FOR OFFICIAL USE

Centre No.	Subject No.	Grade	Paper No.	Group No.	Marker's No.

Total

[C012/SQP052]

Intermediate 1 Chemistry

Time: 1 hour 30 minutes

NATIONAL QUALIFICATIONS

Specimen Question Paper

Fill in these boxes and read what is printed below.

Full name of centre | Town

First name and initials | Surname

Date of birth
Day Month Year | Candidate number | Number of seat

Part 1 (questions 1 to 20)

Check that the answer sheet provided is for Chemistry Intermediate 1.

Fill in the details required on the answer sheet.

Rough working, if required, should be done only on this question paper, or on the rough working sheet provided—**not** on the answer sheet.

Instructions for the completion of **Part 1** are given on page two.

Part 2 (questions 21 to 33)

All questions should be attempted.

The questions may be answered in any order but all answers are to be written in this answer book, and must be written clearly and legibly in ink.

Rough work, if any should be necessary, as well as the fair copy, is to be written in this book.

Rough work should be scored through when the fair copy has been written.

Additional space for answers and rough work will be found at the end of the book. If further space is required, supplementary sheets may be obtained from the invigilator and should be inserted inside the **front** cover of this booklet.

Before leaving the examination room you must give this book to the invigilator. If you do not, you may lose all the marks for this paper.

Necessary data will be found in the Intermediate 1 Chemistry Data Booklet (1999 Edition). **[This will be provided in 1999.]**

SCOTTISH QUALIFICATIONS AUTHORITY

PART 1

In questions 1 to 20 of this part of the paper, an answer is given by indicating the choice A, B, C or D by a stroke made in INK in the appropriate place in Part 1 of the answer sheet—see the sample question below.

For each question there is only ONE correct answer.

This part of the paper is worth 20 marks.

SAMPLE QUESTION

To show that the ink in a ball-pen consists of a mixture of dyes, the method of separation would be

A fractional distillation

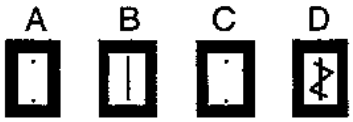
B chromatography

C fractional crystallisation

D filtration.

The correct answer is B—chromatography. A **heavy** vertical line should be drawn joining the two dots in the appropriate box in the column headed **B** as shown **in the example on the answer sheet**.

If, after you have recorded your answer, you decide that you have made an error and wish to make a change, you should cancel the original answer and put a vertical stroke in the box you now consider to be correct. Thus, if you want to change an answer **D** to an answer **B**, your answer sheet would look like this:



If you want to change back to an answer which has already been scored out, you should **enter a tick (✓)** to the RIGHT of the box of your choice, thus:

PART 1

This part of the question paper consists of twenty multiple choice items.

1. Which compound contains oxygen?

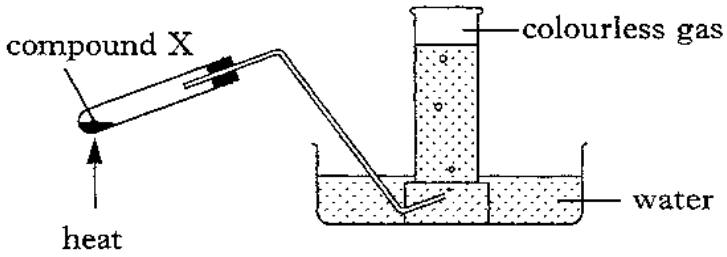
A Calcium chloride

B Copper sulphate

C Sodium sulphide

D Magnesium bromide

2. Compound **X** was heated as shown in the diagram.



A pupil made the following observations.

(i) A silvery liquid metal formed in the test tube.

(ii) The colourless gas relit a glowing splint.

The elements present in compound **X** are

A copper and hydrogen

B copper and oxygen

C mercury and oxygen

D mercury and hydrogen.

3. Isobel added dilute potassium hydroxide solution to dilute sulphuric acid solution in a beaker.

Which statement is correct?

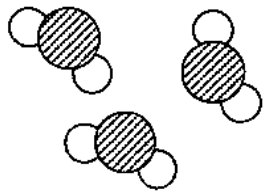
A The pH of the solution in the beaker increased.

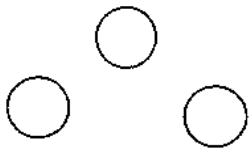
B The salt formed was potassium sulphide.

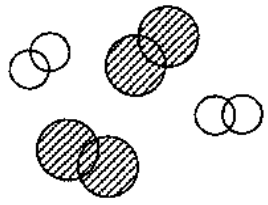
C The salt formed was sodium sulphate.

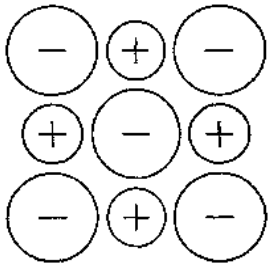
D The pH of the solution in the beaker decreased.

4. Which diagram could represent the structure of an ionic compound?

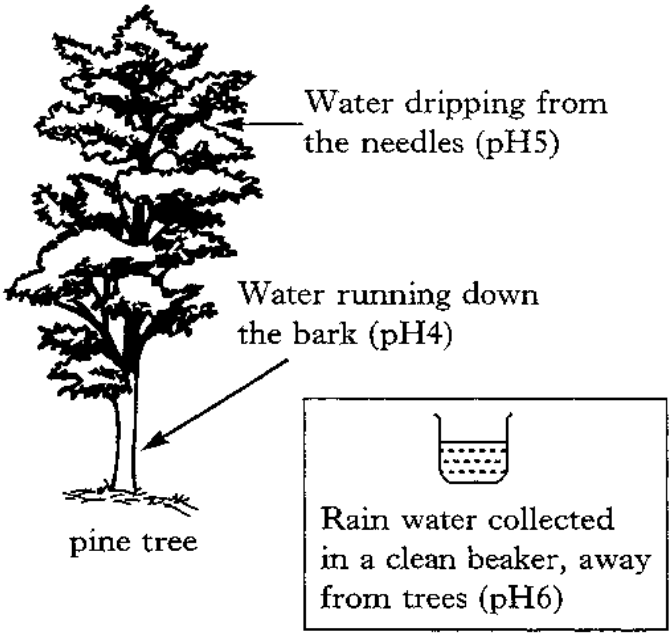
A 

B 

C 

D 

5. Maureen carried out a project on acid rain. She took samples and recorded the following pH values.



Which statement is correct?

A The rain water is neutral.

B Pine needles increase the acidity of rain water.

C Pine bark has no effect on the acidity of rain water.

D The water dripping from the needles is more acidic than the water running down the bark.

6. When water changes to steam

A strong bonds between atoms in water molecules are broken

B strong bonds between water molecules are broken

C weak bonds between atoms in water molecules are broken

D weak bonds between water molecules are broken.

7. Which substance is not a household acid?

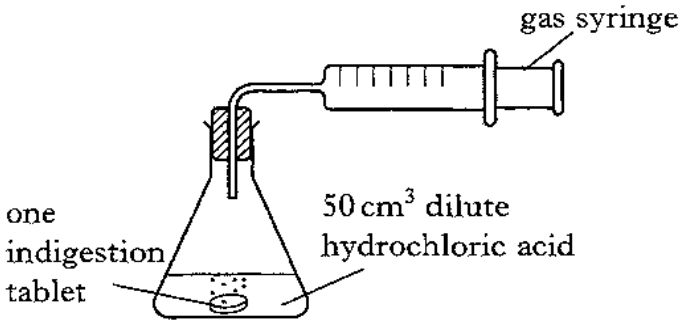
A Lemon juice

B Oven cleaner

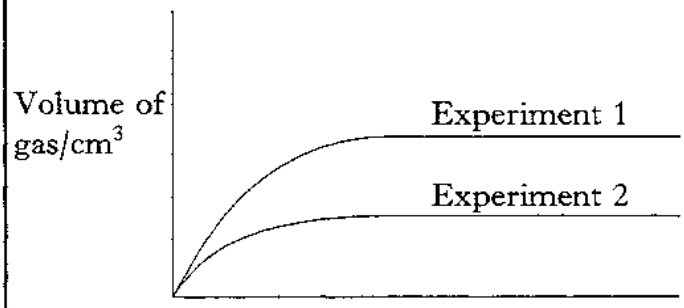
C Soda water

D Vinegar

8. Anna investigated the rate at which gas was given off when indigestion tablets were added to dilute hydrochloric acid. She used her results to draw two curves on a graph.



Experiment 1



Anna could have carried out her second experiment

A at a lower temperature

B using more concentrated hydrochloric acid

C using half an indigestion tablet

D using a crushed tablet.

9. Which fibre is a synthetic fibre?

A Cotton

B Silk

C Polyester

D Wool

10. Which statement is true for soapless detergents?

A They are soluble in grease but not in water.

B They form a scum with hard water.

C They are soluble in water but not in grease.

D They can be used to form a lather with hard water.

11. Polystyrene is a useful plastic because after it is made it can be heated and re-shaped. However it causes pollution problems because bacteria are unable to break it down.

Which statement is true for polystyrene?

A It is a natural polymer.

B The monomer used to make polystyrene is ethene.

C It is a thermoplastic polymer.

D It is biodegradeable.

12. Which of the following is a renewable source of energy?

A Coal

B Methane

C Oil

D Peat

13. The level of which of the following pollutants has increased due to motorists using unleaded petrol in place of leaded petrol?

A Benzene

B Carbon

C Carbon monoxide

D Nitrogen dioxide

14. Metals used to make aircraft have a density of less than 3 g per cm^3 and have to withstand temperatures up to 600 °C.

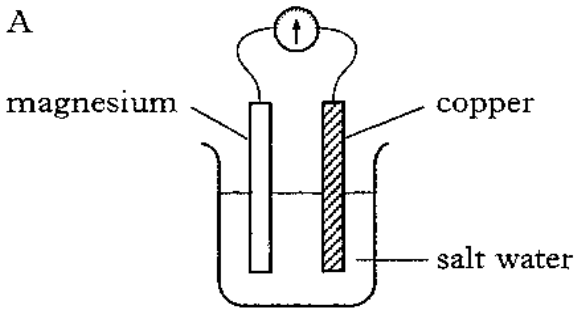
Which set of data could be for a metal used to make aircraft?

	Melting point/°C	Density/g per cm^3
A	98	0·97
B	660	2·70
C	1857	7·20
D	1083	8·92

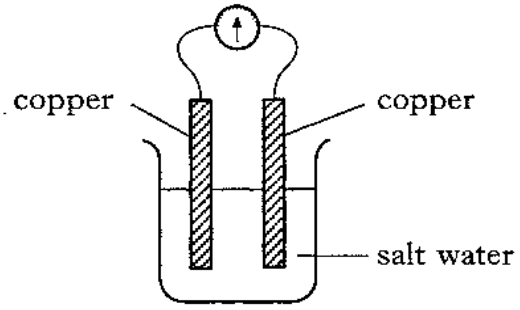
15. Philip was investigating making electricity.

Which arrangement would have given Philip the largest reading on the meter?

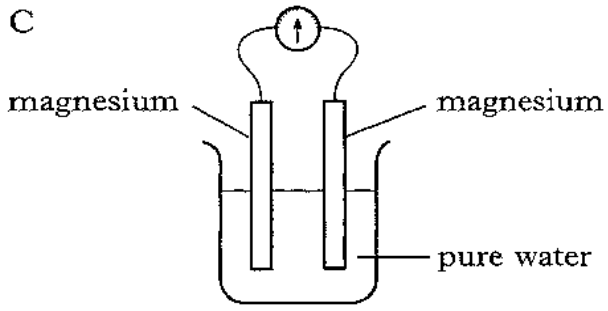
A



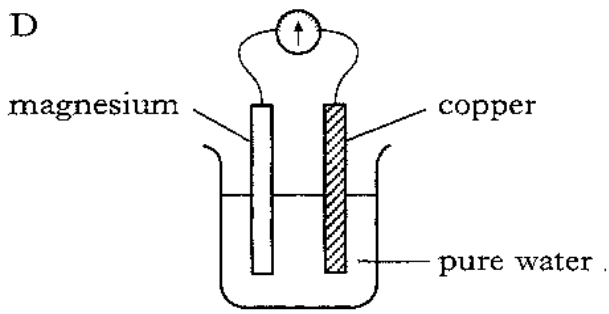
B



C



D



16. Which of the following is used to make a plastic?

A Polymerisation of ethene

B Combustion of hydrocarbons

C Distillation of crude oil

D Fermentation of glucose

17. Which type of reaction provides your body with energy?

A Fermentation

B Photosynthesis

C Polymerisation

D Respiration

18. Which substance would produce an alkaline gas when heated with soda lime?

A Fat

B Protein

C Starch

D Sucrose

19. Which drug is illegal?

A Alcohol

B Caffeine

C Cannabis

D Nicotine

20. Which drink is made by fermentation followed by distillation?

A Beer (5% alcohol)

B Cider (8% alcohol)

C Rum (40% alcohol)

D Wine (11% alcohol)

PART 2

Marks

A total of 40 marks is available in this section of the paper.

21. Aluminium metal can be protected from corrosion by thickening the layer of aluminum oxide on the metal's surface.

(*a*) In what year was aluminium discovered?
(You may wish to refer to the data booklet to help you.)

_____ **1**

(*b*) The main ore of aluminium is bauxite. What method is used to obtain aluminium from bauxite?

_____

_____

_____ **1**

(*c*) Name the process used to thicken the oxide layer on the surface of aluminium.

_____ **1**

(3)

write in th margin

Marks

22. Diesel fuel contains sulphur compounds.

(*a*) Which process is used to obtain diesel fuel from crude oil?

_____

_____

_____ **1**

(*b*) Burning diesel fuel produces sulphur dioxide.

(i) Write the formula for sulphur dioxide.

1

(ii) In what way can sulphur dioxide harm the environment?

_____

_____

_____ **1**

(*c*) Why is the **incomplete** combustion of diesel fuel harmful?

_____

_____

_____ **1**

(4)

23. Colin was investigating the height of lather produced when drops of Dazzle washing-up liquid were shaken with 10 cm^3 of water in a test tube. *Marks*

Temperature/°C	Number of shakes	Height of lather/cm^3
20	4	3·2
30	4	3·8
40	4	5·6
20	6	4·7
20	8	6·3

(*a*) Write down **two** conclusions that Colin can make from his results.

1 _____

_____

_____

2 _____

_____

_____ **2**

(*b*) Colin thought that the number of drops of Dazzle added to the water would also have an effect on the height of the lather produced.

What factors would Colin need to keep the same in his experiments to test this?

_____

_____

_____

_____

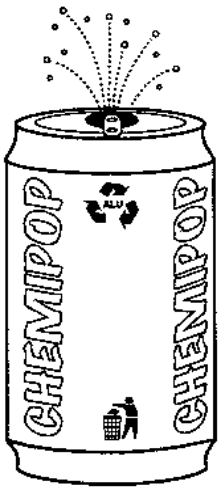
_____

_____ **2**

(4)

24. What's in a can of *Chemipop*?

Marks



Ingredients:
Carbon dioxide
Phosphoric acid
Glucose
Water
Flavourings

(*a*) State the test for carbon dioxide.

_____

_____ **1**

(*b*) *Chemipop* contains phosphoric acid. Suggest a pH for *Chemipop*.

_____ **1**

(*c*) Why is *Chemipop* an energy food?

_____

_____

_____ **1**

(*d*) Glucose reacts with Benedict's solution.

(i) Draw a diagram to show how *Chemipop* could be tested with Benedict's solution.

2

24. (*d*) (continued)

Marks

(ii) Describe the change which would show that a reaction had taken place.

_____

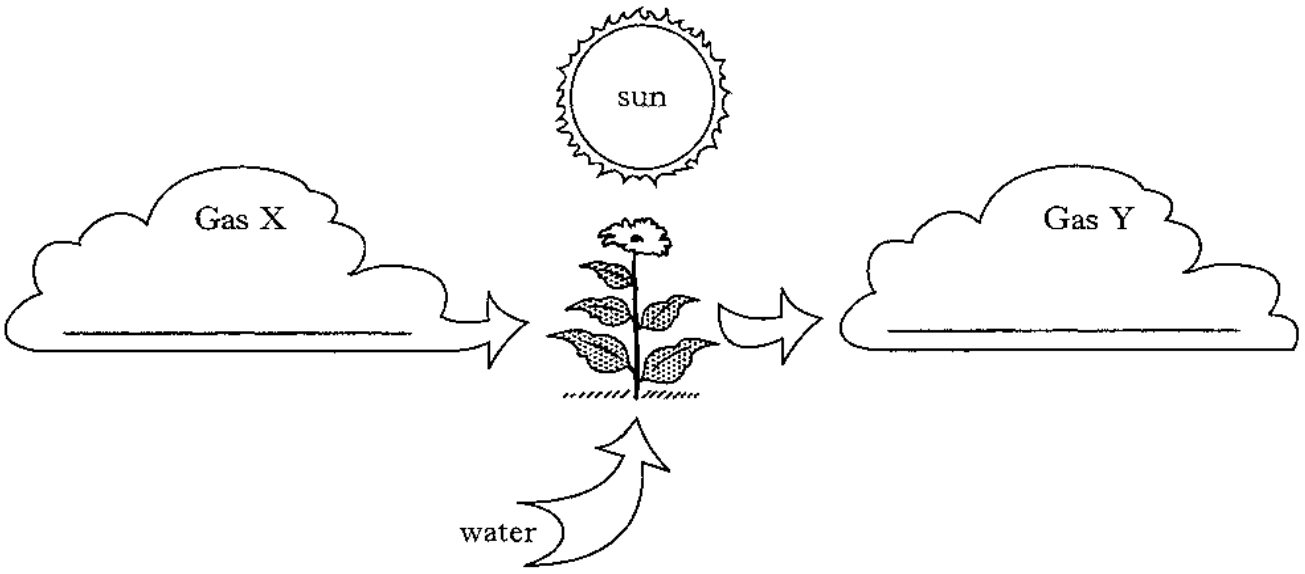
_____

_____ **1**

(6)

Marks

25. Plants make glucose by photosynthesis.



(*a*) On the diagram, write the names of gases X and Y. **1**

(*b*) Name the substance, stored in plants, which is made when glucose units join together.

_____ **1**

(*c*) Many gardeners use pesticides. What are pesticides used for?

_____

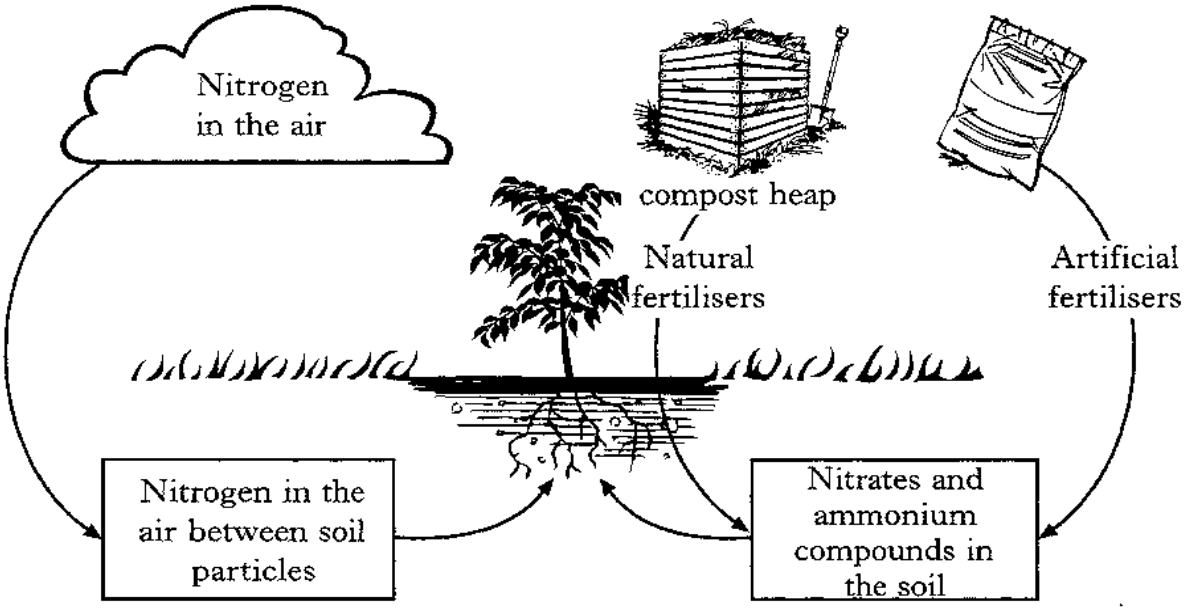
_____

_____ **1**

(3)

Marks

26. Nitrogen is an essential element for healthy plant growth.
The diagram shows ways in which plants can obtain nitrogen.



(*a*) Name a plant which is able to absorb nitrogen from the air in the soil.

_____ **1**

(*b*) Why is it no longer possible for farmers to rely on natural fertilisers?

_____

_____

_____ **1**

(*c*) Give an example of an environmental problem that can be caused by the use of artificial fertilisers.

_____

_____

_____ **1**

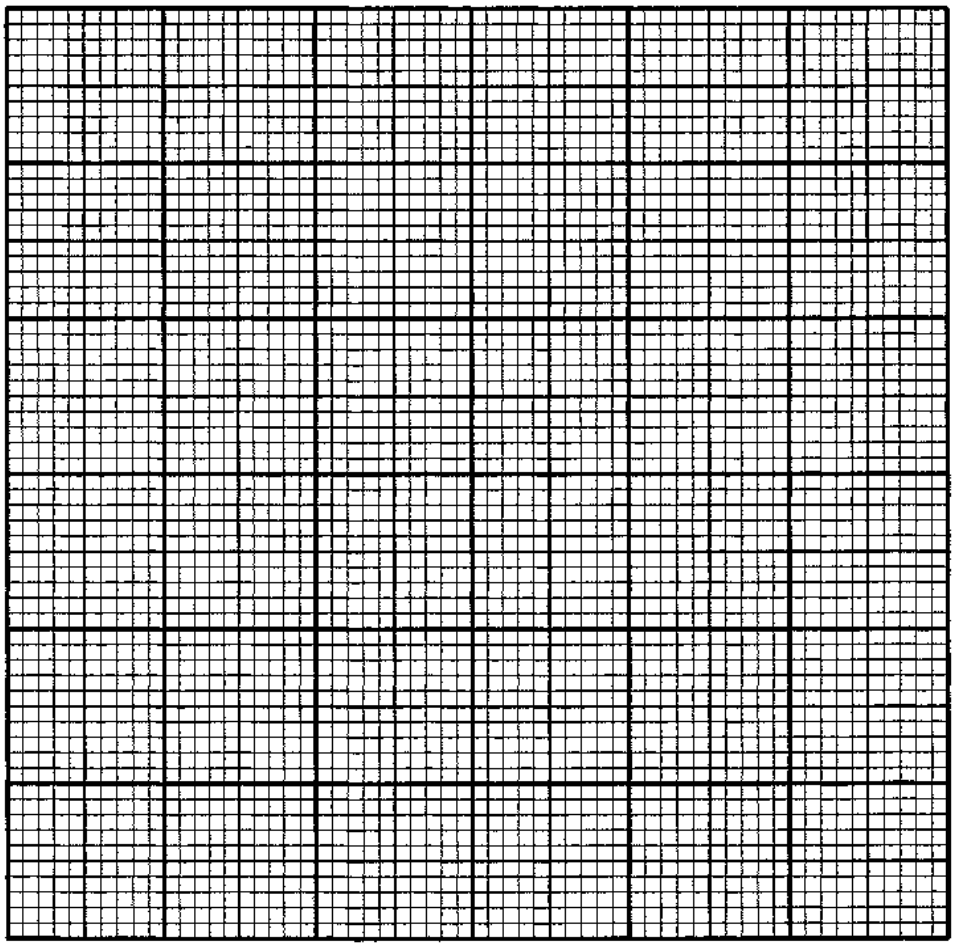
(3)

Marks

27. A breakfast cereal gives the following nutritional information.

Food Type	**Mass per 100 g**
Protein	*10 grams*
Sugars	*34 grams*
Starch	*47 grams*
Fat	*5 grams*
Fibre	*3 grams*
Sodium	*1 gram*

(*a*) Present this information as a bar chart.
(Additional graph paper, if required, will be found on page 21.)



2

(*b*) Why is it important that our diets contain fibre?

_____

_____

_____

1

(3)

28. **Testing the pH of solutions**

Marks

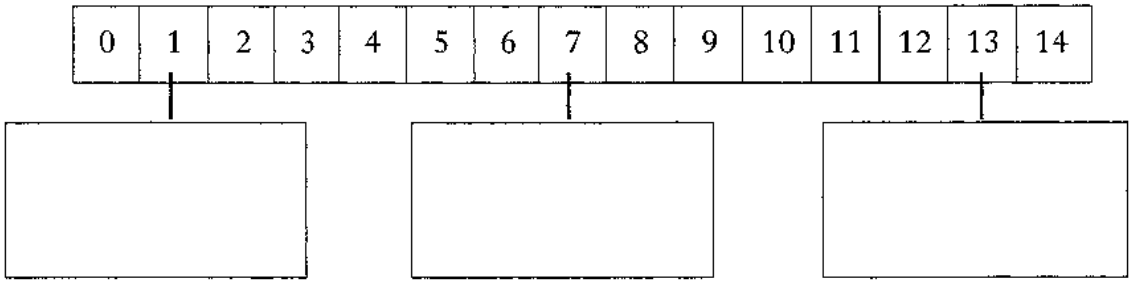
Equipment	Solutions
Dimple tile	Dilute hydrochloric acid
Dropper	Dilute sodium chloride solution
pH paper	Dilute sodium hydroxide solution
pH chart	
Beaker	
Water	

(*a*) Describe how you would use the equipment listed to measure the pH of the solutions.

2

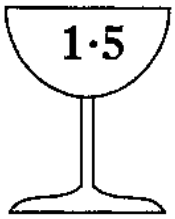
(*b*) Write the names of the solutions in the boxes on the pH chart to show the pH results you would expect.

pH chart



1

(3)

29. 

A bottle of red wine states that a 125 cm^3 glass contained 1·5 units of alcohol.

Marks

Mr Finlayson drank three 125 cm^3 glasses of red wine with his meal.

He also drank a liqueur which contained 1 unit of alcohol at the end of his meal.

The body breaks alcohol down at a rate of 1 unit per hour.

(*a*) Calculate how long it would take before Mr Finlayson's body had broken the alcohol down.
(Show your working clearly.)

2

(*b*) Drinking too much alcohol can have harmful effects on our bodies.
State **one** way in which the body can be harmed by alcohol.

_____

_____

_____

1

(3)

30. Fire due to different causes requires different types of fire extinguisher to be used. *Marks*

Complete the table to show which type of extinguisher would be suitable for use in the event of each type of fire. (✓ – suitable, ✘ – unsuitable)

Cause	Extinguisher type		
	Water	Foam	Carbon dioxide
Burning paper	✓	✓	✓
Electrical	✘		
Oil		✘	

(2)

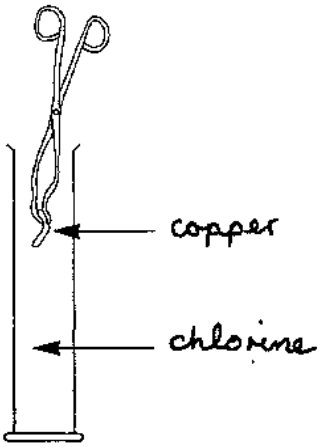
31. On Andy's first day in chemistry, his teacher demonstrated an experiment to the class.

Marks

Here is the report that Andy wrote in his note book.

Mr Murray took this really thin kind of copper and put it in a jar of gas. The gas was chlorine. We had to keep clear of the chlorine he said. When the copper went in the gas it shrivelled up. Then it went on fire. When it stopped there was green stuff in the jar.

This is a CHEMICAL REACTION



(*a*) From Andy's report, give **two** pieces of evidence which suggest that a chemical reaction had taken place.

1 _____

_____

_____

2 _____

_____

_____ **1**

(*b*) Write a **word** equation for this reaction.

_____

_____ **1**

(2)

Marks

32. Steel is an alloy of iron and carbon. The table shows how two properties of steel change as the percentage of carbon is increased.

	Hardness			Strength		
Percentage of carbon	High	Medium	Low	High	Medium	Low
0·00 – 0·15			✓	✓		
0·16 – 0·25		✓		✓		
0·26 – 0·50	✓				✓	
0·51 – 1·50	✓					✓

(*a*) Predict the **two** properties of a steel containing 1·7% of carbon.

_____

_____

_____

_____ **1**

(*b*) Name another alloy.

_____ **1**

(2)

Marks

33. Catalysts can be produced as pellets of different shapes.

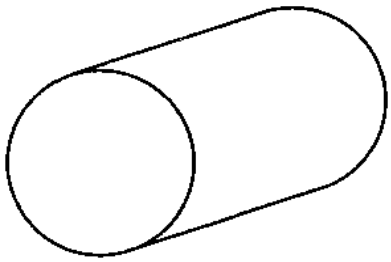
(*a*) What is the purpose of a catalyst?

_____

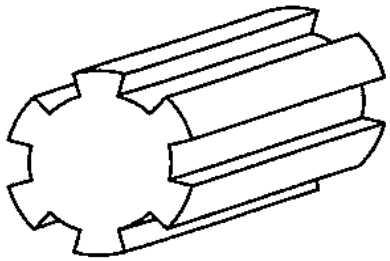
_____

_____ **1**

(*b*) Reactions take place on the surface of the catalyst.
Suggest why the shape of catalyst B might be better than that of catalyst A.



A



B

_____

_____

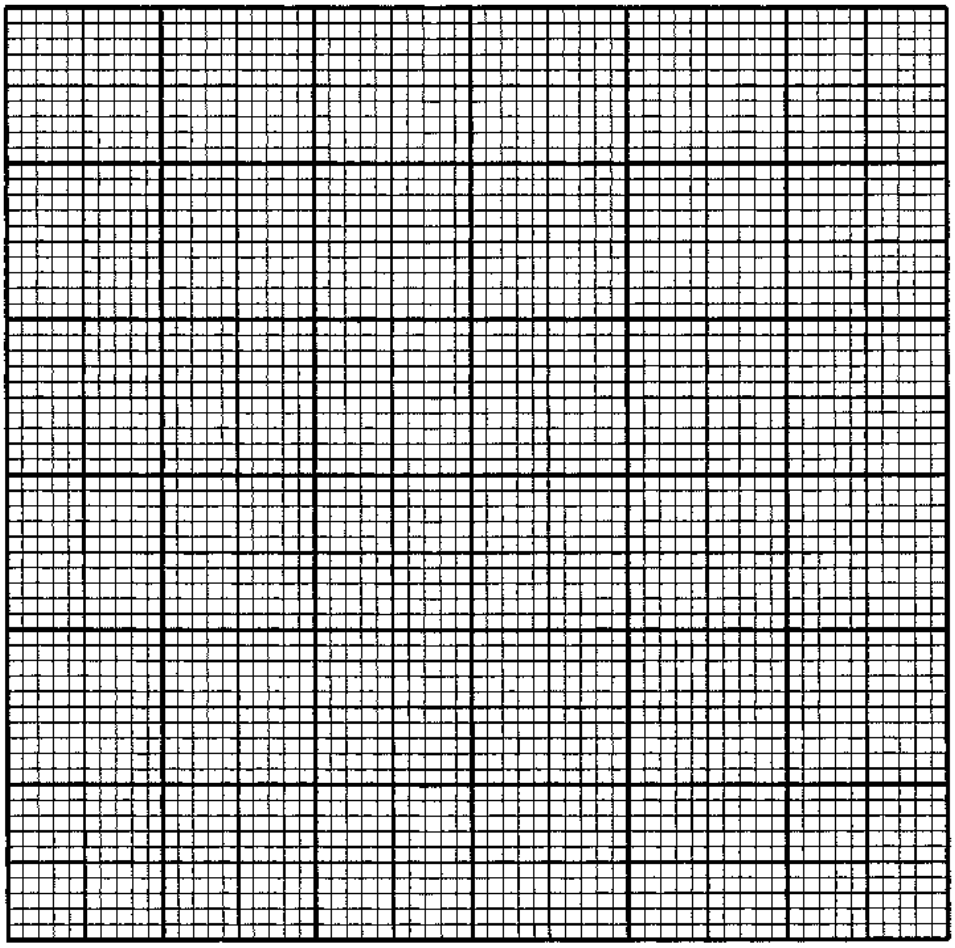
_____ **1**

(2)

[*END OF QUESTION PAPER*]

ADDITIONAL SPACE FOR ANSWERS

ADDITIONAL GRAPH PAPER FOR QUESTION 27(*a*)



ADDITIONAL SPACE FOR ANSWERS

FOR OFFICIAL USE

Total

Intermediate 1
Chemistry
Specimen Question Paper

NATIONAL QUALIFICATIONS

ANSWER SHEET

Full name of school or college

Town

First name and initials

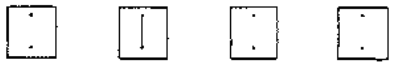
Surname

Date of birth
Day Month Year

Candidate number

Number of seat

Using ink, indicate your choice of answer by a single stroke **joining the two dots** in the box, as in the following example:



	A	B	C	D
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

	A	B	C	D
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

[C012/SQP052]

Intermediate 1 Chemistry

Specimen Marking Instructions

NATIONAL QUALIFICATIONS

SCOTTISH QUALIFICATIONS AUTHORITY

Intermediate 1 Chemistry

Marking Instructions

Section 1 (All questions are worth 1 mark).

1	B	6	D	11	C	16	A
2	C	7	B	12	B	17	D
3	A	8	C	13	A	18	B
4	D	9	C	14	B	19	C
5	B	10	D	15	A	20	C

Section 2

21. a) 1827 **1 mark**

b) Using electricity **1 mark**

c) Anodising **1 mark**

22. a) Fractional distillation **1 mark**

b) i) SO_2 **1 mark**

ii) It causes acid rain or it is poisonous **1 mark**

c) Burning diesel produces soot particles **1 mark**

23. a) 1 the hotter the water the greater the height of lather produced. **1 mark**

2 the greater the number of shakes the greater the height of lather produced **1 mark**

b) Controlling any 3 varieties from the following
Size of test tubes
Volume of water
Temperature and
Number of shakes **2 marks**

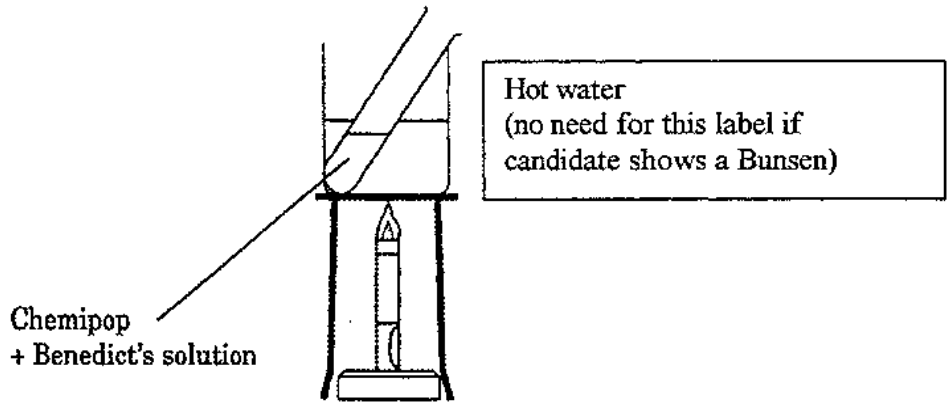
Controlling any 2 variables **1 mark**

24. a) It turns limewater milky/cloudy **1 mark**

b) pH less than 7 **1 mark**

c) Chemipop contains glucose **1 mark**

d) i Diagram showing reaction mixture being heated appropriately **1 mark**
labelled **1 mark**



ii a brown *or* reddish brown *or* orange precipitate would be obtained. **1 mark**

25. a) Gas X Carbon dioxide
Gas Y Oxygen **2* ½ mark**

b) Starch **1 mark**

c) To kill pests or to kill any named pest **1 mark**

26. a) Clover *or* peas *or* beans *or* other leguminous plant **1 mark**

b) There is increased demand due to increase in World population **1 mark**

c) They can get into rivers and lakes, which can become lifeless. **1 mark**

27. a) Bar graph format **½mark**

Each axis appropriately labelled and scaled **2* ½ mark**

Correctly entered data. **½ mark**

b) Fibre prevents constipation. **1 mark**

28. a) 4 points to be included in the description
drops of each liquid to be added to separate dimples
dropper to be washed out after each use
pH paper to be dipped into the liquid
colour of paper to be compared with a pH chart. **4* ½ mark**

b) pH 1 – (dilute) hydrochloric acid
pH 7 – (dilute) sodium chloride (solution)
pH 13 – (dilute) sodium hydroxide (solution). **1 mark**

29. a) Units of alcohol drunk = (3 * 1.5) + 1
= 5.5 units **1 mark**

Time to break alcohol down = 5.5 hours. **1 mark**

b) It can cause liver or brain damage. **1 mark**

30. Electrical fire Foam ✗ Carbon dioxide ✓ **1 mark**
Oil fire Water ✗ Carbon dioxide ✓ **1 mark**

31. a) 1 the copper went on fire

2 a new substance (green stuff) was produced **2* ½ mark**

b) Copper + Chlorine ⟶ Copper chloride **1 mark**

32. a) It will be very hard but have low strength **1 mark**
b) Brass *or* Bronze *or* solder *or* other named alloy **1 mark**

33. a) to speed up a chemical reaction **1 mark**

b) B has a bigger surface area. **1 mark**

[END OF MARKING INSTRUCTIONS]