

Candidate forename		Candidate surname	
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Centre number						Candidate number				
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**OXFORD CAMBRIDGE AND RSA EXAMINATIONS  
GENERAL CERTIFICATE OF SECONDARY EDUCATION**

**A335/01**

**TWENTY FIRST CENTURY SCIENCE  
ADDITIONAL APPLIED SCIENCE A**

**Harnessing Chemicals (Foundation Tier)**

**MONDAY 17 JANUARY 2011: Morning**

**DURATION: 45 minutes**

**SUITABLE FOR VISUALLY IMPAIRED CANDIDATES**

**Candidates answer on the question paper.  
A calculator may be used for this paper.**

**OCR SUPPLIED MATERIALS:**

**None**

**OTHER MATERIALS REQUIRED:**

**Pencil**

**Ruler (cm/mm)**

**READ INSTRUCTIONS OVERLEAF**

## **INSTRUCTIONS TO CANDIDATES**

- **Write your name, centre number and candidate number in the boxes on the first page. Please write clearly and in capital letters.**
- **Use black ink. Pencil may be used for graphs and diagrams only.**
- **Read each question carefully. Make sure you know what you have to do before starting your answer.**
- **Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).**
- **Answer ALL the questions.**

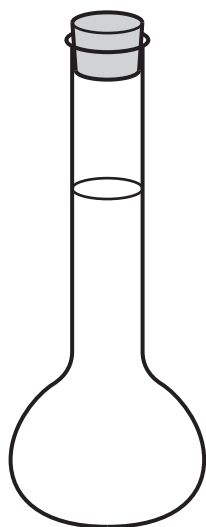
## **INFORMATION FOR CANDIDATES**

- **The number of marks is given in brackets [ ] at the end of each question or part question.**
- **The total number of marks for this paper is 36.**

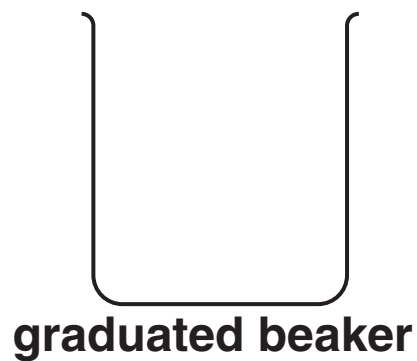
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**Answer ALL the questions.**

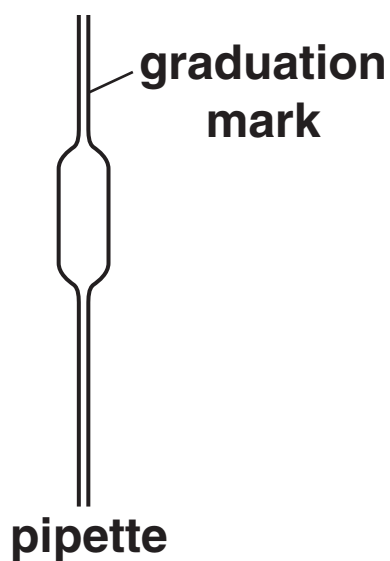
**1 Chemists use the apparatus shown below.**



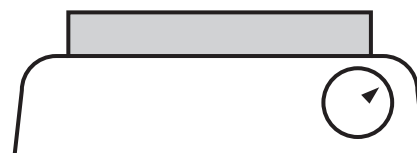
**A**



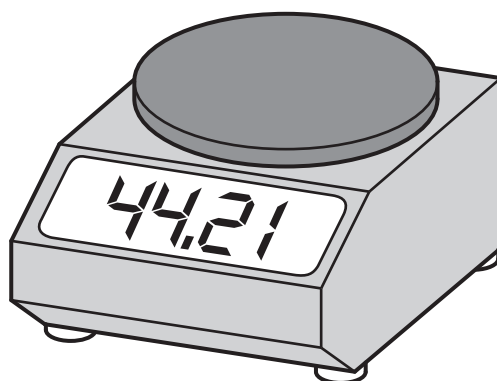
**B**



**C**



**D**



**E**

**Choose from A, B, C, D and E on the opposite page to answer the following questions.**

**(a) Which diagram shows a balance?**

**answer \_\_\_\_\_ [1]**

**(b) Which piece of apparatus is used for heating liquids?**

**answer \_\_\_\_\_ [1]**

**(c) Which TWO pieces of apparatus are used to measure an amount of liquid ACCURATELY?**

**answer \_\_\_\_\_ and \_\_\_\_\_ [2]**

**[Total: 4]**

**2 It takes a long time to develop a new medicine.**

**There are many different stages to go through.**

**(a) Draw a straight line from the name of each stage to the best description of that stage.**

**NAME OF  
STAGE**

**DESCRIPTION OF  
STAGE**

**quality  
assurance**

**new compounds  
invented and tested**

**laboratory  
testing**

**chosen compounds  
tested on patients**

**clinical testing**

**industrial chemists  
design a method  
for scaling up to  
a manufacturing  
process**

**process  
development**

**chemists check  
that chemicals  
used and products  
meet necessary  
standards**

**[3]**

**(b) Ibuprofen is a medicine that was developed in this way.**

**The formula of ibuprofen is  $C_{13}H_{18}O_2$ .**

**(i) How many different elements are there in the formula of ibuprofen?**

**answer \_\_\_\_\_ [1]**

**(ii) What is the TOTAL number of atoms in the formula of ibuprofen?**

**answer \_\_\_\_\_ [1]**

**(c) Ibuprofen is made on a small scale.**

**What term is used to describe this type of chemical?**

**Put a tick (✓) in the box next to the correct answer.**

**bulk**

**fine**

**rare**

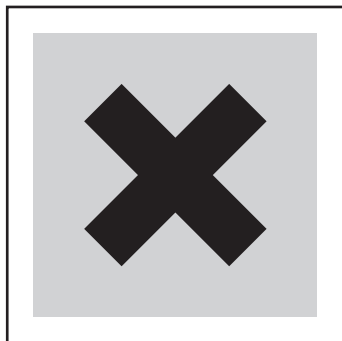
**small**

**[1]**

**[Total: 6]**

**3 Substances that are hazardous to health should have a hazard symbol clearly shown on the container.**

**(a) The diagrams labelled A, B, C, D and E each show a different hazard symbol**



**A**



**B**



**C**



**D**



**E**



**Write one letter, from A, B, C, D or E opposite, in each of the boxes below to show which hazard symbol goes with each hazard.**

**The first one has been done for you.**

**toxic**     

**oxidising**     

**irritant**     

**corrosive**     

**[3]**

**(b) The Government has strict regulations to control the storage and transport of chemicals.**

**Suggest TWO reasons why.**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_ **[2]**

**(c) Name the organisation in the UK that is responsible for the regulation of risks to health and safety arising from the manufacture and use of chemicals.**

\_\_\_\_\_ **[1]**

**[Total: 6]**

4 Minesh and Sam investigate the rate of chemical reactions.

(a) What is meant by the term RATE of a chemical reaction?

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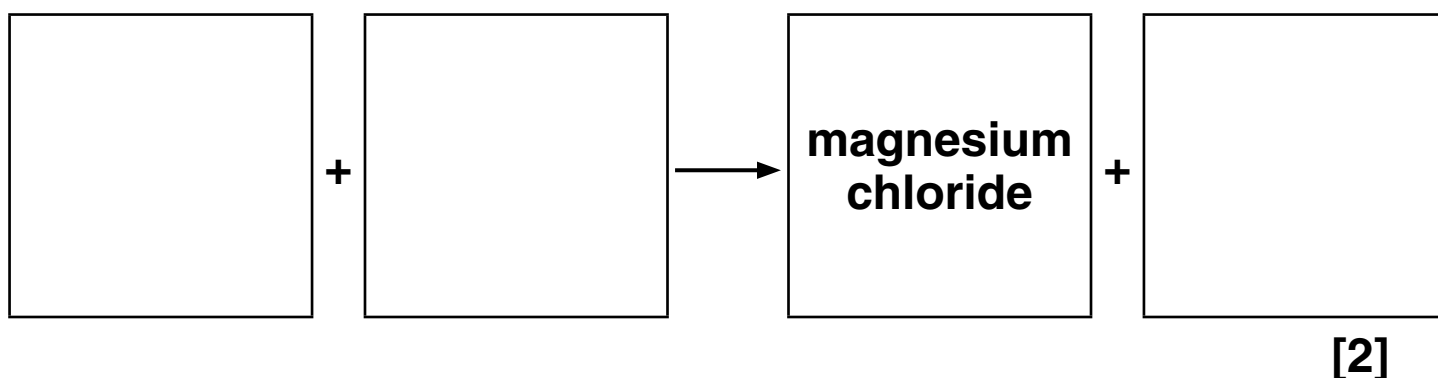
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[2]

(b) They use the reaction between hydrochloric acid and magnesium.

Complete the word equation for this reaction.



(c) Minesh says that this reaction is exothermic.

(i) What does EXOTHERMIC mean?

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---

[1]

**(ii) How could Sam check that the reaction was exothermic?**

---

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[1]

**[Total: 6]**

5 Malachite is a pigment that is used in the manufacture of paint.

(a) Malachite is an inorganic chemical.

Put a tick (✓) in the box next to the statement which describes an inorganic chemical.

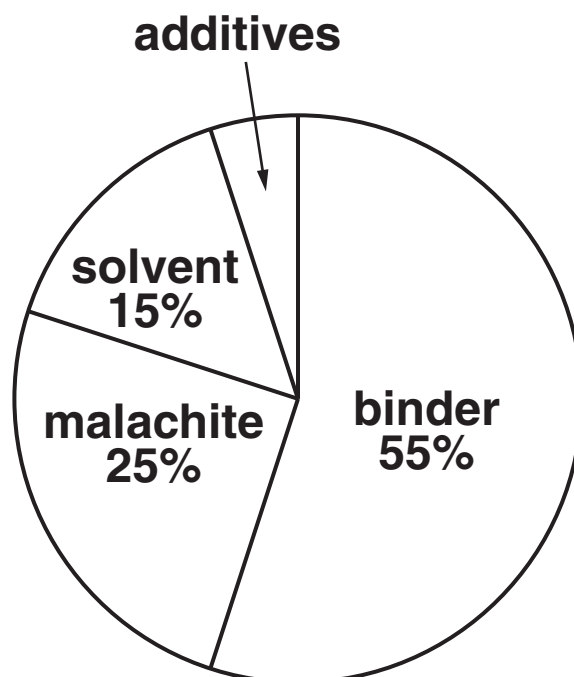
It is obtained from living sources.

It is obtained from non-living sources.

It is obtained from never-lived sources.

[1]

(b) This pie chart shows that gloss paint contains malachite and other chemicals.



Use the pie chart to find the percentage of additives in the paint.

answer \_\_\_\_\_ %

[1]

**(c) The paint industry carries out tests on each batch of paint before it is sold.**

**Suggest TWO reasons why they do this.**

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**[2]**

**(d) The solvent used in the manufacture of paint is an example of a bulk chemical.**

**What is a BULK chemical?**

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**[1]**

**[Total: 5]**

**6 Peter prepares an aqueous solution of sodium chloride using the following steps.**

**The steps are in the wrong order.**

**step A Stopper the graduated flask and mix well.**

**step B Transfer the sodium chloride solution into a 100 cm<sup>3</sup> graduated flask.**

**step C Dissolve the sodium chloride in a small amount of water.**

**step D Accurately weigh 2.5 g of solid sodium chloride and transfer to a beaker.**

**step E Rinse the beaker with water and add to the graduated flask.**

**step F Add water carefully until the solution in the flask is up to the 100 cm<sup>3</sup> mark.**

**(a) Write down the steps in the correct order.**

**The first and last ones have been done for you.**

**D \_\_\_\_\_ A**

**[3]**

- (b) It is important that the sodium chloride solution is transferred to the graduated flask without any spillage.**

**Describe TWO ways step B can be carried out to avoid any spillage of the solution.**

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[2]

- (c) Name the SOLUTE used in this procedure.**

---

[1]

- (d) Name the SOLVENT used in this procedure.**

---

[1]

- (e) 100 ml of the solution contains 2.5 g of sodium chloride.

Calculate the concentration of the solution in grams per litre (g/l).

Show your working.

$$\text{concentration (g/l)} = \frac{\text{mass (g)}}{\text{volume (l)}}$$

concentration = \_\_\_\_\_ g/l [2]

[Total: 9]

**END OF QUESTION PAPER**



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