Name : ……..……...……..… Class : ……..

CONFIDENTIAL
4541/3
Chemistry
Paper 3
September
2010
1½ hours

MAKTAB RENDAH SAINS MARA
SIJIL PELAJARAN MALAYSIA
TRIAL EXAMINATION
2010

CHEMISTRY
Paper 3
One hour and thirty minutes

DO NOT OPEN THIS QUESTION BOOKLET UNTIL BEING TOLD TO DO SO

1. Write down your name and class in the space provided
Tuliskan nama dan kelas anda pada ruang yang disediakan.

2. The question booklet is bilingual.
Buku soalan ini adalah dalam dwibahasa.

3. Candidates are required to answer all questions.
Calon dikehendaki menjawab semua soalan

For Examiner's Use		
Question	Full Mark	Mark
1	33	
2	17	
Total	50	

This question booklet contains 12 printed pages including the front page.

[See Next Page

1 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 cm^3 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 cm^3 *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 cm^3 of 1.0 mol dm^{-3} silver nitrate solution was added to test tube P from a burette.
Langkah II : 1.00 cm^3 *larutan argentum nitrat* 1.0 mol dm^{-3} *ditambah 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. Diagram 1 shows the initial and final burette readings.
Langkah III : *Langkah* II *diulangi bagi tabung uji* Q, R, S, T, U *dan* V *menggunakan isipadu larutan argentum nitrat yang berlainan. Rajah* 1 *menunjukkan bacaan awal dan akhir buret.*

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.

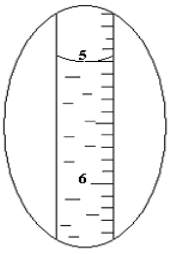
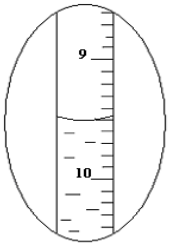
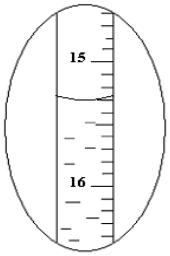
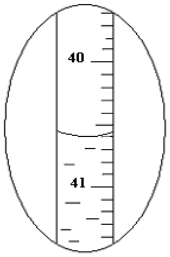
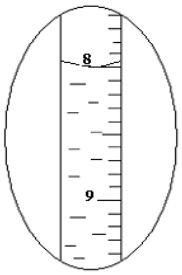
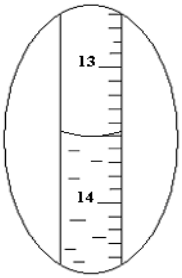
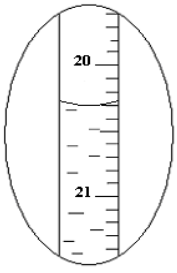
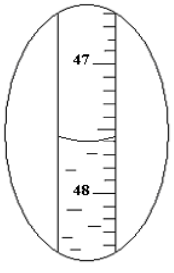
Test tubes ***Tabung uji***	**R**	**S**	**T**	**V**
Initial reading ***Bacaan awal***	 ..... cm^3	 ..... cm^3	 ..... cm^3	 ..... cm^3
Final reading ***Bacaan akhir***	 ..... cm^3	 ..... cm^3	 ..... cm^3	 ..... cm^3

Diagram 1
***Rajah* 1**

Test tube *Tabung uji*	P	Q	R	S	T	U	V
Volume of silver nitrate/ cm^3 *Isipadu argentum nitrat / cm^3*	1.00	2.00				6.00	
Height of precipitate/ cm *Ketinggian mendakan / cm*	1.0	2.0	3.0	4.0	5.0	5.0	5.0

Table 1
***Jadual* 1**

(*a*) Record the burette readings in the spaces provided in Diagram 1.
Rekodkan bacaan buret pada ruang yang disediakan dalam Rajah 1.

[3 *marks*]
[3 *markah*]

1(*a*)

(*b*) Complete Table 1.
Lengkapkan Jadual 1.

[3*marks*]
[3 *markah*]

1(*b*)

(*c*) (i) State the variables involved in this experiment.
Nyatakan pembolehubah yang terlibat dalam eksperimen ini.

Manipulated variable
Pembolehubah dimanipulasikan:

……...

Responding variable
Pembolehubah bergerak balas:

……...

Constant variable
Pembolehubah dimalarkan:

……...

[3*marks*]
[3*markah*]

1(*c*)(i)

(ii) State the hypothesis for the experiment.
Nyatakan hipotesis untuk eksperimen ini.

……...

……...

……...

[3*marks*]
[3 *markah*]

1(*c*)(ii)

For Examiner's Use

(*d*) Based on Table 1, plot a graph of height of precipitate against volume of silver nitrate solution on the graph paper provided on page 5.
Berdasarkan Jadual 1*, plotkan graf ketinggian mendakan melawan isipadu larutan argentum nitrat yang digunakan pada kertas graf di muka surat* 5.

[3*marks*]
[3 *markah*]

1(*d*)

(*e*) State what is observed regarding the height of the precipitate.
Nyatakan apa yang diperhatikan tentang ketinggian mendakan.

…..

…..

…..

[3*marks*]
[3 *markah*]

1(*e*)

(*f*) (i) On the graph in (*d*), 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 di (*d*)*, tanda dan tuliskan isipadu larutan argentum nitrat yang diperlukan untuk bertindak balas lengkap dengan* 5.00 cm^3 *larutan kalium klorida* 1.0 mol dm^{-3}

[3*marks*]
[3 *markah*]

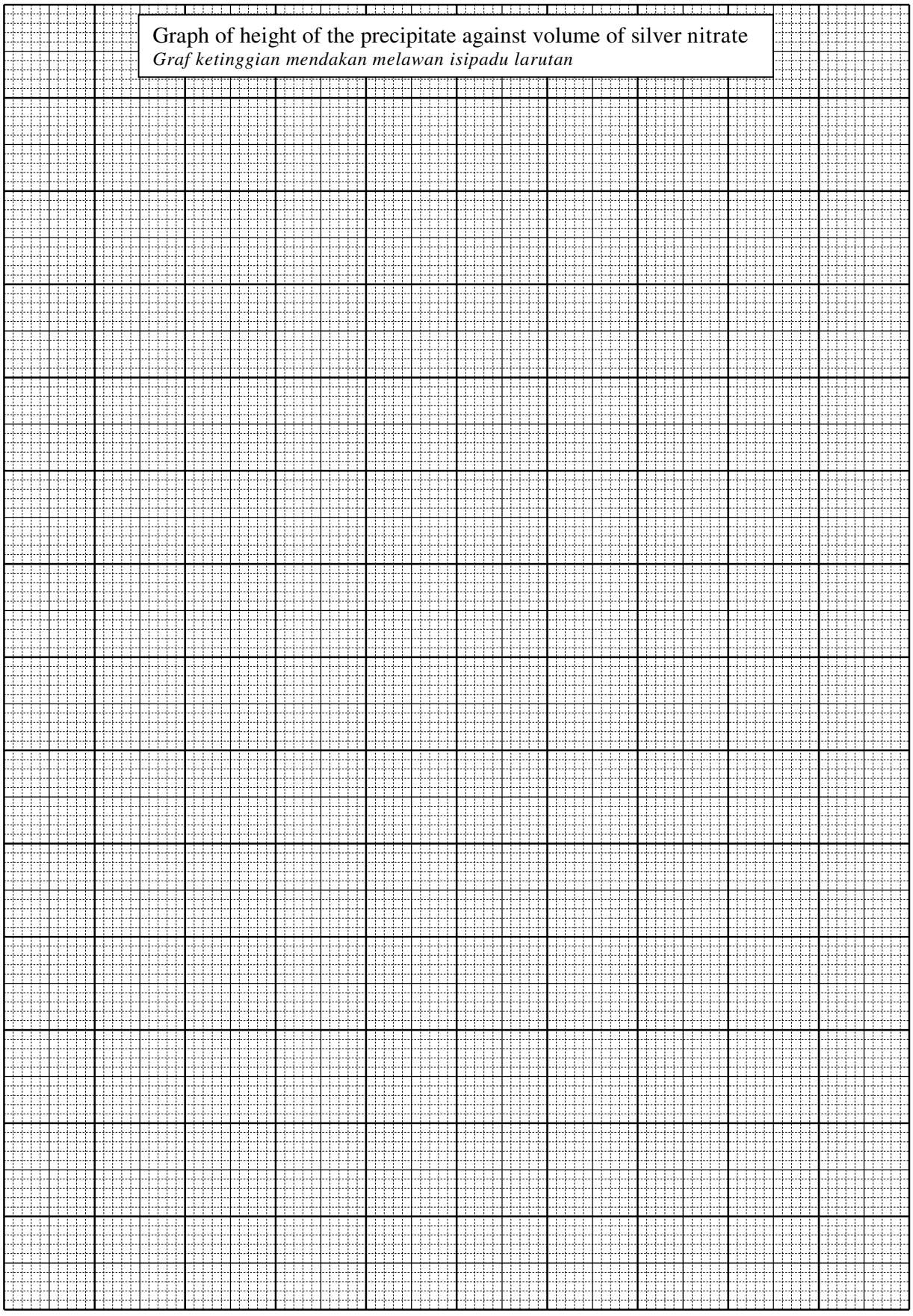
1(*f*)(i)

(ii) Using the volume obtained in (*f*)(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 (*f*)(i)*, hitung 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*]
[3 *markah*]

1(*f*)(ii)

Graph of height of the precipitate against volume of silver nitrate
Graf ketinggian mendakan melawan isipadu larutan



For Examiner's Use

(iii) Write the ionic equation for the precipitation of silver chloride.
Tuliskan persamaan ion untuk pemendakan argentum klorida.

1(*f*)(iii)

……...

[3*marks*]
[3 *markah*]

(*g*) Give the operational definition for double decomposition reaction.
Berikan definisi secara operasi bagi tindak balas penguraian gandadua.

1(*g*)

…...……

…...……

[3*marks*]
[3 *markah*]

(*h*) Classify the ions found in silver nitrate solution and potassium chloride solution into anions and cations.
Kelaskan ion-ion yang terdapat dalam larutan argentum nitrat dan kalium klorida kepada anion dan kation.

1(*h*)

[3*marks*]
[3 *markah*]

2 Diagram 2 shows a galvanised zinc roof which is made from iron coated by zinc layer and a food can made from iron coated by tin layer. Both galvanised zinc roof and food can are not easily corroded.
Rajah 2 *menunjukkan atap zinc galvani diperbuat daripada besi yang disadurkan dengan lapisan zink dan tin makanan yang disadurkan dengan lapisan timah. Kedua-dua atap zink galvani dan tin makanan tidak mudah berkarat.*

Galvanised zinc roof
Atap zink galvani

Food can
Tin makanan

Diagram 2
Rajah 2

Referring to the above example, plan a laboratory experiment to investigate the effect of other metals on the rusting of iron.
You are given iron nails, magnesium ribbon, zinc strip, copper strip and tin strip.
Merujuk kepada contoh di atas, rancang satu eksperimen dalam makmal untuk mengkaji kesan logam lain terhadap pengaratan besi.
Anda dibekalkan dengan paku besi, pita magnesium, kerajang zink, kerajang kuprum dan kerajang stanum.

Your planning should include the following:
Perancangan anda haruslah mengandungi perkara-perkara berikut :

(*a*) Statement of problem
Pernyataan masalah

(*b*) All the variables
Semua pembolehubah

(*c*) Statement of hypothesis
Pernyataan hipotesis

(*d*) List of substances and apparatus
Senarai bahan dan alat radas

(*e*) Procedure of the experiment
Prosedur eksperimen

(*f*) Tabulation of data
Penjadualan data

[17 *marks*]
[17 *markah*]

END OF QUESTION PAPER
KERTAS SOALAN TAMAT

For Examiner's Use

SPACE FOR YOUR ANSWERS / RUANG JAWAPAN

For Examiner's Use

SPACE FOR YOUR ANSWERS / RUANG JAWAPAN

For Examiner's Use

SPACE FOR YOUR ANSWERS / RUANG JAWAPAN

For Examiner's Use

SPACE FOR YOUR ANSWERS / RUANG JAWAPAN

INFORMATION FOR CANDIDATES
MAKLUMAT UNTUK CALON

1. This question paper consists of two questions. Answer **all** questions.
Kertas soalan ini mengandungi dua soalan. Jawab **semua** *soalan*

2. Write your answers for **Question 1** in the spaces provided in the question paper.
Tuliskan jawapan bagi **Soalan 1** *dalam ruang yang disediakan dalam kertas soalan*

3. Write your answers for **Question 2** on the lined pages at the end of the question paper in detail.
Tuliskan jawapan bagi **Soalan 2** *pada halaman bergaris di bahagian akhir kertas soalan ini dengan terperinci.*

4. Show your working, it may help you to get marks.
Tunjukkan cara mengira kerana ia boleh membantu anda mendapatkan markah.

5. If you wish to cancel any answer, neatly cross out the 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 terdapat dalam soalan tidak dilukis mengikut skala kecuali dinyatakan sebaliknya.

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

8. The time suggested to complete **Question 1** is 45 minutes and **Question 2** is 45 minutes.
Masa yang dicadangkan untuk menjawab **Soalan 1** *ialah 45 minit dan* **Soalan 2** *ialah 45 minit.*

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

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