

FOR OFFICIAL USE

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G

KU PS

Total  
Marks

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**0500/401**

NATIONAL  
QUALIFICATIONS  
2011

THURSDAY, 26 MAY  
9.00 AM – 10.30 AM

CHEMISTRY  
STANDARD GRADE  
General Level

Fill in these boxes and read what is printed below.

Full name of centre

Town

Forename(s)

Surname

Date of birth

Day Month Year

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Scottish candidate number

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Number of seat

- 1 All questions should be attempted.
- 2 Necessary data will be found in the Data Booklet provided for Chemistry at Standard Grade and Intermediate 2.
- 3 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.
- 4 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.
- 5 Additional space for answers and rough work will be found at the end of the book.
- 6 The size of the space provided for an answer should not be taken as an indication of how much to write. It is not necessary to use all the space.
- 7 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.



## PART 1

In Questions 1 to 8 of this part of the paper, an answer is given by circling the appropriate letter (or letters) in the answer grid provided.

In some questions, two letters are required for full marks.

If more than the correct number of answers is given, marks will be deducted.

A total of 20 marks is available in this part of the paper.

### SAMPLE QUESTION

A	CH <sub>4</sub>	B	H <sub>2</sub>	C	CO <sub>2</sub>
D	CO	E	C <sub>2</sub> H <sub>5</sub> OH	F	C

(a) Identify the hydrocarbon.

Ⓐ	B	C
D	E	F

The one correct answer to part (a) is A. This should be circled.

(b) Identify the **two** elements.

A	Ⓑ	C
D	E	Ⓕ

As indicated in this question, there are **two** correct answers to part (b). These are B and F. Both answers are circled.

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 circle the answer you now consider to be correct. Thus, in part (a), if you want to change an answer A to an answer D, your answer sheet would look like this:

<del>Ⓐ</del>	B	C
Ⓓ	E	F

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

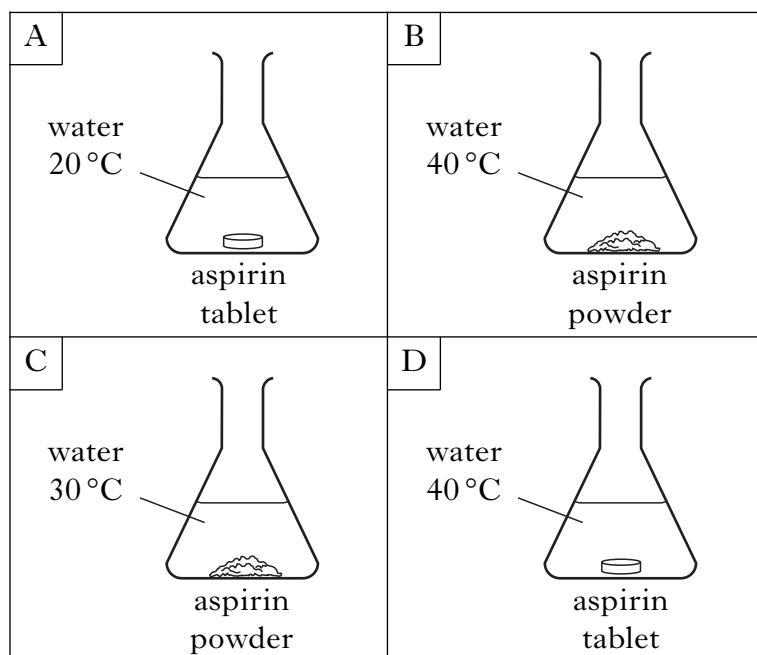
✓ <del>Ⓐ</del>	B	C
<del>Ⓓ</del>	E	F



Marks

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2. A student set up four experiments to investigate the solubility of aspirin.



(a) Identify the experiment in which the aspirin would take the longest time to dissolve.

A	B
C	D

1

(b) Identify the **two** experiments which should be compared to show the effect of particle size on the speed of dissolving.

A	B
C	D

1  
(2)





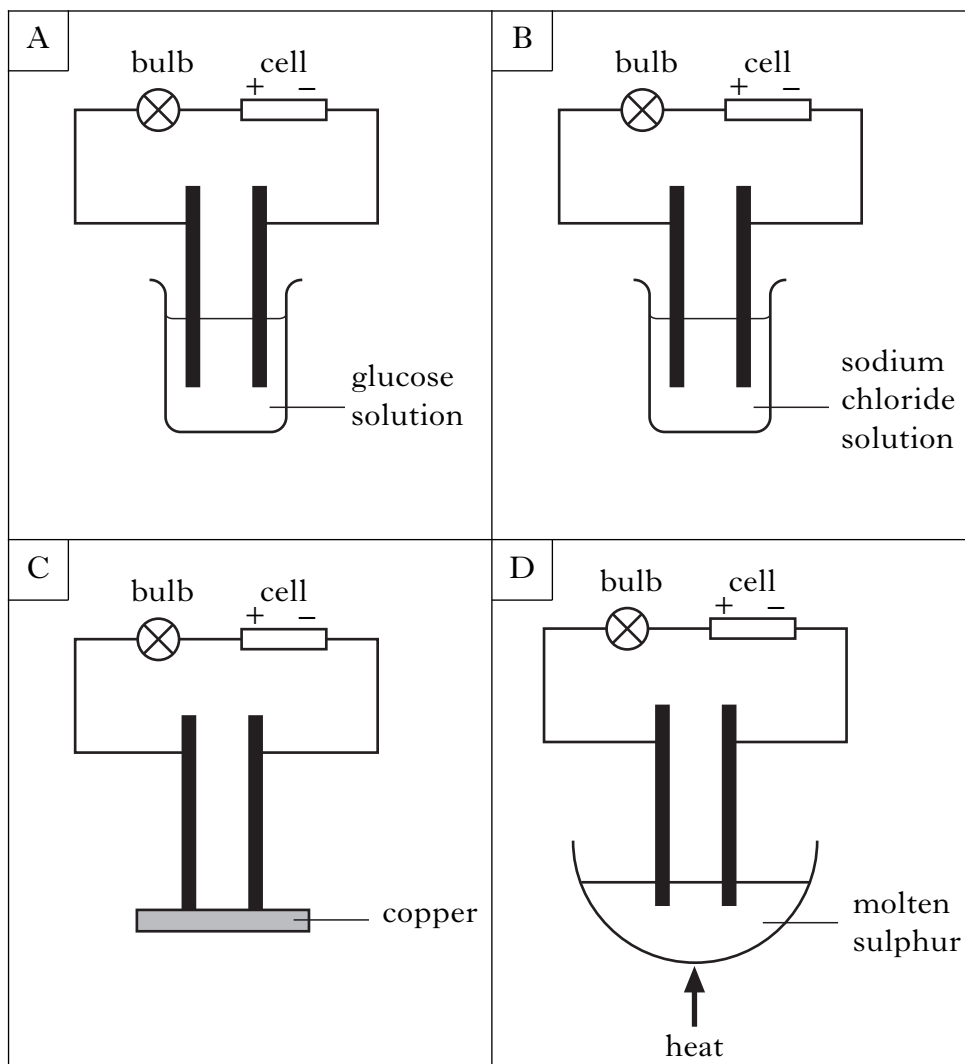








8. A teacher set up some experiments to investigate electrical conductivity.



Identify the **two** experiments in which the bulb will light.

A	B
C	D

(2)

**[Turn over for Part 2 on *Page twelve***

Marks

KU	PS
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**PART 2**

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

9. The Periodic Table lists the names of elements.

(a) Elements are made up of atoms.

Why are atoms neutral?

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**1**

(b) The alkali metals, the halogens and the noble gases are groups of elements in the Periodic Table.

Complete the table by **circling** a word in each box to give correct information about each group.

(Two pieces of correct information have already been circled.)

You may wish to use page 1 of the data booklet to help you.

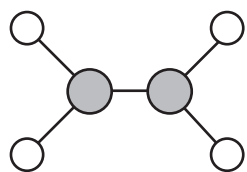
Alkali Metals	Halogens	Noble Gases
<b>metal</b> / non-metal	metal / non-metal	metal / non-metal
reactive / unreactive	<b>reactive</b> / unreactive	reactive / unreactive

**2  
(3)**

Marks

KU	PS
1	
1	
1	
(3)	

10. Hydrazine is a fuel used in rockets. The diagram represents a molecule of hydrazine.



● represents a nitrogen atom (N)

○ represents a hydrogen atom (H)

- (a) Write the molecular formula for hydrazine.

- (b) What holds the atoms together in a molecule of hydrazine?

\_\_\_\_\_

- (c) Hydrazine is unstable and can break down to produce ammonia, nitrogen and hydrogen.

Write a **word** equation for this reaction.

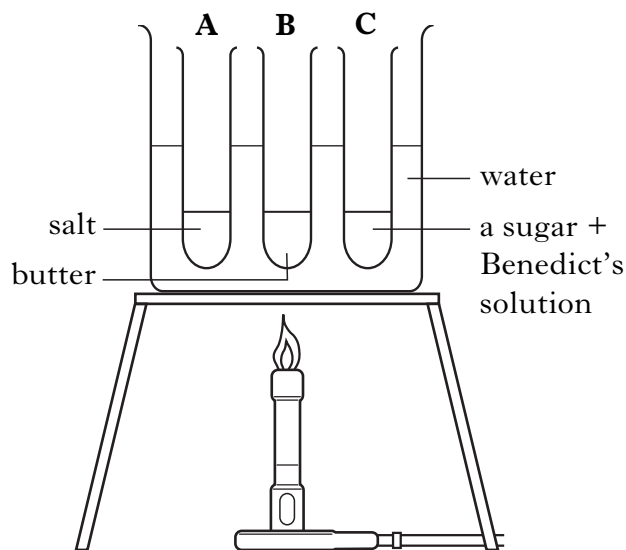
[Turn over



Marks

KU PS

12. The experiment below was carried out to investigate what happens when different substances are heated and then allowed to cool.



The results are shown.

Test tube	Contents	Observation on heating	Observation on cooling
<b>A</b>	salt	no change	no change
<b>B</b>	butter	yellow solid to yellow liquid	yellow liquid to yellow solid
<b>C</b>	a sugar and Benedict's solution	blue liquid to orange solid	orange solid remains

- (a) In which test tube, **A**, **B** or **C**, did a chemical reaction take place?

\_\_\_\_\_

1

- (b) Suggest a name for the sugar in test tube **C**.

\_\_\_\_\_

1

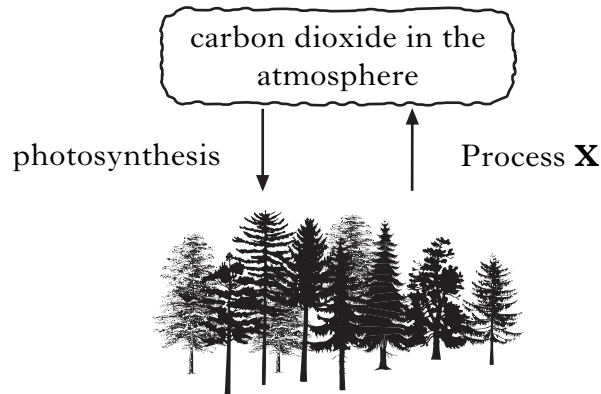
(2)

[Turn over

Marks

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13. Forests are important in maintaining the level of carbon dioxide in the atmosphere.

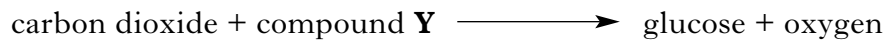


- (a) Name Process X.

\_\_\_\_\_

1

- (b) The equation for photosynthesis is:



Name compound Y.

\_\_\_\_\_

1

- (c) The table shows how the level of carbon dioxide in the atmosphere has changed since 1975.

Year	Level of carbon dioxide/units
1975	330
1985	345
1995	358
2005	374
2015	

Predict the level of carbon dioxide in the atmosphere in 2015 if the trend continues.

\_\_\_\_\_ units

1  
(3)







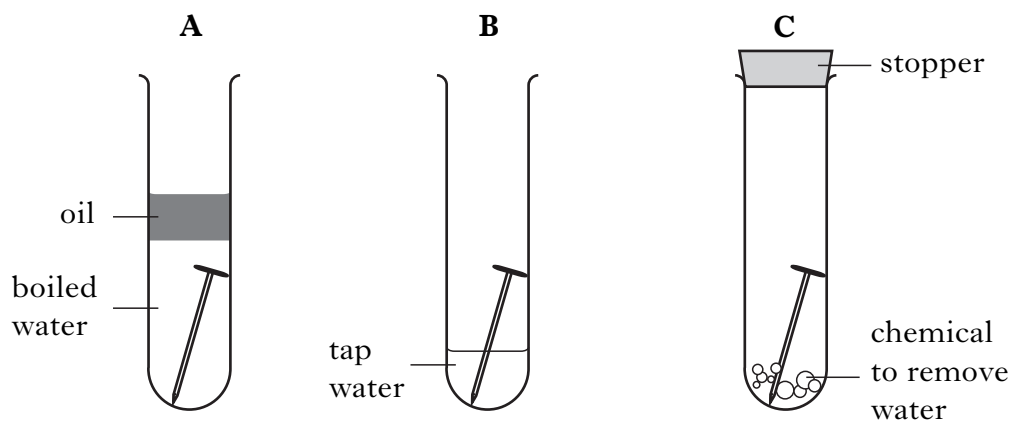


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16. A student investigated the rusting of iron.

(a) He set up three test tubes each containing a clean iron nail.



Test tube	Observation after one week
<b>A</b>	Nail stayed bright
<b>B</b>	Nail rusted
<b>C</b>	Nail stayed bright

Suggest why the nail in test tube **A** did not rust.

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1



17.

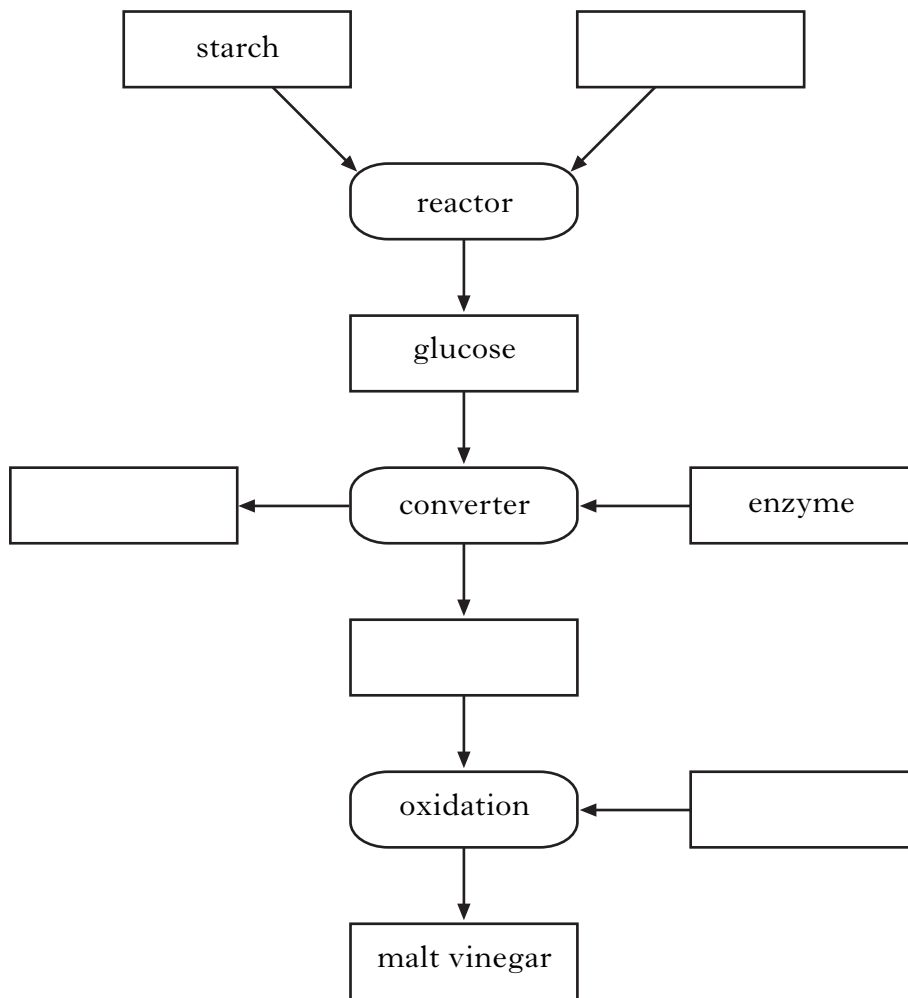
**Manufacture of Malt Vinegar**

In the manufacture of malt vinegar, starch reacts with water to produce glucose.

Glucose is converted to carbon dioxide and ethanol using an enzyme.

Ethanol is oxidised, by bacteria, producing malt vinegar.

(a) Use the information to complete the flow diagram.



2





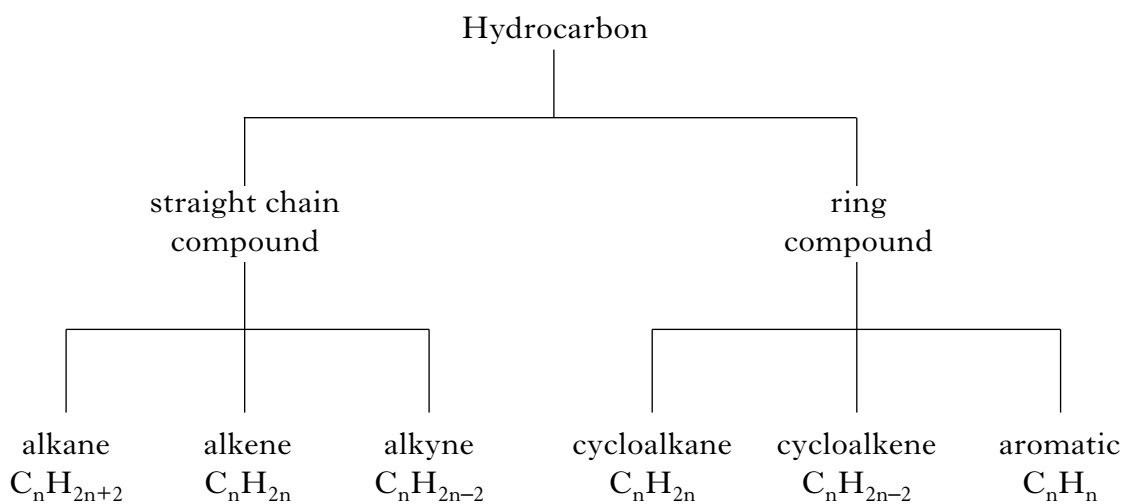




Marks

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1	
1	
1	
(4)	

20. The key below shows the name and general formula of some families of hydrocarbons.



- (a) (i) Butyne is an alkyne with 4 carbon atoms.

Using the key, write the **molecular** formula for butyne.

1

- (ii) Hydrocarbon **X** is a ring compound with molecular formula  $C_6H_6$ .

Using the key, name the **family** to which it belongs.

\_\_\_\_\_

1

- (b) Draw a structural formula for the alkane pentane.

1

- (c) Describe the chemical test, including the result, which shows that an alkene is unsaturated.

\_\_\_\_\_

\_\_\_\_\_

1

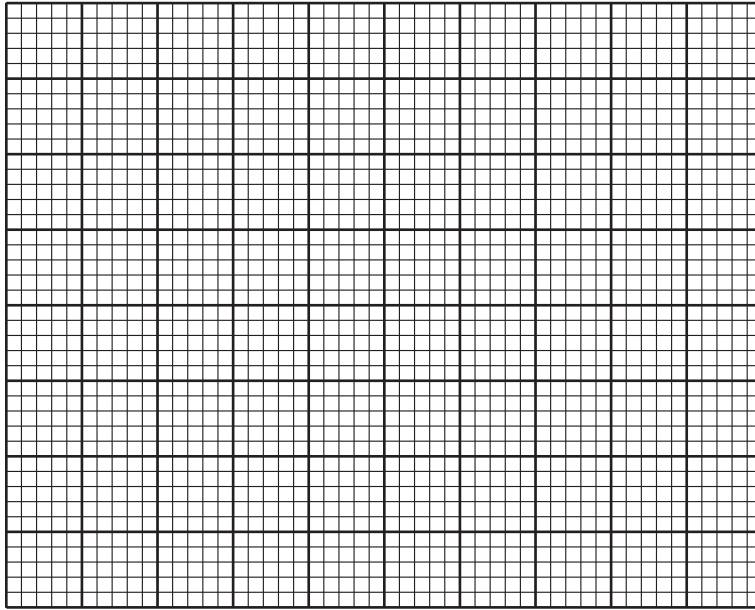
(4)



**ADDITIONAL SPACE FOR ANSWERS**

KU	PS

ADDITIONAL GRAPH PAPER FOR QUESTION 11(a)



**ADDITIONAL SPACE FOR ANSWERS**

KU	PS

**ADDITIONAL SPACE FOR ANSWERS**

KU	PS

**ADDITIONAL SPACE FOR ANSWERS**

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**ADDITIONAL SPACE FOR ANSWERS**

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