

SULIT

4541/2

KIMIA

KERTAS 2

2 JAM 30 MINIT

NAMA:

TINGKATAN:



MAJLIS PENGETUA SEKOLAH MALAYSIA (MPSM)
NEGERI PERAK

MODUL KECEMERLANGAN SPM 2023

SET 1

KIMIA

KERTAS 2

2 JAM 30 MINIT

JANGAN BUKA KERTAS PEPERIKSAAN INI SEHINGGA DIBERITAHU

ARAHAN:

1. Kertas soalan ini mengandungi tiga bahagian: **Bahagian A**, **Bahagian B** dan **Bahagian C**.
2. Jawab semua soalan daripada **Bahagian A**, pilih satu soalan daripada **Bahagian B** dan jawab semua soalan daripada **Bahagian C**.
3. Jawapan hendaklah ditulis dalam kertas jawapan yang disediakan.
4. Markah yang diperuntukkan bagi setiap soalan atau ceraihan soalan ditunjukkan dalam kurungan.
5. Penggunaan kalkulator saintifik yang tidak boleh diprogramkan adalah dibenarkan.

<i>Untuk Kegunaan Pemeriksa</i>			
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 ini mengandungi 29 halaman bercetak.

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[Lihat halaman sebelah
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Bahagian A
Section A

[60 markah]

[60 marks]

Jawab **semua** soalan dalam bahagian ini.*Answer all questions in this section.*

- 1 Rajah 1 menunjukkan simbol kimia yang mewakili empat unsur W, X, Y dan Z.

Diagram 1 shows the chemical symbols which represent four elements W, X, Y and Z.

7 3 W	12 6 X	14 6 Y	40 18 Z
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Rajah 1
Diagram 1

- (a) (i) Nyatakan maksud nombor nukleon.

State the meaning of nucleon number.

.....
.....

[1 markah / mark]

- (ii) Nyatakan nombor proton atom X.

State the proton number of atom X.

.....
.....

[1 markah / mark]

- (b) Berdasarkan Rajah 1,
Based on Diagram 1,

- (i) Dua unsur yang manakah ialah isotop?

Which two elements are isotopes?

.....
.....

[1 markah / mark]

- (ii) Terangkan mengapa isotop yang dinyatakan di (b)(i) mempunyai sifat kimia yang sama?

Explain why isotopes mentioned in (b)(i) have the same chemical properties?

.....

.....

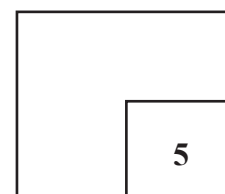
[1 markah / mark]

- (iii) Berikan satu kegunaan isotop yang dinyatakan di (b)(i).

Give one use of the isotope mentioned in (b)(i).

.....

[1 markah / mark]



- 2 (a) Rajah 2 menunjukkan satu pingat dan komposisinya.
Diagram 2 shows a medal and its compositions.



90% kuprum, 5% unsur Q
90% *copper*, 5% *element Q*

Rajah 2
Diagram 2

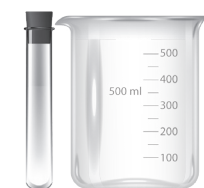
- (i) Apakah maksud aloi?
What is the meaning of alloy?

.....
[1 markah / *mark*]

- (ii) Nyatakan unsur Q.
State element Q.

.....
[1 markah / *mark*]

- (b) Rajah 3 menunjukkan radas makmal yang diperbuat daripada sejenis kaca.
Diagram 3 shows laboratory apparatus made from a type of glass.



Rajah 3
Diagram 3

- (i) Nyatakan jenis kaca yang digunakan dalam penghasilan radas makmal ini.
State the type of glass used in making the laboratory apparatus.

.....
[1 markah / mark]

- (ii) Nyatakan satu sifat jenis kaca yang dinyatakan di 2(b)(i).
State one property of the type of glass mentioned in 2(b)(i).

.....
[1 markah / mark]

- (c) Rajah 4 menunjukkan sebuah pasu porselin.
Diagram 4 shows a porcelain vase.



Rajah 4
Diagram 4

- Nyatakan komponen utama yang digunakan untuk menghasilkan pasu porselin itu.
State the main component used in making the porcelain vase.

.....
[1 markah / mark]



- 3 Jadual 1 menunjukkan unsur-unsur dalam Kala 3 dalam Jadual Berkala Unsur. P, Q, R, S, T, U, V dan W tidak mewakili simbol sebenar unsur berkenaan.

Table 1 shows the element in the Period 3 of Periodic Table of Elements. P, Q, R, S, T, U, V and W do not represent the actual symbol of the elements.

Unsur Element	P	Q	R	S	T	U	V	W
Nombor proton Proton number	11	12	13	14	15	16	17	18

Jadual 1

Table 1

- (a) Apakah yang dimaksudkan dengan kala?

What is meant by period?

.....
[1 markah / mark]

- (b) Unsur W merupakan gas monoatom. Terangkan.

Element W is a monoatomic gas. Explain.

.....
[1 markah / mark]

- (c) 0.2 mol unsur P bertindak balas lengkap dengan gas oksigen yang berlebihan membentuk oksida logam P.

0.2 mol of element P reacts completely with excess oxygen gas forming oxide of metal P.

- (i) Tuliskan persamaan kimia seimbang bagi tindak balas itu.

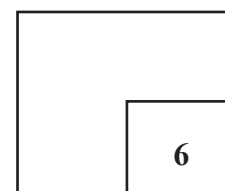
Write a balanced chemical equation for the reaction.

.....
[2 markah / marks]

- (ii) Hitung jisim maksimum oksida logam P yang terbentuk.

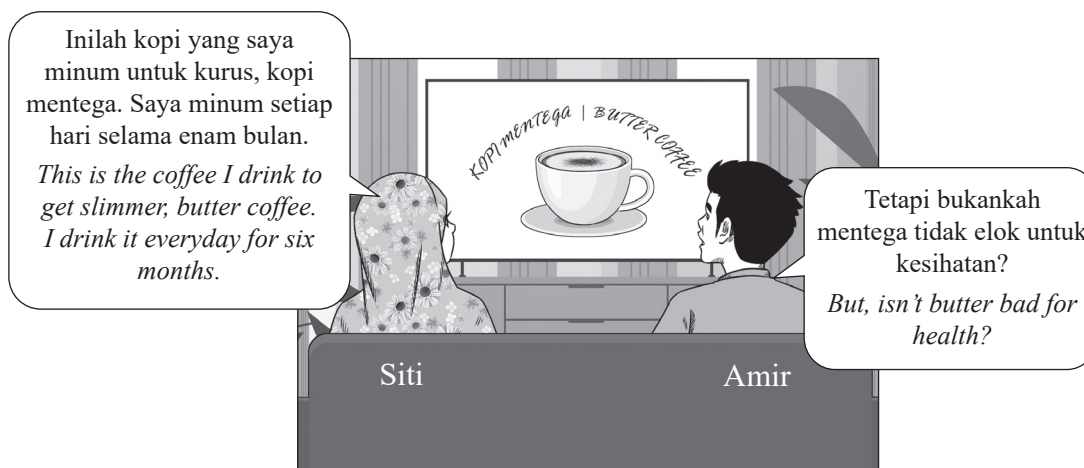
Calculate the maximum mass of oxide of metal P formed.

[2 markah / marks]



- 4 (a) Rajah 5 menunjukkan perbualan antara Siti dengan Amir semasa membaca satu iklan dalam media sosial.

Diagram 5 shows a conversation between Siti and Amir while reading an advertisement in social media.



Rajah 5
 Diagram 5

- (i) Mentega ialah satu contoh lemak. Nyatakan siri homolog bagi lemak.
Butter is an example of fats. State the homologous series of fats.

.....
 [1 markah / mark]

- (ii) Bandingkan kandungan asid lemak tepu dan tak tepu dalam lemak dan minyak.
Compare the content of saturated fatty acids and unsaturated fatty acids in fats and oils.

.....

 [2 markah / marks]

- (iii) Apakah nasihat yang boleh diberikan oleh Amir kepada Siti berkaitan dengan dietnya, iaitu meminum kopi mentega pada setiap hari?

What advice can Amir give to Siti regarding her diet, drinking butter coffee every day?

.....
.....

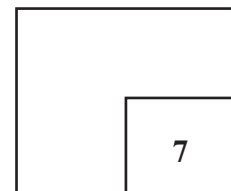
[2 markah / marks]

- (b) Ali ialah seorang penghidap kencing manis. Apakah pemanis yang boleh digunakan oleh Ali dalam minumannya? Terangkan.

Ali is a diabetes patient. What sweetener can Ali use in his drink? Explain.

.....
.....

[2 markah / marks]



- 5 (a) Seorang murid menjalankan eksperimen untuk membina persamaan ion bagi pembentukan mendakan plumbum(II) iodida dengan menggunakan kaedah X.

Jadual 2 menunjukkan ketinggian mendakan yang terbentuk di dalam setiap tabung uji.

A student carries out an experiment to construct ionic equation for the formation of lead(II) iodide by using method X.

Table 2 shows the height of precipitate formed in each test tubes.

Tabung uji <i>Test tube</i>	1	2	3	4	5	6	7
Isi padu larutan plumbum(II) nitrat 0.5 mol dm^{-3} (cm^3) <i>Volume of 0.5 mol dm^{-3} lead(II) nitrate solution (cm^3)</i>	5.00	5.00	5.00	5.00	5.00	5.00	5.00
Isi padu larutan kalium iodida 1.0 mol dm^{-3} (cm^3) <i>Volume of 1.0 mol dm^{-3} potassium iodide solution (cm^3)</i>	1.00	2.00	3.00	4.00	5.00	6.00	7.00
Tinggi mendakan (cm) <i>Height of precipitate (cm)</i>	1.1	2.2	3.3	4.4	5.5	5.5	5.5

Jadual 2
Table 2

- (i) Nyatakan nama kaedah X.
State the name of method X.

.....
[1 markah / mark]

- (ii) Berdasarkan Jadual 2, tentukan isi padu larutan kalium iodida yang bertindak balas lengkap dengan 5 cm^3 larutan plumbum(II) nitrat.
Based on Table 2, determine the volume of potassium iodide solution that completely reacts with 5 cm^3 lead(II) nitrate solution.

.....
[1 markah / mark]

- (iii) Hitung bilangan mol ion iodida yang bertindak balas dengan 1 mol ion plumbum(II).
Calculate the number of mole of iodide ion that reacts with 1 mole of lead(II) ion.

[3 markah / marks]

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- (iv) Berdasarkan jawapan di 5(a)(iii), bina persamaan ion bagi pembentukan plumbum(II) iodida.

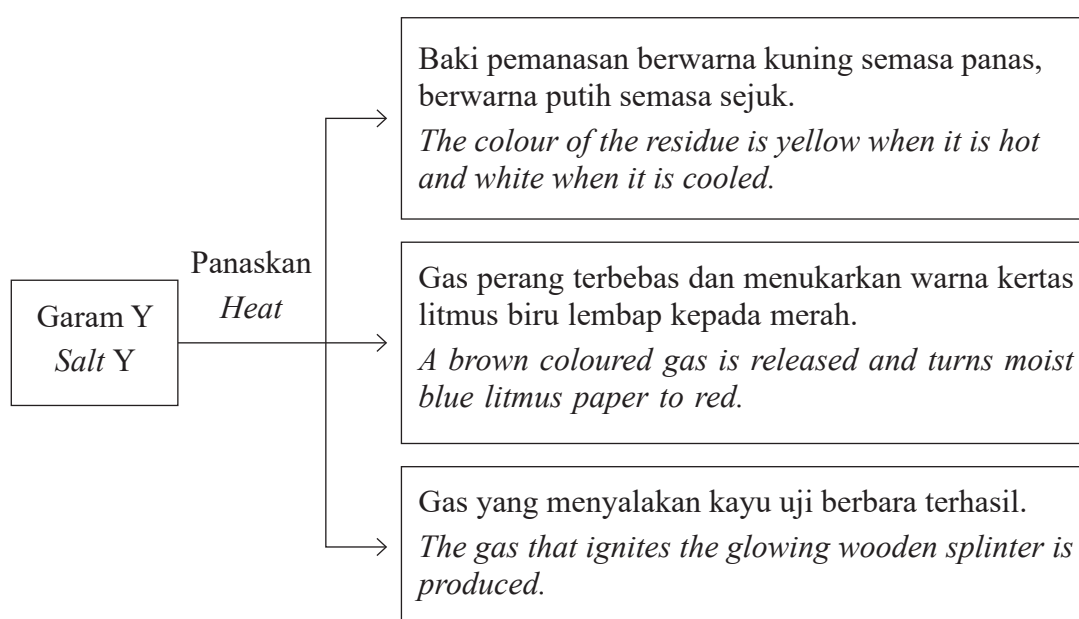
Based on the answer in 5(a)(iii), construct an ionic equation for the formation of lead(II) iodide.

[1 markah / mark]

- (b) Daniel menjalankan satu eksperimen untuk mengkaji kesan haba ke atas garam Y. Rajah 6 menunjukkan pemerhatian bagi eksperimen ini.

Daniel conducted an experiment to study the effect of heat on salt Y.

Diagram 6 shows the observations for this experiment.



Rajah 6

Diagram 6

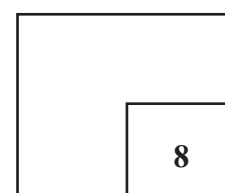
Tulis formula bagi kation dan anion dalam garam Y.

Write the formula of the cation and anion in salt Y.

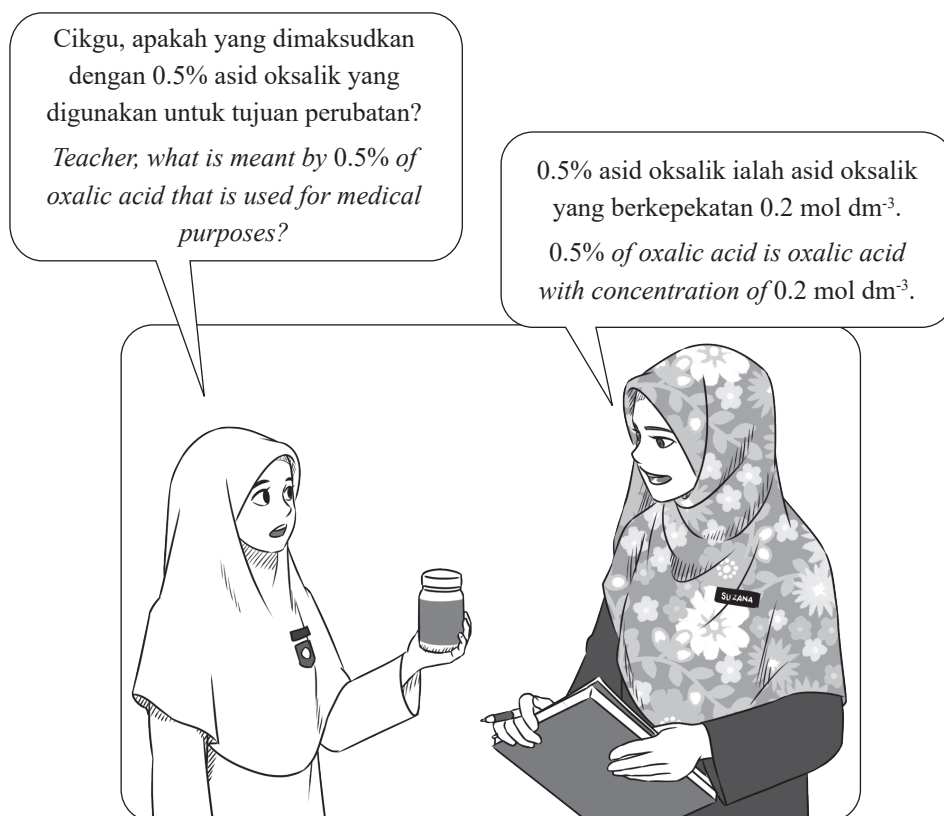
Kation :
Cation :

Anion :
Anion :

[2 markah / marks]



- 6 Rajah 7 menunjukkan perbualan antara Puan Suzana, seorang guru kimia dengan muridnya. Diagram 7 shows the conversation between Puan Suzana, a chemistry teacher and her student.



Rajah 7
Diagram 7

- (a) (i) Apakah istilah yang diberikan kepada larutan yang kepekannya diketahui dengan tepat?

What is the term given to a solution at which its concentration is precisely known?

.....
[1 markah / mark]

- (ii) Asid oksalik boleh bertindak balas dengan ketulan marmar untuk menghasilkan sejenis gas tidak berwarna. Namakan gas tersebut.

Oxalic acid can react with marble chips to produce a colourless gas. Name the gas produced.

.....
[1 markah / mark]

- (iii) Sarah ingin menyediakan 250 cm^3 asid oksalik 0.1 mol dm^{-3} daripada 0.5% asid oksalik.

Hitung isi padu asid oksalik 0.5% yang diperlukan untuk menyediakan larutan yang diinginkan.

Sarah wants to prepare 250 cm^3 0.1 mol dm^{-3} oxalic acid from the 0.5% oxalic acid.

Calculate the volume of 0.5% oxalic acid needed to prepare the required solution.

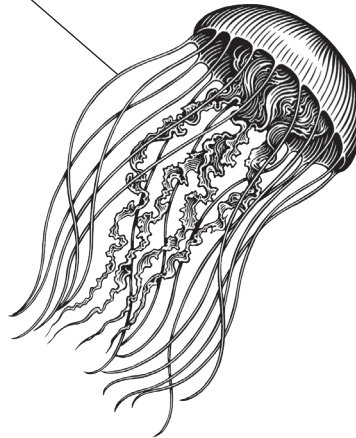
[2 markah / marks]

- (b) Rajah 8 menunjukkan seekor obor-obor.

Diagram 8 shows a jellyfish.

Sesungut yang mempunyai sengatan bersifat alkali

The stinging tentacles are alkaline



Rajah 8
Diagram 8

Kaki Raju telah disengat oleh obor-obor. Cadangkan satu bahan yang boleh disapu pada kakinya untuk mengurangkan rasa sakit tanpa menyebabkan kecederaan seterusnya. Nyatakan sebab bagi cadangan anda.

Raju's leg is stung by a jellyfish. Suggest one substance that can be applied to the skin to relieve the pain without causing further injury. Give a reason for your suggestion.

.....

.....

.....

[2 markah / marks]

- (c) Jadual 3 menunjukkan nilai pH bagi dua jenis asid yang mempunyai kepekatan yang sama.

Table 3 shows pH values for two acids that have the same concentration.

Asid <i>Acid</i>	Formula kimia <i>Chemical formula</i>	Nilai pH <i>pH value</i>
P	HX	4.0
Q	HZ	2.0

Jadual 3

Table 3

Terangkan perbezaan nilai pH asid.

Explain the difference in pH values of acids.

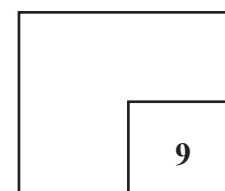
.....

.....

.....

.....

[3 markah / marks]



- 7 (a) Getah asli telah memberikan sumbangan besar kepada pembangunan negara kita. Pelbagai barangan telah dihasilkan daripada getah asli. Rajah 9 menunjukkan beberapa barangan yang dihasilkan daripadanya.

Natural rubber has greatly contributed to the development of our country. Various goods have been produced from it. Diagram 9 shows some of the products produced from it.



Rajah 9
Diagram 9

- (i) Namakan polimer bagi getah asli.
Name the polymer of natural rubber.

.....
[1 markah / mark]

- (ii) Pempolimeran ialah proses untuk menghasilkan polimer.
Cadangkan jenis pempolimeran untuk menghasilkan getah.
*Polymerisation is the process to produce polymer.
Suggest the type of polymerisation to produce rubber.*

.....
[1 markah / mark]

- (iii) Getah asli sangat lembut dan tidak tahan haba.
Jelaskan bagaimana anda dapat memperbaiki sifat getah asli agar dapat menghasilkan barangan seperti dalam Rajah 9 yang bermutu dan tahan lama.

Natural rubber is very soft and not resistant to heat.

Explain how you can enhance the properties of natural rubber to produce the goods in Diagram 9 that have better quality and durability.

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

- (b) Getah sintetik ialah polimer buatan manusia yang disintesis daripada petroleum dan mineral lain.

Synthetic rubber is a man-made polymer synthesised from petroleum and other minerals.

- (i) Getah stirena-butadiena, SBR ialah salah satu contoh getah sintetik. Selain getah tervulkan, SBR juga digunakan untuk membuat tayar kereta. Ramai berpendapat bahawa tayar daripada SBR adalah lebih baik berbanding dengan getah tervulkan.

Pada pendapat anda, mengapakah tayar SBR dikatakan lebih baik?

Styrene-butadiene rubber, SBR is one example of synthetic rubbers. Other than vulcanised rubber, SBR is also used to make car tyres. Many people think that SBR tyres are better than vulcanised rubber.

Why do you think SBR tyres are said to be better?

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

[2 markah / marks]

- (ii) Getah asli dan getah sintetik digunakan secara meluas dalam kehidupan harian. Walau bagaimanapun, penggunaan getah tersebut boleh memberi kesan buruk terhadap alam sekitar.

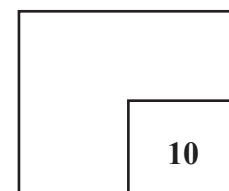
Wajarkan kenyataan tersebut.

Natural and synthetic rubber are widely used in daily life. However, the use of rubber might be harmful to the environment.

Justify the statement.

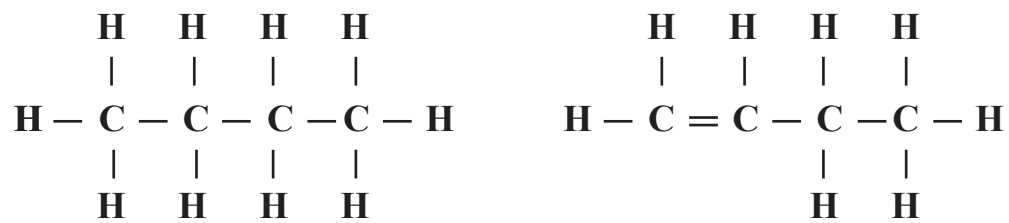
.....
.....
.....

[3 markah / marks]



- 8 (a) Rajah 10 menunjukkan formula struktur bagi dua hidrokarbon.

Diagram 10 shows the structural formulae of two hydrocarbons.



Sebatian X
Compound X

Sebatian Y
Compound Y

Rajah 10
Diagram 10

- (i) Nyatakan maksud isomer.
State the meaning of isomer.

.....
[1 markah / mark]

- (ii) Nyatakan nama sebatian X dan sebatian Y dengan menggunakan penamaan IUPAC.
State the names of compound X and compound Y by using IUPAC nomenclature.

Sebatian X
Compound X :

Sebatian Y
Compound Y :

[2 markah / marks]

- (iii) Lukis formula struktur untuk satu lagi isomer sebatian X.
Draw the structural formula for another isomer of compound X.

[1 markah / mark]

- (b) (i) Hidrokarbon X dan Y menghasilkan jelaga apabila terbakar.
Bandingkan kejelagaan nyalaan semasa pembakaran hidrokarbon X dan Y dalam keadaan gas oksigen berlebihan.

Hydrocarbon X and Y produce soot when burnt.

Compare the sootiness of the flame during combustion of hydrocarbon X and Y in excess of oxygen gas.

.....

.....

[1 markah / mark]

- (ii) Terangkan mengapa terdapat perbezaan kejelagaan hidrokarbon X dan Y?

[Jisim atom relatif: C = 12, H = 1]

Explain why there is a difference in the sootiness of the flame of hydrocarbon X dan hydrocarbon Y?

[Relative atomic mass: C = 12, H = 1]

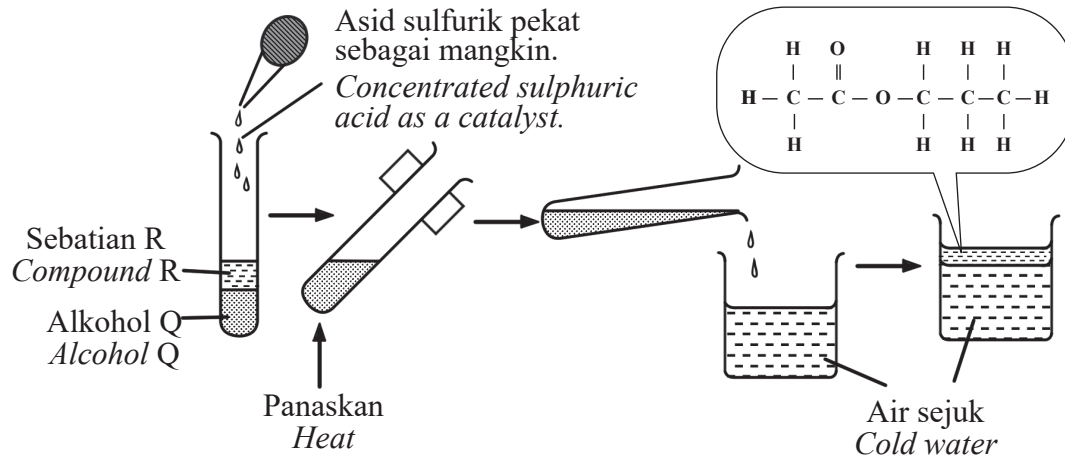
.....

.....

[2 markah / marks]

- (c) Pengusaha sebuah kilang gula-gula ingin mengeluarkan gula-gula berperisa pir. Seorang ahli kimia di kilang tersebut diarahkan untuk menyediakan satu sampel ester dengan perisa pir melalui tindak balas pengesteran antara alkohol Q dengan sebatian R. Rajah 11 menunjukkan langkah penyediaan sampel ester tersebut di dalam makmal.

The owner of a candy factory wants to manufacture pear-flavoured candies. A chemist in the factory is instructed to prepare a sample of ester with pear flavour through the esterification reaction between alcohol Q dan compound R. Diagram 11 shows the steps of preparation for the sample of the ester in the laboratory.



Rajah 11
Diagram 11

Berdasarkan Rajah 11,
Based on the Diagram 11,

- (i) Tulis satu persamaan kimia bagi tindak balas pengesteran antara alkohol Q dengan sebatian R.

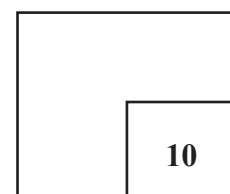
Write a chemical equation for the esterification reaction between alcohol Q and compound R.

.....
[1 markah / mark]

- (ii) Wajarkan penggunaan ester dalam gula-gula dan berikan **satu** sebab.

*Justify the usage of ester in candy and give **one** reason.*

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



Bahagian B
Section B

[20 markah]

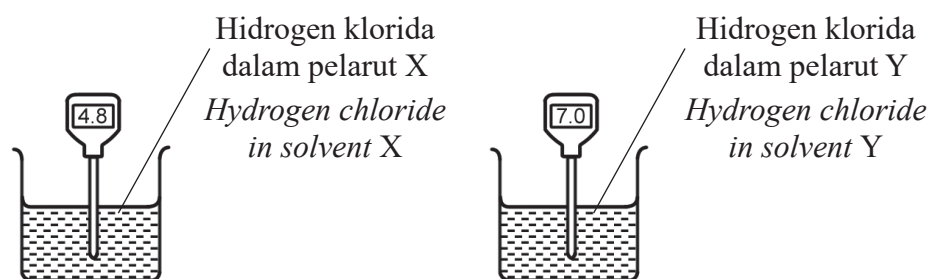
[20 marks]

Jawab mana-mana **satu** soalan.

*Answer any **one** questions.*

- 9 (a) Rajah 12 menunjukkan hidrogen klorida dalam dua pelarut yang berbeza dan nilai pH masing-masing.

Diagram 12 shows the hydrogen chloride in two different solvents and their respective pH values.



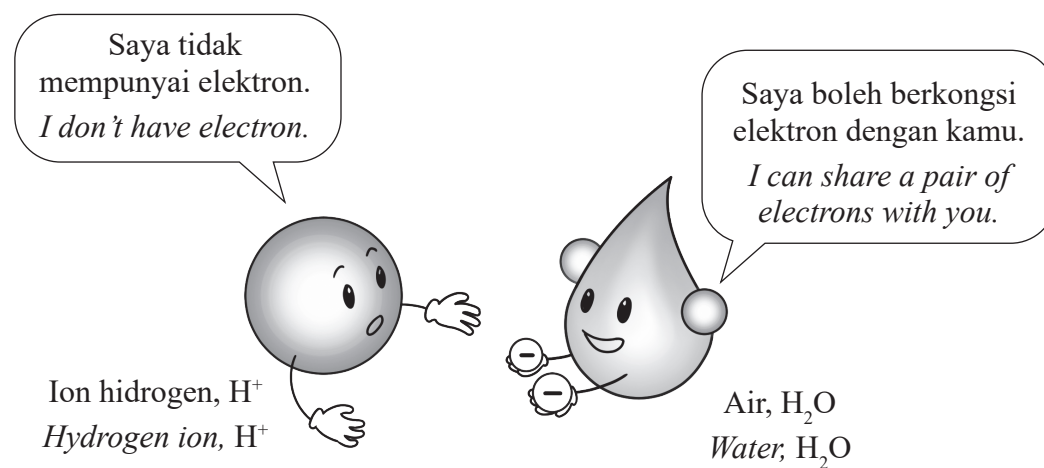
Rajah 12
Diagram 12

- (i) Berikan satu contoh bagi pelarut X dan pelarut Y.
Give one example of each solvent X and solvent Y.
- [2 markah / marks]
- (ii) Terangkan mengapa hidrogen klorida dalam pelarut X mempunyai nilai pH 4.8.
Explain why hydrogen chloride in solvent X has the pH value of 4.8.
- [2 markah / marks]
- (iii) Aminah ingin menjalankan eksperimen elektrolisis larutan hidrogen klorida dengan menggunakan elektrod karbon. Sebagai seorang pelajar kimia, larutan yang manakah akan anda cadangkan untuk digunakan semasa menjalankan eksperimen itu? Jelaskan.
Aminah would like to carry out an experiment on electrolysis of hydrogen chloride solution using carbon electrodes. As a chemistry student, which solution will you suggest for her to use while carrying out the experiment? Explain.

[2 markah / marks]

- (b) Rajah 13 menunjukkan perbualan antara ion hidrogen, H^+ dengan molekul air, H_2O dalam sebuah komik Kimia.

Diagram 13 shows the conversation between a hydrogen ion, H^+ and a water molecule, H_2O in a Chemistry comic.



Rajah 13
Diagram 13

Nyatakan jenis ikatan yang terbentuk dan terangkan pembentukan ikatan tersebut.

State the type of bond formed and explain the formation of the bond.

[4 markah / marks]

- (c) Jadual 4 menunjukkan pemerhatian bagi satu eksperimen untuk mengkaji kekonduksian elektrik plumbum(II) bromida, naftalena dan zink.

Table 4 shows the observations of an experiment to study electrical conductivity of lead(II) bromide, naphthalene and zinc.

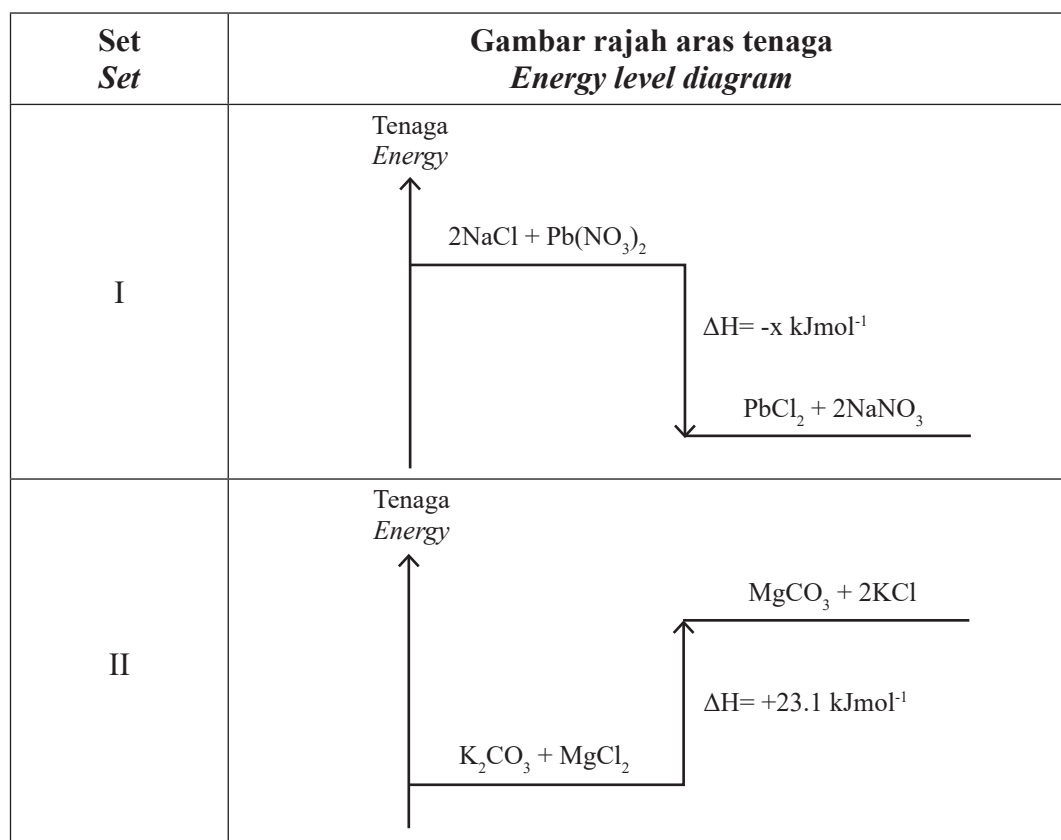
Sebatian <i>Substance</i>	Plumbum(II) bromide <i>Lead(II) bromide</i>		Naftalena <i>Naphthalene</i>		Zink <i>Zinc</i>	
	Pepejal <i>Solid</i>	Leburan <i>Molten</i>	Pepejal <i>Solid</i>	Leburan <i>Molten</i>	Pepejal <i>Solid</i>	Leburan <i>Molten</i>
Pemerhatian <i>Observation</i>	Mentol tidak menyala <i>Bulb does not light up</i>	Mentol menyala <i>Bulb lights up</i>	Mentol tidak menyala <i>Bulb does not light up</i>	Mentol tidak menyala <i>Bulb does not light up</i>	Mentol menyala <i>Bulb lights up</i>	Mentol menyala <i>Bulb lights up</i>

Jadual 4

Table 4

- (i) Nyatakan jenis ikatan dalam pembentukan plumbum(II) bromida dan zink.
State the type of bond in lead(II) bromide and zinc.
- [2 markah / marks]
- (ii) Berdasarkan Jadual 4, terangkan perbezaan pemerhatian bagi bahan-bahan tersebut.
Based on Table 4, explain the differences in observation for the substances.
- [8 markah / marks]

- 10 (a) Rajah 14 menunjukkan gambar rajah aras tenaga bagi dua tindak balas pemendakan.
Diagram 14 shows energy level diagrams for two sets of precipitation reaction.



Rajah 14
Diagram 14

Berdasarkan Rajah 14,
Based on Diagram 14,

- (i) Tindak balas yang manakah membebaskan tenaga haba ke persekitaran semasa tindak balas berlaku? Terangkan.

Which reaction release heat energy to the surrounding during the reaction? Explain.

[2 markah / marks]

- (ii) Dalam Set I, apabila 50 cm^3 larutan natrium klorida 1.0 mol dm^{-3} ditambahkan kepada 50 cm^3 larutan plumbum(II) nitrat, suhu meningkat sebanyak 3.5°C . Tentukan bahan tindak balas yang manakah berlebihan. Hitungkan nilai x .

[Ketumpatan air = 1.0 g cm^{-3} , muatan haba tentu air, $c = 4.2 \text{ Jg}^{-1}\text{C}^{-1}$]

In Set I, when 50 cm^3 of 1.0 mol dm^{-3} sodium chloride solution is added into 50 cm^3 of 1.0 mol dm^{-3} lead(II) nitrate solution, temperature increases by 3.5°C . Determine which reactant is in excess. Calculate the value of x .

[Density of water = 1.0 g cm^{-3} , specific heat capacity of water, $c = 4.2 \text{ Jg}^{-1}\text{C}^{-1}$]

[5 markah / marks]

ralat:
kemolaran plumbum(II) nitrat
 1.0 moldm^{-3}

- (iii) Ahmad menjalankan eksperimen Set II dengan menambahkan 50 cm³ larutan kalium karbonat 1.0 mol dm⁻³ ke dalam 50 cm³ larutan magnesium klorida 1.0 mol dm⁻³. Perubahan suhu dicatat dan seterusnya haba pemendakan bagi eksperimen tersebut dihitung. Akan tetapi, nilai haba pemendakan yang diperoleh tidak sama seperti dalam Rajah 14.

Nyatakan maksud haba pemendakan dan terangkan mengapa nilai haba pemendakan ini berbeza? Tuliskan persamaan termokimia bagi tindak balas ini. Nyatakan warna mendakan yang terbentuk dalam tindak balas ini.

Ahmad conducted the experiment in Set II by adding 50 cm³ of 1.0 mol dm⁻³ potassium carbonate solution into 50 cm³ of 1.0 mol dm⁻³ magnesium chloride solution. The temperature change is recorded and then the heat of precipitation for the reaction is calculated. However, the value of heat of precipitation obtained is not the same as in Diagram 14.

State the meaning of heat of precipitation and explain why these heat values of precipitation are different? Write a thermochemical equation for the reaction. State the colour of precipitate formed in this reaction.

[4 markah / marks]

- (b) Jadual 5 menunjukkan bahan tindak balas yang digunakan oleh Jeffrey semasa menjalankan eksperimen untuk menentukan haba penyesaran kuprum.

Table 5 shows the reactants used by Jeffrey when carrying out an experiment to determine the heat of displacement of copper.

Set <i>Set</i>	Bahan tindak balas <i>Reactants</i>
I	Serbuk magnesium berlebihan + 50 cm ³ larutan kuprum(II) nitrat 0.5 mol dm ⁻³ <i>Excess magnesium powder + 50 cm³ of 0.5 mol dm⁻³ copper(II) nitrate solution</i>
II	Serbuk ferum berlebihan + 50 cm ³ larutan kuprum(II) nitrat 0.5 mol dm ⁻³ <i>Excess iron powder + 50 cm³ of 0.5 mol dm⁻³ copper(II) nitrate solution</i>

Jadual 5

Table 5

- (i) Nyatakan dua pemerhatian daripada Set I.

State two observations from Set I.

[2 markah / marks]

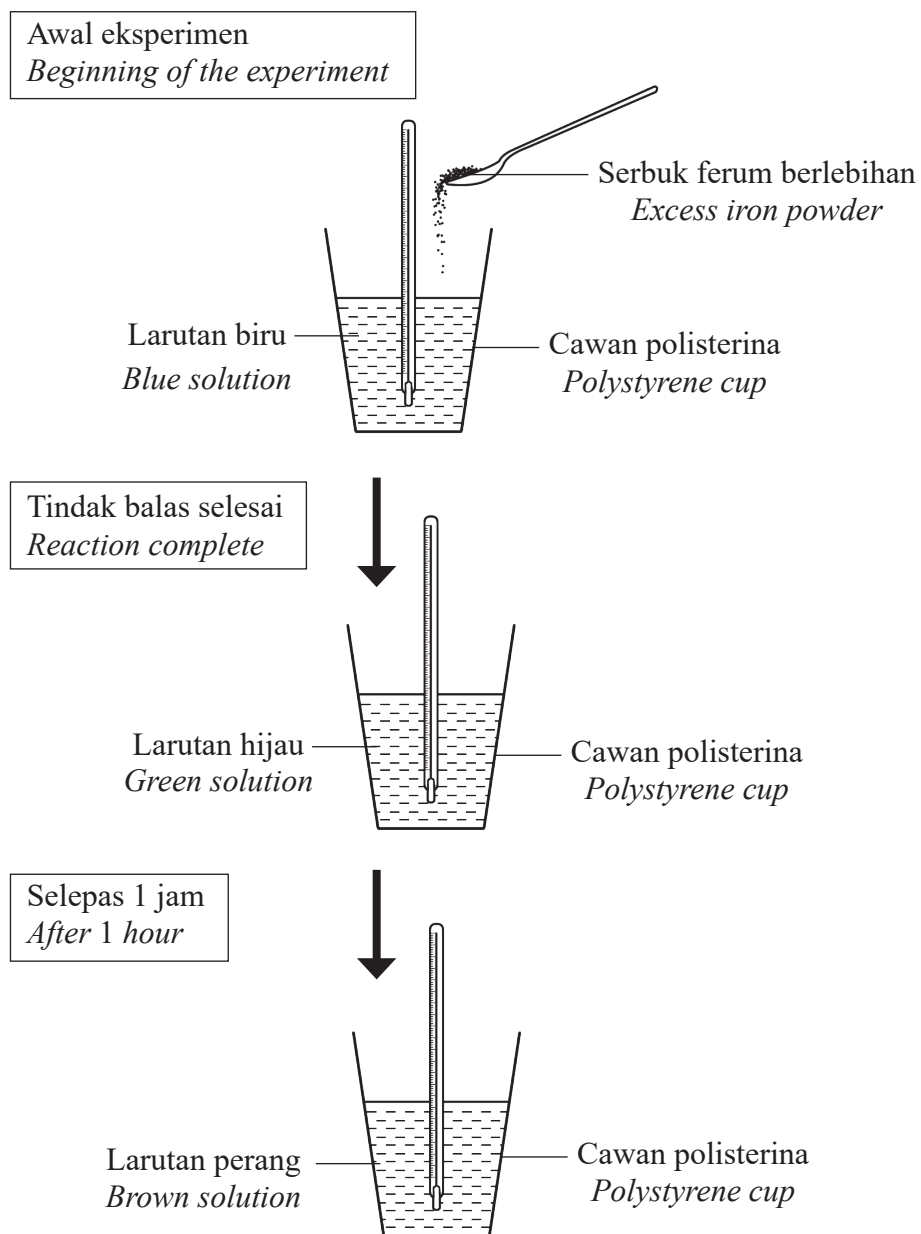
- (ii) Bandingkan haba penyesaran Set I dan Set II. Terangkan.

Compare the heat of displacement of Set I and Set II. Explain.

[3 markah / marks]

- (iii) Rajah 15 menunjukkan perubahan warna larutan dalam Set II selepas tindak balas selesai.

Diagram 15 shows the colour change of solution in Set II after the reaction complete.



Rajah 15
Diagram 15

Terangkan perubahan warna larutan ini.
Explain the colour change of the solution.

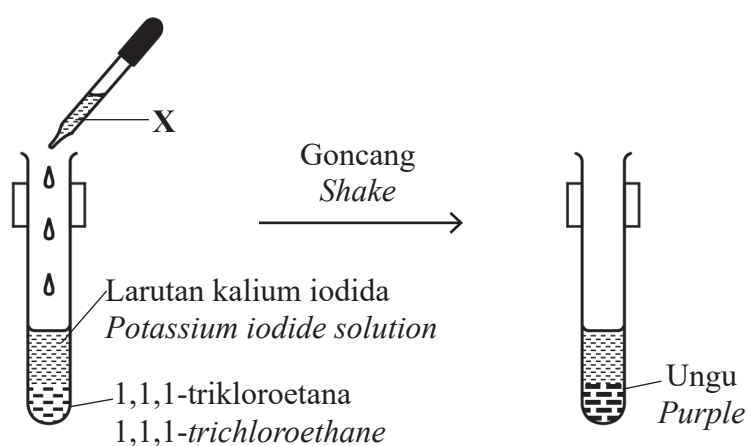
[4 markah / marks]

Bahagian C
Section C

[20 markah]
[20 marks]

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

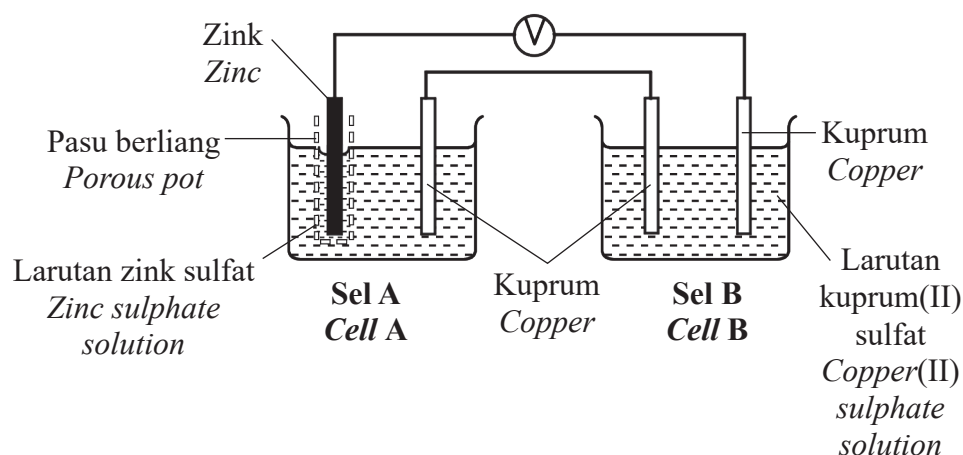
- 11 Rajah 16 menunjukkan susunan radas untuk mengkaji penyesaran halogen daripada larutan halidanya oleh halogen X.
Diagram 16 shows an apparatus set-up to investigate the displacement of halogen from its halide solution by halogen X.



Rajah 16
Diagram 16

- (a) Apakah maksud tindak balas redoks?
What is the meaning of redox reaction? [1 markah / mark]
- (b) (i) Cadangkan satu nama bagi halogen X.
Suggest a name for halogen X. [1 markah / marks]
- (ii) Tuliskan persamaan setengah pengoksidaan dan penurunan bagi proses yang berlaku.
Write the half equation for the oxidation and reduction process that has occurs. [2 markah / marks]
- (iii) Namakan hasil tindak balas dan huraikan ujian kimia untuk mengesahkan hasil tindak balas tersebut.
Name the product of the reaction and describe the chemical test to confirm the product of the reactions. [4 markah / marks]

- (c) Rajah 17 menunjukkan susunan radas sel A dan sel B.
Diagram 17 shows the apparatus set-up for cell A and cell B.



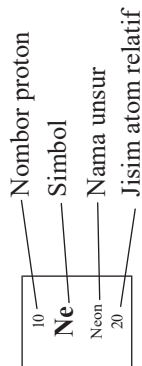
Rajah 17
Diagram 17

- (i) Bandingkan sel A dan sel B dari segi hasil yang terbentuk dan pemerhatian pada anod. Tuliskan setengah persamaan pada anod.
Compare cell A and cell B in terms of product formed and observation at anode. Write half equation at anode.
- [6 markah / marks]
- (ii) Rumah Aminah terletak di kawasan persisiran pantai. Dia menghadapi masalah apabila kunci besi rumahnya sering perlu diganti kerana pengurangan berlaku dengan cepat di kawasan tersebut. Sebagai rakan Aminah, cadangkan satu cara bagi menyelesaikan masalah tersebut dengan menggunakan konsep elektrolisis.
Aminah's house is located at seaside. She has a problem when her iron key always needed to be replaced due to rusting that occur faster at that area. As Aminah's friend, suggest a way to solve the problem by using electrolysis concept.
- [6 markah / marks]

KERTAS PEPERIKSAAN TAMAT
END OF EXAM PAPER

JADUAL BERKALA UNSUR

1 H Hidrogen 1	2 He Helium 4	3 Li Litium 7	4 Be Berilium 9	5 B Boron 11	6 C Karbon 12	7 N Nitrogen 14	8 O Oksigen 16	9 F Flourin 19	10 Ne Neon 20
11 Na Natrium 23	12 Mg Magnesium 24	13 Al Aluminium 27	14 Si Silikon 28	15 P Fosforus 31	16 S Sulfur 32	17 Cl Klorin 35	18 Ar Argon 40	19 K Kalium 39	20 Ca Kalsium 40
37 Rb Rubidium 86	38 St Strontium 88	39 Y Itrium 89	40 Zr Zirkonium 91	41 Nb Niobium 93	42 Mb Molibdenum 96	43 Ta Tantalum 181	44 Hf Hafnium 179	45 La Lantanum 139	46 Ce Sesium 133
55 Cs Sesium 133	56 Ra Barium 137	57 La Lantanum 139	58 Pr Praseodimium 141	59 Pd Palladium 106	60 Nd Neodimium 144	61 Pm Prometium 147	62 Eu Europium 152	63 Gd Gadolium 157	64 Tb Terbium 159
87 Fr Fransium 223	88 Ra Radium 226	89 Ac Aktinium 227	90 Th Torium 232	91 Pa Proaktinium 231	92 U Uranium 238	93 Np Neptunium 237	94 Pu Plutonium 244	95 Am Amerisium 243	96 Cm Kuriun 247
101 Ag Argentum 108	102 Cd Kadmium 112	103 In Indium 115	104 Sn Stannum 119	105 Pb Plumbum 207	106 Tl Thalium 204	107 Po Polonium 210	108 At Astatin 210	109 Rn Radon 222	110 Xe Xenon 131
111 Zn Zink 65	112 Cu Kuprum 64	113 Ga Galium 70	114 Ge Germanium 73	115 As Arsenik 75	116 Se Selenium 79	117 Br Bromin 80	118 Kr Kripton 84	119 Sb Antimon 122	120 Te Telurium 128
121 Hg Mercuri 204	122 Au Aurum 197	123 Ht Hafnium 179	124 Ir Iridium 192	125 Rh Rodium 103	126 Pt Platinum 195	127 Au Aurum 197	128 Hg Mercuri 204	129 Po Polonium 210	130 At Astatin 210
131 Os Osmium 190	132 Ru Rutenium 101	133 Rh Rodium 103	134 Pd Palladium 106	135 Ni Nikel 59	136 Co Kobalt 59	137 Fe Feram 56	138 Mn Mangan 55	139 Cr Kromium 52	140 V Vanadium 51
141 Re Renyum 186	142 Os Osmium 190	143 Ir Iridium 192	144 Pt Platinum 195	145 Au Aurum 197	146 Hg Mercuri 204	147 Po Polonium 210	148 At Astatin 210	149 Rn Radon 222	150 Xe Xenon 131
151 Unq Unnil-kuadium 257	152 Unp Unnil-pentium 260	153 Unh Unnil-heksum 263	154 Uns Unnilseptium 263	155 Uno Unniloktium 263	156 Une Unnilenium 263	157 U Uranium 238	158 Np Neptunium 237	159 Pu Plutonium 244	160 Am Amerisium 243
161 Ce Sesium 133	162 Pr Praseodimium 141	163 Nd Neodimium 144	164 Pm Prometium 147	165 Sm Samarium 150	166 Eu Europium 152	167 Gd Gadolium 157	168 Tb Terbium 159	169 Dy Diprosium 163	170 Ho Holmium 165
171 Er Erbium 167	172 Tm Terbium 169	173 Yb Ytterbium 173	174 Lu Lutetium 175	175 La Lantanum 139	176 Ce Sesium 133	177 Pr Praseodimium 141	178 Nd Neodimium 144	179 Pm Prometium 147	180 Sm Samarium 150
181 Pa Proaktinium 231	182 Th Torium 232	183 Pa Proaktinium 231	184 U Uranium 238	185 Np Neptunium 237	186 Pu Plutonium 244	187 Am Amerisium 243	188 Cm Kuriun 247	189 Bk Berkelium 247	190 Cf Kalifornium 249
191 Es Einsteinium 254	192 Fm Fermium 253	193 Md Mendelevium 258	194 No Nobelium 254	195 Lr Lawrensium 257	196 Lu Lutetium 175	197 Yb Ytterbium 173	198 Lu Lutetium 175	199 Yb Ytterbium 173	200 Lu Lutetium 175



THE PERIODIC TABLE OF ELEMENTS

<table border="1"> <tr> <td>1</td> <td>H Hydrogen 1</td> </tr> </table>		1	H Hydrogen 1	<table border="1"> <tr> <td>10</td> <td>Ne Neon 20</td> <td colspan="2">Proton Number</td> <td colspan="2">Symbol</td> <td colspan="2">Name of the Element</td> <td colspan="2">Relative atomic mass</td> </tr> </table>																10	Ne Neon 20	Proton Number		Symbol		Name of the Element		Relative atomic mass		<table border="1"> <tr> <td>2</td> <td>He Helium 4</td> </tr> </table>		2	He Helium 4																																						
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MAKLUMAT UNTUK CALON
INFORMATION FOR CANDIDATES

1. Kertas ini mengandungi tiga bahagian: **Bahagian A**, **Bahagian B** dan **Bahagian C**.
This question paper consists of three sections: Section A, Section B and Section C.
2. Jawab **semua** soalan dalam **Bahagian A**. Tulis jawapan bagi **Bahagian A** dalam ruang yang disediakan dalam kertas soalan.
Answer all questions in Section A. Write your answers for Section A in the spaces provided in this question paper.
3. Jawab **satu** soalan daripada **Bahagian B** dan **semua** soalan daripada **Bahagian C**.
Tulis jawapan bagi **Bahagian B** dan **Bahagian C** pada kertas kajang yang dibekalkan oleh pengawas peperiksaan. Anda boleh menggunakan persamaan, rajah, jadual, graf dan cara lain yang sesuai untuk menjelaskan jawapan anda.
Answer any one question from Section B and all question from Section C. Write your answers for Section B and Section C on the testpad provided by the invigilators. You may use equations, diagrams, tables, graphs and other suitable methods to explain your answers.
4. Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.
The diagrams in the questions provided are not drawn to scale unless stated.
5. Markah yang diperuntukkan bagi setiap ceraihan soalan ditunjukkan dalam kurungan.
The marks allocated for each sub-part of a question are shown in brackets.
6. Tunjukkan kerja mengira. Ini membantu anda mendapat markah.
Show your working. It may help you get marks.
7. Sekiranya anda hendak menukar jawapan, batalkan jawapan yang telah dibuat. Kemudian, tulis jawapan yang baharu.
If you wish to change your answer, cross out the answer that you have done. Then, write down the new answer.
8. Jadual Berkala Unsur disediakan di halaman 27 dan 28.
The Periodic Table of Elements is provided on page 27 and 28.
9. Anda dibenarkan menggunakan kalkulator saintifik.
You may use a scientific calculator.
10. Ikat kertas kajang (jawapan bagi **Bahagian B** dan **Bahagian C**) bersama-sama kertas soalan ini dan serahkan kepada pengawas peperiksaan pada akhir peperiksaan.
Tie the testpad together (answers for Section B and Section C) with this question paper and hand in to the invigilators at the end of the examination.