

SULIT

4541/3

Kimia

Kertas 3

September

2011

1 jam 30 minit

Nama :

Tingkatan :



**MAJLIS PENGETUA SEKOLAH - SEKOLAH MALAYSIA (MPSM)
CAWANGAN KELANTAN**

**PEPERIKSAAN PERCUBAAN SPM
TINGKATAN 5
2011**

**KIMIA
KERTAS 3
Masa : 1 jam 30 minit**

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

Arahan

1. *Kertas soalan ini adalah dalam dwibahasa.*
2. *Soalan dalam Bahasa Inggeris mendahului soalan yang sepadan dalam Bahasa Melayu.*
3. *Calon dibenarkan menjawab keseluruhan atau sebahagian soalan sama ada dalam Bahasa Inggeris atau Bahasa Melayu.*
4. *Calon dikehendaki membaca maklumat di halaman belakang kertas soalan ini.*

Untuk Kegunaan Pemeriksa		
Soalan	Markah penuh	Markah diperoleh
1	18	
2	15	
3	17	
JUMLAH		

Kertas soalan ini mengandungi 10 halaman bercetak.

INFORMATION FOR CANDIDITES

1. This question paper consists of three questions. Answer all questions.
2. Write your answers for **Question 1 and Question 2** in the spaces provided in the question paper.
3. Write your answers for **Question 3** on the “helaian tambahan”. You may use equation, diagrams, tables, graphs and other suitable methods to explain your answer.
4. Show your working, it may help you to get marks.
5. If you wish to change your answer, neatly cross out the answer that you have done. Then write down the new answer.
6. The diagrams in the questions are not drawn to scale unless stated.
7. Mark allocated for each question or part question are shown in brackets.
8. The time suggested to answers **Question 1 and Question 2** is 45 minutes and **Question 3** is 45 minutes.
9. You may use a non-programmable scientific calculator.
10. Hand your answer sheets at the end of the examination.

Marks awarded:

Mark	Description
3	Excellent : The best response
2	Satisfactory : An average response
1	Weak : An inaccurate response
0	No response or wrong response

Answer all questions.

Jawab semua soalan.

- 1 A student is carried out three experiments to investigate the electrical conductivity of three compounds in their molten state. Diagram 1.2 shows the results obtained from the experiment. *Seorang pelajar menjalankan tiga eksperimen untuk mengkaji kekonduksian elektrik tiga sebatian dalam keadaan leburan. Rajah 1.2 menunjukkan keputusan yang diperolehi daripada eksperimen.*

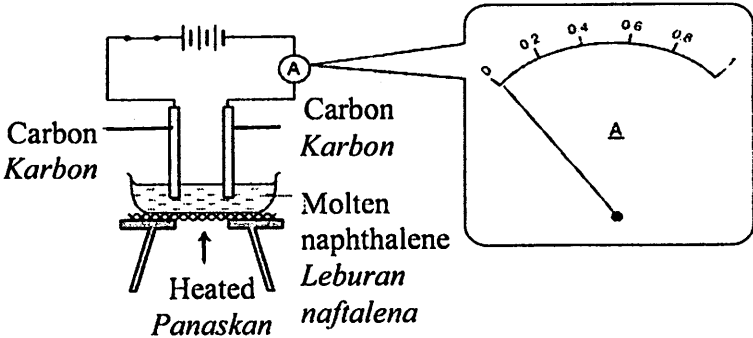
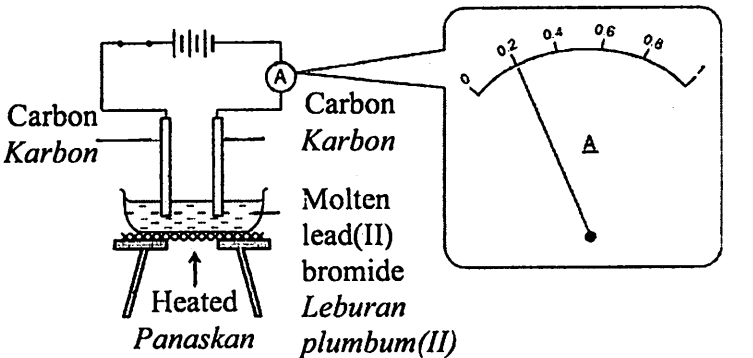
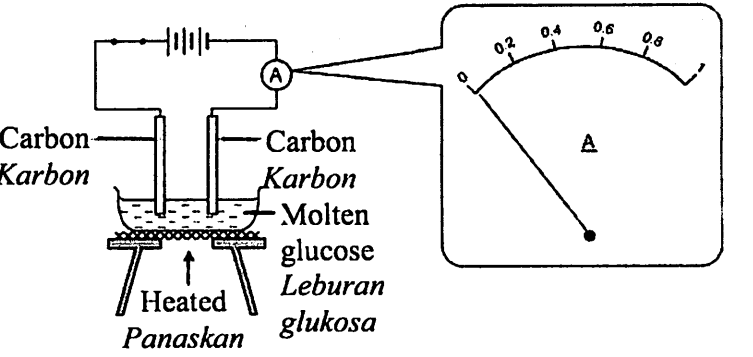
Experiment Eksperimen	Result Keputusan
I	 <p>Carbon Karbon</p> <p>Carbon Karbon</p> <p>Molten naphthalene Leburan naftalena</p> <p>Heated Panaskan</p>
II	 <p>Carbon Karbon</p> <p>Carbon Karbon</p> <p>Molten lead(II) bromide Leburan plumbum(II) bromida</p> <p>Heated Panaskan</p>
III	 <p>Carbon Karbon</p> <p>Carbon Karbon</p> <p>Molten glucose Leburan glukosa</p> <p>Heated Panaskan</p>

Diagram 1.2

Rajah 1.2

- (a) State **one** observation that can be obtained from each experiment.
Nyatakan satu pemerhatian yang dapat diperolehi daripada setiap set eksperimen ini.

Experiment I :

Experiment II :

Experiment III :

[3 marks]

- (b) Based on your observations in (a), state the inference for these experiments.
Berdasarkan pemerhatian anda di (a), nyatakan inferens bagi eksperimen ini.

.....

.....

[3 marks]

- (c) State the operational definition for the electrical conductivity.
Nyatakan definisi secara operasi bagi kekonduksian elektrik.

.....

.....

[3 marks]

- (d) State one hypothesis for this experiment.
Nyatakan satu hipotesis bagi eksperimen ini.

.....

.....

[3 marks]

(c) State all the variables for this experiment.

Nyatakan semua pemboleh ubah-pemboleh ubah bagi eksperimen ini.

Manipulated variable:

Pemboleh ubah dimanipulasikan:

.....

Responding variable:

Pemboleh ubah bergerak balas:

.....

Fixed variable:

Pemboleh ubah dimalarkan

.....

[3 marks]

(f) Compounds can be classified into ionic compound and covalent compound. Based on the compounds in Diagram 1.2, complete Table 1 by classifying the compounds into ionic or covalent compounds.

Sebatian boleh dikelaskan kepada sebatian ion dan sebatian kovalen. Berdasarkan sebatian dalam Rajah 1.2, lengkapkan Jadual 1 dengan mengelaskan sebatian tersebut kepada sebatian ion atau sebatian kovalen.

Ionic compound <i>Sebatian ionik</i>	Covalent compound <i>Sebatian kovalen</i>

Table 1
Jadual 1

[3 marks]

2. An experiment was carried out to construct an ionic equation for the precipitation of silver chloride according to the following steps:
Satu eksperimen telah dijalankan untuk membina persamaan ion bagi pemendakan argentum klorida mengikut langkah berikut:

Step I : 5.00 cm³ of 1.0 mol dm⁻³ potassium chloride solution was poured into 7 test tubes labelled P, Q, R, S, T, U and V.

Langkah I : 5.00 cm³ larutan kalium klorida 1.0 mol dm⁻³ dimasukkan ke dalam 7 tabung uji berlabel P, Q, R, S, T, U dan V.

Step II : 1.00 cm³ of 1.0 mol dm⁻³ silver nitrate solution was added to test tube P from burette.

Langkah II : 1.00 cm³ larutan argentum nitrat 1.0 mol dm⁻³ ditambahkan ke dalam tabung uji P menggunakan buret.

Step III : Step II was repeated for test tubes Q, R, S, T, U and V using different volumes of silver nitrate solution.

Langkah III : Langkah II diulangi bagi tabung uji P, Q, R, S, T, U dan V menggunakan isipadu larutan argentum nitrat yang berlainan.

Step IV : All the test tubes were put in the rack to allow silver chloride precipitate to settle. Height of precipitate formed is recorded in Table 1.

Langkah IV : Semua tabung uji diletakkan di atas rak supaya argentum klorida termendak. Ketinggian mendakan dicatat dalam Jadual 1.

Test tube	P	Q	R	S	T	U	V
Volume of silver nitrate (cm ³) <i>Isipadu argentum nitrat</i>	1.00	2.00	3.00	4.00	5.00	6.00	X
Height of precipitate (cm) <i>Ketinggian mendakan</i>	1.0	2.0	3.0	4.0	5.0	5.0	5.0

Table 1
Jadual 1

(a) Diagram 1 shows the initial and final burette reading for test tube V.

Rajah 1 menunjukkan bacaan awal dan akhir buret bagi tabung uji V.

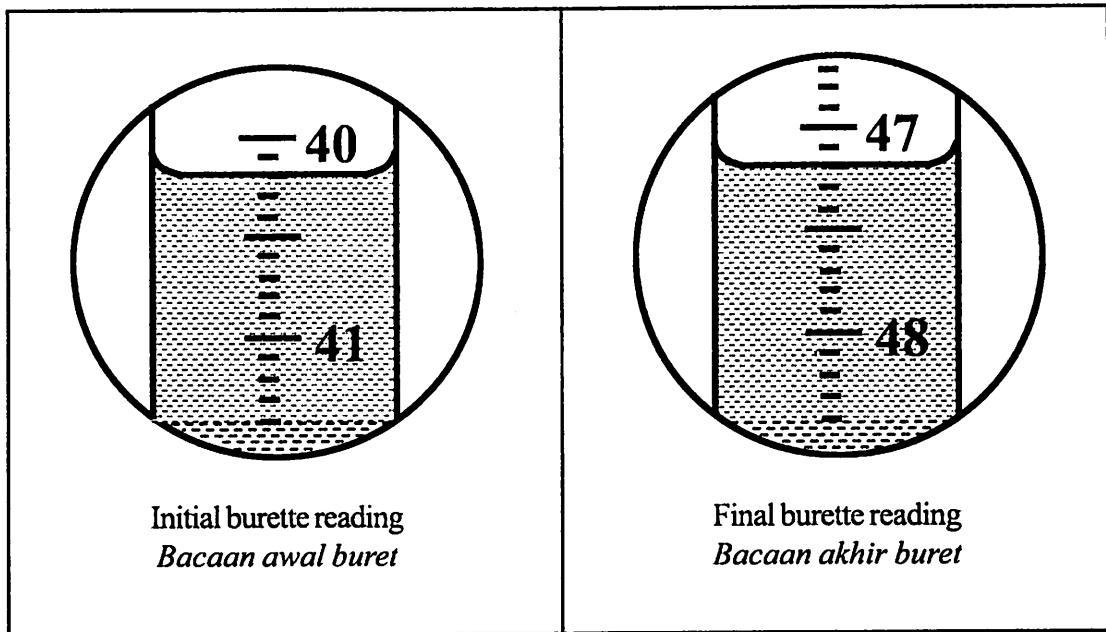


Diagram 1
Rajah 1

Based on Diagram 1, determine value X in Table 1.

Berdasarkan Rajah 1, tentukan nilai X dalam Jadual 1.

X = final burette reading - initial burette reading
Bacaan akhir buret - bacaan awal buret

= -

= cm³

[3 marks]

(b) Based on Table 1, plot a graph of height of precipitate against volume of silver nitrate solution on the graph provided.

Berdasarkan Jadual 1, plotkan graf ketinggian mendakan melawan isipadu larutan argentum nitrat yang digunakan pada kertas graf yang disediakan.

[3 marks]

- (c) (i) On the graph, mark and write the minimum volume of silver nitrate solution needed for complete reaction with 5.00 cm^3 of 1.0 mol dm^{-3} potassium chloride solution.
Pada graf, tanda dan tuliskan isipadularutan argentum nitrat yang diperlukan untuk bertindak balas lengkap dengan 5.00 cm^3 larutan kalium klorida 1.0 mol dm^{-3} .

[3 marks]

- (ii) Using the volume obtained in (c) (i), calculate the number of moles of silver ions and chloride ions used. Then calculate the number of moles of chloride ions that will react with 1.0 mole of silver ions.

Menggunakan isipadu di (c) (i), hitungkan bilangan mol ion argentum dan ion klorida yang digunakan. Kemudian, hitungkan bilangan mol ion klorida yang akan bertindak balas dengan 1.0 mol ion argentum.

[3 marks]

- (d) Predict the height of precipitate when 3.50 cm^3 silver nitrate solution is added into 5.00 cm^3 potassium chloride solution.
Ramalkan ketinggian mendakan apabila 3.50 cm^3 larutan argentum nitrat ditambahkan ke dalam 5.00 cm^3 larutan kalium klorida.

[3 marks]

3. Diagram 3 shows rusting of iron naturally occurs when iron is exposed to air.
Rajah 3 menunjukkan pengaratan besi berlaku secara semulajadi apabila besi terdedah kepada udara.

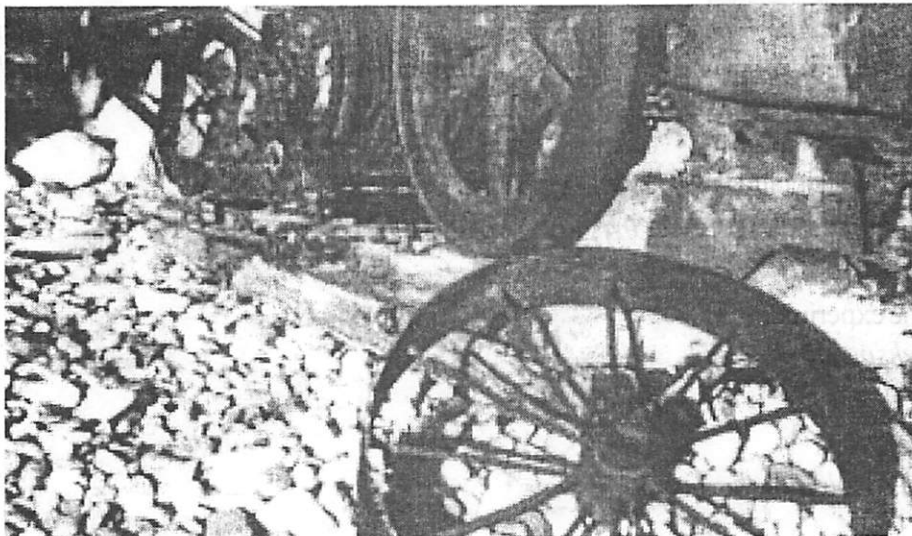


Diagram 3
Rajah 3

The rusting of iron can be affected by the present of other metal that is in contact with iron.
Pengaratan besi boleh dipengaruhi oleh kehadiran logam lain yang bersentuhan dengan besi.

Table 3 shows the results when metal P and metal Q are in contact with iron
Jadual 3 menunjukkan keputusan apabila logam P dan logam Q bersentuhan dengan besi.

Metal in contact with iron <i>Logam yang bersentuhan dengan besi</i>	Results <i>Keputusan</i>
Metal P <i>Logam P</i>	Iron does not rust <i>Besi tidak berkarat</i>
Metal Q <i>Logam Q</i>	Iron rust <i>Besi berkarat</i>

Table 3
Jadual 3

Referring to the information above, plan a laboratory experiment to investigate the effect of named metals P and Q on the rusting of iron and arrange the position of metal P, Q and iron in electrochemical series.

Merujuk kepada maklumat di atas, rancangkan satu eksperimen dalam makmal untuk mengkaji kesan logam-logam P dan Q yang dinamakan ke atas pengaratan besi dan susunkan kedudukan logam P, Q dan besi dalam siri elektrokimia.

Your planning should include the following aspects:

Perancangan anda hendaklah mengandungi aspek-aspek berikut:

- (a) Aim of the experiment
Tujuan eksperimen.
- (b) All the variables
Semua pembolehubah
- (c) Hypothesis
Hipotesis
- (d) List of materials and apparatus
Senarai bahan dan radas
- (e) Procedure
Prosedur
- (f) Tabulation of data
Penjadualan data

[17 marks]

END OF QUESTION PAPER
KERTAS SOALAN TAMAT