

SULIT

NAMA :

TINGKATAN :

**MAJLIS PENGETUA SEKOLAH MALAYSIA
KUALA LUMPUR**

MODUL PSMA KUALA LUMPUR 2025

KIMIA 4541/2

TINGKATAN 5

Kertas 2 aDin

2 jam 30 minit



JANGAN BUKA KERTAS PEPERIKSAAN INI SEHINGGA DIBERITAHU

1. Tuliskan **nama dan kelas** anda pada ruang yang disediakan.
2. Kertas peperiksaan ini mengandungi **tiga** bahagian: **Bahagian A, Bahagian B dan Bahagian C.**
3. Jawapan hendaklah ditulis pada ruang jawapan yang disediakan di dalam kertas peperiksaan ini.
4. Kertas peperiksaan ini adalah dalam dwibahasa.
5. Jawapan boleh ditulis dalam bahasa Melayu atau bahasa Inggeris.
6. Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.
7. Kerja mengira anda mesti ditunjukkan.
8. **Kertas peperiksaan** ini hendaklah diserahkan kepada pengawas peperiksaan pada akhir peperiksaan.

Untuk Kegunaan Pemeriksa			
Bahagian	Soalan	Markah Penuh	Markah Diperoleh
A	1	5	
	2	5	
	3	6	
	4	7	
	5	8	
	6	9	
	7	10	
	8	10	
B	9	20	
	10	20	
C	11	20	
Jumlah		100	

Kertas peperiksaan ini mengandungi 36 halaman bercetak.

Bahagian A

[60 markah]

Jawab semua soalan.

- 1 Jadual 1 menunjukkan maklumat bagi dua unsur, X dan Y.

Table 1 shows information for two elements, X and Y.

Unsur <i>Element</i>	Susunan elektron <i>Electron arrangement</i>	Bilangan neutron <i>Number of neutrons</i>
X	2.7	10
Y	2.8.8.2	20

Jadual 1

Table 1

- (a) Nyatakan nombor proton dan nombor nukleon bagi atom Y.

State the proton number and nucleon number of atom Y.

Nombor proton :

Proton number

Nombor nukleon :

Nucleon number

[2 markah]

[2 marks]

- (b) Tuliskan susunan elektron bagi ion X.

Write the electron arrangement of ion X.

.....

[1 markah]

[1 mark]

- (c) Lukiskan struktur atom bagi atom X.

Draw the atomic structure of atom X.

[2 markah]

[2 marks]

- 2 Seorang tukang kebun menggunakan baja ammonium nitrat, NH_4NO_3 , untuk menyuburkan tanaman. Beliau melarutkan 0.042 mol ammonium nitrat dalam air. Kemudian, larutan natrium hidroksida ditambah bertujuan untuk meneutralkan tanah tersebut.

A gardener uses ammonium nitrate fertiliser, NH_4NO_3 , to fertilise plants. He dissolved 0.042 mol of ammonium nitrate in water. Then, sodium hydroxide solution is added to neutralise the soil.

- (a) Tulis persamaan kimia bagi tindak balas ammonium nitrat dengan natrium hidroksida untuk menghasilkan natrium nitrat, ammonia dan air.

Write the chemical equation for the reaction between ammonium nitrate and sodium hydroxide to produce sodium nitrate, ammonia and water.

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

- (b) Hitungkan jisim air yang terbentuk daripada tindak balas ini.
[Jisim atom relatif: H = 1; N = 14; O = 16]

Calculate the mass of water produced.
[Relative atomic mass: H = 1; N = 14; O = 16]

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

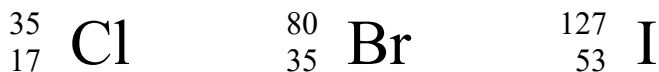
- (c) Huraikan persamaan kimia daripada 2(a) secara kualitatif.

Describe the chemical equation in 2(a) qualitatively.

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

- 3 Rajah 1 menunjukkan perwakilan piawai bagi beberapa unsur dari kumpulan yang sama.

Diagram 1 shows the standard representation of several elements from the same group.



Rajah 1
Diagram 1

- (a) Apakah maksud kumpulan?

What is the meaning of group?

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

- (b) Nyatakan kumpulan bagi unsur-unsur itu.

State the group for all the elements.

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

- (c) Mengapakah unsur-unsur berkenaan terletak dalam kumpulan yang sama?

Why are these elements placed in the same group?

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

- (d) Klorin dan bromin bertindak balas dengan ferum untuk menghasilkan logam halida. Bandingkan kereaktifan di antara klorin dan bromin dengan ferum. Terangkan jawapan anda.

Chlorine and bromine react with iron to produce metal halides.

Compare the reactivity of chlorine and bromine with iron.

Explain your answer.

.....
.....
.....
.....
[3 markah]
[3 marks]

- 4 (a) Jadual 2 menunjukkan nama dan formula molekul beberapa sebatian.

Table 2 shows the name and molecular formulae of some compounds.

Nama <i>Name</i>	Formula molekul <i>Molecular formulae</i>
Magnesium oksida <i>Magnesium oxide</i>	MgO
Ammonia <i>Ammonia</i>	NH ₃
Naftalena <i>Naphthalene</i>	C ₁₀ H ₈

Jadual 2
Table 2

Berdasarkan Jadual 2,

Based on Table 2,

- (i) nyatakan sebatian ion.

state the ionic compound.

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

- (ii) terangkan keterlarutan ammonia dalam air.

explain the solubility of ammonia in water.

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

- (b) Nitrogen dan hidrogen bertindak balas untuk membentuk sebatian ammonia.
Lukis pembentukan ikatan hidrogen bagi sebatian yang terbentuk.

Nitrogen and hydrogen react to form ammonia compound.

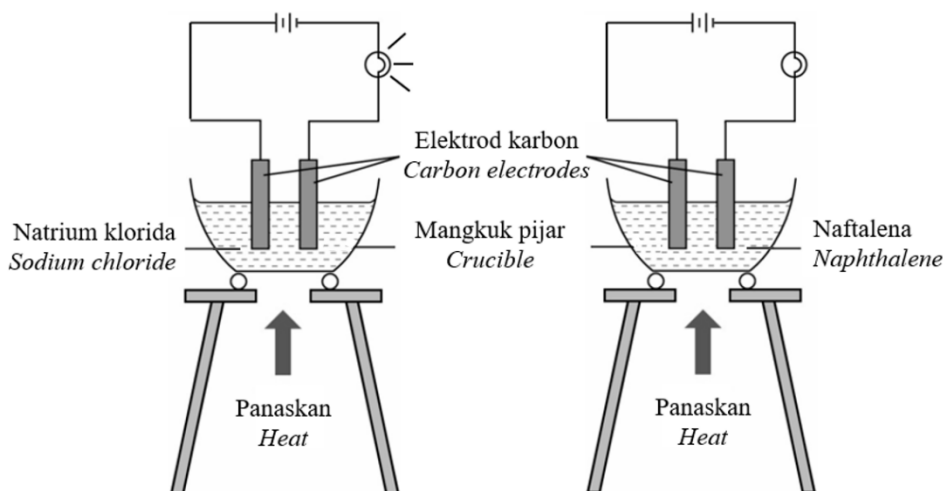
Draw the formation of hydrogen bond for the compound formed.

[2 markah]
[2 marks]

[Lihat halaman sebelah
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- (c) Rajah 2 menunjukkan satu eksperimen yang dijalankan oleh seorang murid untuk membandingkan sifat fizik dua sebatian yang berbeza.

Diagram 2 shows an experiment conducted by a student to compare the physical property of two different compounds.



Rajah 2
Diagram 2

Berdasarkan Rajah 2, bandingkan kekonduksian elektrik bagi kedua-dua sebatian itu. Terangkan jawapan anda.

Based on Diagram 2, compare the electrical conductivity of both compounds. Explain your answer.

.....

.....

.....

.....

[2 markah]
[2 marks]

5 Jadual 3 menunjukkan komposisi dan kegunaan tiga jenis aloi.

Table 3 shows the composition and uses of three types of alloys.

Jenis aloi <i>Type of alloy</i>	Komposisi <i>Composition</i>	Kegunaan <i>Use</i>
Loyang <i>Brass</i>	70% Kuprum <i>70% Copper</i> 30% Zink <i>30% Zinc</i>	P
Q	90% Kuprum <i>90% Copper</i> 10% Stanum <i>10% Tin</i>	 Piala <i>Trophy</i>
Duralumin <i>Duralumin</i>	93% Aluminium <i>93% Aluminium</i> 3% Kuprum <i>3% Copper</i> 3% Magnesium <i>3% Magnesium</i> 1% Mangan <i>1% Manganese</i>	 Basikal lumba <i>Racing bicycle</i>

Jadual 3

Table 3

Berdasarkan Jadual 3,

Based on Table 3,

(a) (i) cadangkan P.

suggest P.

[1 markah]

[1 mark]

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- (ii) nyatakan nama bagi aloi Q.

state the name of alloy Q.

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

- (b) Anda diberikan piala loyang dan piala Q. Setiap piala mempunyai jisim sama iaitu 400 g. Hitung jisim kuprum dalam setiap piala tersebut.

You are given a brass trophy and a trophy Q. Every trophy has the same mass of 400 g. Calculate the mass of copper in each of the trophy.

[2 markah]
[2 marks]

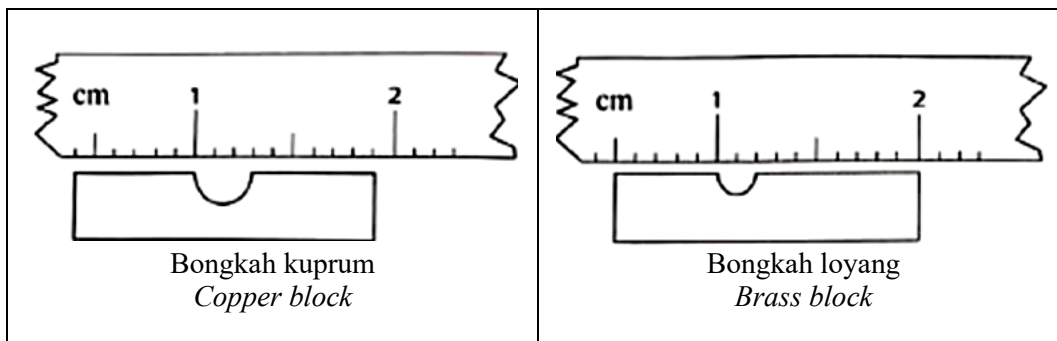
- (c) Alex Yoong ialah pelumba kereta kebangsaan. Cadangkan aloi yang sesuai untuk pembuatan kereta lumba beliau. Berikan alasan anda.

Alex Yoong is a national car racer. Suggest a type of alloy that is suitable to manufacture his racing car. Give your reason.

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

- (d) Rajah 3 menunjukkan diameter lekuk bagi bongkah kuprum dan bongkah loyang bagi satu eksperimen untuk mengkaji kekerasan logam tulen dan aloi.

Diagram 3 shows the diameter of the dents of the copper and brass blocks of an experiment to study the hardness of pure metal and alloy.



Rajah 3
Diagram 3

Jelaskan mengapa diameter lekuk yang terbentuk pada bongkah loyang lebih kecil?

Explain why the diameter of the dent formed on the brass block is smaller?

.....

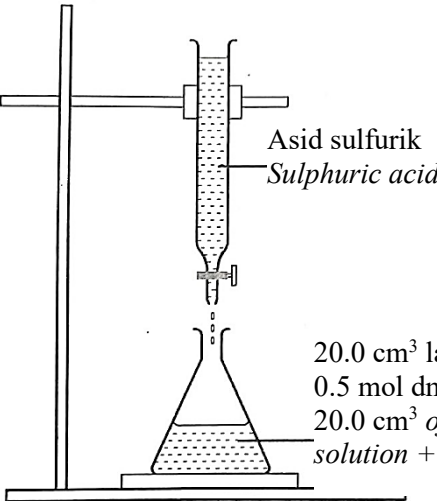
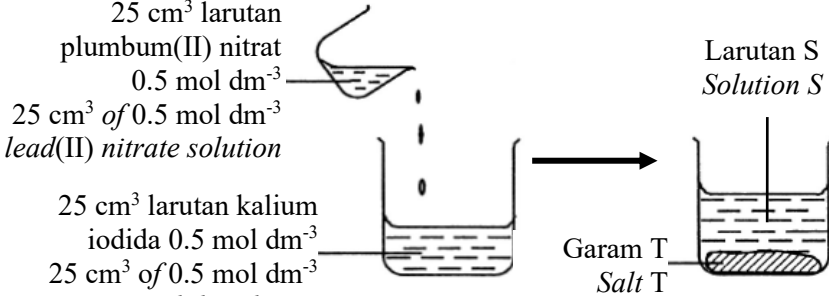
.....

.....

.....

[2 markah]
[2 marks]

- 6 Jadual 4 menunjukkan Eksperimen I dan Eksperimen II dalam penyediaan garam.
Table 4 shows Experiment I and Experiment II in the preparation of salt.

Eksperimen <i>Experiment</i>	Kaedah <i>Method</i>
I	 Asid sulfurik <i>Sulphuric acid</i> 20.0 cm³ larutan kalium hidroksida 0.5 mol dm⁻³ + fenolftalein 20.0 cm³ of 0.5 mol dm⁻³ potassium hydroxide solution + phenolphthalein
II	 25 cm³ larutan plumbum(II) nitrat 0.5 mol dm⁻³ 25 cm³ of 0.5 mol dm⁻³ lead(II) nitrate solution 25 cm³ larutan kalium iodida 0.5 mol dm⁻³ 25 cm³ of 0.5 mol dm⁻³ potassium iodide solution Larutan S <i>Solution S</i> Garam T <i>Salt T</i>

Jadual 4
Table 4

- (a) Berdasarkan Eksperimen I:

Based on Experiment I:

- (i) tulis persamaan kimia bagi tindak balas yang berlaku.

write the chemical equation for the reaction that takes place.

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

- (ii) nyatakan nama garam yang terbentuk dalam kelalang kon.

state the name of salt formed in the conical flask.

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

- (iii) nyatakan **satu** contoh garam lain yang boleh disediakan melalui kaedah ini.

*state **one** example of salt that can be prepared through this method.*

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

- (b) Berdasarkan Eksperimen II:

Based on Experiment II:

- (i) nyatakan nama bagi tindak balas penyediaan garam T.

state the name of the reaction for the preparation of salt T.

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

- (ii) nyatakan warna bagi garam T.

state the colour of salt T.

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

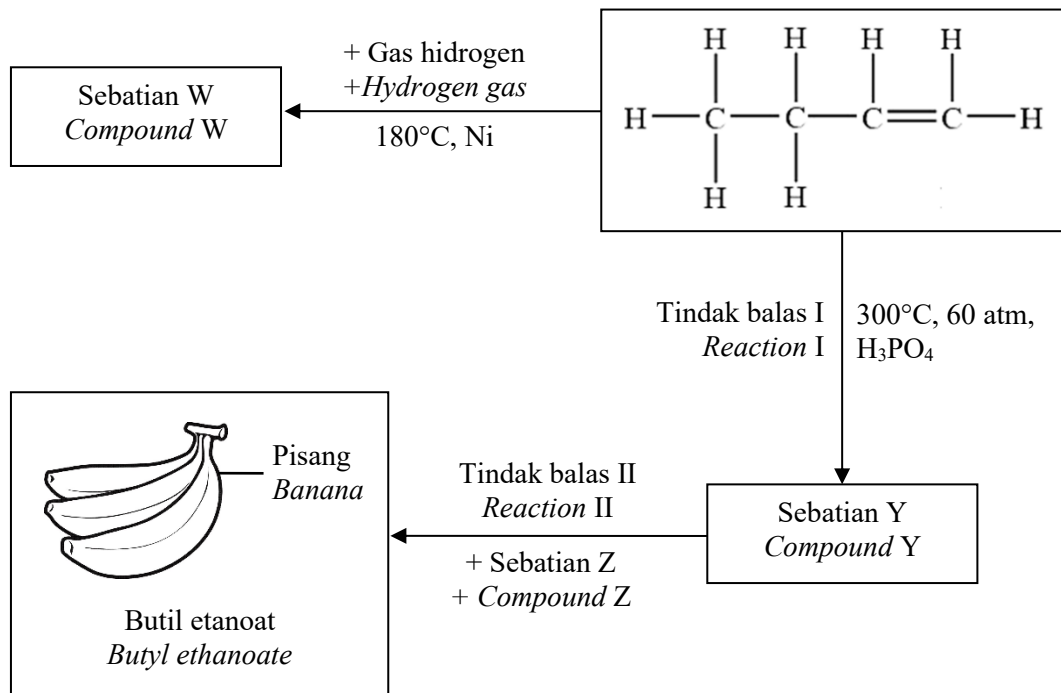
- (c) Huraikan secara ringkas ujian pengesahan anion bagi larutan S.

Describe briefly confirmatory test of anion of solution S.

.....
.....
.....
.....
[3 markah]
[3 marks]

7 Rajah 4.1 menunjukkan satu siri tindak balas yang berlaku ke atas butena.

Diagram 4.1 shows a series of reactions that occurred on butene.



Rajah 4.1
Diagram 4.1

Berdasarkan Rajah 4.1,

Based on Diagram 4.1,

(a) (i) nyatakan nama bagi tindak balas I.

state the name of reaction I.

.....
[1 markah]

[1 mark]

(ii) nyatakan kumpulan berfungsi bagi sebatian Y.

state the functional group for compound Y.

.....
[1 markah]

[1 mark]

- (iii) lukis formula struktur bagi **satu** isomer sebatian Y.
*draw structural formula of **one** of the isomers of compound Y.*

[1 markah]

[1 mark]

- (b) (i) Nyatakan sebatian Z.

State compound Z.

.....
[1 markah]

[1 mark]

- (ii) Tulis persamaan kimia untuk menghasilkan butil etanoat.

Write a chemical equation to produce butyl ethanoate.

.....
[2 markah]

[2 marks]

- (iii) Cadangkan produk dalam industri pembuatan makanan yang menggunakan butil etanoat.

Suggest a product in the food manufactured industry that used butyl ethanoate.

.....
[1 markah]

[1 mark]

- (c) (i) Nyatakan formula kimia bagi sebatian W.

State the chemical formula for compound W.

.....
[1 markah]

[1 mark]

- (ii) Rajah 4.2 menunjukkan permukaan periuk milik Puan Salma telah menjadi hitam selepas menggunakan bahan api yang tidak sesuai.

Diagram 4.2 shows that the surface of Mrs. Salma's pot has turned black after using unsuitable fuel.



Rajah 4.2
Diagram 4.2

Pada pandangan anda, antara butena dan sebatian W, yang manakah lebih sesuai dijadikan sebagai bahan api untuk memasak di rumah. Terangkan jawapan anda.

In your opinion, between butene and compound W, which is more suitable to be used as fuel for cooking at home? Explain your answer.

.....

.....

.....

[2 markah]

[2 marks]

- 8 Rajah 5.1 menunjukkan formula struktur bagi dua jenis polimer dan kegunaannya dalam kehidupan harian.

Diagram 5.1 shows the structural formula of two types of polymers and their uses in daily life.

Polimer <i>Polymer</i>	Formula struktur <i>Structural formula</i>	Kegunaan <i>Uses</i>
X	$\left[\begin{array}{cc} \text{H} & \text{H} \\ & \\ -\text{C} & -\text{C}- \\ & \\ \text{H} & \text{CH}_3 \end{array} \right]_n$	 Penyedut minuman Straw
Y	$\left[\begin{array}{cccc} \text{H} & & \text{H} & \\ & & & \\ -\text{C} & -\text{C} = & \text{C} & -\text{C}- \\ & & & \\ \text{H} & \text{CH}_3 & \text{H} & \text{H} \end{array} \right]_n$	 Sarung tangan Glove

Rajah 5.1
Diagram 5.1

- (a) Apakah yang dimaksudkan dengan polimer?

What is meant by polymer?

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

- (b) Lukis formula struktur bagi monomer yang membentuk polimer X.
Draw the structural formula of the monomer that forms polymer X.

[1 markah]
[1 mark]

- (c) Berdasarkan Rajah 5.1, polimer manakah lebih mesra alam?
Terangkan jawapan anda.
*Based on Diagram 5.1, which polymer is more environmentally friendly?
Explain your answer.*

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

[2 markah]
[2 marks]

- (d) Sarung tangan getah yang diperbuat daripada polimer Y didapati mudah terkoyak apabila disimpan terlalu lama.
Terangkan mengapakah perkara ini berlaku dan cadangkan **satu** cara untuk menambah baik penghasilan sarung tangan itu.
*Rubber gloves made from polymer Y are easily tear when stored for too long. Explain why this happens and suggest **one** way to improve the production of gloves.*

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

[2 markah]
[2 marks]



- (e) Kerajaan mengadakan pelbagai program kesedaran masyarakat terhadap pencemaran alam sekitar bagi mempercepatkan usaha ke arah penghasilan serta penggunaan Teknologi Hijau. Rajah 5.2 menunjukkan poster kempen pengurangan penggunaan penyedut minuman yang diperbuat daripada polimer X di sebuah restoran untuk menyambut baik usaha kerajaan.

The government organises various public awareness programs towards environmental pollution to accelerate efforts in producing and utilising Green Technology.

Diagram 5.2 shows a campaign poster for reducing the use of drinking straws made from polymer X in a restaurant in support of the government's initiative.



Rajah 5.2
Diagram 5.2

- (i) Sebagai seorang murid yang mempunyai pengetahuan tentang Teknologi Hijau, wajarkan tindakan pemilik restoran tersebut.

As a student with knowledge of Green Technology, justify the action of the restaurant owner.

.....

.....

.....

[3 markah]

[3 marks]

- (ii) Cadangkan **satu** jenis penyedut minuman yang mesra alam sebagai alternatif kepada penyedut minuman yang diperbuat daripada polimer X.

*Suggest **one** type of eco-friendly drinking straw as an alternative to drinking straws made from polymer X.*

.....

[1 markah]

[1 mark]

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Bahagian B

[20 markah]

Bahagian ini mengandungi **dua** soalan. Jawab **satu** soalan.

- 9 (a) Jadual 5 menunjukkan formula kimia bagi dua sebatian oksida vanadium.

Table 5 shows the chemical formulae for two oxides of vanadium compounds.

Sebatian Compound	Formula kimia Chemical formulae
P	VO
Q	V ₂ O ₅

Jadual 5

Table 5

Berdasarkan Jadual 5,

Based on Table 5,

- (i) nyatakan **dua** ciri istimewa bagi unsur vanadium.

state **two** special characteristics of vanadium element.

[2 markah]

[2 marks]

- (ii) nyatakan nama bagi kedua-dua sebatian tersebut berdasarkan sistem penama IUPAC. Terangkan jawapan anda.

state the name for both compounds based on the IUPAC nomenclature system. Explain your answers.

[4 markah]

[4 marks]

- (iii) Pepejal Q bertindak balas dengan gas hidrogen membentuk vanadium(III) oksida dan air.

Berdasarkan pernyataan tersebut,

- tuliskan persamaan kimia
- tentukan bahan yang dioksidakan
- tentukan bahan yang diturunkan

Solid Q reacts with hydrogen gas to form vanadium(III) oxide and water.

Based on the statement,

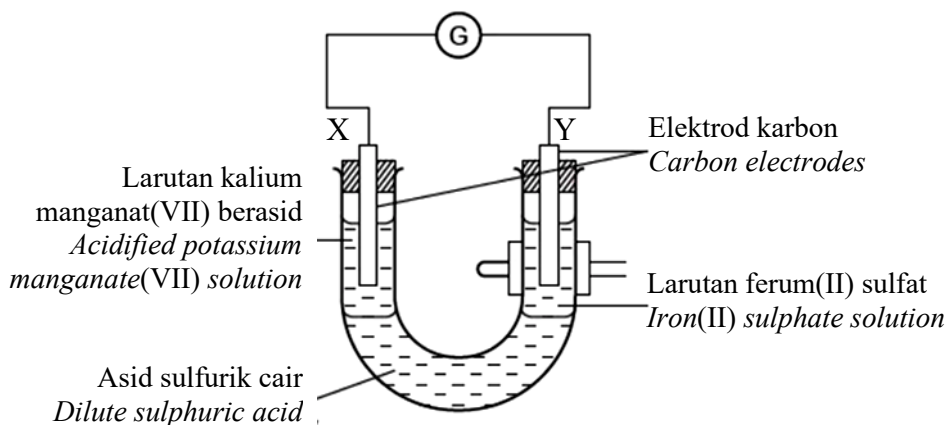
- write chemical equation
- determine substance that is oxidised
- determine substance that is reduced

[4 markah]

[4 marks]

- (b) Rajah 6 menunjukkan susunan radas bagi eksperimen untuk mengkaji pemindahan elektron pada suatu jarak bagi suatu tindak balas redoks.

Diagram 6 shows apparatus set-up of an experiment to investigate the transfer of electrons at a distance for a redox reaction.



Rajah 6
Diagram 6

Berdasarkan Rajah 6,

Based on Diagram 6,

- nyatakan maksud tindak balas redoks
state the meaning of redox reaction
- kenal pasti terminal positif dan terminal negatif
identify positive terminal dan negative terminal
- nyatakan arah pengaliran elektron
state the direction of electron flow
- nyatakan pemerhatian di terminal positif dan terminal negatif
state the observation at positive terminal and negative terminal
- tuliskan setengah persamaan bagi tindak balas di terminal positif dan terminal negatif
write half equation for the reaction at positive terminal and negative terminal
- huraikan secara ringkas ujian kimia untuk mengenal pasti kehadiran ion yang terhasil di terminal negatif.
describe briefly the chemical test to identify the presence of ions formed at the negative terminal.

[10 markah]

[10 marks]

[Lihat halaman sebelah

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Soalan 9

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- 10 (a) Hana menjalankan satu eksperimen untuk mengkaji kadar tindak balas antara kalsium karbonat berlebihan dan asid hidroklorik. Gas X yang terbebas dikumpulkan di dalam picagari gas dan isi padu gas X direkod dalam Jadual 6.1 pada selang masa 1 minit selama 6 minit.

Hana conducted an experiment to study the rate of reaction between excess calcium carbonate and hydrochloric acid. Gas X liberated was collected in a gas syringe and the volume of gas X was recorded in Table 6.1 at 1 minute interval for 6 minutes.

Masa (min) Time (min)	0.0	1.0	2.0	3.0	4.0	5.0	6.0
Isi padu gas X (cm³) Volume of gas X (cm³)	0.0	25.0	40.0	51.0	59.0	65.0	65.0

Jadual 6.1
Table 6.1

- (i) Nyatakan maksud kadar tindak balas.
State the meaning of rate of reaction.
[1 markah]
[1 mark]
- (ii) Nyatakan nama gas X yang terbentuk dalam eksperimen ini.
State the name of gas X formed in this experiment.
[1 markah]
[1 mark]
- (iii) Berdasarkan Jadual 6.1, lukis graf isi padu gas melawan masa pada kertas graf di halaman **28** dan hitung:
- kadar tindak balas purata keseluruhan tindak balas
 - kadar tindak balas pada minit kedua.
- Based on Table 6.1, draw a graph of the volume of gas against time on the graph paper on page **28** and calculate:*
- *the average rate of reaction for the overall reaction*
 - *the rate of reaction at the second minute.*
- [8 markah]
[8 marks]

- (b) Jadual 6.2 menunjukkan maklumat bagi tiga set eksperimen untuk menyiasat faktor-faktor yang mempengaruhi kadar tindak balas antara kalsium karbonat, CaCO_3 dan dua jenis asid yang berlainan.

Table 6.2 shows information for three sets of experiments to investigate the factors that affect the rate of reaction between calcium carbonate, CaCO_3 and two different types of acid.

Set	Bahan tidak balas <i>Reactants</i>	Masa yang diambil untuk mengumpul 70 cm ³ gas (min) <i>Time taken to collect 70 cm³ gas (min)</i>
I	Serbuk kalsium karbonat berlebihan + 25 cm ³ asid hidroklorik 0.5 mol dm ⁻³ <i>Excess calcium carbonate powder + 25 cm³ of 0.5 mol dm⁻³ hydrochloric acid</i>	7.0
II	Ketulan kalsium karbonat berlebihan + 25 cm ³ asid hidroklorik 0.5 mol dm ⁻³ <i>Excess calcium carbonate chips + 25 cm³ of 0.5 mol dm⁻³ hydrochloric acid</i>	12.0
III	Serbuk kalsium karbonat berlebihan + 25 cm ³ asid etanoik 0.5 mol dm ⁻³ <i>Excess calcium carbonate powder + 25 cm³ of 0.5 mol dm⁻³ ethanoic acid</i>	14.0

Jadual 6.2

Table 6.2

Dengan menggunakan Teori Pelanggaran, bandingkan kadar tindak balas antara:

Using the Collision Theory, compare the rate of reaction between:

- (i) Set I dan Set II

Set I and Set II

- (ii) Set I dan Set III

Set I and Set III

[10 markah]

[10 marks]

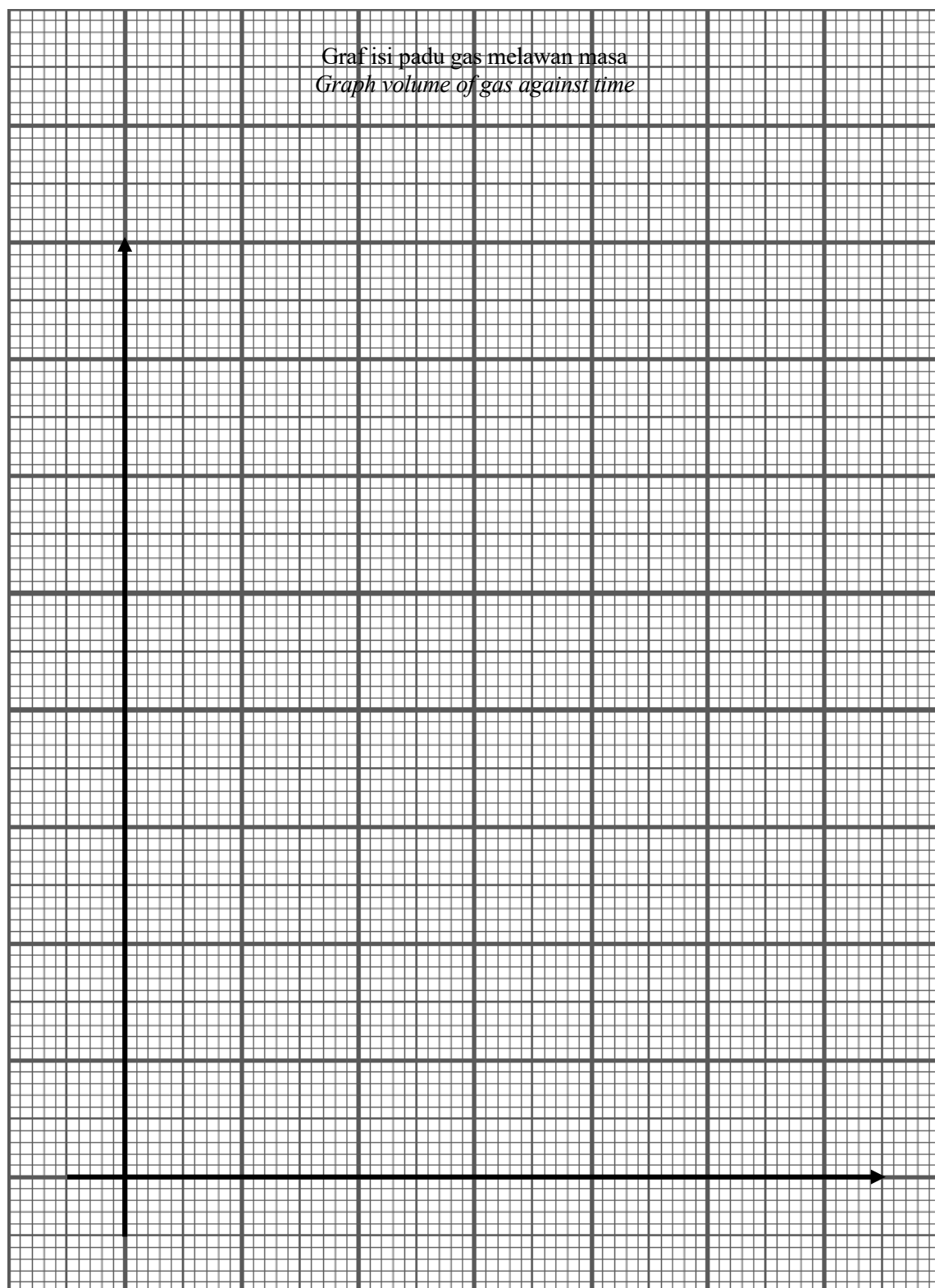
Soalan 10

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Soalan 10



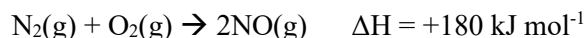
Bahagian C

[20 markah]

Soalan ini mesti dijawab.

- 11 (a) Tindak balas antara gas nitrogen dan gas oksigen yang ditunjukkan dalam persamaan termokimia berikut merupakan tindak balas endotermik.

The reaction between nitrogen gas and oxygen gas shown in the following thermochemical equation is endothermic reaction.



Apakah yang dimaksudkan dengan tindak balas endotermik?

What is meant by endothermic reaction?

[1 markah]

[1 mark]

- (b) Rajah 7.1 menunjukkan satu senarai tindak balas kimia.

Diagram 7.1 shows a list of chemical reactions.

- Melarutkan ammonium sulfat dalam air
Dissolve ammonium sulphate into water
- Melarutkan natrium hidroksida dalam air
Dissolve sodium hydroxide into water
- Tindak balas antara natrium karbonat dengan asid hidroklorik
Reaction between sodium carbonate with hydrochloric acid
- Tindak balas antara natrium hidrogen karbonat dengan asid hidroklorik
Reaction between sodium hydrogen carbonate with hydrochloric acid

Rajah 7.1

Diagram 7.1

Kelaskan **semua** tindak balas kimia dalam Rajah 7.1 kepada tindak balas endotermik dan tindak balas eksotermik.

*Classify **all** the chemical reactions in Diagram 7.1 to endothermic reaction and exothermic reaction.*

[2 markah]

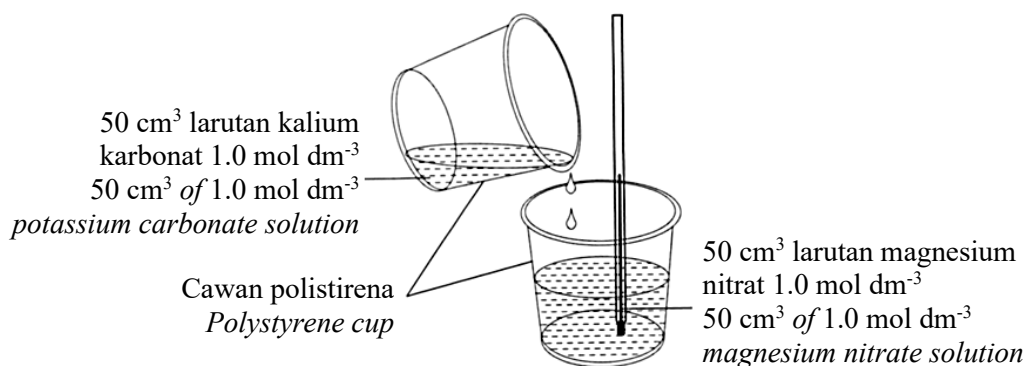
[2 marks]

[Lihat halaman sebelah

SULIT

- (c) Rajah 7.2 menunjukkan susunan radas untuk menentukan haba pemendakan bagi magnesium karbonat.

Diagram 7.2 shows apparatus set-up to determine heat of precipitation of magnesium carbonate.



Rajah 7.2
Diagram 7.2

Jadual 7 menunjukkan keputusan yang diperoleh daripada eksperimen di atas.

Table 7 shows results obtained from the above experiment.

Penerangan <i>Explanation</i>	Suhu (°C) <i>Temperature (°C)</i>
Suhu awal larutan magnesium nitrat <i>Initial temperature of magnesium nitrate solution</i>	29.0
Suhu awal larutan kalium karbonat <i>Initial temperature of potassium carbonate solution</i>	30.0
Suhu terendah campuran <i>Lowest temperature of mixture</i>	27.0

Jadual 7
Table 7

Berdasarkan Rajah 7.2,

Based on Diagram 7.2,

- (i) tuliskan persamaan ion yang terlibat.
write the ionic equation involved.

[2 markah]
[2 marks]

- (ii) hitung perubahan haba dalam tindak balas itu.
calculate heat change of the reaction.
[Muatan haba tentu bagi larutan, $c = 4.2 \text{ J g}^{-1} \text{ }^{\circ}\text{C}^{-1}$;
Ketumpatan larutan = 1 g cm^{-3}]
[Specific heat capacity, $c = 4.2 \text{ J g}^{-1} \text{ }^{\circ}\text{C}^{-1}$;
Density of solution = 1 g cm^{-3}]
[2 markah]
[2 marks]
- (iii) hitung haba pemendakan bagi magnesium karbonat.
calculate heat of precipitation of magnesium carbonate.
[3 markah]
[3 marks]
- (d) Eksperimen itu diulangi dengan menggunakan 50 cm^3 larutan natrium karbonat 1.0 mol dm^{-3} bagi menggantikan larutan kalium karbonat. Ramalkan haba pemendakan yang akan diperoleh. Terangkan jawapan anda.
The experiment is repeated by using 50 cm^3 of 1.0 mol dm^{-3} sodium carbonate solution to replace potassium carbonate solution. Predict the heat of precipitation will be obtained. Explain your answer.
[3 markah]
[3 marks]
- (e) Kaki Aqif terseliuh apabila dia menuruni tangga di rumahnya. Aqif teringat bahawa dia pernah belajar tentang penggunaan pek sejuk untuk meredakan sakit kakinya yang bengkak. Cadangkan **dua** bahan yang boleh didapati di rumah untuk menghasilkan pek sejuk. Huraikan kaedah untuk menghasilkan pek sejuk dengan bahan yang dicadangkan.
*Aqif's leg was sprained when he walked down the staircase at home. Aqif remembered that he learned about using cold pack to ease the pain of his swollen leg. Suggest **two** materials which can be obtained at home to make cold pack. Describe the method to produce cold pack by using the suggested materials.*
[7 markah]
[7 marks]

Soalan 11

This image shows a full page of white paper with horizontal dotted lines. The lines are evenly spaced and run across the width of the page, providing a guide for handwriting practice. There are no margins, text, or other markings on the page.

This image shows a full page of white paper with horizontal dotted lines. The lines are evenly spaced and run across the width of the page, providing a guide for handwriting practice. There are no margins, text, or other markings on the page.

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KERTAS PEPERIKSAAN TAMAT

JADUAL BERKALA UNSUR

1 H Hidrogen 1		10 Ne Neon 20 Nombor proton Simbol Nama unsur Jisim atom relatif																2 He Helium 4																																																																		
3 Li Litium 7	4 Be Berilium 9																	10 Ne Neon 20																																																																		
11 Na Natrium 23	12 Mg Magnesium 24																	18 Ar Argon 40																																																																		
19 K Kalium 39	20 Ca Kalsium 40	21 Sc Skandium 45	22 Ti Titanium 48	23 V Vanadium 51	24 Cr Kromium 52	25 Mn Mangan 55	26 Fe Ferum 56	27 Co Kobalt 59	28 Ni Nikel 59	29 Cu Kuprum 64	30 Zn Zink 65	31 Ga Germanium 70	32 Ge Germanium 73	33 As Arsenik 75	34 Se Selenium 79	35 Br Bromin 80	36 Kr Krypton 84	37 Rb Rubidium 86	38 Sr Strontium 88	39 Y Itrium 89	40 Zr Zirkonium 91	41 Nb Niobium 93	42 Mo Molibdenum 96	43 Tc Teknetium 98	44 Ru Rutenium 101	45 Rh Rodium 103	46 Pd Paladium 106	47 Ag Argentum 108	48 Cd Kadmium 112	49 In Indium 115	50 Sn Stannum 119	51 Sb Antimoni 122	52 Te Telurium 128	53 I Iodin 127	54 Xe Xenon 131	55 Cs Sesium 133	56 Ba Barium 137	57 La Lantanum 139	58 Ce Serium 140	59 Pr Praseodimium 141	60 Nd Neodimium 144	61 Pm Prometium 147	62 Sm Samarium 150	63 Eu Europium 152	64 Gd Gadolinium 157	65 Tb Terbium 159	66 Dy Disprosium 163	67 Ho Holmium 165	68 Er Erbium 167	69 Tm Tulium 169	70 Yb Itorbium 173	71 Lu Lutetium 175	72 Hf Hafnium 178	73 Ta Tantalum 181	74 W Tungsten 184	75 Re Renium 186	76 Os Osmium 190	77 Ir Iridium 192	78 Pt Platinum 195	79 Au Aurum 197	80 Hg Merkuri 201	81 Tl Tallium 204	82 Pb Plumbum 207	83 Bi Bismut 209	84 Po Polonium 210	85 At Astatin 210	86 Rn Radon 222	87 Fr Francium 223	88 Ra Radium 226	89 Ac Aktinium 227	90 Th Torium 232	91 Pa Protaktinium 231	92 U Uranium 238	93 Np Neptunium 237	94 Pu Plutonium 244	95 Am Amerisium 243	96 Cm Kurium 247	97 Bk Berkelium 247	98 Cf Kalifornium 249	99 Es Einsteinium 254	100 Fm Fermium 253	101 Md Mendelevium 256	102 No Nobelium 254	103 Lr Lawrensium 257

THE PERIODIC TABLE OF ELEMENTS

1 H Hydrogen 1		10 Ne Neon 20 Proton number Symbol Name of element Relative atomic mass																2 He Helium 4									
3 Li Lithium 7	4 Be Beryllium 9																	10 Ne Neon 20									
11 Na Sodium 23	12 Mg Magnesium 24																	18 Ar Argon 40									
19 K Potassium 39	20 Ca Calcium 40	21 Sc Scandium 45	22 Ti Titanium 48	23 V Vanadium 51	24 Cr Chromium 52	25 Mn Manganese 55	26 Fe Iron 56	27 Co Cobalt 59	28 Ni Nickel 59	29 Cu Copper 64	30 Zn Zinc 65	31 Ga Gallium 70	32 Ge Germanium 73	33 As Arsenic 75	34 Se Selenium 79	35 Br Bromine 80	36 Kr Krypton 84	5 B Boron 11	13 Al Aluminium 27	14 Si Silicon 28	15 P Phosphorus 31	16 S Sulfur 32	17 Cl Chlorine 35	18 Ar Argon 40			
37 Rb Rubidium 86	38 Sr Strontium 88	39 Y Yttrium 89	40 Zr Zirconium 91	41 Nb Niobium 93	42 Mo Molybdenum 96	43 Tc Technetium 98	44 Ru Ruthenium 101	45 Rh Rhodium 103	46 Pd Palladium 106	47 Ag Silver 108	48 Cd Cadmium 112	49 In Indium 115	50 Sn Tin 119	51 Sb Antimony 122	52 Te Tellurium 128	53 I Iodine 127	54 Xe Xenon 131	6 C Carbon 12	7 N Nitrogen 14	8 O Oxygen 16	9 F Flourine 19	10 Ne Neon 20					
55 Cs Cesium 133	56 Ba Barium 137	57 La Lanthanum 139	72 Hf Hafnium 179	73 Ta Tantalum 181	74 W Tungsten 184	75 Re Rhenium 186	76 Os Osmium 190	77 Ir Iridium 192	78 Pt Platinum 195	79 Au Gold 197	80 Hg Mercury 201	81 Tl Thallium 204	82 Pb Lead 207	83 Bi Bismuth 209	84 Po Polonium 210	85 At Astatine 210	86 Rn Radon 222	87 Fr Francium 223	88 Ra Radium 226	89 Ac Actinium 227	104 Rf Rutherfordium 257	105 Db Dubnium 260	106 Sg Seaborgium 263	107 Bh Bohrrium 262	108 Hs Hassium 265	109 Mt Meitnerium 266	110 Ds Darmstadtium 281
58 Ce Cerium 140	59 Pr Praseo- dymium 141	60 Nd Neodymium 144	61 Pm Promethium 147	62 Sm Samarium 150	63 Eu Europium 152	64 Gd Gadolinium 157	65 Tb Terbium 159	66 Dy Dysprosium 163	67 Ho Holmium 165	68 Er Erbium 167	69 Tm Thulium 169	70 Yb Ytterbium 173	71 Lu Lutetium 175	90 Th Thorium 232	91 Pa Proactinium 231	92 U Uranium 238	93 Np Nepunium 237	94 Pu Plutonium 244	95 Am Americium 243	96 Cm Curium 247	97 Bk Berkelium 247	98 Cf Californium 249	99 Es Einsteinium 254	100 Fm Fermium 253	101 Md Mendelivium 256	102 No Nobelium 254	103 Lr Lawrensium 257