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BEDOK VIEW SECONDARY SCHOOL MID-YEAR EXAMINATION 2018

CANDIDATE
NAME

REGISTER
NUMBER

CLASS

LOWER SECONDARY SCIENCE Secondary 1 Express

07 May 2018
1 hour 30 minutes

Additional Materials: Multiple Choice Answer Sheet

READ THESE INSTRUCTIONS FIRST

Write in soft pencil.

Do not use staples, paper clips, glue or correction fluid.

Write your name and index number on the Answer Sheet in the spaces provided unless this has been done for you.

Information for Candidates

Section A

There are **twenty** questions in this section. 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.

Section B

Answer **all** questions.

Write your answers in the spaces provided on the Question Paper.

Candidates are reminded that **all** quantitative answers should include appropriate units.

The use of an approved scientific calculator is expected, where appropriate.

Candidates are advised to show all their working in a clear and orderly manner, as more marks are awarded for sound use of concepts than for correct answers.

For Examiner's Use		
Section A		/ 20
21		/ 5
22		/ 4
23		/ 4
24		/ 6
25		/ 8
26		/ 4
27		/ 5
28		/ 4
Section B		/ 40
Total		/ 60
% / Grade		/

At the end of the examination, fasten all your work securely together. The number of marks is given in brackets [] at the end of each question or part question.

Setter(s): Ms Wong W L

Parent's / Guardian's Signature:

This document consists of **16** printed pages.

Do not turn over the page until you are told to do so.

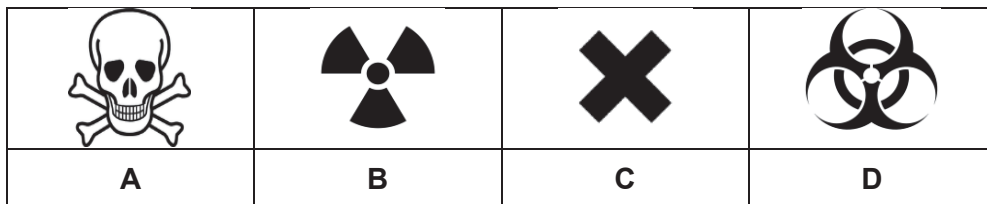
Section A

Answer **all** the questions in this section.

- 1 Which of the steps could be carried out first before formulating a hypothesis?

- A** decide on the variables **B** gather relevant information
C share of results with others **D** design an experiment

- 2 Laboratory tests showed that a patient is suffering from radioactive poisoning. Which hazard symbol did the patient most likely ignore before the incident?

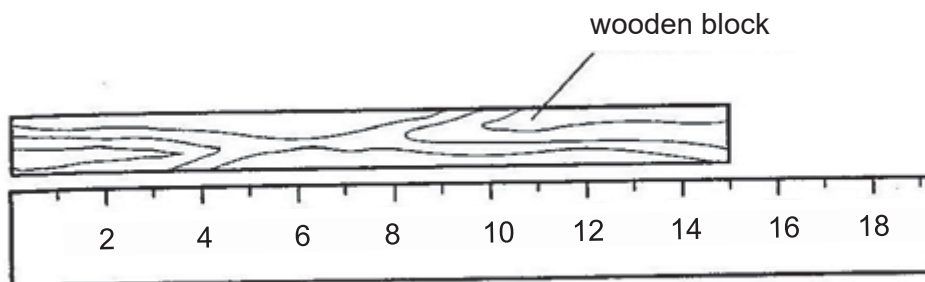


- 3 In mining fields, drills are used to remove rocks to search for the valuable metal ores below. The intense drilling generates high amount of frictional heat.

Which physical properties should be considered when we choose a material to make the drills?

- A** strength, melting point, transparency
B strength, electrical conductivity, thermal conductivity
C hardness, strength, melting point
D hardness, electrical conductivity, boiling point

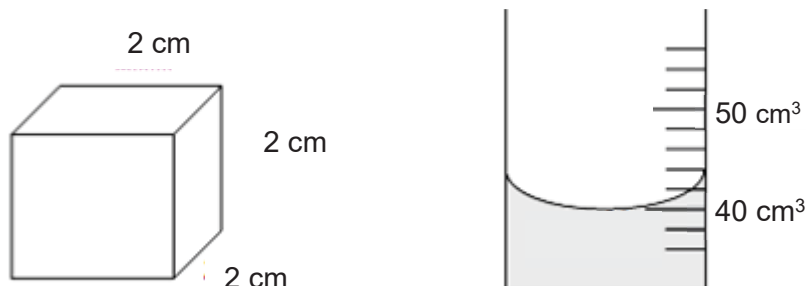
- 4 Tommy used a metre scale to measure the length of a wooden block in the diagram below.



What is the length of the block of wood?

- A** 13.5 m
B 14.0 m
C 14.5 m
D 15.0 m

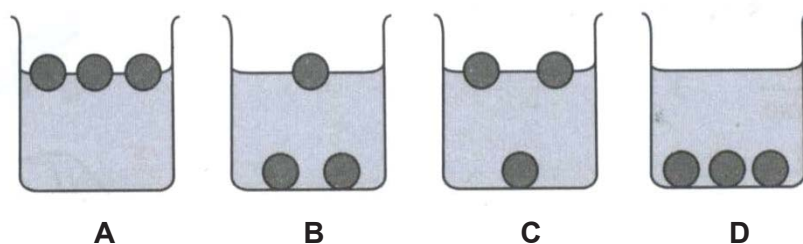
- 5 During an experiment, Janany placed a cube of nata de coco into the measuring cylinder below.



What is the final water level in the measuring cylinder if the nata de coco sinks in water?

- A 42 cm³ B 46 cm³
C 48 cm³ D 52 cm³
- 6 Three balls of the same size but different densities are immersed in four beakers carrying different liquids.
The densities of the balls are 0.8 g/cm³, 1.1 g/cm³, 1.4 g/cm³.

Which beaker holds a liquid of density 1.2 g/cm³?



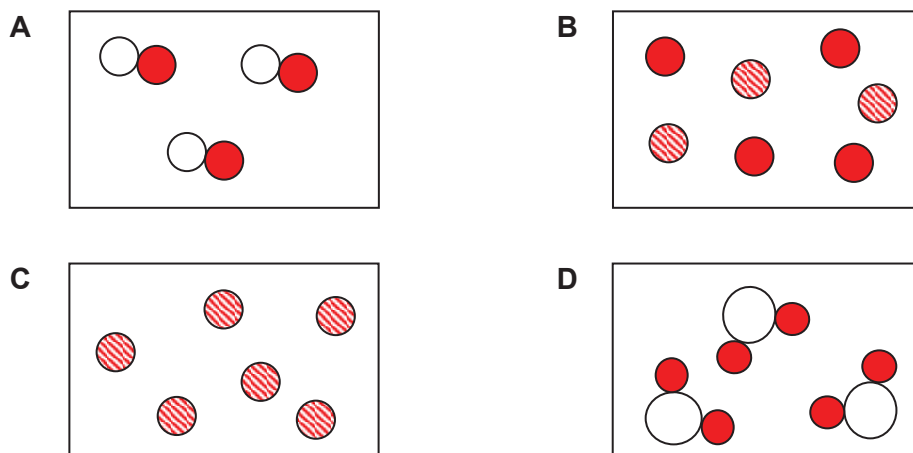
- 7 Which of the following gives the correct SI units for length and time respectively?

	length	time
A	m	h
B	m ²	min
C	m ³	h
D	m	s

- 8 Which of the following is correct?

	name of element	chemical symbol
A	nitrogen	Ni
B	cobalt	Co
C	carbon	Ca
D	beryllium	B

9 Which of the following diagrams represents a mixture?



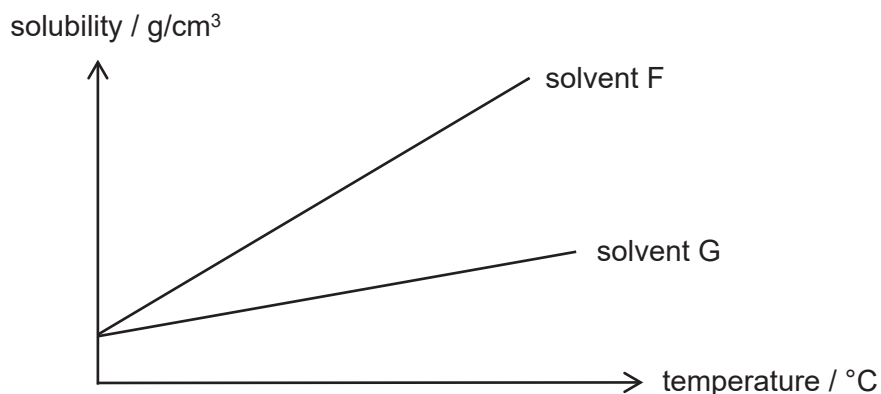
10 Which of the following shows the correct classification of substances?

	element	compound	mixture
A	mineral water	carbon dioxide	diamond
B	diamond	mineral water	carbon dioxide
C	carbon dioxide	diamond	mineral water
D	diamond	carbon dioxide	mineral water

11 Which of the following gives the correct description of a compound?

- A** A compound has the same properties as its constituent elements.
- B** A compound can only be decomposed by heat into its constituent elements.
- C** A compound consists of two or more elements chemically combined together.
- D** A compound has the same physical state as its constituent elements.

- 12** The graph below shows how the solubility of solute S in solvent F and solvent G changes with temperature.



Which of the following statements regarding the solubility of solid S is correct?

- A** Solid S has the same solubility in both solvents.
- B** Solid S has higher solubility in Solvent F than in solvent G in general.
- C** Solid S has lower solubility in Solvent F than in solvent G in general.
- D** Solid S is insoluble in both solvents.

- 13** Some sugar and steel powder are mixed together.

Which is the most appropriate method to separate the mixture?

- | | |
|-----------------------|------------------------------|
| A distillation | B filtration |
| C evaporation | D magnetic attraction |

- 14** Water that is safe for consumption can be obtained by

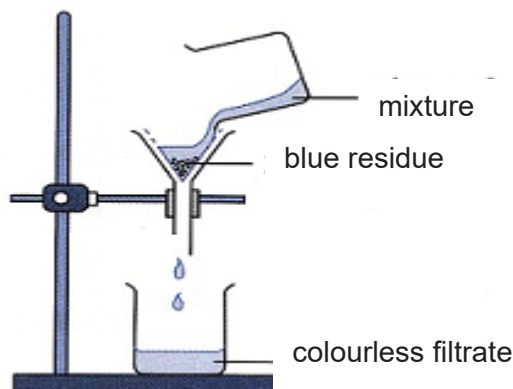
- 1 chromatography
- 2 distillation
- 3 evaporation

- | | |
|-----------------|-----------------------|
| A 1 only | B 1 and 2 only |
| C 2 only | D 2 and 3 only |

- 15** The table below shows the colour and solubilities of four types of solids in water.

solid	colour	solubility in water
1	white	soluble
2	white	insoluble
3	blue	insoluble
4	blue	soluble

A mixture containing two of the four types of solids undergoes filtration as shown below.



Which are the two solids in the mixture?

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

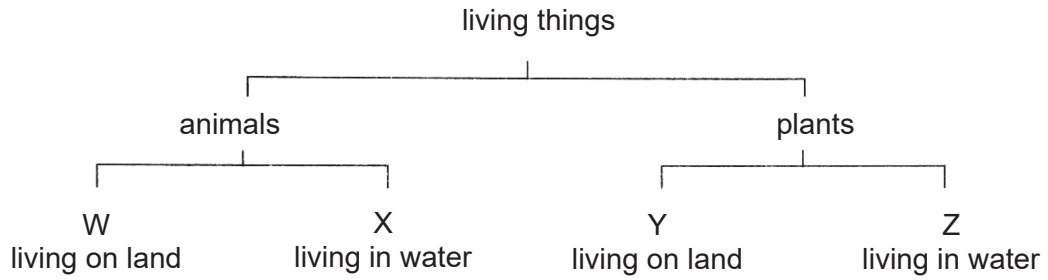
- 16** Which of the following is the correct sequence to obtain dry salt and sand from a salt-and-sand mixture?

- A** crystallisation → dissolving → filtration → heating
B dissolving → crystallisation → evaporation → filtration
C dissolving → filtration → evaporation → crystallisation
D heating → dissolving → crystallisation → filtration

- 17** Chromatography is a suitable separation technique for substances which

- A** have different solubilities. **B** decompose upon heating.
C have the same colour. **D** do not dissolve in a solvent.

- 18 Study the classification below.



Which of the following matches the classification shown above?

	W	X	Y	Z
A	chicken	frog	aloe vera	orchid
B	mackerel	elephant	grass	crab
C	rabbit	clownfish	pine tree	water lettuce
D	lion	starfish	pine tree	stingray

- 19 Which of the following groups are all vertebrates?

- A leopard, owl, rabbit B monkey, cat, earthworm
 C zebra, jellyfish, rat D beetle, octopus, starfish

- 20 Which of the following statements about a dichotomous key is **not** correct?

- A We can understand things easier with the use of a dichotomous key.
 B It can help us to differentiate between living things and non-living things.
 C A dichotomous key divides things based on their similarities and differences.
 D At each stage of the dichotomous key, three smaller groups of classifications always appear.

Section B

Answer **all** questions in the spaces provided.

- 21 Fig. 21.1 shows an experimental set-up to determine the boiling point of a liquid.

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examiner's
use

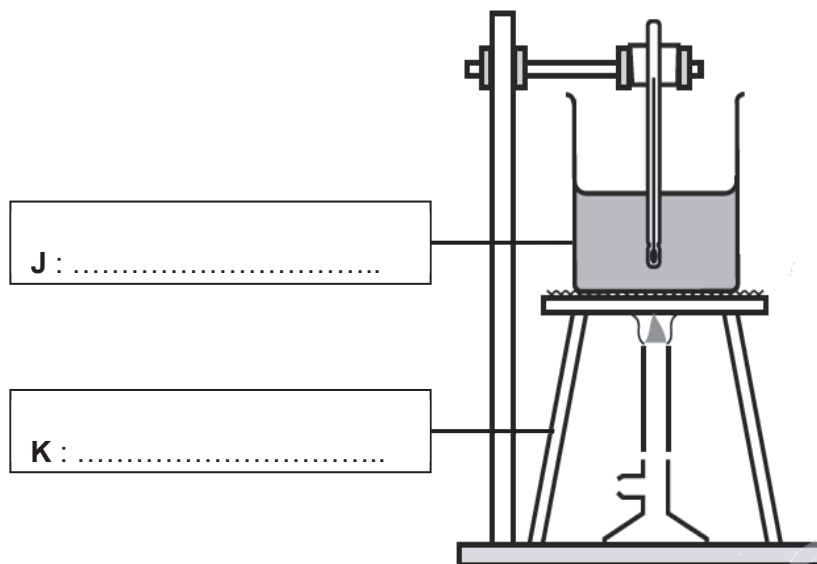


Fig. 21.1

- (a) Name the apparatus labelled J and K in Fig. 21.1 above. [2]

- (b) Write down a safety precaution you should take when you conduct the experiment above.

..... [1]

- (c) State the type of flame that should be used in the experiment above. Give a reason for your answer.

..... [2]

[Total:5]

- 22** Moh's scale of hardness is a scale used to classify the hardness of matter. The higher the number, the harder the substance is. Hence, the hardest substance will be given 10 and the least hard will be given 1 on the Moh's scale.

*For
examiner's
use*

Table 22.1 below shows a list of substances and their respective hardness on Moh's scale. With reference to the table, answer the following questions.

Table 22.1

substance	Moh's scale
talc	1
fingernail	2.5
calcite	3
fluorite	4
steel	6
quartz	8
diamond	10

- (a)** Write down the hardness (Moh's scale) required to scratch calcite.

..... [1]

- (b)** Jessica has a piece of glass that she thinks has a hardness of about 5. What can she do to check if she is correct?

.....

 [3]

[Total:4]

23 (a) Convert the following physical quantities

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use

(i) 1.25 kg = g

(ii) 1.44 km = cm [2]

(b) Fig. 23.1 shows the outline of mainland Singapore.



Fig. 23.1

Given that each grid square unit represents an area of 18 km^2 , calculate the approximated area of mainland Singapore. Show your working.

approximated area of mainland Singapore = km^2 [2]

[Total:4]

- 24 Read the following passage titled Landfills “The Good and Bad of Semakau Landfill”.

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examiner's
use

Semakau Landfill, the world's first man-made offshore landfill opened in 1999, is home to more than 700 types of plants, animals and several endangered species. Having been transformed into an eco-park, mangroves and coral reefs ring the island and many nature-related recreational activities are held here.

By locating it offshore, 8 miles south of Singapore, the risk for soil pollution is greatly decreased. Through innovative engineering solutions, the waste is effectively contained within the landfill area, which is lined with impermeable membrane, marine clay and rock layers.

Every year, about 200,000 tonnes of solid waste and ash are received at this landfill. At the rate in which waste is being sent there, it is projected to run out of space by 2035.

(adapted from <http://blog.nus.edu.sg/pollutionistheword/2015/04/02/landfills-the-good-and-bad-of-semakau-landfill/>)

- (a) State what are used to contain the waste in the landfill area.
..... [1]
- (b) Suggest what the rock layers are used for.
..... [1]
- (c) Suggest what the marine clay is used for.
..... [1]
- (d) Explain why there is a need for an impermeable membrane around the landfill.
.....
.....
..... [2]
- (e) Explain why using landfill to hold waste disposal is **not** sustainable in Singapore.
.....
..... [1]

[Total: 6]

25 Fig. 25.1 below shows the different species of sea snails found in an ocean.

For
examiner's
use

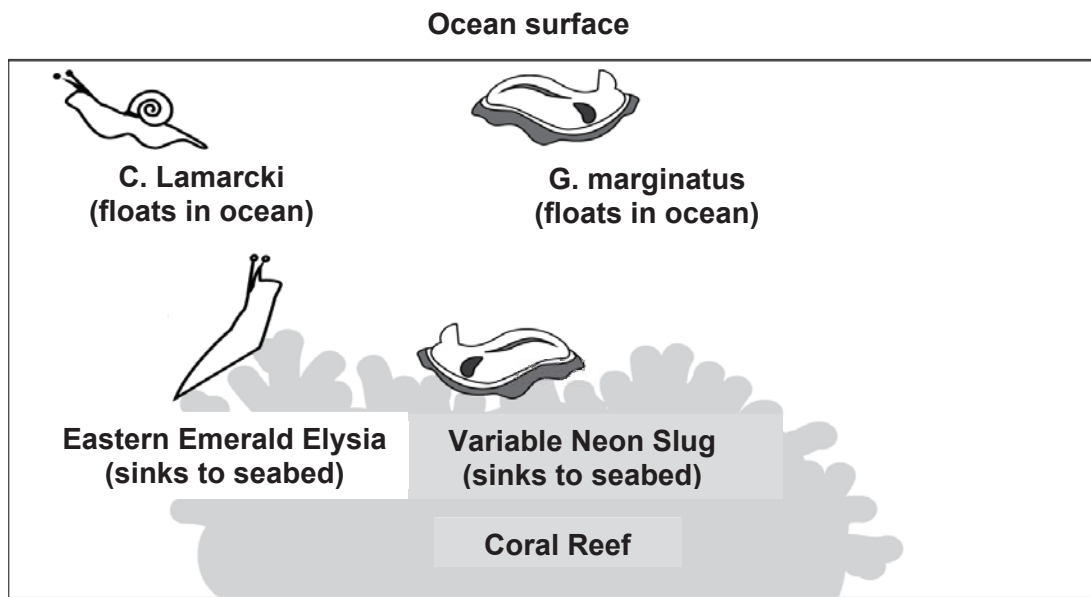


Fig. 25.1

(a) Name the apparatus required to measure the

- (i) mass of a shell. [2]
 (ii) volume of a shell.

(b) Table 25.2 shows some information about the two other species of snails, *H. physis* and *O. olivacea*.

Table 25.2

	mass of shell	volume of shell	density
* <i>H. physis</i>	9 g	5.5 cm ³	
* <i>O. olivacea</i>	4 g	7.0 cm ³	0.57 g/cm ³

* These two species are not included in Fig. 25.1 above

- (i) Calculate the density of the shell of *H. physis* and fill up Table 25.2. Show your working. [2]
- (ii) Sea water has a density of 1.02 g/cm³. State where you are most likely to find *O. olivacea* in the ocean. Explain why. [2]
-
-

- (c) The main component of the shells on sea snails is calcium carbonate, CaCO_3 . Write down the number of atoms in one molecule of calcium carbonate, CaCO_3 .

..... [1]

- (d) Occupying less than 1% of the ocean floor, coral reefs are home to more than 25% of marine life. Write down one threat to the survival of corals.

..... [1]

[Total:8]

- 26 Joanne set up the experiment in Fig. 26.1 below to investigate whether the particle size of the sodium chloride affects the rate of dissolving.

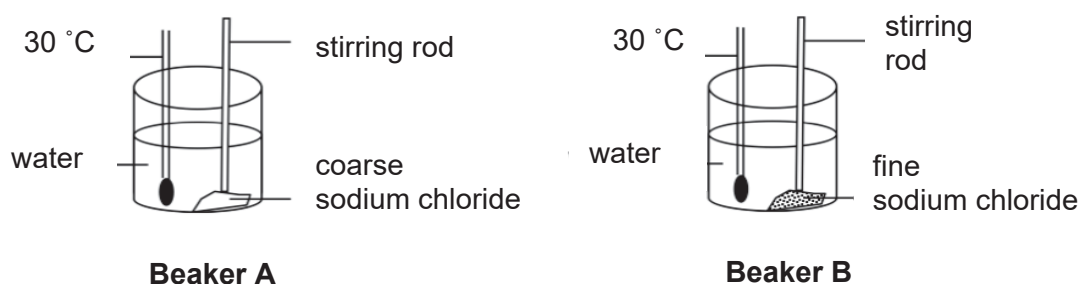


Fig. 26.1

- (a) Identify the independent and dependent variable for the above experiment.

Independent variable :

Dependent variable : [2]

- (b) State which beaker will allow sodium chloride to dissolve faster. Explain why.

.....

.....

..... [2]

[Total:4]

27 Fig. 27.1 below shows a simple distillation setup.

For
examiner's
use

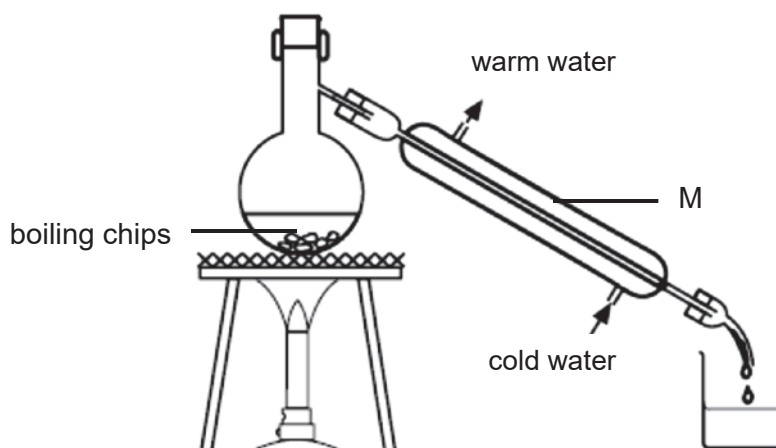


Fig. 27.1

(a) Indicate with an 'X' on Fig. 27.1, the position where the bulb of the thermometer should be placed. [1]

(b) (i) State the function of M.

..... [1]
.....

(ii) Suggest why cold water enters from the bottom of apparatus M.

..... [1]
.....

(c) Give a reason why smooth boiling is crucial during distillation.

..... [2]
.....
.....

[Total:5]

- 28** An investigation was carried out on two different fruit juices, P and Q and four known coloured dyes, 1, 2, 3 and 4. The results are shown in the chromatogram below. Dye 2 is found in a list of banned dyes.

*For
examiner's
use*

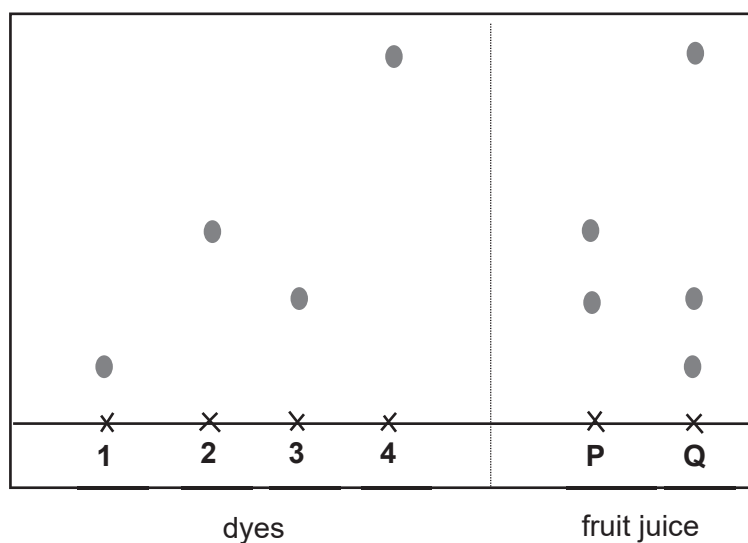


Fig. 28.1

- (a)** Which dye is most soluble in the solvent?

..... [1]

- (b)** Which dye(s) is/are found in Q?

..... [1]

- (c)** Are both fruit juices safe to drink? Explain your answer.

.....
 [2]

[Total:4]

End of Paper

DATA SHEET

The Periodic Table of the Elements

Group																	
I	II	Key										III	IV	V	VI	VII	0
		proton (atomic) number atomic symbol name relative atomic mass															
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 -		

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
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 -

actinoids

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

