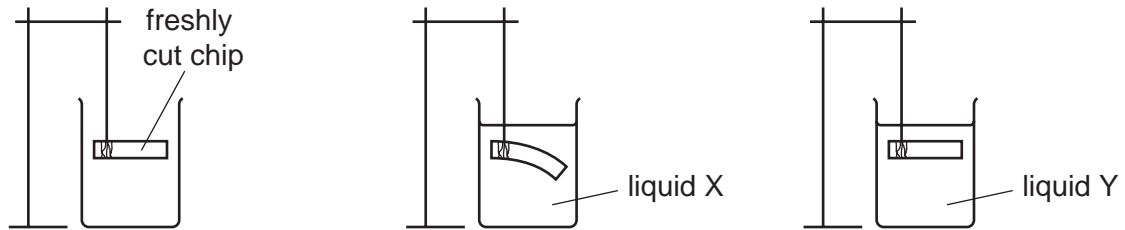
This document consists of **17** printed pages and **3** blank pages.



1 Which system is used for naming and classifying living organisms?

- A binomial
- B biological
- C scientific
- D specific

2 The diagram shows a freshly cut potato chip, a chip suspended in liquid X and a chip suspended in liquid Y.

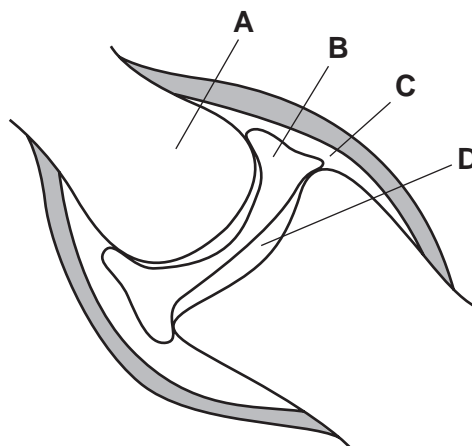


What identifies the liquids?

	liquid X	liquid Y
A	concentrated sugar solution	very dilute sugar solution
B	pure water	dilute sugar solution
C	dilute sugar solution	concentrated sugar solution
D	pure water	concentrated sugar solution

3 The diagram shows a synovial joint.

Which area contains synovial fluid?



4 What is used to remove the colour from a leaf in the starch test?

- A alcohol (methylated spirits)
- B cold water
- C hot water
- D iodine solution

5 Which structures carry blood towards the heart?

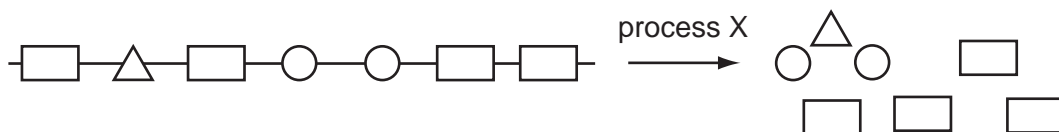
	aorta	pulmonary artery	pulmonary vein	vena cava
A	✓	✓	x	x
B	✓	x	✓	x
C	x	✓	x	✓
D	x	x	✓	✓

6 When farm animals are kept for meat production they have a special diet to increase their muscle growth.

Which nutrient is increased in the diet?

- A carbohydrate
- B fat
- C protein
- D vitamins

7 The diagram shows how a large food molecule is changed into smaller molecules.



What is process X?

- A absorption
- B chewing
- C digestion
- D secretion

- 8 An elderly person has broken several bones. The doctor advises him to drink more milk. What is the reason for this advice?
- A Milk helps to prevent dehydration.
 - B Milk is a good source of calcium.
 - C Milk is a good source of iron.
 - D Milk is low in fat.
- 9 What is homeostasis?
- A the maintenance of the body's external environment
 - B the maintenance of the body's internal environment
 - C the processes that produce heat in the body
 - D the removal of wastes from the body
- 10 After a plant has produced flowers, what is the correct sequence of events leading to reproduction in that plant?
- A fertilisation, pollination, seed formation
 - B pollination, fertilisation, seed formation
 - C seed formation, fertilisation, pollination
 - D seed formation, pollination, fertilisation
- 11 What is the name of the organ in which a human baby grows until it is born?
- A ovary
 - B oviduct
 - C uterus
 - D vagina

- 12 The diagram shows the results of crossing two tall pea plants. T represents the dominant allele for tallness.

	T	t
T	TT	Tt
t	Tt	tt

What information can be obtained from this diagram?

- A The parent plants were heterozygous.
 B All the offspring are homozygous.
 C The shaded row shows the phenotypes of the parents.
 D The right hand column shows mutations.
- 13 What is released by decomposers from decaying organic matter?

- A carbohydrates
 B inorganic ions
 C oxygen
 D protein

- 14 When water is heated to 100°C, it changes to steam.

The steam has a larger volume than the water.

Which change on heating explains this increase in volume?

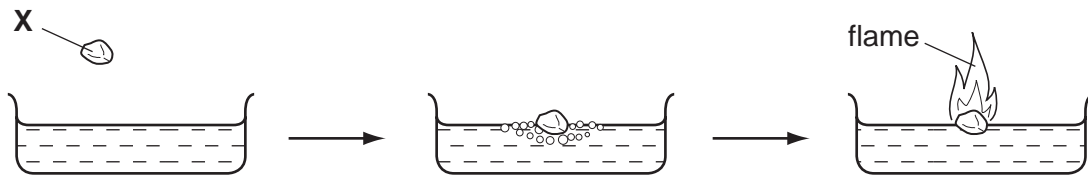
- A The bonds between hydrogen and oxygen break.
 B The molecules become lighter.
 C The spacing between the molecules increases.
 D The water molecules expand.
- 15 A silver coin contains the same number of atoms as a gold coin.

Is the mass, and number of electrons, the same for the two coins?

	mass	number of electrons
A	✓	✓
B	✓	x
C	x	✓
D	x	x

6

16 A small piece of element **X** is dropped into a bowl of water. The diagrams show what

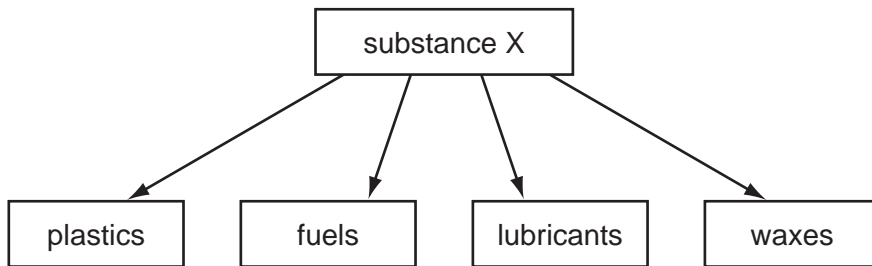


When the reaction stops, the remaining solution turns Universal Indicator blue.

To which group of the Periodic Table does element **X** belong?

- A** 1 **B** 3 **C** 5 **D** 6

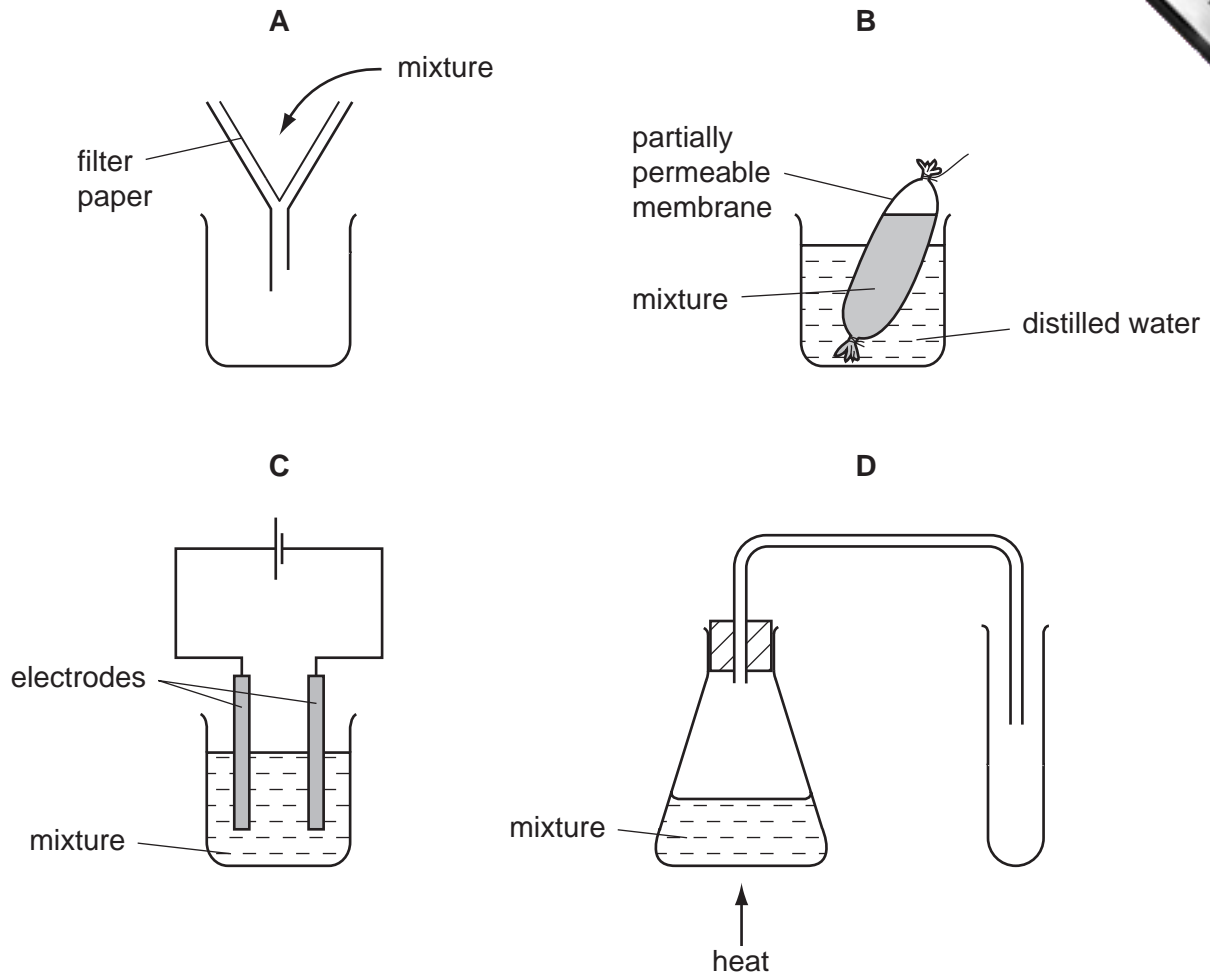
17 The diagram shows some of the useful products manufactured in the chemical industry from substance **X**.



What is substance **X**?

- A** limestone
B methane
C petroleum
D salt

18 Which diagram shows how to separate glucose from a mixture of starch and glucose



19 It is unusual for a hot drink to be served in a metal cup.

Why is this?

- A Metals are usually hard.
- B Metals are usually strong.
- C Metals have high porosity.
- D Metals have high thermal conductivity.

20 Neon and nitrogen are gaseous non-metals.

Which of these elements can be oxidised?

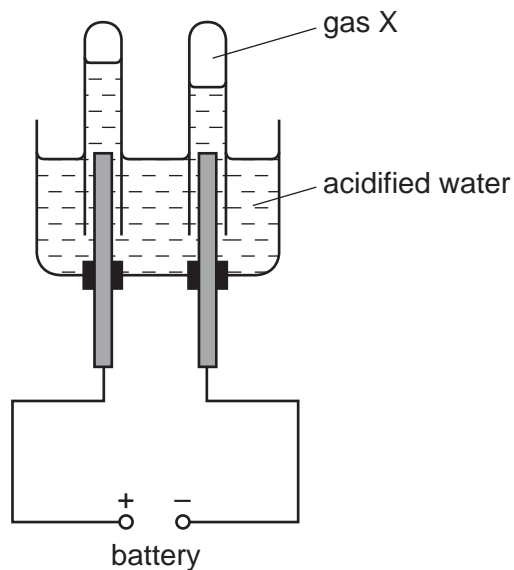
	neon	nitrogen
A	✓	✓
B	✓	x
C	x	✓
D	x	x

21 The gas from a leaking cylinder is tested by using damp litmus paper. The damp litmus paper is bleached.

What is the gas?

- A** ammonia
- B** chlorine
- C** hydrogen
- D** oxygen

22 The diagram shows the electrolysis of acidified water.



Gas X ignites with a pop when tested with a lighted splint.

What is gas X and at which electrode is it formed?

	X is	electrode
A	hydrogen	anode
B	hydrogen	cathode
C	oxygen	anode
D	oxygen	cathode

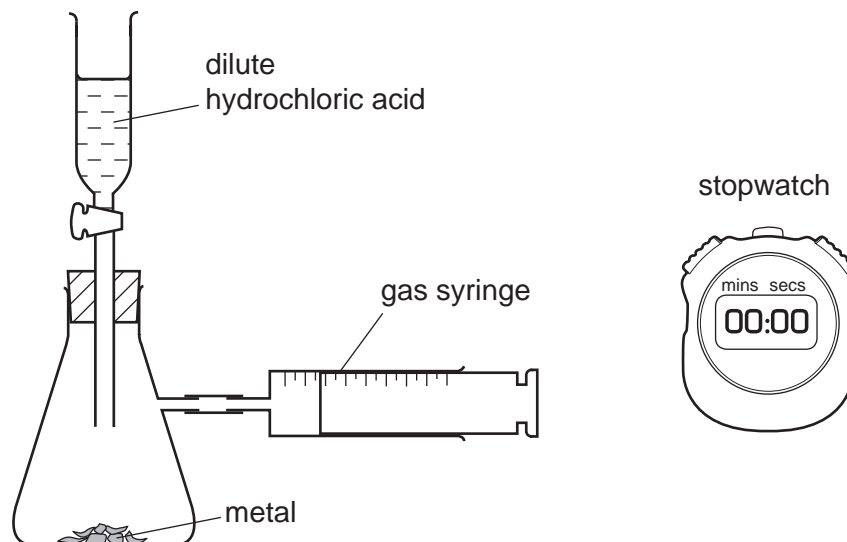
23 In the extraction of iron, its ore is first treated with sulphuric acid. This leaves a solid waste which contains unreacted acid.

The best way of treating this waste is to neutralise the acid.

How could this be done?

- A** by adding lime
- B** by adding rock salt
- C** by adding sand
- D** by adding water

24 The diagram shows apparatus used to investigate the reactivity of metals with a dilute

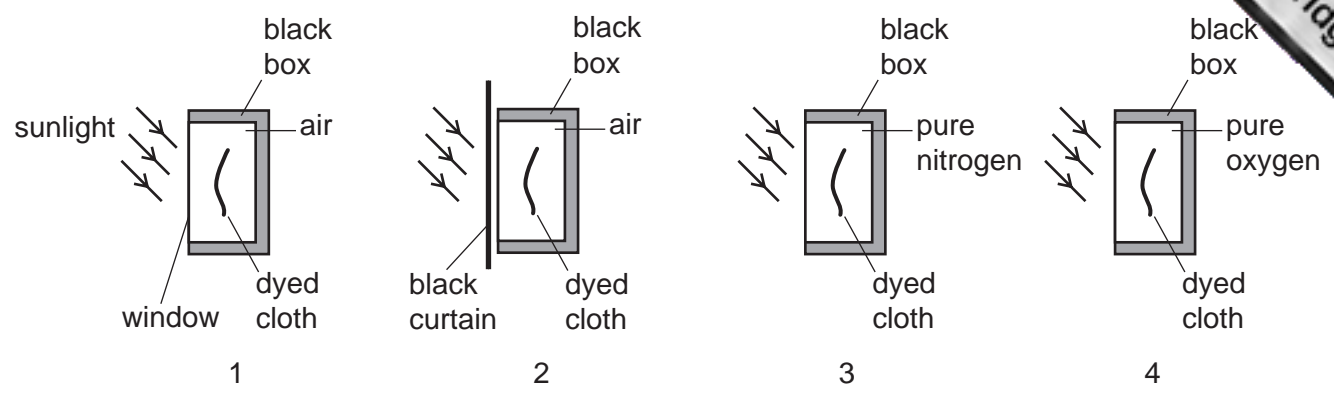


The experiment is repeated using an equal volume of the same acid each time, but changing the metal.

With which metal is the time taken to fill the syringe the shortest?

- A copper foil
- B copper powder
- C magnesium powder
- D magnesium ribbon

25 It is suggested that the colour of a dye fades over time because sunlight causes the dye to react with oxygen.



Which of the experiments shown would help test this suggestion?

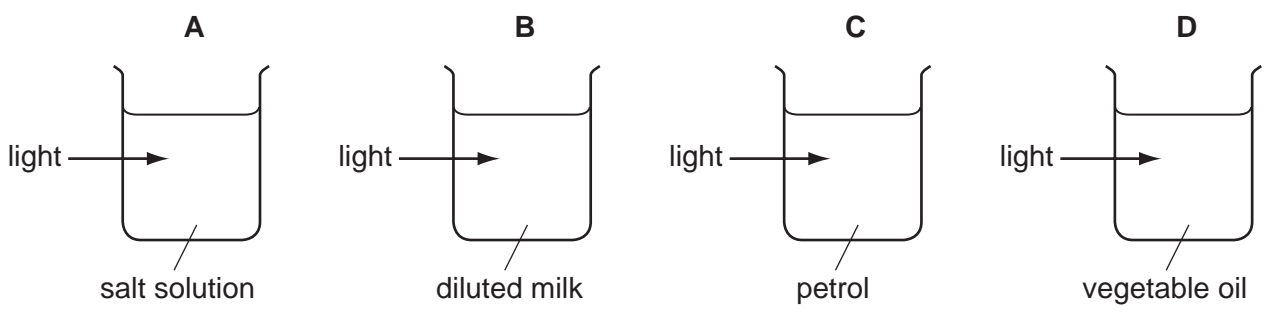
	1	2	3	4
A	✓	✓	✓	✓
B	✓	✓	✓	x
C	✓	✓	x	✓
D	x	✓	✓	✓

26 In which form do plants receive essential elements from fertilisers?

- A atoms
- B carbohydrates
- C ions
- D proteins

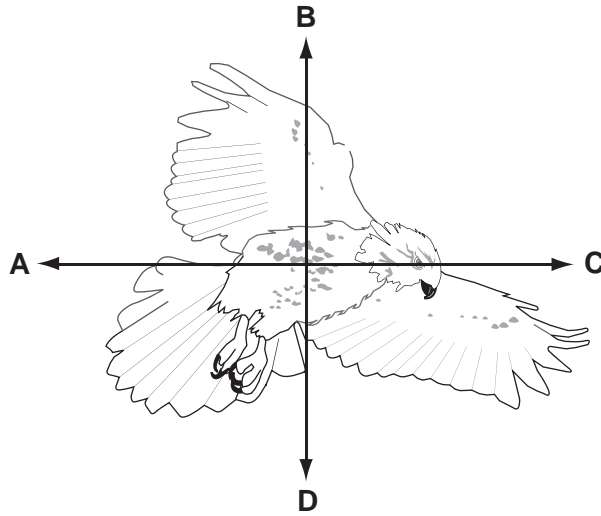
27 Light is shone into four liquids in clear glass containers.

In which container is the light scattered?



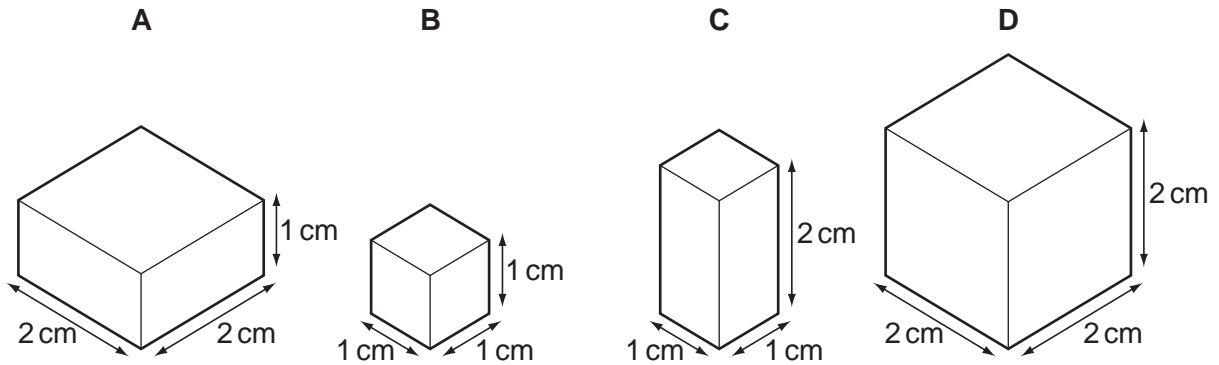
28 The diagram shows a bird in flight.

In which direction does the weight of the bird act?



29 Each of the solids shown in the diagram has the same mass.

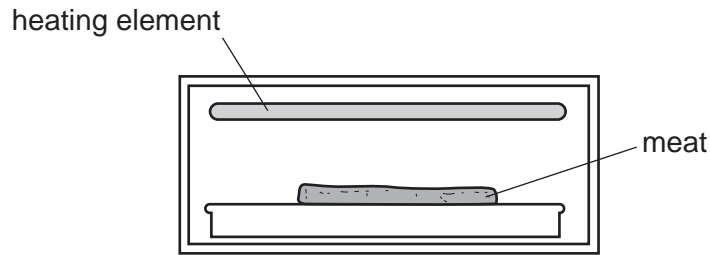
Which solid has the greatest density?



30 Which unit is used to measure work?

- A joule
- B kilogram
- C newton
- D watt

- 31 Meat can be cooked by placing it below, but not touching, a heating element.

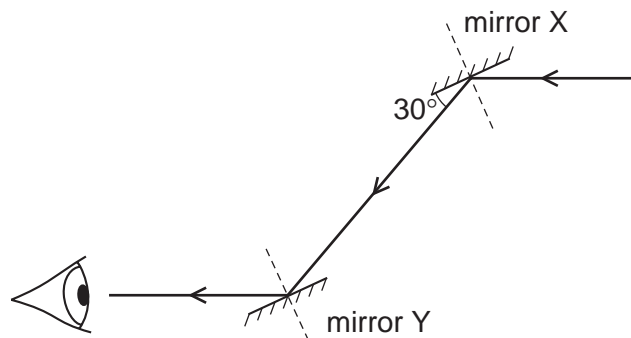


Which process transfers thermal energy from the heating element to the meat?

- A conduction
 - B convection
 - C insulation
 - D radiation
- 32 Water waves are reflected at a plane surface.
- Which property of the waves is changed by the reflection?

- A direction
- B frequency
- C speed
- D wavelength

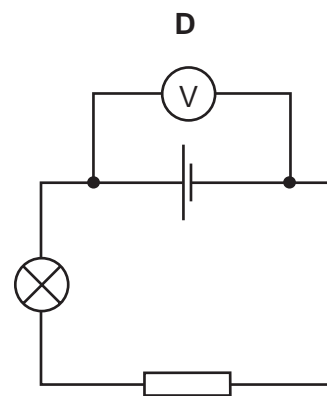
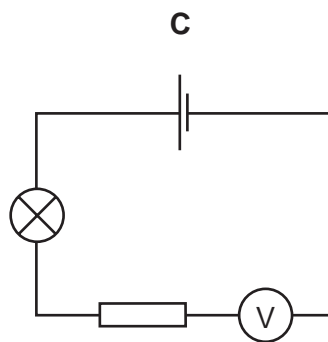
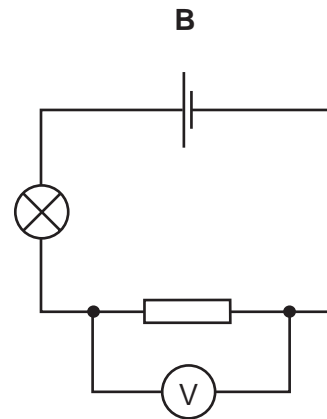
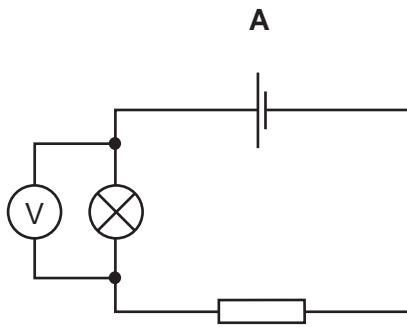
- 33 A ray of light is reflected by two parallel plane mirrors X and Y.



Which statement is correct?

- A The angle of incidence at mirror X is 30° .
- B The angle of incidence at mirror Y is 60° .
- C The angle of reflection at mirror X is 120° .
- D The angle of reflection at mirror Y is 0° .

34 Which circuit shows the correct use of a voltmeter in measuring the p.d. across the resistor?



35 Four wires are made from the same material.

Which wire has the greatest resistance?

	length of wire / cm	diameter of wire / mm
A	50	0.1
B	50	0.2
C	100	0.1
D	100	0.2

36 A vehicle of mass 900 kg is travelling with a velocity of 20 m/s.

What is the momentum of the vehicle?

- A** 45 Ns **B** 450 Ns **C** 18 000 Ns **D** 180 000 Ns

37 The diagram, which is not to scale, shows the planets Mars and Earth.



Which statement is correct?

- A Earth repels Mars but Mars attracts Earth.
- B Earth attracts Mars but Mars repels Earth.
- C Earth and Mars attract each other.
- D Earth and Mars repel each other.

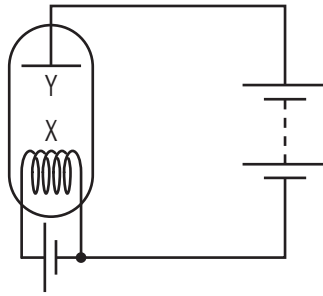
38 The list gives some ways of communicating.

- smoke signals, using a fire and blanket
- lighting fires on hill tops
- turning a torch on and off
- using flags on ships

What enables all these methods to work?

- A light and a code
- B light and infra-red waves
- C sound and a code
- D sound and infra-red waves

39 The diagram shows a thermionic diode.



Which particles are emitted in the diode, and from where are they emitted?

	particles	from where emitted
A	electrons	X
B	electrons	Y
C	protons	X
D	protons	Y

40 The half-life of a radioactive substance is 5 hours. A sample is tested and found to contain 0.48 g of the substance.

How much of the substance was present in the sample 20 hours before the sample was tested?

- A** 0.03g **B** 0.12g **C** 1.92g **D** 7.68g

DATA SHEET
The Periodic Table of the Elements

		Group															
I	II	III	IV	V	VI	VII	VIII					0					
1 H Hydrogen												2 He Helium					
3 Li Lithium	4 Be Beryllium											5 B Boron					
11 Na Sodium	12 Mg Magnesium	13 Al Aluminium	14 Si Silicon	15 P Phosphorus	16 S Sulphur	17 Cl Chlorine	18 Ar Argon						19 F Fluorine				
19 K Potassium	20 Ca Calcium	21 Sc Scandium	22 Ti Titanium	23 V Vanadium	24 Cr Chromium	25 Mn Manganese	26 Fe Iron	27 Co Cobalt	28 Ni Nickel	29 Cu Copper	30 Zn Zinc	31 Ga Gallium	32 Ge Germanium	33 As Arsenic	34 Se Selenium	35 Br Bromine	36 Kr Krypton
37 Rb Rubidium	38 Sr Strontium	39 Y Yttrium	40 Zr Zirconium	41 Nb Niobium	42 Mo Molybdenum	43 Tc Technetium	44 Ru Ruthenium	45 Rh Rhodium	46 Pd Palladium	47 Ag Silver	48 Cd Cadmium	49 In Indium	50 Sn Tin	51 Sb Antimony	52 Te Tellurium	53 I Iodine	54 Xe Xenon
55 Cs Caesium	56 Ba Barium	57 La Lanthanum	72 Hf Hafnium	73 Ta Tantalum	74 W Tungsten	75 Re Rhenium	76 Os Osmium	77 Ir Iridium	78 Pt Platinum	79 Au Gold	80 Hg Mercury	81 Tl Thallium	82 Pb Lead	83 Bi Bismuth	84 Po Polonium	85 At Astatine	86 Rn Radon
87 Fr Francium	88 Ra Radium	89 Ac Actinium											103 Lr Lawrencium				
		*58-71 Lanthanoid series										104 Rf Rutherfordium					
		†90-103 Actinoid series										105 Db Dubnium					
												106 Sg Seaborgium					
												107 Bh Bohrium					
												108 Hs Hassium					
												109 Mt Meitnerium					
												110 Ds Darmstadtium					
												111 Rg Roentgenium					
												112 Cn Copernicium					
												113 Nh Nihonium					
												114 Fl Flerovium					
												115 Mc Moscovium					
												116 Lv Livermorium					
												117 Ts Tennessine					
												118 Og Oganesson					

Key

a	X
b	

a = relative atomic mass
X = atomic symbol
b = proton (atomic) number

The volume of one mole of any gas is 24 dm³ at room temperature and pressure (r.t.p.).