INFORMATION FOR CANDIDATE
MAKLUMAT UNTUK CALON

1. This question paper consists of three sections: **Section A**, **B** and **C.**
   Kertas soalan ini mengandungi tiga bahagian: ***Bahagian*** **A, B** *dan* **C.**

2. Answer **all** questions in Section A. Write your answers for **Section A** in the spaces provided in the question paper.
   Jawab ***semua*** *soalan dalam* ***Bahagian*** **A.** *Tuliskan jawapan bagi* ***Bahagian*** **A** *dalam ruang yang disediakan dalam kertas soalan*

3. Answer one question from **Section B** and one question from **Section C**.
   Write your answers for **Section B** and **Section C** on the `writing paper' provided by the invigilators.
   Answer questions in **Section B** and **Section C** in detail.
   You may use equations, diagrams, tables, graphs and other suitable methods to explain your answer.
   Jawab ***satu*** *soalan daripada* **Bahagian B** *dan* **satu** *soalan daripada* **Bahagian C**. *Tuliskan jawapan bagi* **Bahagian B** *dan* **Bahagian C** *pada halaman bergaris di bahagian akhir kertas soalan ini. Jawab* **Bahagian B** *dan* **Bahagian C** *dengan terperinci. Anda boleh menggunakan persamaan, gambar rajah, jadual, graf dan cara lain yang sesuai untuk menjelaskan jawapan anda*

4. Show your working. It may help you to get marks.
   Tunjukkan kerja mengira.Ini membantu anda mendapatkan markah.

5. If you wish to change your answer, neatly cross out the answer that you have done. Then write down the new answer.
   Sekiranya anda hendak membatalkan sesuatu jawapan, buat garisan di atas jawapan itu.

6. The diagrams in the questions are not drawn to scale unless stated.
   Rajah yang mengiringi soalan tidak dilukiskan mengikut skala kecuali dinyatakan

7. Marks allocated for each question or part question are shown in brackets.
   Markah yang diperuntukkan bagi setiap soalan atau ceraian soalan ditunjukkan dalam kurungan

8. The time suggested to answer **Section A** is 90 minutes, **Section B** is 30 minutes and **Section C** is 30 minutes.
   Masa yang dicadangkan untuk menjawab **Bahagian A** *ialah* 90 *minit,* **Bahagian B** *ialah* 30 *minit dan* **Bahagian C** *ialah* 30 *minit*

9. You may use a non-programmable scientific calculator.
   Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogramkan.

10. Hand in your answer sheets at the end of the examination.
    Serahkan semua kertas jawapan anda di akhir peperiksaan

Section A

[60 *marks*]

Answer **all** questions in this section

*Jawab **semua** soalan dalam bahagian ini.*

1 Diagram 1.1 shows the apparatus set up of an experiment to investigate the movement of copper(II) sulphate particles in water.
Rajah 1.1 *menunjukkan susunan radas bagi satu eksperimen untuk mengkaji pergerakan zarah-zarah kuprum(II)sulfat dalam air.*

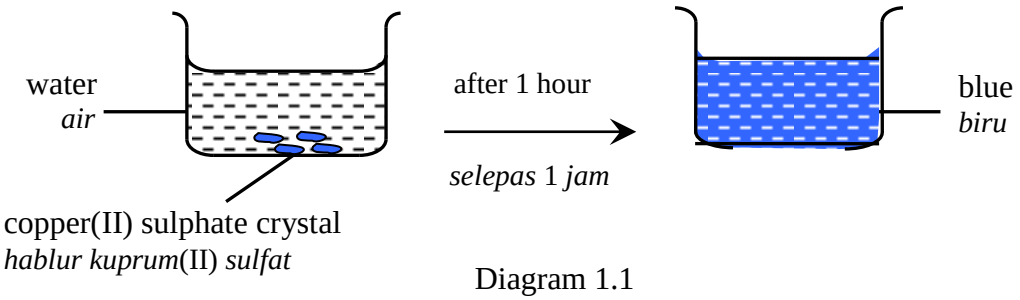


Diagram 1.1

(a)

(i) State the name of the process involved in the experiment.
Nyatakan nama proses yang terlibat dalam eksperimen ini.

…….

[1 *mark*]

(ii) State the type of particles in copper (II) sulphate crystal.
Nyatakan jenis zarah yang terdapat dalam hablur kuprum(II) *sulfat.*

……

[1 *mark*]

(iii) The experiment is repeated by using hot water.
Predict the time taken for the blue colour to spread throughout the solution.
Eksperimen diulang dengan menggunakan air panas.
Ramalkan masa yang diambil untuk warna biru itu meresap ke seluruh larutan.

……

[1 *mark*]

(iv) Draw the arrangement of particles of copper(II)sulphate in solid state.
Lukiskan susunan zarah kuprum(II) sulfat dalam keadaan pepejal.

Diagram 1.2 [1 *mark*]

An experiment is carried out to determine the melting point of naphthalene.
Satu eksperimen telah dijalankan untuk menentukan takat lebur naftalena.

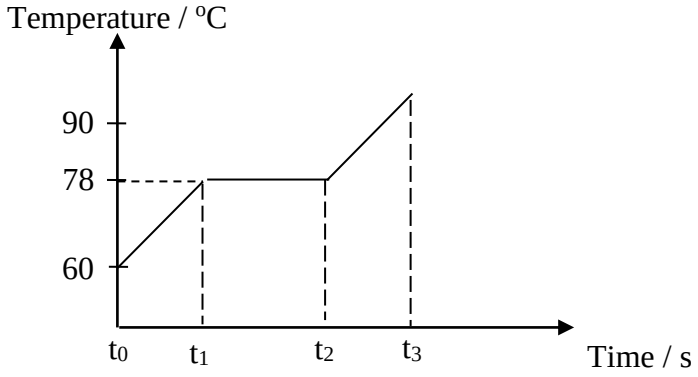


Diagram 1.3

(b) Diagram 1.3 shows the plotted graph of temperature against time .
Rajah 1.3 *menunjukkan lakaran graf suhu melawan masa.*

(i) From the graph, determine the melting point of naphthalene.
Daripada graf , tentukan takat lebur bagi naftalena.

…….
[1 *mark*]

(ii) What is meant by melting point.
Apakah maksud takat lebur?

…….
[1 *mark*]

(iii) Explain why there is no change in temperature from t_1 to t_2 .
Terangkan mengapa tiada perubahan suhu dari t_1 *hingga* t_2.

……..

……...
[2 *marks*]

(c) Diagram 1.4 shows the changes of the two states of matter.
Rajah 1.4 *menunjukkan perunahan keadaan jirim bagi dua keadaan.*

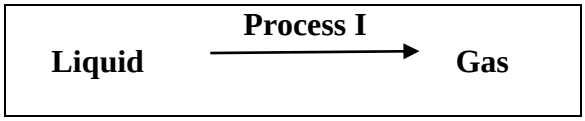


Diagram 1.4

(i) Name process I.
Namakan proses I

……

(ii) State the changes in the movement of the particles in Process I
Nyatakan perubahan dalam pergerakkan zarah-zarah dalam Proses I

……

[2 *marks]*

2. Diagram 2.1 shows part of the Periodic Table of Elements.
Rajah 2.1 *menunjukkan sebahagian daripada Jadual Berkala Unsur.*

Li																	
Na																Cl	Ar
							Fe										

Diagram 2.1

(a) (i) State the name of the element represented by the symbol Fe.
Nyatakan nama unsur yang diwakili oleh simbol Fe

……

[1 *mark*]

(ii) Fe is a transition element. State one special characteristic of the transition elements.
Fe *adalah unsur peralihan. Nyatakan satu sifat istimewa unsur peralihan.*

……..

[1 *mark*]

(b) Which element is stable and unreactive . Explain your answer.
Unsur yang manakah stabil dan tidak reaktif. Terangkan jawapan anda.

……

[2 *marks*]

(c) Cl is more electronegative than Na. Explain why.
Cl *adalah lebih elektronegatif daripada* Na. *Terangkan kenapa.*

……...

[1 *mark*]

(d) Between Li and Na, which element is more reactive?
Antara Li *dan* Na, *yang manakah lebih reaktif* ?

…….

[1 *mark*]

(e) Atoms of elements Na and Cl react to form a compound.
Atom bagi unsur-unsur Na *dan* Cl *bertindak balas membentuk suatu sebatian.*

(i) State the type of bond in the compound formed.
Nyatakan jenis ikatan dalam sebatian yang terbentuk.

…….....

[1 *mark*]

(ii) Draw the electron arrangement for the compound formed.
Lukiskan susunan elektron bagi sebatian yang terbentuk.

[2 *marks*]

(iii) State **one** physical property for the compound formed.
Nyatakan ***satu*** *sifat fizik yang ditunjukkan oleh sebatian itu.*

…….

[1 *mark*]

3. Diagram 3.1 shows the apparatus set-up for two methods used to determine the empirical formula of two compounds.
Rajah 3.1 *menunjukkan susunan radas bagi dua kaedah yang digunakan untuk menentukan formula empirik bagi dua sebatian.*

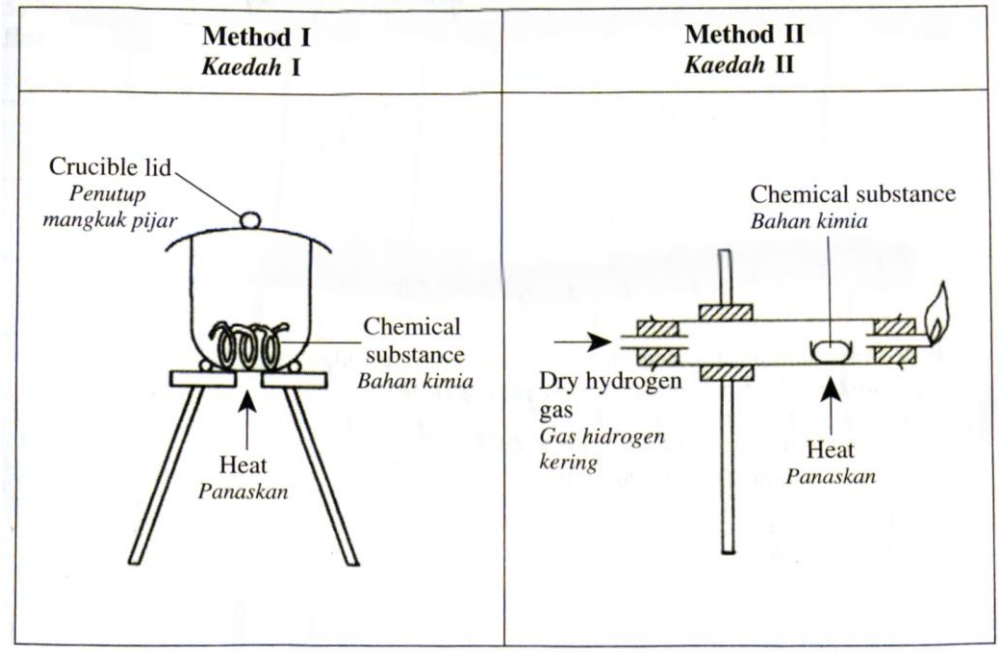


Diagram 3.1

(a) What is the meaning of empirical formula?
Apakah yang dimaksudkan dengan formula enpirik ?

……..……..

……

[1 *mark*]

(b) A student want to determine the empirical formula for copper(II) oxide.
Seorang pelajar mahu menentukan formula empirik bagi kuprum(II)*oksida.*

(i) Which method should the student used?
Kaedah yang manakah patut pelajar itu guna?

……..……..

[1 *mark*]

(ii) Explain your answer.
Terangkan jawapan anda.

……
[1 *mark*]

(c) Table 3.2 shows the results for the experiment to determine the empirical formula of magnesium oxide.
Jadual 3.2 *menunjukkan keputusan bagi satu eksperimen untuk menentukan formula empirik bagi magnesium oksida.*

Mass of crucible + lid *Jisim mangkuk pijar + penutup*	28.24 g
Mass of crucible + lid + magnesium ribbon *Jisim mangkuk pijar + penutup + pita magnesium*	30.64 g
Mass of crucible + lid + magnesium oxide *Jisim mangkuk pijar + penutup + magnesium oksida*	32.24 g

Table 3.2

Based on Table 3.2, complete Table 3.3 and determine the empirical formula of magnesium oxide.
Berdasarkan Jadual 3.2, *lengkapkan Jadual* 3.3 *dan seterusnya tentukan formula empirik bagi magnesium oksida*:
[Relative atomic mass: O = 16, Mg = 24]

Element *Unsur*	Mg	O
Mass (g) *Jisim*		
Number of moles *Bilangan mol*		
Simplest ratio of moles *Nisbah ringkas bilangan mol*		
Empirical formula *Formula empirik*		

Table 3.3

(d) Write the chemical equation for the reaction in the experiment.
Tuliskan persamaan kimia bagi tindak balas dalam eksperimen itu.

……..
[2 *marks*]

4 Diagram 4.1 shows the reactions of compound P. Reactions I and II produced compound Q and R.
Rajah 4.1 *menunjukkan tindak balas bagi sebatian* P. *Tindak balas* I *dan* II *menghasilkan sebatian* Q *dan* R.

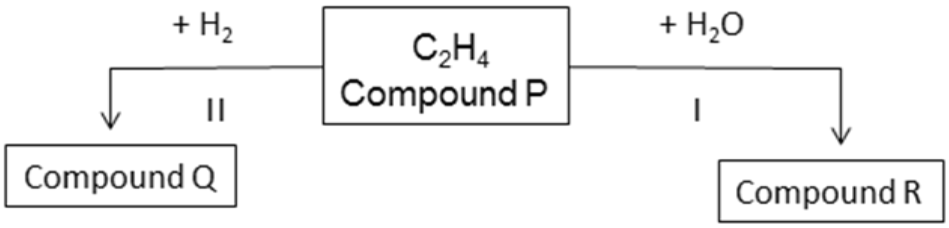


Diagram 4.1

(a) (i) Name compound P
Namakan sebatian P

…….
[1 *mark*]

(ii) State the homologous series for compound P.
Nyatakan siri homolog bagi sebatian P.

……..
[1 *mark*]

(iii) Draw the structural formula for compound P.
Lukiskan formula struktur untuk sebatian P.

[1 *mark*]

(b) Compound P undergoes Reaction I to produce compound R.
Sebatian P *melalui Tindakbalas* I *untuk menghasilkan sebatian* R.

(i) Name Reaction I.
Namakan Tindakbalas I.

……
[1 *mark*]

(ii) Compound R is ethanol. State one physical property of compound R.
Sebatian R *adalah etanol. Nyatakan satu sifat fizikal bagi sebatian* R.

……
[1 *mark*]

(c) Compound P react with hydrogen in Reaction II.
Sebatian P *bertindak balas dengan hidrogen dalam tindak balas* II

(i) Name the suitable catalyst in this reaction.
Namakan mangkin yang digunakan dalam tindak balas ini.

……..
[1 *mark*]

(ii) Write the chemical equation for Reaction II
Tuliskan persamaan kimia bagi Tindakbalas II

……
[2 *marks*]

(d) Compound Q and compound R burnt in air and produce soot.

Compare the sootiness produced from compound Q and compound R. Explain.
Sebatian Q *dan sebatian* R *terbakar dalam udara dan menghasilkan jelaga Bandingkan kejelagaan yang terhasil daripada sebatian* Q *dan sebatian* R. *Terangkan.*

.....

.....
[2 marks]

5 Diagram 5.1 shows the apparatus set-up for the neutralisation reaction between nitric acid and potassium hydroxide solution for the preparation of potassium nitrate salt..
Rajah 5.1 *menunjukkan susunan radas untuk tindak balas peneutralan antara asid nitrik dan larutan kalium hidroksida untuk penyediaan garam kalium nitrat.*

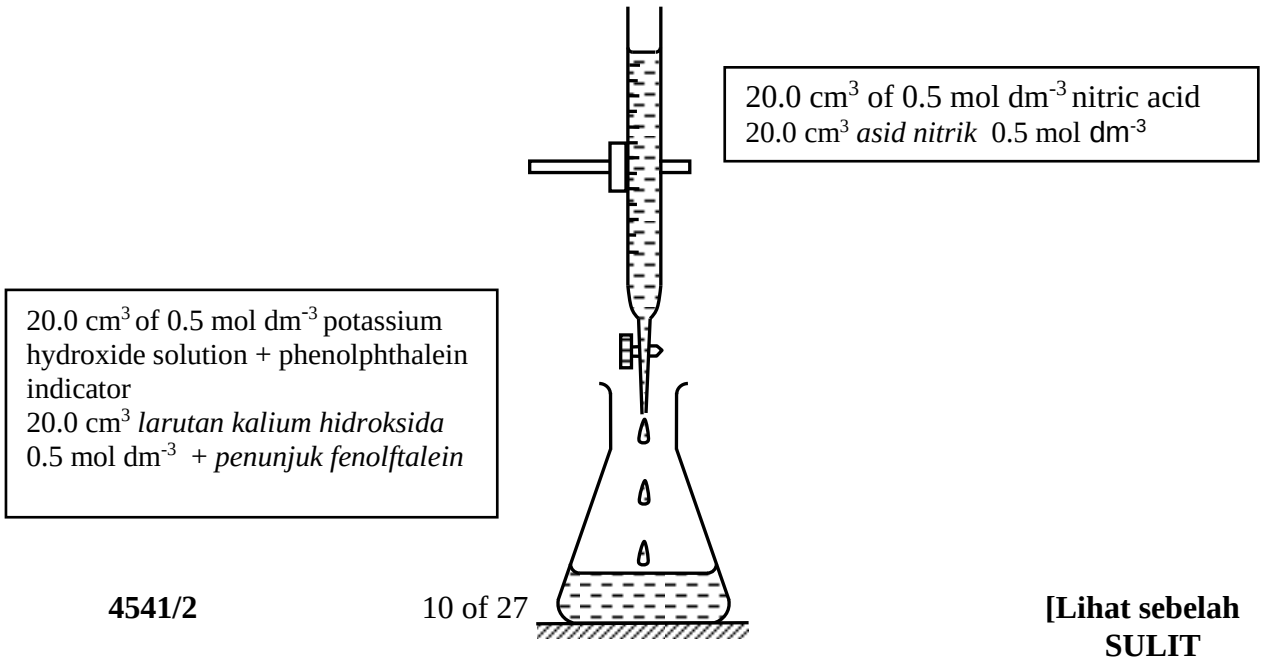


Diagram 5.1

(a) Nitric acid is a monoprotic acid. State the meaning of monoprotic acid.
Asid nitrik adalah asid monoprotik. Nyatakan makna asid monoprotik.

…….
[1 *mark*]

(b) (i) State the colour change of the solution in the conical flask at the end point.
Nyatakan perubahan warna larutan dalam kelalang kon pada takat akhir.

……
[1 *mark*]

(ii) Suggest an indicator to replace phenolphthalein .
Cadangkan satu penunjuk untuk menggantikan fenolftalein.

……..
[1 *mark*]

(c) The chemical equation for the reaction.between nitric acid and potassium hydroxide solution is:
Persamaan kimia bagi tindakbalas antara asid nitkic dan larutan kalium hidroksida ialah:

$$KOH + HNO_3 \rightarrow KNO_3 + H_2O$$

(i) Calculate the maximum mass of potassium nitrate salt formed.
Hitungkan jisim maksimum garam kalium nitrat yang terbentuk.

[Molar mass of salt X = 101 g mol^{-1}]

[3 *marks*]

(ii) The experiment is repeated with 0.5 mol dm^{-3} sulphuric acid to replace nitric acid. Predict the volume of sulphuric acid needed to neutralize completely.
Eksperimen itu diulangi dengan menggunakan 0.5 mol dm^{-3} *asid sulfurik bagi menggantikan asid nitrik. Ramalkan isipadu asid sulfurik yang diperlukan untuk peneutralan lengkap.*

……
[1 *mark*]

(iii) Explain your answer in (c) (ii).
Terangkan jawapan anda dalam (c) (ii).

……

……
[2 *marks*]

(iv) Write the ionic equation for the reaction in (c) (ii).
Tuliskan persamaan ion bagi tindak balas dalam (c) (ii)
.
……
[1 *mark*]

6. Diagram 6.1 shows the set-up of the apparatus to study the heat of displacement .
Rajah 6.1 *menunjukkan susunan radas bagi mengkaji haba penyesaran.*

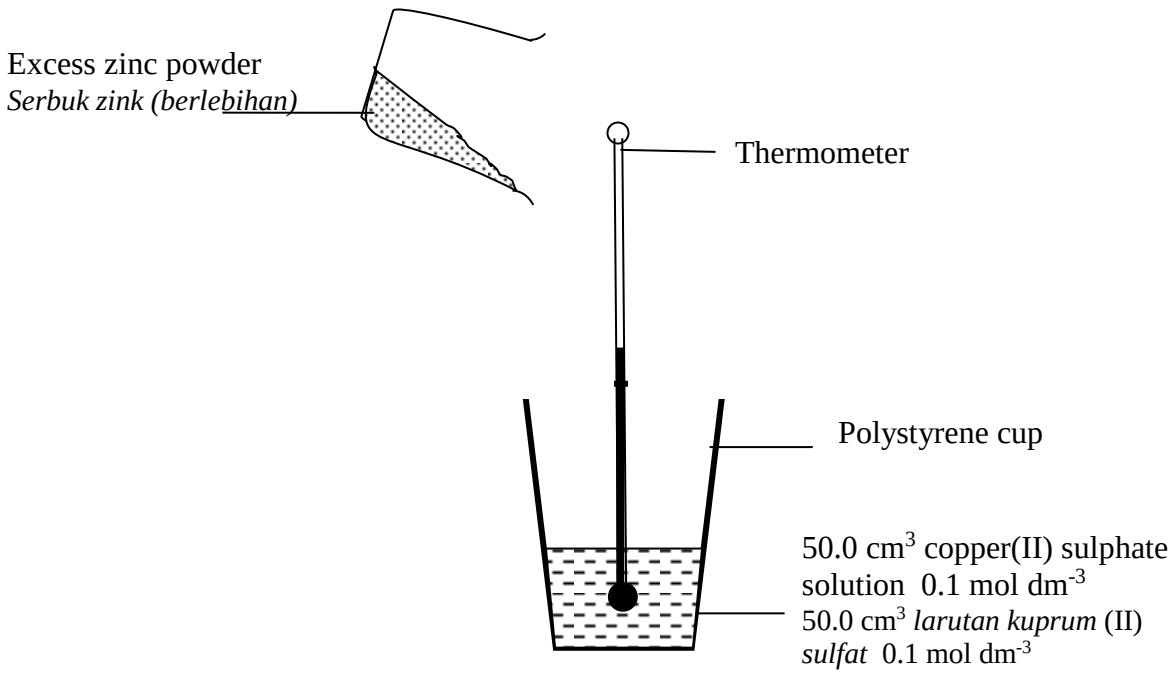


Diagram 6.1

The following data was obtained in Table 6.2 :
Data yang berikut telah diperolehi di dalam Jadual 6.2 :

Observation I *Pemerhatian* I	Brown solid is produced *Pepejal perang terhasil*
Observation II *Pemerhatian* II	

Table 6.2

(a) (i) State the name of the brown solid.
Nyatakan nama pepejal perang yang terhasil.

……
[1 *mark]*

(ii) State another observation in Table 6.2
Nyatakan satu pemerhatian lain dalam Jadual 6.2

……....
[1 *mark*]

The following data was obtained in Table 6.3 :
Data yang berikut telah diperolehi di dalam Jadual 6.3 :

Initial temperature of copper(II) sulphate solution *Suhu awal larutan kuprum*(II) *sulfat*	29.0 ^{o}C
The highest temperature of the mixture *Suhu tertinggi campuran*	34.0 ^{o}C

Table 6.3

(b) Write an ionic equation for the displacement reaction above.
Tuliskan persamaan ion bagi tindak balas penyesaran di atas.

……...
[2 *marks*]

(c) (i) Calculate the temperature change in Table 6.3
Hitungkan perubahan suhu dalam Jadual 6.3

……..
.[1 *mark*]

(ii) Calculate the heat of displacement for this experiment if excess zinc powder is added to 50cm^3 copper(II) sulphate solution 0.1 mol dm^{-3}.
Hitungkan haba penyesaran bagi eksperimen ini jika serbuk zink berlebihan ditambah kepada 50 cm^3 *larutan kuprum(II) sulfat* 0.1 mol dm^{-3}.

[Specific heat capacity of solution= 4.2 J g^{-1} $^{o}C^{-1}$.Density of solution=1.0 g cm^{-3}]

[4 *marks*]

(d) State why is a polystyrene cup used.
Nyatakan kenapa cawan polistren digunakan.

……

[1 *mark*]

Section B

[20 *marks*]

Answer any **one** question.

*Jawab mana-mana **satu** soalan.*

7.

Redox reactions occurs in Electrolytic cells and Chemical cells

(a) Diagram 7.1 shows a voltaic cell. Metal Q is above copper in the electrochemical series.
Rajah 7.1 *menunjukkan suatu sel voltan . Logam* Q *terletak di atas kuprum dalam siri elektrokimia*

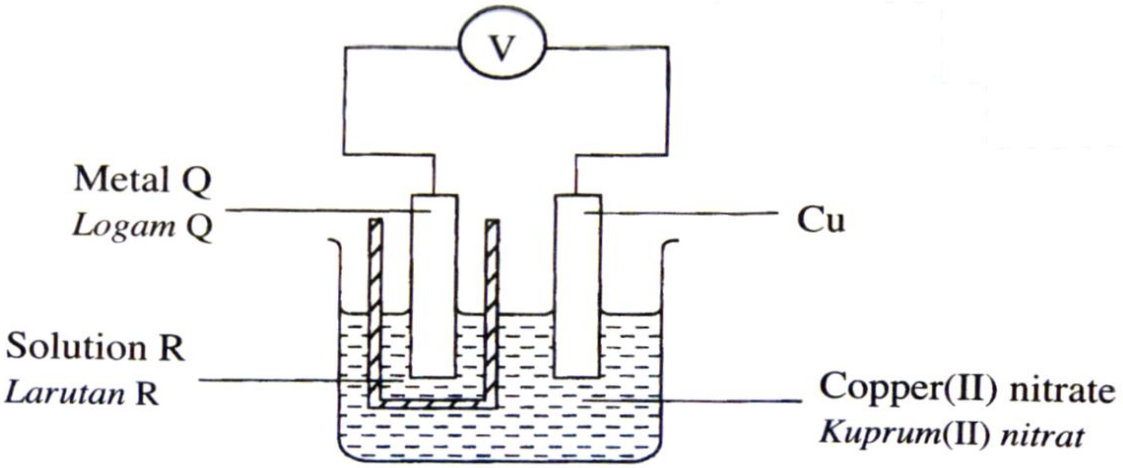


Diagram 7.1

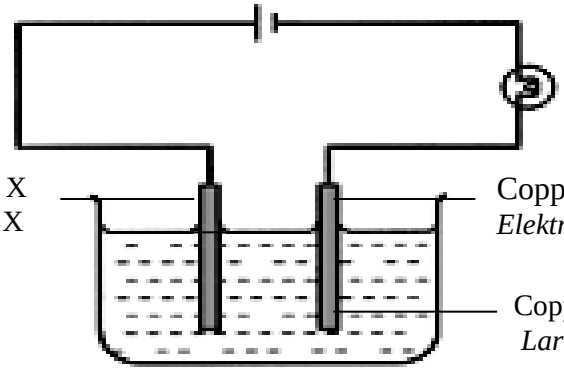
(i) State all the anions and cations in copper(II)nitrate solution.
Nyatakan semua anion dan kation dalam larutan kuprum(II) nitrat.

[3 marks]

(ii) State the positive terminal and the negative terminal thia cell.
Suggest a metal that is suitable as metal Q and a solution that is suitable for solution R.
Nyatakan terminal positif dan terminal negative bagi sel ini.
Cadangkan logam yang sesuai sebagai logam Q *dan larutan yang sesuai sebagai larutan* R.

[4 marks]

(b) Diagram 7.2 shows the apparatus set-up and observations for experiments I using copper(II)sulphate solution using copper electrodes and experiment II using carbon electrodes.
Rajah 7.2 *menunjukkan susunan radas dan pemerhatian bagi eksperimen* I *menggunakan larutan kuprum*(II) *sulfat dengan menggunakan elektrod-elektrod kuprum dan eksperimen* II *menggunakan elektrod-elektrod karbon*

Experiment I	 Copper electrode X *Elektrod kuprum* X Copper electrode Y *Elektrod kuprum* Y Copper(II) sulphate solution *Larutan kuprum*(II) *sulfat* Observations: *Pemerhatian* At X: Saiz become smaller *Di X: Saiz menjadi kecil* At Y: Brown layer *Di Y: Lapisan perang*

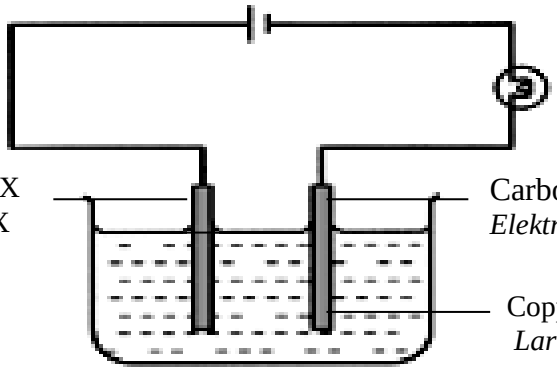
Experiment II	 Carbon electrode X *Elektrod karbon* X Carbon electrode Y *Elektrod karbon* Y Copper(II) sulphate solution *Larutan kuprum*(II) *sulfat* Observations: *Pemerhatian* At X: Bubbles of gas *Di X: Gelembung gas* At Y: Brown layer *Di Y: Lapisan perang*

Diagram 7.2

(i) In both experiment I and experiment II, the product formed at cathode is the same.

Using your knowledge of factors affecting the selective discharge of ions at the electrodes,

- suggest one possible cation
- write the half equation for the reaction at the cathode
- state the name of the product at cathode

Dalam kedua-dua eksperimen I *dan eksperimen* II, *hasil yang terbentuk di katod adalah sama. Dengan menggunakan pengetahuan anda tentang faktor-faktor yang mempengaruhi pemilihan ion untuk dinyahcas di elektrod,*

- *cadangkan satu kation yang mungkin.*
- *tuliskan persamaan setengah bagi tindak balas di katod*
- *nyatakan nama bagi hasil tindak balas di katod.*

[4 *marks*]

(ii) Name the product formed at anode in experiment II.
Describe a confirmatory test to identify the gas produced.
Namakan hasil tindak balas yang terbentuk di anod dalam eksperimen II.
Huraikan satu ujian pengesahan untuk mengenal pasti gas yang terhasil.

[3 *marks*]

(iii) Name the product at the anode in Experiment I and explain the formation of the product in the experiment.
Namakan hasil tindak balas di anod dalam Eksperimen I *dan terangkan pembentukan hasil tindak balas dalam eksperimen ini.*

[6 *marks*]

8 A student carried out three experiments to investigate the factors that has effects on the rate of reaction.
Table 8.1 shows the results of the experiments.
Seorang pelajar telah menjalankan tiga eksperimen untuk menyiasat kesan faktor-faktor yang mempengaruhi kadar tindak balas.
Jadual 8.1 *menunjukkan keputusan-keputusan eksperimen tersebut.*

Expt	**Reactants** ***Bahan Tindak Balas***	**Total volume of gas collected in two minutes, cm^3.** ***Jumlah isipadu gas yang terkumpul dalam dua minit,* cm³.**
I	2.0 g of calcium carbonate chips, $CaCO_3$ and $25cm^3$ of sulphuric acid, H_2SO_4, 0.3 mol dm^{-3} in 60°C 2.0 g *ketul kalsium karbonat*, $CaCO_3$ *dan* $25cm^3$ *asid sulfurik*, H_2SO_4, 0.3 mol dm^{-3} *pada* 60°C	……
II	2.0 g of marble chips, calcium carbonate, $CaCO_3$ and $25cm^3$ of sulphuric acid, H_2SO_4, 1 mol dm^{-3} in 60°C 2.0 g *ketul kalsium karbonat*, $CaCO_3$ *dan* $25cm^3$ *asid sulfurik*, H_2SO_4, 1 mol dm^{-3} *dalam* 60°C	45.00
III	2.0 g of marble chips, calcium carbonate, $CaCO_3$ and $25cm^3$ of sulphuric acid, H_2SO_4, 0.3 mol dm^{-3} in 40°C 2.0 g *ketul kalsium karbonat*, $CaCO_3$ *dan* $25cm^3$ *asid sulfurik*, H_2SO_4, 0.3 mol dm^{-3} *pada* 40°C	15.00

Table 8.1

(a) (i) Based on Experiments I, II and III , state the meaning of rate of reaction.
Write **Three** factors that can affect the rate of reaction.
Merujuk kepada Eksperimen I,II *dan* III, *nyatakan maksud kadar tindak balas.*
Tuliskan ***Tiga*** *faktor yang boleh mempengaruhi kadar tindak balas.*

[4 *marks*]

(ii) Write a balanced chemical equation for the reaction in Eksperiment I.
Tuliskan persamaan kimia bagi tindak balas dalam Eksperimen I.

[2 *marks*]

Calculate the volume of carbon dioxide gas released in **Experiment I.**
Hitungkan jumlah isipadu gas karbon dioksida yang dibebaskan dalam ***Eksperimen*** **I.**

[Molar gas volume at room condition is 24 dm^3]

[3 marks]

(b) Calculate the average rate of reaction for :
(i) Experiment II
(ii) Experiment III

Hitungkan kadar tindak balas purata bagi:
(i) *Experimen* II
(ii) *Experimen* III

[4 marks]

(c) Diagram 8.2 shows the results of experiment 1.
Rajah 8.2 *menunjukkan keputusan eksperimen* 1.

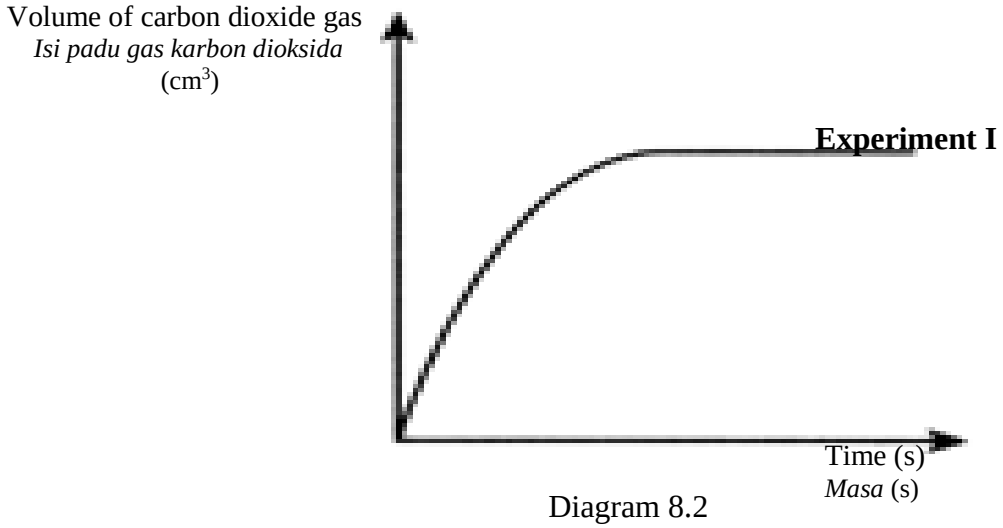


Diagram 8.2

(i) Sketch the curve for **experiment III** on Diagram 8.2.
Lakarkan lengkung bagi ***eksperimen*** **III** *pada Rajah 8.2*

[2 *marks*]

(iii) Compare the rate of reaction between experiment 1 and experiment III.
Use the collision theory in your explanation.
Gunakan teori perlanggaran dalam penerangan anda.
Bandingkan kadar tindak balas antara eksperimen 1 *dan eksperimen* III.
Gunakan teori perlanggaran dalam penerangan anda.

[4 marks]

(d) Meat cut into smaller pieces will cook faster. Explain why.
Daging yang dipotong kecil-kecil akan masak dengan lebih cepat. Terangkan mengapa.

[1 mark]

Section C
[20 *marks*]
Answer any **one** question.
Jawab mana-mana ***satu*** *soalan.*

9 (a) A student carried out an experiment on powdered copper (II) carbonate..
Satu eksperimen dijalankan ke atas serbuk kuprum (II) karbonat.

No.	Activity	Observations
1	Powder copper(II)carbonate is heated strongly *Serbuk kuprum*(II)*karbonat dipanaskan dengan kuat*	Green solid change to black solid. Colourless gas is produced *Pepejal solid bertukar kepada pepejal hitam* *Gas tidak berwarna terhasil*
2	Black solid residue is added with hydrochloric acid *Pepejal hitam ditambah dengan asid hidroklorik*	Black solid dissolved. Blue solution is produced *Pepejal hitam larut.* *Larytan biru terhasil*

Table 9.1

(i) Identify the black solid , colourless gas and the blue solution.

Kenalpasti pepejal hitam , gas tak berwarna dan larutan biru itu.

[3 marks]

(ii) Describe a chemical test to identify the colourless gas.
Huraikan satu ujian kimia untuk mengenalpasti gas tak berwarna itu .

[3 marks]

(iii) Write the chemical equations for the reaction in activity 1 and 2.
Tuliskan persamaan kimia bagi tindak balas dalam aktiviti 1 *dan* 2.

[4 marks]

(b)

Standard solution is a solution in which its concentration is accurately known *Larutan piawai adalah larutan yang diketahui dengan tepat kepekatannya.*

The apparatus and materials in Table 9.2 are used to prepare 250 cm^3 0.5 $moldm^{-3}$ sodium carbonate solution .
Radas dan bahan dalam Jadual 9.2 *digunakan di dalam persediaan* 250 cm^3 0.5 $moldm^{-3}$ *larutan natrium karbonat.*

Materials: Solid sodium carbonate , Distilled water
Appratus: 250 cm^3 volumetric flask, 50 cm^3 beaker, glass rod weighing bottle, stopper, electronic balance, filter funnel

Table 9.2

Calculate the mass of sodium carbonate used.
Describe the procedure to prepare a standard solution of 250 cm^3 0.5 mol dm^{-3} sodium carbonate, Na_2CO_3
Hitungkan jisim natrium karbonat yang digunakan.
Huraikan prosedur penyediaan 250 cm^3 0.5 mol dm^{-3} larutan piawai natrium karbonat, Na_2CO_3.

[Relative atomic mass: Na = 23, C = 12, O = 16]

[10 *marks*]

10. (a) Diagram 10 shows the structural formulae of two cleansing agents X and Y.
Rajah 10 *menunjukkan formula struktur bagi dua agen pembersih* X *dan* Y.

Cleansing agent X:
Agen pembersih X :

$CH_3CH_2CH_2CH_2CH_2CH_2CH_2CH_2CH_2CH_2CH_2CH_2CH_2CH_2COONa$

Cleansing agent Y:
Agen pembersih Y :

$CH_3CH_2CH_2CH_2CH_2CH_2CH_2CH_2CH_2CH_2CH_2CH_2CH_2CH_2COSO_3Na$

Diagram 10.1

(i) Based on Diagram 10.1, determine which cleansing agents is **soap** and which is **detergent.**
Berdasarkan pada Rajah 10.1, *tentukan agen pencuci yang manakah adalah* ***sabun*** *dan yang manakah adalah* ***detergen****.*

[2marks]

(ii) Diagram 10.2 shows the apparatus set-up to investigate how to remove oily stain from a cloth. The observation is made before the experiment.
Rajah 10.2 *menunjukkan susunan radas yang digunakan untuk mengkaji bagaimana membersihkan kesan minyak daripada sehelai kain. Pemerhatian dibuat sebelum eksperimen.*

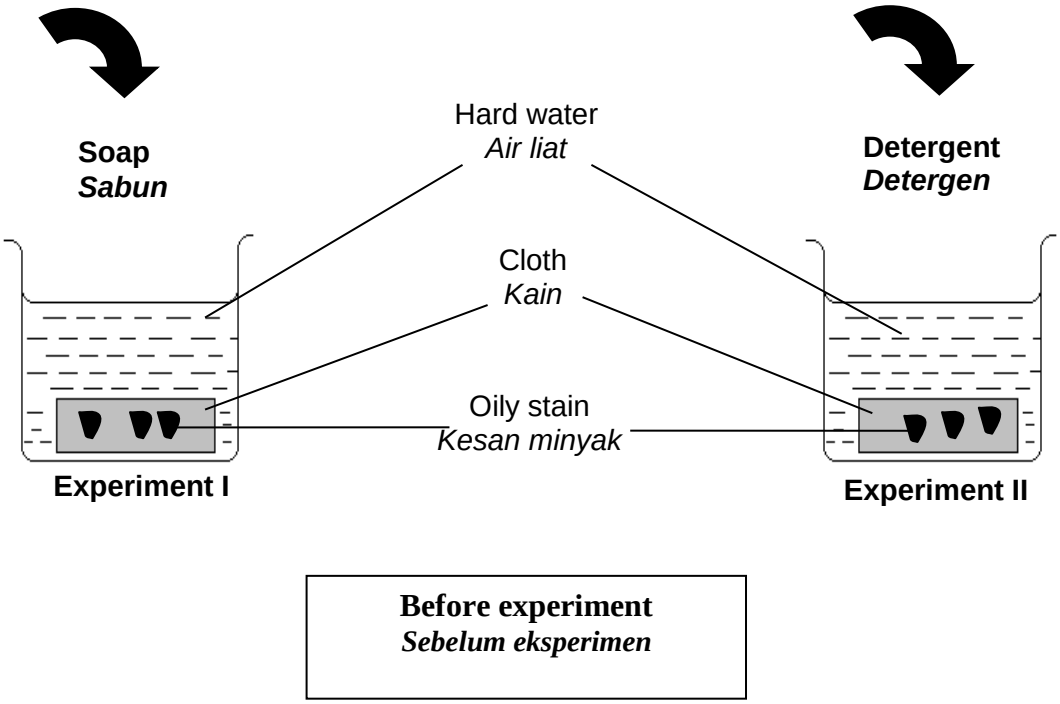


Diagram 10.2

Table 10.3 shows the observations after the experiment
Jadual 10.3 *menunjukkan pemerhatian selepas eksperimen itu.*

Cleaning agent *Agen pencuci*	Observations *Pemerhatian*
Soap *Sabun*	Oily stain remain *Kesan minyak kekal*

Detergent *Detergen*	Oily stain remove *Kesan minyak hilang*

Table 10.3

Based on Table 10.3, compare and explain the effectiveness of the cleansing action between detergent and soap in hard water
Berdasarkan Jadual 10.3, *banding dan terangkan keberkesanan tindakan pencucian di antara detergen dan sabun dalam air liat.*

[8 marks]

(b) Diagram 10.4 shows a medal.
Rajah 10.4 *menunjukkan sebuah piala.*

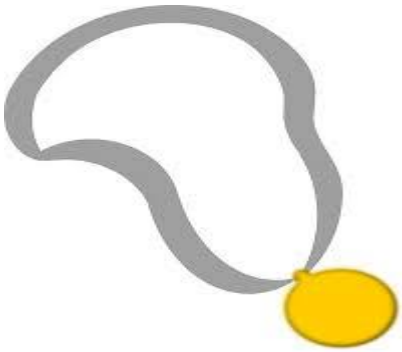


Diagram 10.4

Most medals are made of alloy and not from pure metal because pure metal is easily dented when it is knocked.

Kebanyakkan piala diperbuat daripada aloi dan bukan daripada logam tulen kerana logam tulen mudah kemek apabila diketuk.

By using **one** suitable example of pure metal and its alloy, describe a laboratory experiment to show the hardness of the alloy compared to its pure metal.
*Dengan menggunakan **satu** contoh yang sesuai bagi logam tulen dan aloinya,*

huraikan satu eksperimen untuk menunjukkan kekerasan aloi berbanding dengan logam tulennya.

(i) Your description should include the following:
Huraian anda perlu mengandungi perkara berikut:

- Apparatus set-up
  Susunan radas
- Procedure
  Prosedur
- Tabulation of data
  Penjadualan data

(ii) Explain the difference in hardness of the pure metal and its alloy based on the arrangement of the atoms.
Jelaskan perbezaan dari segi kekerasan bagi logam dan aloinya berdasarkan susunan atom.

[10 *marks*]

END OF QUESTION PAPER