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Index Number	Class	Name
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CHIJ ST JOSEPH'S CONVENT SEMESTRAL ASSESSMENT 1



SCIENCE (CHEMISTRY)

Secondary 1 Express

Thursday, 5 May 2016
50 minutes

READ THESE INSTRUCTIONS FIRST

Write your index number, class and name on all the work you hand in.
Write in dark blue or black pen.
Do not use staples, paper clips, highlighters, glue or correction fluid.

Section A

There are ten questions. Answer **all** questions. For each question there are four possible answers A, B, C, and D.

Choose the **one** you consider correct and shade your choice in the Multiple Choice Answer Sheet with a 2B pencil.

Each correct answer will score one mark. A mark will not be deducted for a wrong answer.

Section B

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

The number of marks is given in brackets [] at the end of each question or part question.

Show all your working on the same page as the rest of the answer.

Omission of essential working will result in loss of marks.

Electronic calculator may be used in this paper.

The total of the marks for this paper is 40.

A copy of the Periodic Table is printed on page 11.

FOR EXAMINER'S USE	
A	
B	
Total	40

This document consists of **11** printed pages.

Setter(s) : Ms Izzati Jamil & Mr Zulkifli

Section A (10 marks)

Answer **all** questions.

- 1 Acids are commonly found in the lab.
Which of the following labels is found on bottles of acid?

A



B



C



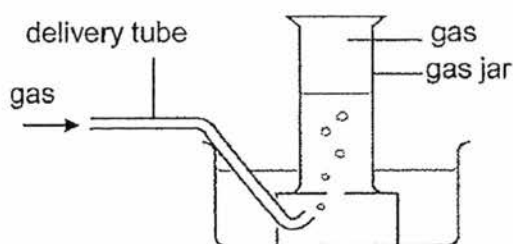
D



- 2 Jane measured 3 g of sugar and dissolved it in 30 cm³ of water.
Which of the following apparatus did she use?

- A burette and measuring cylinder
B beaker and measuring cylinder
C electronic balance and beaker
D electronic balance and measuring cylinder

- 3 A gas produced in a chemical reaction can be collected by the set-up shown in the diagram.

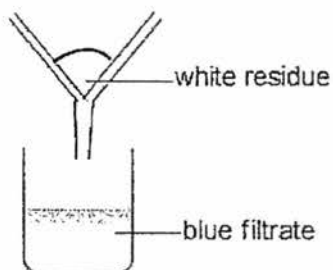


Some properties of four gases are given below. Which one **cannot** be collected by this set-up?

gas	density of gas compared to air	solubility of gas in water
A	denser	slightly soluble
B	less dense	insoluble
C	denser	very soluble
D	less dense	slightly soluble

- 4 Which of the following statement is **not** true about mixtures?
- A Mixtures can be separated by physical methods.
 - B Mixtures can be either a solution or a suspension.
 - C Mixtures have the same properties as its constituents.
 - D Mixtures are made up of two or more substances chemically combined together.
- 5 Baking soda contains the compound, sodium hydrogen carbonate, NaHCO_3 .
How many elements are there in this compound?
- A 4
 - B 5
 - C 6
 - D 7
- 6 The maximum quantity of solute present in a given volume of solvent represents
- A solution.
 - B dilution.
 - C saturation.
 - D concentration.
- 7 Which of these changes would speed up the rate of dissolving the most?
- | | size of particles | temperature of surroundings |
|---|-------------------|-----------------------------|
| A | decrease | decrease |
| B | decrease | increase |
| C | increase | decrease |
| D | increase | increase |
- 8 A separating funnel is used to separate
- A two miscible liquids.
 - B two immiscible liquids.
 - C two liquids with similar densities .
 - D two liquids with similar boiling points.

- 9 Which of the following methods can be used to show that seawater contains a soluble solid?
- A evaporation
 - B filtration
 - C magnetic attraction
 - D condensation
- 10 A mixture containing two solids is added to excess water, stirred and filtered. A blue filtrate and a white residue are obtained after filtration.



Given that,

solid	colour	solubility in water
W	blue	insoluble
X	blue	soluble
Y	white	insoluble
Z	white	soluble

Determine which two solids were present in the mixture.

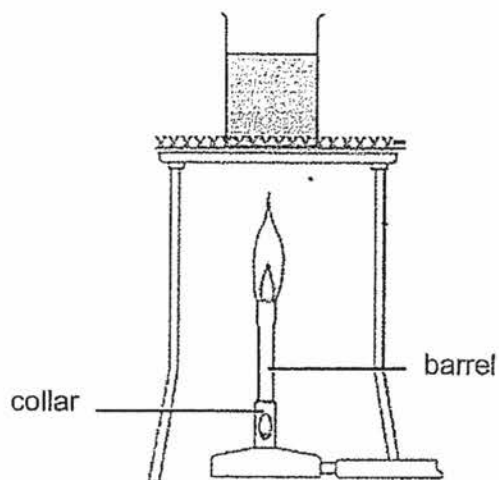
- A W and X
- B W and Y
- C X and Y
- D X and Z

Section B (30 marks)

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

- 1 Anna carried out an experiment in the school's Chemistry laboratory. She heated some chemicals as shown in the diagram below.

For
Examiner's
Use



- (a) State the function of the collar in the Bunsen burner.

.....
.....

[1]

- (b) Anna opened the air hole and lighted the Bunsen burner. A loud hissing sound was heard.

- (i) State the colour and the position of the flame.

colour:

position of flame:

[1]

- (ii) Explain why this is dangerous.

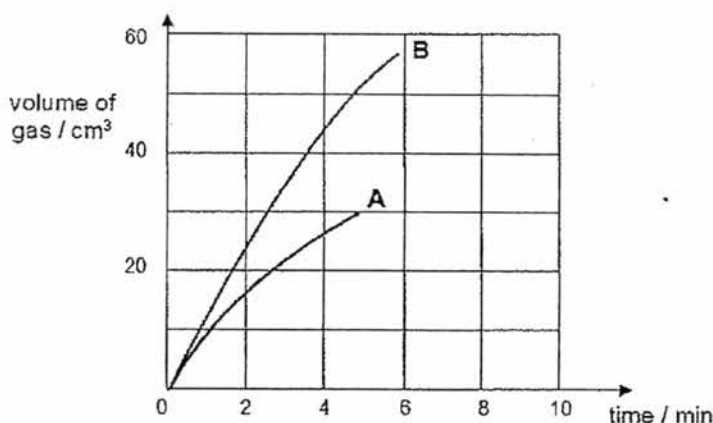
.....
.....

[1]

- 2 Magnesium ribbon was added to different volumes of hydrochloric acid.

For
Examiner's
Use

The volume of hydrogen gas produced was measured at regular time intervals and the results were plotted as shown in the graph below.



- (a) Suggest which curve represents the reaction with the greater volume of hydrochloric acid used.

..... [1]

- (b) (i) Identify the independent variable in the experiment.

..... [1]

- (ii) Identify the dependent variable in the experiment.

..... [1]

- (c) A student wanted to investigate the effect of the mass of metal used on the volume of hydrogen gas produced.

- (i) Suggest a hypothesis for this experiment.

..... [1]

- (ii) Briefly describe how the student can carry out an experiment to test her hypothesis.

.....

.....

.....

.....

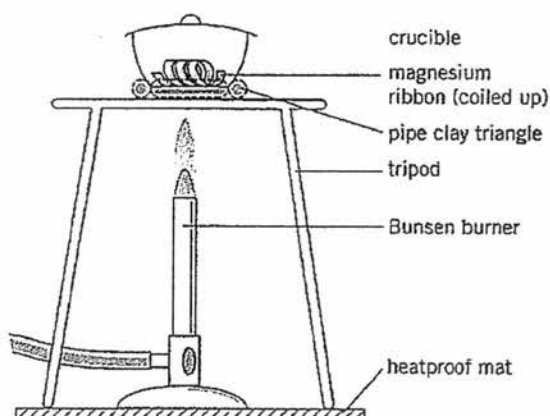
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.....

.....

[3]

- 3 The following shows the set-up and describes an experiment in which magnesium was heated in air.



1. Magnesium is a grey metal. A piece magnesium ribbon was placed in a crucible and weighed.
2. The crucible was heated and the magnesium ribbon was burnt with a very bright flame.
3. A white solid consisting of magnesium oxide and a small amount of magnesium nitride was formed.
4. The white solid and crucible were weighed.

- (a) In this experiment, identify:

- (i) an element: [1]
- (ii) two compounds: [2]
- (iii) a mixture: [1]

- (b) State the evidences to indicate that a chemical change has taken place.

For
Examiner's
Use

.....

.....

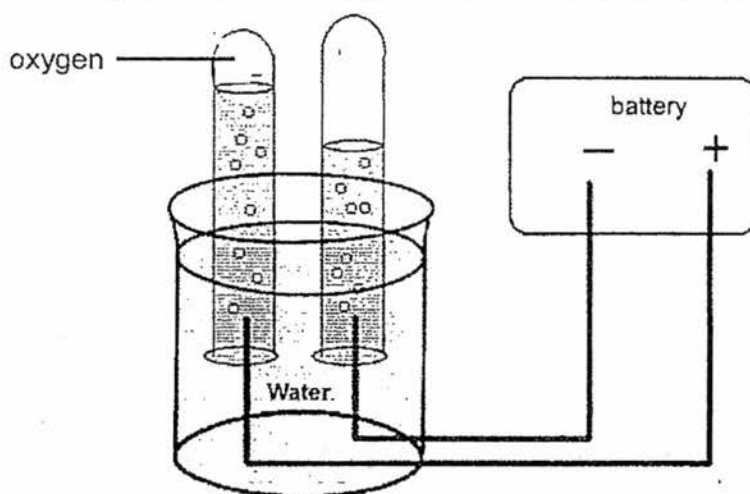
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.....

[2]

- 4 When an electric current is passed through water, H_2O , it breaks down into two gases. One of the gases formed is oxygen. The experimental set-up is shown below.



- (a) Identify the other gas produced from this reaction.

..... [1]

- (b) Explain how this experiment shows that water is a compound.

.....

..... [1]

- (c) Identify which Group and Period oxygen is in.

Group:

Period:

[1]

- 5 (a) Copper(II) sulfate is highly soluble in water. A student accidentally mixed iron fillings, copper(II) sulfate and sand. Describe how you would obtain a pure dry sample of copper(II) sulfate crystals.

.....

.....

.....

.....

.....

.....

.....

.....

[4]

- (b) Sugar cannot be obtained from sugar solution by evaporation to dryness.

- (i) What would happen if sugar solution was evaporated to dryness?

.....

[1]

- (ii) Name the method best used to obtain sugar from sugar solution.

.....

[1]

- (iii) Explain why sugar cannot be separated from its solution by filtration method.

.....

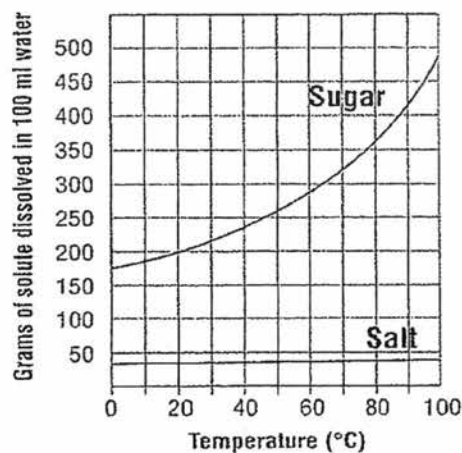
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[2]

- 6 The graph below shows the solubility of various substances in water.

For
Examiner's
Use



- (a) State the relationship between the mass of sugar dissolved and the temperature.

..... [1]

- (b) If a sugar solution at 70°C was cooled to 20°C, determine the amount of sugar that will crystallise out. Show your working clearly.

Mass of sugar that will crystallise out:g

[1]

- (c) If I have a sugar solution at 100°C, suggest the temperature I should cool it down to, in order to get about 250g sugar crystals. Show your working clearly.

Temperature to cool down to:°C [1]

END OF PAPER

The volume of one mole of any gas is 24 dm^3 at room temperature and pressure (r.t.p.).

Sec 1 Exp SA1 2016 Science Chemistry

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

1	(a) Collar: To <u>regulate/control</u> the flow of <u>air into</u> the barrel	1
	(b) (i) Colour: <u>green</u> Position of flame: At the <u>air hole</u> of the Bunsen burner/ on the <u>jet</u>	1
	(ii) <u>strike-back</u> would occur / <u>flame is extremely/very hot.</u>	1
2	(a) Curve B	1
	(b) (i) <u>volume</u> of acid	1
	(ii) <u>volume</u> of hydrogen gas produced	1
	(c) (i) the greater the mass of <u>magnesium</u> used, the greater the volume of <u>hydrogen gas</u> produced.	1
	(ii) 1) Measure out <u>50cm³(equal volume)</u> of acid with the same/equal concentration → <u>1m</u> 2) Add <u>5g(different amount)</u> of magnesium metal <u>to the acid (must state that metal is added to acid)</u> 3) <u>Measure</u> the volume of hydrogen gas produced. (preferably correctly identify use of gas syringe for measurement; or displacement of water method for comparison) Do not accept upward/downward delivery method.	3
3	(a) (i) magnesium/ oxygen/ nitrogen (ii) magnesium oxide and magnesium nitride (iii) white solid / air	1 2 1
	(b) the crucible was heated and it burnt with a bright flame. Magnesium was grey in colour but the product was white in colour	1 1
4	(a) hydrogen	1
	(b) Water can be broken down by chemical methods (passing electricity through it) (Reject: Chemically combined)	1
	(c) Group: VI, Period: 2 Group number must be written in roman numerals	1

5	(a)	1
	1) magnetic attraction/AW	1
	2) dissolution/ add water/ AW	1
	3) filter/filtration	
	4) identify residue and filtrate	1
	5) heat filtrate till saturation/half the solution	
	6) crystallization/ cool to form crystals	
	7) filter crystals/ collect/ pick crystals	
	8) wash and dry with filter paper	
	2 points 1 mark	
	OR (no magnetic attraction)	
	1) dissolution/ add water/ AW	
	2) sand and iron are insoluble but copper (II) sulfate is soluble	
	3) filter/filtration	
	4) identify residue and filtrate	
	5) heat filtrate till saturation/half the solution	
	6) crystallization/ cool to form crystals	
	7) filter crystals/ collect/ pick crystals	
	8) wash and dry with filter paper	
	2 points 1 mark	
	(b) (i) crystallization	1
	(ii) it will decompose (caramelized) - ie undergo chemical change	1
	(ii)	
	Sugar is <u>soluble in water</u>	1
	Its particles <u>are smaller than the pores of the filter paper</u> and thus are able to pass through the filter paper.	1
6	a) the higher the temperature, the more mass of sugar dissolves	1
	c) 225 g	
	Working (extrapolate from graph given) :	
	At 70°C , 325g solute /100ml water	1
	At 20°C, 200g solute/100ml water	
	Hence, 325g -200g = <u>125 g</u> solute/ 100ml water	1
	d) at <u>30/35/40°C</u> , as 475g – 225g (at 30°C) = 250g	1