

Idi Pengenalan

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Angka Gilliran

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**UNIT PEPERIKSAAN
KOLEJ YAYASAN SAAD, MELAKA**

Name :

Form 5 :

Chemistry
Paper 2
September
2 1/2 hours

4541 / 2

TRIAL EXAMINATION
SIJIL PELAJARAN MALAYSIA 2012

CHEMISTRY

Paper 2

Two hour 30 minutes

DO NOT OPEN THIS QUESTION PAPER UNTIL YOU ARE TOLD TO DO SO

- This question paper consists of three sections :
Section A, Section B and Section C.*
- Answer all questions in Section A. Write your answers in the spaces provided in the question paper.*
- Answer one question from Section B and one question from Section C. Answer questions in Section B and Section C in detail. You may use equations, tables, graphs and other suitable methods to explain your answers.*
- Show your workings. It may help you to get marks.*
- The diagrams in the questions are not drawn to scale unless stated.*
- You may use a non-programmable calculator.*

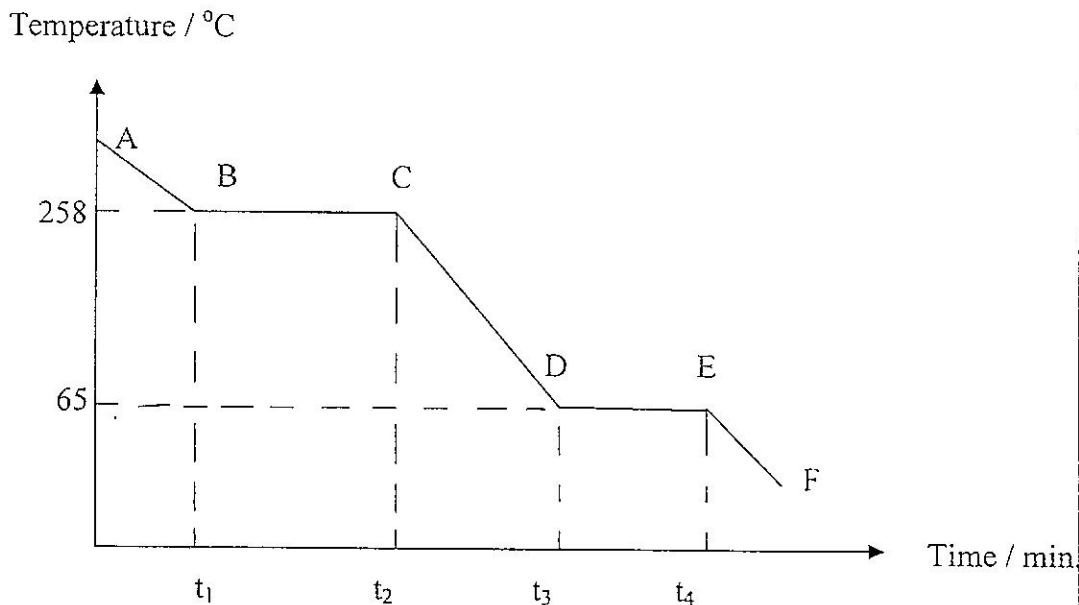
For Examiner's use only		
Section	No.	Marks
A	1	
	2	
	3	
	4	
	5	
	6	
Total		
	7	
	8	
Total		
	9	
	10	
Total		
Total Marks		

This question paper consists of 15 printed pages.

Section A.
(60 marks)

Answer all questions in this section.

1. The graph below shows a temperature against time when a substance Y in the gas state is cooled to room temperature.



(a) State the condensation point and freezing point of substance Y.

Condensation point :

Freezing point :

[2 marks]

2

(b) Complete the table below by stating the physical state of substance Y at the region mentioned.

Region	Physical state
BC	
CD	

2

[2 marks]

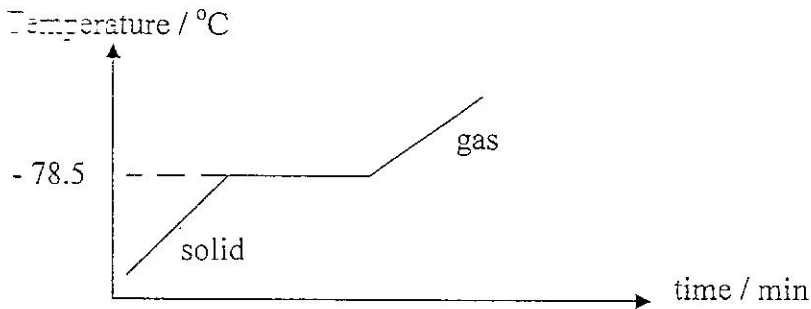
(c) Explain why the temperature remains constant from t_1 to t_2 .

.....

2

[2 marks]

1. A certain substance W when heated shows the state change as shown by the graph below.

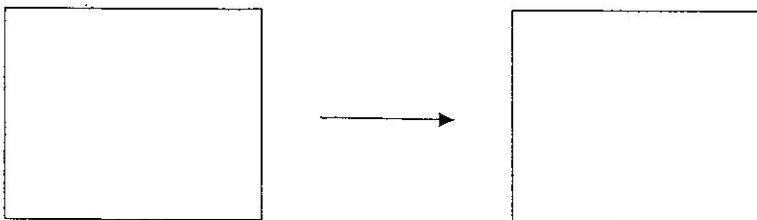


(d) (i) Name the type of physical change as shown by substance W in the above diagram.

1

[1 mark]

(ii) In the boxes below draw the arrangement of the particles of W before and after it has undergone the state change.



1

[1 mark]

(iii) Name an example of a substance that undergoes the type of change as shown by substance W.

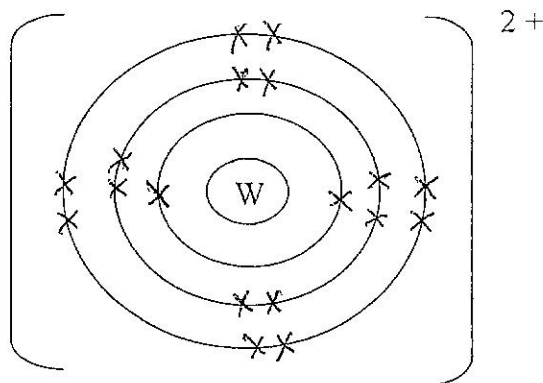
1

[1 mark]

Total

9

2. The electron arrangement of the ion of element W is as shown below.



(a) (i) What is the electron arrangement of atom W ?

.....

[1 mark]

<table border="1"> <tr> <td>1</td> </tr> </table>	1
1	

(ii) State the proton number of atom W.

.....

[1 mark]

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1	

(iii) In which group of the Periodic Table is element W ?

.....

[1 mark]

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1	

(iv) Give the reason for your answer to (a) (iii) above.

.....

[1 mark]

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1	

(b) Fluorine is an element in group 17 of the Periodic Table with a proton number of 9.

Draw the electron arrangement of the compound formed between element W and fluorine.

[2 marks]

<table border="1"> <tr> <td>2</td> </tr> </table>	2
2	

i. Name the type of bond formed between atom W and fluorine.

.....
[1 mark]

1

ii. State two physical properties of the compound formed between atom W and fluorine.

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

2

(d) Nitrogen, proton number 7 also reacts with fluorine to form a toxic, odourless and colourless gas used in the production of LCDs.
Draw the electron arrangement for the compound formed between nitrogen and fluorine.

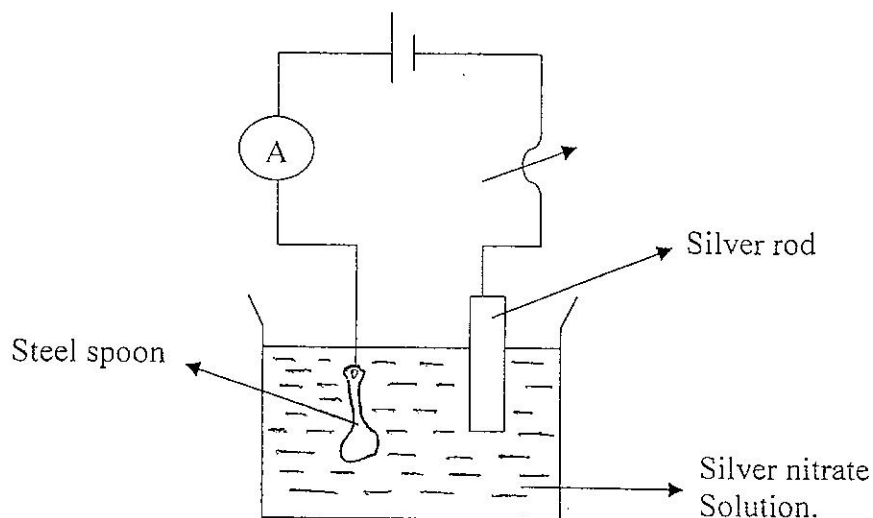
[2 marks]

2

Total

11

3. One of the applications of electrolysis is the electroplating of metal objects. Below shows the apparatus set-up for the silver plating of a steel spoon.



In the apparatus shown above, the electroplating was NOT successful. Identify the **error** in the apparatus set-up then draw the correct set-up in the space below.

[1 mark]

1

(b) After the error was corrected, the electroplating of the spoon was successfully carried out.

(i) Write the formula of **all** the ions present in the silver nitrate solution.

.....
[1 mark]

1

(c) (i) State the observation at the silver rod after 10 minutes of electroplating.

.....
[1 mark]

1

Write the half ionic equation for the reaction that occurred at the ^{steel} ~~silver~~ spoon.

Name the type of reaction that occurred at the ^{steel} ~~silver~~ spoon. [1 mark]

[1 mark]

(d) State the observation at the steel spoon after 10 minutes of electroplating.

[1 mark]

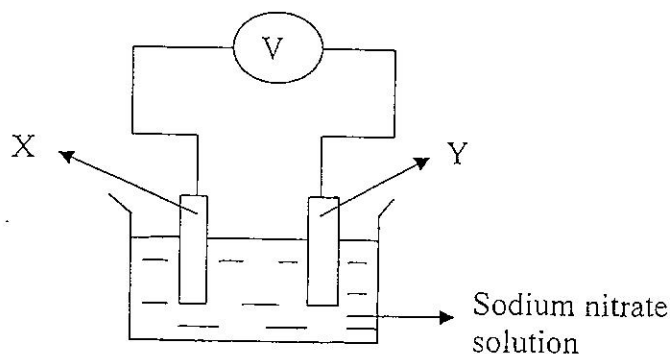
(e) If a piece of impure silver were to be purified by using electrolysis, name the substance to be used as the :

(i) anode :

(ii) cathode :

[2 marks]

An electrochemical cell was prepared by immersing two different metals X and Y in an electrolyte solution as shown below.



The voltage of different metal pairs were measured and recorded in the table below.

Pair of metals	Voltmeter reading / v	Negative terminal
P and Q	2.0	P
R and Q	0.8	R
S and R	0.3	S
P and S	0.9	P
S and Q	1.1	S

(f) (i) Arrange the metals in ascending order of electropositivity.

.....
[2 marks]

2

(ii) State the hypothesis used to construct the electrochemical series of metals in (f)(i).

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

1

Total

11

4. Soluble and insoluble salts are prepared using different methods. Two of the methods are given below.

Method 1 : Reaction between acid and metal carbonate.
Method 2 : Double decomposition involving two salt solutions.

An experiment was carried out to prepare two different salts, lead (II) iodide and zinc nitrate.

(a) Which of the methods mentioned above can be used to prepare :

lead (II) iodide :

zinc nitrate :

[2 marks]

2

(b) (i) State is the observation when lead (II) iodide was formed.

.....
[1 mark]

1

(ii) Write the ionic equation for the formation of lead (II) iodide.

.....
[1 mark]

1

In another method to prepare zinc nitrate, **excess** zinc oxide was added to 30 cm³ of 0.5 mol dm⁻³ nitric acid. The equation for the reaction is as follows :



(i) Give the reason why excess zinc oxide was used in the above reaction.

.....
[1 mark]

1

(ii) How is the excess zinc oxide removed from the reaction mixture ?

.....
[1 mark]

1

(iii) In the final stage of obtaining **dry** crystals of zinc nitrate, give the reason why the crystals were **not** heated until dry.

.....
[1 mark]

1

(d) Calculate the mass of zinc nitrate produced in the above reaction .
[r.a.m.: N = 14 ; O = 16 ; Zn = 65]

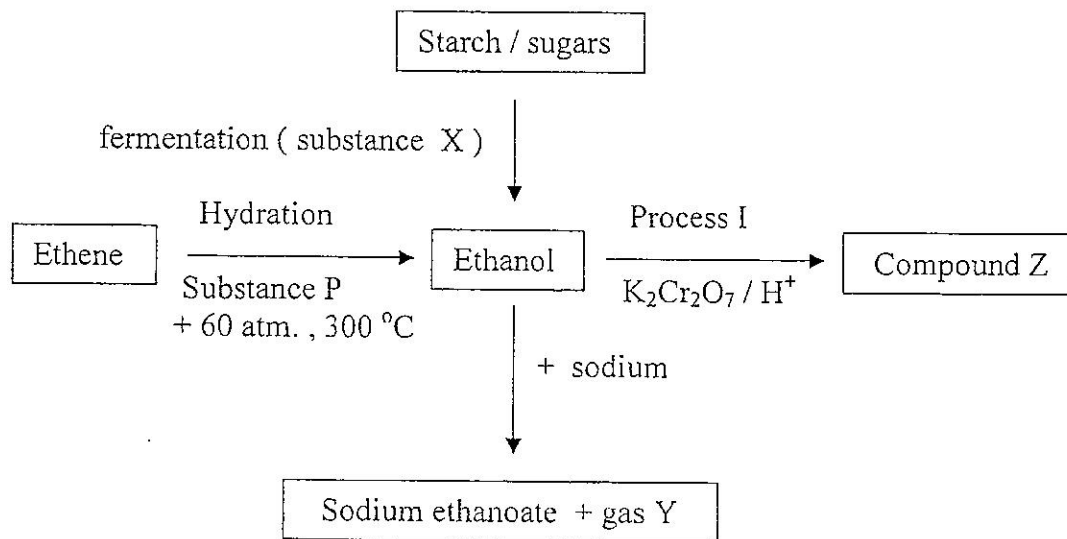
[3 marks]

3

Total

10

5. Ethanol, the principle psychoactive ingredient in alcoholic beverages is obtained by fermentation of sugars or starches. Below shows a flow chart of reactions involving ethanol.



Based on the above flow chart, answer the following questions .

- (a) (i) Name the substance X that causes the fermentation of the starches / sugars.

.....
[1 mark]

1

- (ii) Write the equation for the fermentation of glucose to ethanol.

.....
[2 marks]

2

- (b) (i) State the observation when ethanol reacts with sodium.

.....
[1 mark]

1

- (ii) Name the gas Y .

.....
[1 mark]

1

- (ii) Write the equation for the reaction between ethanol and sodium.

.....
[1 mark]

1

- (c) (i) Name the type of reaction in Process I.

.....
[1 mark]

1

Identify compound Z.

[1 mark]

1

Write the equation for the conversion of ethanol to compound Z.

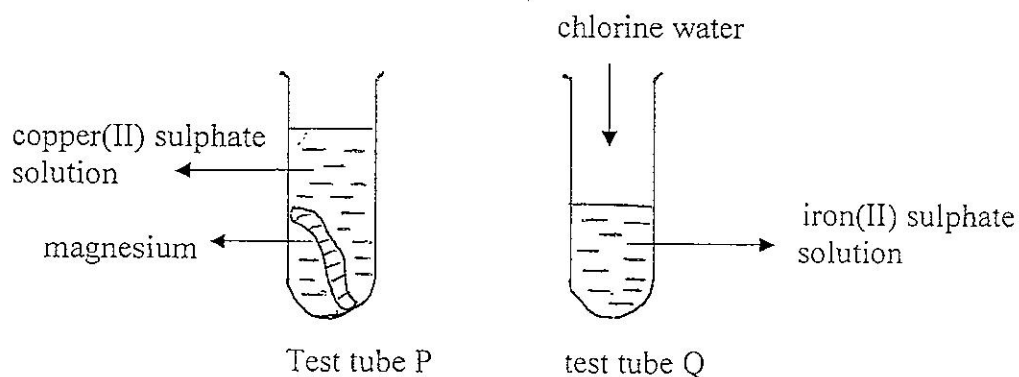
[2 marks]

2

Total

10

6. The figure below shows the set up of an experiment to investigate the reactions that take place in test tubes P and Q.



(a) State the observation for the reaction in test tube:

(i) P :

(ii) Q :

[2 marks]

2

(b) (i) Write the ionic equation for the reaction in (a) (i) above.

[1 mark]

1

(c) State what is meant by oxidizing agent in terms of electron transfer.

.....
[1 mark]

1

(d) Referring to the reaction that place in test tube P :

(i) what is the change in the oxidation number of magnesium ?

.....
[1 mark]

1

(ii) name the oxidizing agent.:

.....
[1 mark]

1

(e) Referring to the reaction that takes place in test tube Q :

(i) state the type of reaction that iron(II) sulphate has undergone.

.....
[1 mark]

1

(ii) what is the change in the oxidation number of iron ?

.....
[1 mark]

1

(iii) Some of the product solution was removed and poured into a test test. 2 cm³ of sodium hydroxide solution was then added to the product solution. State the observation.

.....
[1 mark]

1

(iii) Name another reagent that can replace the chlorine water.

.....
[1 mark]

1

Total

10

Section B.
[20 marks]

Answer any one question from this section.

7. (a) In 1908, a German scientist, Fritz Haber pioneered the large scale manufacture of ammonia, a process which now bears his name.
Describe the Haber process for the manufacture of ammonia. [6 marks]
- (b) The main use of ammonia is for the manufacture of nitrogenous fertilisers such as ammonium nitrate.
Describe the preparation of a sample of dry ammonium nitrate in the laboratory by using the titration method. [12 marks]
- (c) Name two other uses of ammonia other than for making nitrogenous fertilisers. [2 marks]
- (8).(a) What is meant by the term 'polymer' ? [1 mark]
- (b) Natural rubber is the a polymer obtained from the latex of rubber trees.
Describe the structure of natural rubber by :
- naming its monomer
 - writing the molecular and structural formula of the monomer
 - writing the repeating unit of natural rubber
- [4 marks]
- (c) (i) When an acid is added to natural rubber latex, it coagulates.
Name the acid commonly added to the latex to coagulate it and explain the process by which latex coagulates. [7 marks]
- (d) (i) Name the compound found in all fats and oils. [1 mark]
- (ii) State two differences between fats and oils. [2 marks]
- (iii) One of the many uses of palm oil is in the manufacture of margarine.
Name the process used in the manufacture of margarine and state the reaction conditions necessary for the manufacture of margarine. [3 marks]
- (e) Palm oil is said to be a healthy oil. State two reasons why. [2 marks]

Section C
[20 marks]

Answer any one question from this section.

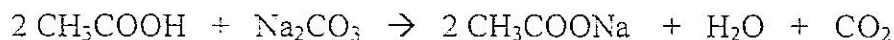
9. (a)(i) By naming an example each, explain the terms 'strong acid' and 'weak acid'.

[6 marks]

(ii) The pH scale is used to measure the strength of acids and alkalis. Describe how the pH scale is used for the stated function.

[5 marks]

(b) In a chemical test for acids, dilute ethanoic acid was added to sodium carbonate. The equation for the reaction is as follows :



Calculate the volume of carbon dioxide gas produced, in cm^3 when 30 cm^3 of 0.5 mol dm^{-3} ethanoic acid was completely reacted with excess sodium carbonate.

[r.a.m. : C = 12 ; O = 16 ; 1 mole of gas occupies 24 dm^3 at room temperature]

[3 marks]

(c) The reaction between an acid and a carbonate as in the above reaction is one of the chemical tests for the presence of an acid. Describe **two** other chemical tests (without the use of any acid-base indicators) that can be used to show that a given solution Q is acidic.

[6 marks]

10.(a) Write an ionic equation to represent a redox reaction. Using the equation, explain the term redox reaction in terms of electron transfer.

[3 marks]

(b) (i) With reference to metals, state the meaning of the term 'corrosion'.

[1 mark]

(ii) The rusting of iron is a redox reaction. Explain how iron rusts.

[7 marks]

1) Name 2 methods used to prevent the rusting of iron. Briefly explain the principle involved in each of the methods.

[4 marks]

2) Redox reactions can also occur by electron transfer from a distance. Given potassium iodide solution, acidified potassium manganate (VII) solution and all other necessary chemicals and apparatus, draw a labeled diagram to represent the apparatus used to show that electrons can be transferred from a distance in a redox reaction. Also, indicate in the diagram, the direction of electron flow.

[5 marks]

- End of Question Paper -

Prepared by :

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(Mr. Tan Thwan Hoa)

Checked by :

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