

Nama: ..... Tingkatan: .....

**SULIT**  
**4541/3**  
**Chemistry**  
**Kertas 3**  
**Ogos**  
**2013**  
**1 ½ jam**



**BAHAGIAN PENGURUSAN SEKOLAH BERASRAMA PENUH  
DAN SEKOLAH KECEMERLANGAN**  
**KEMENTERIAN PENDIDIKAN MALAYSIA**  
<http://cikguadura.wordpress.com/>

**PENTAKSIRAN DIAGNOSTIK AKADEMIK SBP 2013**  
**SIJIL PELAJARAN MALAYSIA**

**CHEMISTRY**  
**Kertas 3**

**Satu jam tiga puluh minit**

**JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU**

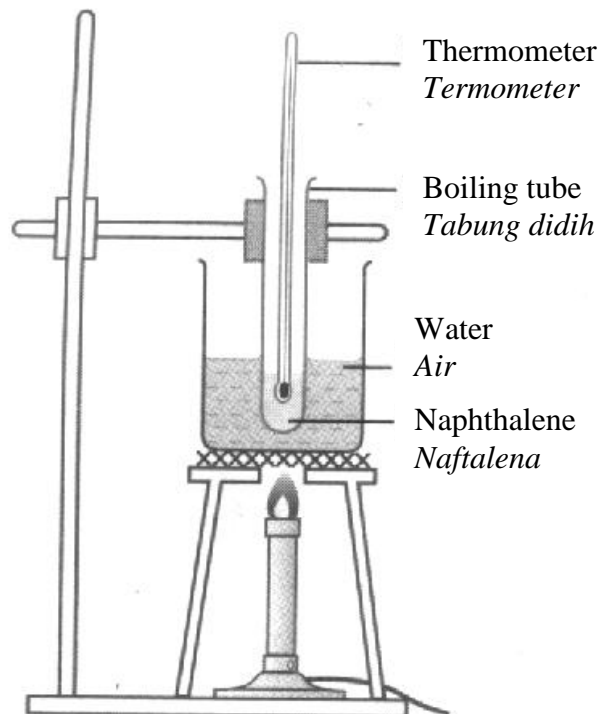
1. Tuliskan *nama* dan *tingkatan* pada ruang yang disediakan di atas.
2. Kertas soalan ini adalah dalam *dwibahasa*.
3. Soalan dalam bahasa Inggeris mendahului soalan yang sepadan dalam Bahasa Melayu.
4. Calon dibenarkan menjawab keseluruhan atau sebahagian soalan sama ada dalam *Bahasa Inggeris* atau *Bahasa Melayu*.
5. Calon dikehendaki membaca maklumat di halaman belakang kertas soalan ini.

<i>Untuk Kegunaan Pemeriksa</i>		
Soalan	Markah Penuh	Markah Diperoleh
1	15	
2	18	
3	17	
<b>Jumlah</b>	<b>50</b>	

Kertas ini mengandungi 12 halaman bercetak

Answer **all** questions  
*Jawab semua* soalan

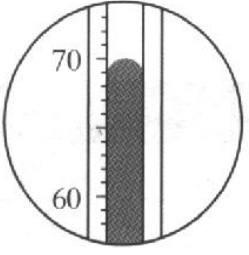
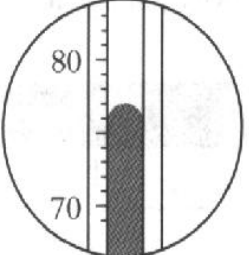
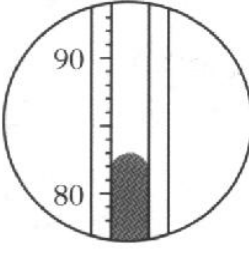
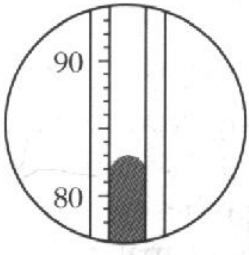
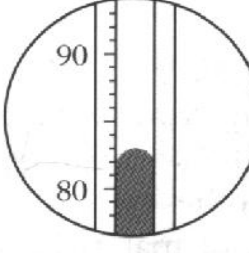
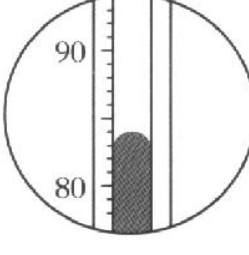
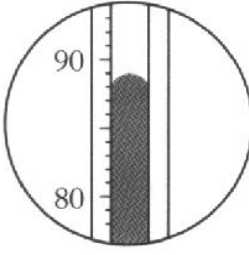
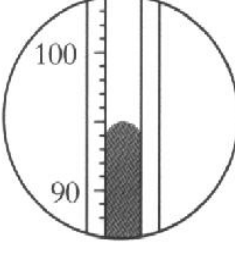
1. Diagram 1.1 shows the apparatus set-up for an experiment to determine the melting point of naphthalene. The temperature reading of naphthalene is recorded at one minute intervals until the temperature is above its melting point. *For examiner's use*
- Rajah 1.1 menunjukkan susunan radas bagi satu eksperimen untuk menentukan takat lebur naftalena. Bacaan suhu direkodkan pada sela masa satu minit sehingga melebihi takat lebur naftalena.*



**Diagram 1.1**  
*Rajah 1.1*

Diagram 1.2 shows the recorded thermometer readings at one minute intervals.  
*Rajah 1.2 menunjukkan bacaan termometer yang direkodkan pada sela masa satu minit.*

*For  
 examiner's  
 use*

 <p>Temperature at <i>Suhu pada</i></p> <p>0 min: .....</p>	 <p>Temperature at <i>Suhu pada</i></p> <p>1 min: .....</p>	 <p>Temperature at <i>Suhu pada</i></p> <p>2 min: .....</p>
 <p>Temperature at <i>Suhu pada</i></p> <p>3 min: .....</p>	 <p>Temperature at <i>Suhu pada</i></p> <p>4 min: .....</p>	 <p>Temperature at <i>Suhu pada</i></p> <p>5 min: .....</p>
 <p>Temperature at <i>Suhu pada</i></p> <p>6 min: .....</p>	 <p>Temperature at <i>Suhu pada</i></p> <p>7 min: .....</p>	

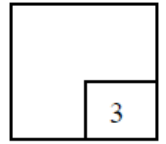
**Diagram 1.2**  
*Rajah 1.2*

- (a) Record all the temperatures in the spaces provided in Diagram 1.2  
*Rekodkan suhu pada ruang yang disediakan dalam Rajah 1.2.*

[3 marks]  
[3 markah]

*For examiner's use*

1(a)

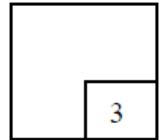


- (b) On the graph paper provided, plot a graph of temperature against time for the heating of naphthalene.

*Pada kertas graf yang disediakan, plot satu graf suhu melawan masa bagi pemanasan naftalena.*

[3 marks]  
[3 markah]

1(b)



- (c) Based on the graph in (b);  
*Berdasarkan graf di (b);*

- (i) Determine the melting point of naphthalene.  
Show on the graph how you determine this melting point.  
*Berdasarkan graf di (b), tentukan takat lebur naftalena.*

*Tunjukkan pada graf bagaimana anda menentukan takat lebur tersebut.*

[3 marks]  
[3 markah]

1(c)(i)

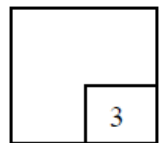


- (ii) How does graph in 1(b) shows the melting point of naphthalene?  
*Bagaimanakah graf di 1(b) dapat menunjukkan takat lebur naftalena?*

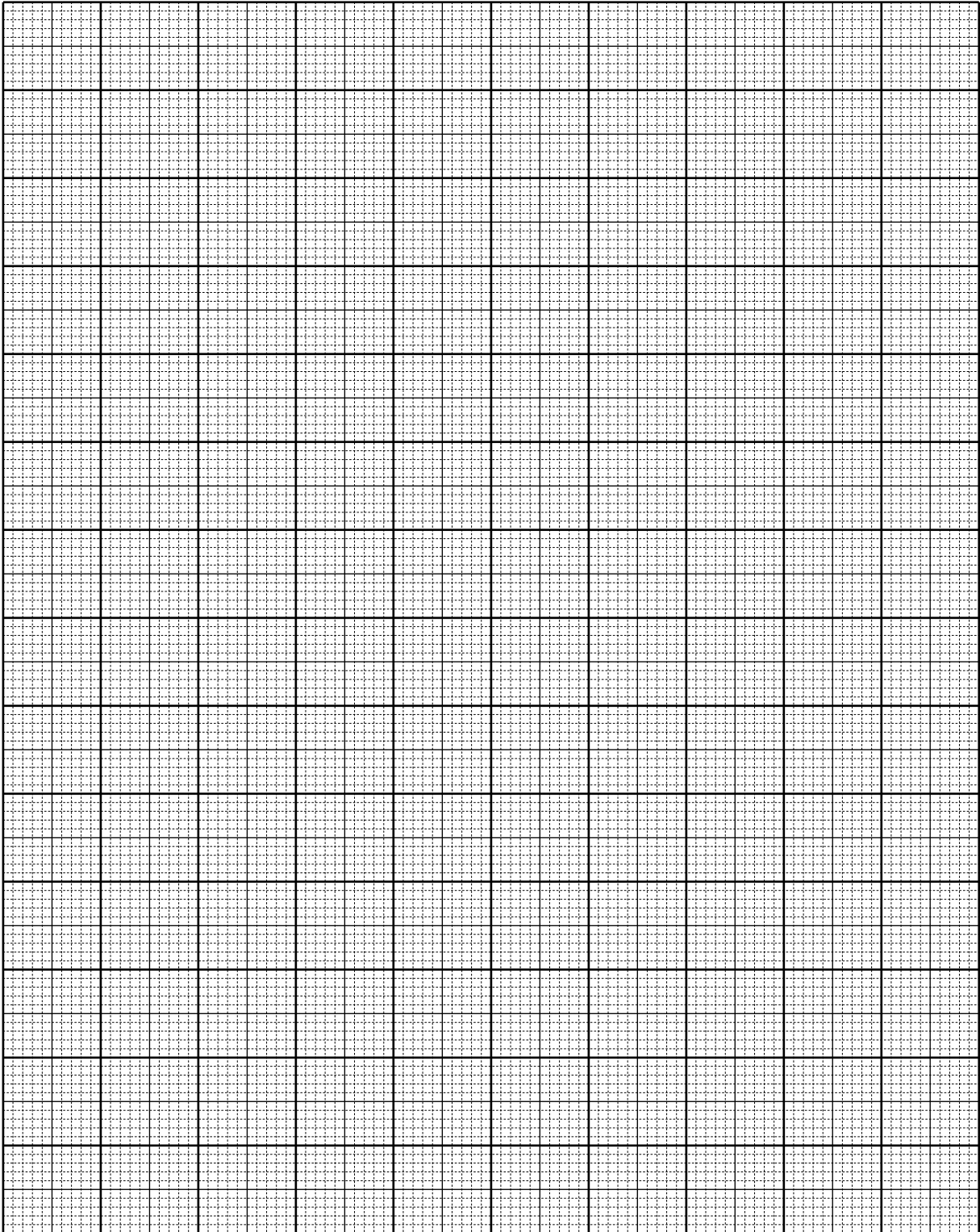
.....  
.....  
.....

[3 marks]  
[3 markah]

1(c)(ii)



Graph of temperature against time.  
*Graf suhu melawan masa*



- (d) The temperature of naphthalene did not change from the 2<sup>nd</sup> minute until 4<sup>th</sup> minute during the heating process. *For examiner's use*

Explain why?

*Suhu naftalena tidak berubah dari minit ke-2 sehingga minit ke-4 semasa proses pemanasan naftalena.*

*Terangkan mengapa?*

.....  
.....  
.....

[3 marks]  
[3 markah]

1(d)

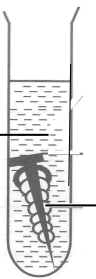
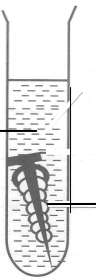
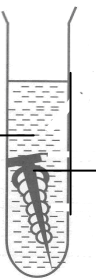
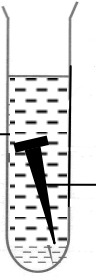
3

**TOTAL**

<b>15</b>

2. Diagram 2.1 shows the apparatus set-up of the experiment to investigate the effect of other metal on rusting of iron. A mixture of jelly solution, potassium hexacyanoferrate (III),  $K_3Fe(CN)_6$  solution and phenolphthalein were used as medium in each test tube. The observation was recorded after one day. *For examiner's use*

*Rajah 2.1 menunjukkan susunan radas bagi eksperimen untuk mengkaji kesan logam lain terhadap pengurangan besi. Medium yang digunakan di dalam setiap tabung uji adalah campuran larutan agar-agar, larutan kalium heksasianoferat (III),  $K_3Fe(CN)_6$  dan fenolftalein. Pemerhatian direkodkan selepas satu hari.*

Test tube	Set-up of apparatus
A	<p>Jelly solution + potassium hexacyanoferrate(III) + phenolphthalein <i>larutan agar-agar, larutan kalium heksasianoferat (III) + fenolftalein</i></p>  <p>Iron nail coiled with magnesium ribbon <i>Paku besi dililit dengan pita magnesium</i></p>
B	<p>Jelly solution + potassium hexacyanoferrate(III) + phenolphthalein <i>larutan agar-agar, larutan kalium heksasianoferat(III) + fenolftalein</i></p>  <p>Iron nail coiled with copper strip <i>Paku besi dililit dengan kepingan kuprum</i></p>
C	<p>Jelly solution + potassium hexacyanoferrate(III) + phenolphthalein <i>larutan agar-agar, larutan kalium heksasianoferat(III) + fenolftalein</i></p>  <p>Iron nail coiled with zinc strip <i>Paku besi dililit dengan kepingan zink</i></p>
D	<p>Jelly solution + potassium hexacyanoferrate(III) + phenolphthalein <i>larutan agar-agar, larutan kalium heksasianoferat(III) + fenolftalein</i></p>  <p>Iron nail <i>Paku besi</i></p>

**Diagram 2.1**  
**Rajah 2.1**

*For examiner's use*

- (a) Table 2.1 shows the result of the experiment.  
State the inference for each test tube.

*Jadual 2.1 menunjukkan keputusan eksperimen tersebut.*

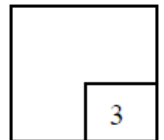
*Nyatakan inferens untuk setiap tabung uji.*

Test tube	A	B	C	D
Intensity of blue colour <i>Keamatan warna biru</i>	None <i>Tiada</i>	High <i>Sangat tinggi</i>	None <i>Tiada</i>	Low <i>Rendah</i>
Pink colouration <i>Warna merah jambu</i>	Present <i>Ada</i>	Present <i>Ada</i>	Present <i>Ada</i>	Present <i>Ada</i>
Inference <i>Inferens</i>				

Table 2.1  
*Jadual 2.1*

2(a)

[3 marks]  
[3 markah]



- (b) State the hypothesis for the experiment.

*Nyatakan hipotesis bagi eksperimen tersebut.*

.....

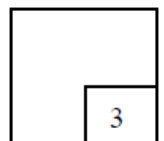
.....

.....

.....

2(b)

[3 marks]  
[3 markah]





(c) State the variables for this experiment.  
*Nyatakan pembolehubah bagi eksperimen ini.*

*For  
examiner's use*

(i) The manipulated variable:  
*Pembolehubah dimanipulasikan:*

.....

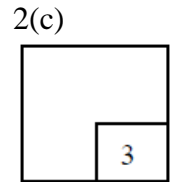
(ii) The responding variable:  
*Pembolehubah bergerak balas:*

.....

(iii) The constant variable:  
*Pembolehubah dimalarkan:*

.....

[3 marks]  
[3 markah]



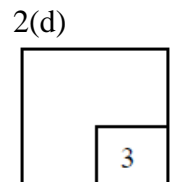
(d) State the operational definition for the rusting of iron.  
*Nyatakan definisi secara operasi bagi pengaratan besi.*

.....

.....

.....

[3 marks]  
[3 markah]



- (e) Based on the experiment, classify the metals that can provide sacrificial protection and metals that cannot provide sacrificial protection to iron.

*Berdasarkan eksperimen ini, kelaskan logam-logam tersebut kepada logam yang boleh menyediakan perlindungan korban dan logam yang tidak boleh menyediakan perlindungan korban.*

[3 marks]  
[3 markah]

2(e)

	3
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*For  
examiner's use*

- (f) Metal Y is placed below copper in Electrochemical Series.  
Predict one observation when metal Y is coiled with iron nail and dipped into the mixture of jelly solution, potassium hexacyanoferrate(III),  $K_3Fe(CN)_6$  solution and phenolphthalein.

*Logam Y terletak di bawah kuprum dalam Siri Elektrokimia.*

*Ramalkan satu pemerhatian apabila logam Y dililitkan pada paku besi dan dicelupkan ke dalam campuran larutan agar-agar, larutan kalium heksasianoferat(III)  $K_3Fe(CN)_6$  dan fenolftalein.*

[3 marks]  
[3 markah]

2(f)

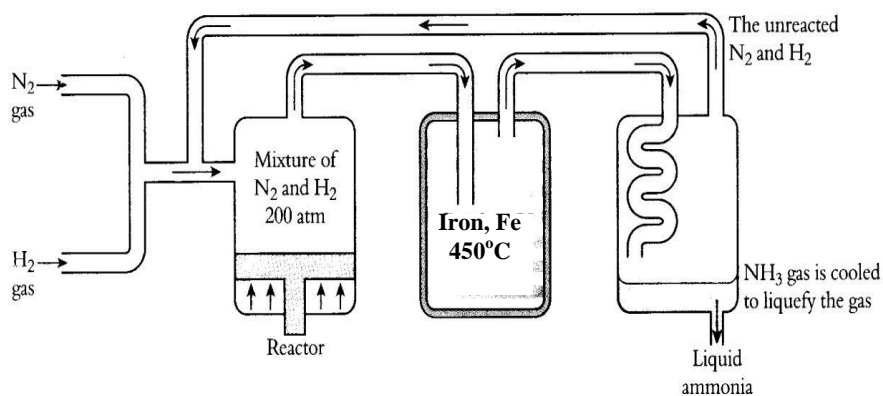
	3
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**TOTAL**

	<b>18</b>
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- 3 Diagram 3.1 shows the production of ammonia,  $\text{NH}_3$  through Haber process. The mixture of nitrogen and hydrogen gases is passed over iron, Fe. Iron acts as the catalyst to increase the rate of the production of ammonia gas.

*Rajah 3.1 menunjukkan penghasilan ammonia,  $\text{NH}_3$  melalui proses Haber. Campuran gas nitrogen dan gas hidrogen dialirkan melalui serbuk besi. Besi bertindak sebagai mangkin yang meningkatkan kadar penghasilan gas ammonia.*



**Diagram 3.1**

**Rajah 3.1**

Based on this idea, plan one laboratory experiment to investigate the effect of the **presence** of catalyst on the rate of decomposition of hydrogen peroxide,  $\text{H}_2\text{O}_2$ .  
*Berdasarkan idea ini, rancangkan satu eksperimen makmal untuk mengkaji kesan **kehadiran** mangkin ke atas kadar penguraian hidrogen peroksida,  $\text{H}_2\text{O}_2$ .*

Your planning should include the following aspects:

*Perancangan anda hendaklah mengandungi aspek-aspek berikut:*

- (a) Problem statement  
*Penyataan masalah*
- (b) All the variables  
*Semua pemboleh ubah*
- (c) Statement of the hypothesis  
*Pernyataan hipotesis*
- (d) List of substances and apparatus  
*Senarai bahan dan radas*
- (e) Procedure for the experiment  
*Prosedur eksperimen*
- (f) Tabulation of data  
*Penjadualan data*

[17 marks]

[17 markah]

INFORMATION FOR CANDIDATES  
MAKLUMAT KEPADA CALON

1. This question paper consists of **three** questions. **Question 1, Question 2 and Question 3.**  
*Kertas soalan ini mengandungi tiga soalan: Soalan 1, Soalan 2 dan Soalan 3.*
2. Answer all questions. Write your s answer for **Question 1** and **Question 2** in the spaces provided in this question paper.  
*Jawab semua soalan. Tuliskan jawapan bagi Soalan 1 dan Soalan 2 pada ruang yang disediakan dalam kertas soalan.*
3. Write your answers for question 3 on the addition answer sheets provided by invigilators. You may use equations, diagrams, tables, graph and other methods to explain your answer.  
*Tulis jawapan anda bagi Soalan 3 di dalam helaian tambahan yang dibekalkan oleh pengawas peperiksaan. Anda boleh menggunakan persamaan, gambar rajah, jadual, graf dan cara lain yang sesuai untuk menjelaskan jawapan anda.*
4. The diagram in the questions is not drawn to scale unless stated.  
*Rajah yang mengiringi soalan tidak dilukiskan mengikut skala kecuali dinyatakan.*
5. The marks allocated for each question or sub-part of a question is shown in brackets.  
*Markah yang diperuntukkan bagi setiap jawapan atau ceraiian soalan ditunjukkan dalam kurungan.*
6. Show your working, it may help you to get marks.  
*Tunjukkan kerja mengira. Ini membantu anda mendapatkan markah,*
7. If you wish to change your answer, cross out the answer that you have done. Then write down the new answer.  
*Sekiranya anda hendak menukar jawapan, batalkan jawapan yang telah dibuat, kemudian tulis jawapan yang baru.*
8. You may use a non-programmable scientific calculator.  
*Anda dibenarkan menggunakan kalkulator saintifik yang tidak diprogramkan.*
9. Tie the addition answer sheets together with this question paper and hand in at the end of the examination.  
*Ikat semua kertas jawapan anda bersama-sama soalan ini di akhir peperiksaan.*

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