

Bahagian A

[60 markah]

Jawab semua soalan.

- 1 Jadual 1 menunjukkan jejari atom dan nombor proton bagi unsur Kala 3 dalam Jadual Berkala Unsur.
Diagram 1 shows a helmet that is made of composite material Q.

Unsur Kala 3 Element of Period 3	Na	Mg	Al	Si	P	S	Cl	Ar
Jejari atom (nm) Atomic radius (nm)	0.186	0.160	0.143	0.118	0.110	0.104	0.100	0.094
Nombor proton Proton number	11	12	13	14	15	16	17	18

Jadual 1
Table 1

- (a) Nyatakan maksud kala.
State the meaning of period.

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

- (b) Berdasarkan Jadual 1, beri **satu** sebab mengapa unsur tersebut ditempatkan dalam Kala 3.
Based on Table 1, give **one** reason why these elements are located in Period 3.

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

- (c) (i) Nyatakan **satu** kegunaan argon, Ar dalam kehidupan harian.
State **one** use of argon, Ar in daily life.

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

- (ii) Nyatakan jenis zarah yang wujud dalam argon, Ar.
State the type of particles that exist in argon, Ar.

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

- (d) Nyatakan perubahan jejari atom bagi unsur dalam Kala 3 daripada natrium, Na ke argon, Ar.
State the change of the atomic radius of elements in Period 3 from sodium, Na to argon, Ar.

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

- 2 Jadual 2 menunjukkan maklumat tentang nombor proton, bilangan neutron dan bilangan elektron bagi atom X dan ion X. X bukan simbol sebenar unsur.

Table 2 shows the information related to proton number, number of neutrons and number of electrons for atom X and ion X. X is not the actual symbol of the element.

Jenis zarah Type of particles	Atom X	Ion X
Nombor proton Proton number	12	12
Bilangan neutron Number of neutrons	12	12
Bilangan elektron Number of electrons	12	10

Jadual 2
Table 2

- (a) (i) Nyatakan maksud nombor proton.
State the meaning of proton number.

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

- (ii) Nyatakan zarah subatom yang terdapat dalam nukleus suatu atom.
State the subatomic particles found in the nucleus of an atom.

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

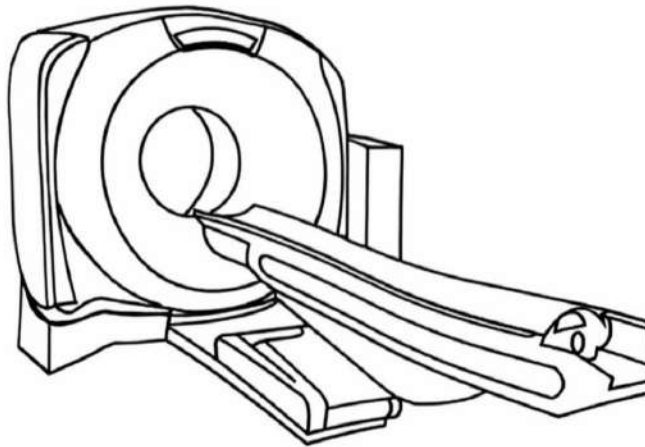
- (b) (i) Tuliskan susunan elektron bagi atom X.
Write the electron arrangement of atom X.

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

- (ii) Tulis formula untuk ion X.
Write the formula of ion X.

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

- 3 (a) Rajah 1 menunjukkan sebuah mesin pengimejan resonans magnet (MRI) yang digunakan untuk membantu mendiagnosis penyakit pada seorang pesakit. Salah satu komponen utama dalam mesin tersebut ialah superkonduktor.
 Diagram 1 shows a Magnetic Resonance Imaging (MRI) machine that is used to help diagnosing a disease on a patient. One of the main components in the machine is superconductor.



Rajah 1
 Diagram 1

- (i) Nyatakan nama superkonduktor yang digunakan dalam mesin MRI itu.
 State the name of a superconductor used in the MRI machine.

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

- (ii) Nyatakan fungsi superkonduktor tersebut.
 State the function of the superconductor.

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

- (iii) Berikan satu sifat superkonduktor itu.
 Give one property of the superconductor.

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

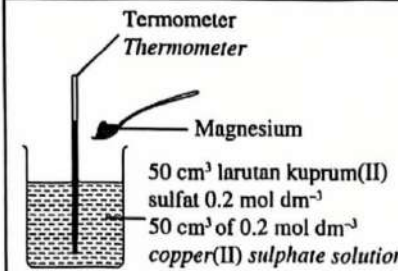
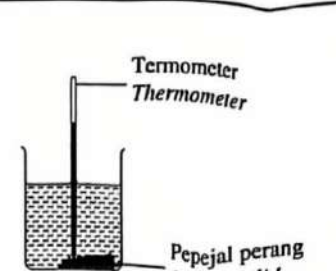
- (b) Siti menuang air sejuk ke dalam periuk kaca yang panas. Periuk-kaca itu retak secara tiba-tiba. Bagi mengatasi masalah tersebut, cadangkan satu jenis kaca yang sesuai bagi pembuatan periuk itu. Terangkan jawapan anda.
 Siti poured cold water into a hot glass pot. The glass pot suddenly cracked. In order to overcome the problem, suggest one suitable type of glass in the manufacturing of the pot. Explain your answer.

.....

 [3 markah]
 [3 marks]

- 4 Rajah 2 menunjukkan susunan radas bagi suatu eksperimen untuk menentukan haba penyesaran bagi tindak balas antara larutan kuprum(II) sulfat dengan logam magnesium.

Diagram 2 shows the apparatus set-up of an experiment to determine the heat of displacement for the reaction between copper(II) sulphate solution with magnesium metal.

Sebelum tindak balas Before reaction	Selepas tindak balas After reaction
 <p>Termometer Thermometer</p> <p>Magnesium</p> <p>50 cm³ larutan kuprum(II) sulfat 0.2 mol dm⁻³ 50 cm³ of 0.2 mol dm⁻³ copper(II) sulphate solution</p>	 <p>Termometer Thermometer</p> <p>Pepejal perang Brown solid</p>
Suhu awal = 27.5 °C Initial temperature	Suhu tertinggi campuran = 38.0 °C Highest temperature of mixture

Rajah 2
Diagram 2

- (a) (i) Nyatakan warna larutan kuprum(II) sulfat.
State the colour of copper(II) sulphate solution.

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

- (ii) Nyatakan perubahan warna larutan kuprum(II) sulfat di akhir eksperimen. Beri satu sebab.
State the colour change of copper(II) sulphate solution at the end of the experiment. Give one reason.

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

- (b) Hitungkan haba penyesaran dalam eksperimen itu.
Calculate the heat of displacement in the experiment.
[Muatan haba tentu larutan : 4.2 Jg⁻¹ °C⁻¹; ketumpatan larutan : 1 gcm⁻³].
[Specific heat capacity of solution : 4.2 Jg⁻¹ °C⁻¹; density of solution : 1 gcm⁻³]

[3 markah]
[3 marks]

- (c) Eksperimen tersebut diulang dengan menggantikan magnesium dengan zink.
Ramalkan perubahan suhu dalam tindak balas itu.
The experiment is repeated by replacing magnesium with zinc.
Predict the temperature change in the reaction.

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

5 (a) Jadual 3 menunjukkan formula struktur dan takat didih bagi klorin, Cl₂ dan etanol, C₂H₅OH.
 Table 3 shows the structural formulae and the boiling points for chlorine, Cl₂ and ethanol, C₂H₅OH.

Bahan Substance	Formula struktur Structural formula	Takat didih (°C) Boiling point (°C)
Klorin Chlorine	Cl — Cl	-34.0
Etanol Ethanol	$ \begin{array}{c} \text{H} \quad \text{H} \\ \quad \\ \text{H} - \text{C} - \text{C} - \text{H} \\ \quad \\ \text{H} \quad \text{OH} \end{array} $	78.0

Jadual 2
Table 2

(i) Nyatakan jenis ikatan dalam molekul klorin.
 State the type of bond in chlorine molecule.

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

(ii) Nyatakan bagaimana ikatan dalam 5(a)(i) terbentuk.
 State how the bond in 5(a)(i) is formed.

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

(iii) Berdasarkan Jadual 3, terangkan perbezaan takat didih antara klorin dan etanol.
 Based on Table 3, explain the difference in boiling points between chlorine and ethanol.

.....

 markah]
 [2 marks]

(b) Rajah 3 menunjukkan beg plastik terbiodegradasi yang sukar untuk dibuka oleh seorang pengguna.
 Diagram 3 shows a biodegradable plastic bag that is difficult to be opened by a consumer.



Rajah 3
Diagram 3

Berdasarkan pengetahuan anda tentang ikatan kimia, cadangkan bagaimana pengguna itu dapat mengatasi masalah tersebut. Berikan satu sebab.

Based on your knowledge about chemical bond, suggest how the consumer can overcome the problem. Give one reason.

.....

.....

.....

[2 markah]

[2 marks]

- (c) Ion ammonium terbentuk melalui ikatan datif antara ion hidrogen, H^+ dengan atom nitrogen, N dalam molekul ammonia, NH_3 .

Lukis ion ammonium dan label ikatan datif itu.

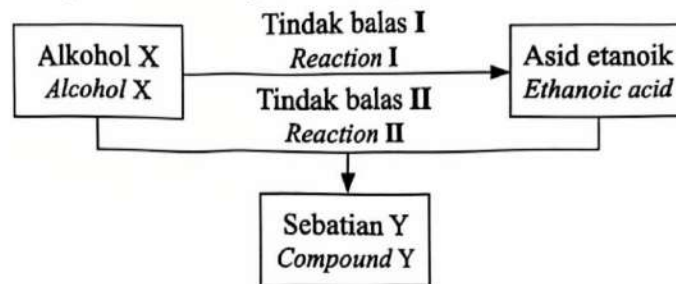
Ammonium ion is formed through a dative bond between hydrogen ion, H^+ with nitrogen atom, N in the ammonia molecule, NH_3 .

Draw ammonium ion and label the dative bond.

[2 markah]

[2 marks]

- 6 Rajah 4 menunjukkan carta alir bagi penukaran sebatian karbon.
Diagram 4 shows a flow chart of the conversion of carbon compound.



Rajah 4
Diagram 4

- (a) Tulis formula am bagi alkohol.
Write the general formula for alcohol.

.....

.....

[1 markah]

[1 mark]

- (b) Nyatakan nama bagi alkohol X.
State the name of alcohol X.

.....

.....

[1 markah]

[1 mark]

[Lihat halaman sebelah
SULIT

(c) Nyatakan nama bagi tindak balas I dan tindak balas II.

State the name of reaction I and reaction II.

Tindak balas I : _____

Reaction I

Tindak balas II : _____

Reaction II

[2 marks]

(d) Nyatakan nama sebatian Y yang terhasil.

State the name of compound Y produced.

[1 mark]

(e) (i) Tulis persamaan kimia bagi pembentukan asid etanoik melalui tindak balas I.

Write the chemical equation for the formation of ethanoic acid through reaction I.

[2 marks]

(ii) 0.3 mol alcohol X diperlukan untuk menghasilkan asid etanik dalam tindak balas I.

Hitung jisim asid etanoik yang terhasil.

0.3 mol of alcohol X is needed to produce ethanoic acid in reaction I.

Calculate the mass of ethanoic acid produced.

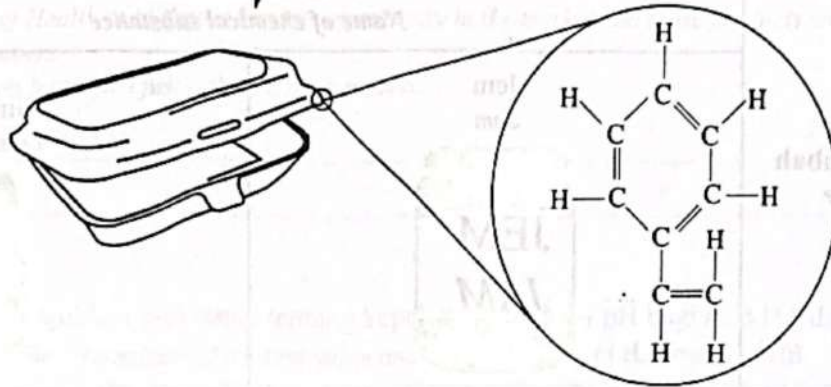
[Jisim atom relatif: H=1,C=12,O=16]

[Relative atomic mass: H=1,C=12;O=16]

[2 marks]

- 7 (a) Rajah 5 menunjukkan sejenis pembungkus makanan yang diperbuat daripada polimer iaitu polistirena. Formula struktur yang ditunjukkan adalah monomer bagi polistirena.

Diagram 5 shows a type of food packaging made of polymer which is polystyrene. The structural formula shown is the monomer for polystyrene.



Rajah 5
Diagram 5

Berdasarkan Rajah 5,
Based on Diagram 5,

- (i) nyatakan jenis tindak balas pempolimeran bagi pembentukan polimer itu
state the type of polymerisation reaction for the formation of the polymer

[1 markah]
[1 mark]

- (ii) nyatakan **satu** kegunaan lain bagi polistirena
state **one other** use of polystyrene

[1 markah]
[1 mark]

- (iii) tuliskan persamaan tindak balas pempolimeran bagi pembentukan polistirena
write the equation of polymerisation reaction for the formation of polystyrene

[2 markah]
[2 marks]

- (iv) hitungkan jisim molekul relatif monomer itu.
calculate the relative molecular mass of the monomer.

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



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

[1 markah]
[1 mark]

[Lihat halaman sebelah
SULIT

- (b) Jadual 4 menunjukkan nama bahan kimia yang digunakan sebagai bahan tambah dalam pembuatan jem dan gincu.

Table 4 shows the names of chemical substances that are used as additives in the manufacturing of jam and lipstick.

Bahan tambah Additive	Nama bahan kimia Name of chemical substance	
	Jem Jam 	Gincu Lipstick 
X	Asid benzoik Benzoic acid Natrium nitrit Sodium nitrite Sulfur dioksida Sulphur dioxide	Paraben Paraben Benzil benzoat Benzyl benzoate Formaldehid Formaldehyde
Y	Monogliserida Monoglycerides Digliserida Diglycerides Lesitin Lecithin	Asid stearik Stearic acid Poligliseril Polyglyceryl Lanolin Lanolin
Pemekat Thickener	Kanji Starch Gelatin Gelatine Gam akasia Acacia gum	Z

Jaduah 4
Table 4

Berdasarkan Jadual 4,
Based on Table 4,

- (i) kenal pasti jenis bahan tambah X dan Y
identify the types of additives of X and Y

X :

Y :

[2 markah]
[2 marks]

- (ii) nyatakan satu contoh bagi bahan kimia Z.
state one example of chemical substance Z.

Z :

[1 markah]
[1 mark]

- (c) Sejak kebelakangan ini, produk kosmetik yang tidak melalui ujian farmaceutikal dan tidak mendapat kelulusan Kementerian Kesihatan Malaysia menjadi lambakan di pasaran, tetapi produk tersebut masih mendapat sambutan hangat dalam kalangan pengguna.

Adakah wajar situasi ini berlaku? Berikan satu sebab.

Nowadays, cosmetic products that did not go through pharmaceutical testings and did not obtain the approval from the Ministry of Health of Malaysia become abundantly in the market, but those products still received great response among consumers.

Is the situation happened justifiable? Give a reason.

[2 markah]

[2 marks]

- 8 (a) Jadual 5 menunjukkan maklumat tentang kepekatan dan nilai pH bagi asid HA dan asid HB.
Table 5 shows the information of concentration and pH values of acid HA and acid HB.

Asid Acid	Kepekatan (mol dm^{-3}) Concentration (mol dm^{-3})	Nilai pH pH value
HA	0.1	1
HB	0.1	5

Jadual 5
Table 5

Berdasarkan maklumat dalam Jadual 5,

Based on the information in Table 5,

- (i) nyatakan maksud nilai pH
state the meaning of pH value

[1 markah]

[1 mark]

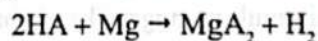
- (ii) terangkan mengapa asid HB mempunyai nilai pH yang lebih tinggi daripada asid HA
explain why acid HB has a higher pH value than acid HA

[1 markah]

[1 mark]

- (iii) 50 cm^3 larutan asid HA 0.1 mol dm^{-3} bertindak balas dengan serbuk magnesium berlebihan. Persamaan kimia berikut mewakili tindak balas itu.

50 cm^3 of 0.1 mol dm^{-3} of solution acid HA reacts with excess magnesium powder. The following chemical equation represents the reaction.



Hitung isi padu gas hidrogen yang terhasil.

Calculate the volume of hydrogen gas produced.

[Isi padu molar gas pada keadaan bilik = $24 \text{ dm}^3 \text{ mol}^{-1}$]

[Molar volume of gas at room conditions = $24 \text{ dm}^3 \text{ mol}^{-1}$]

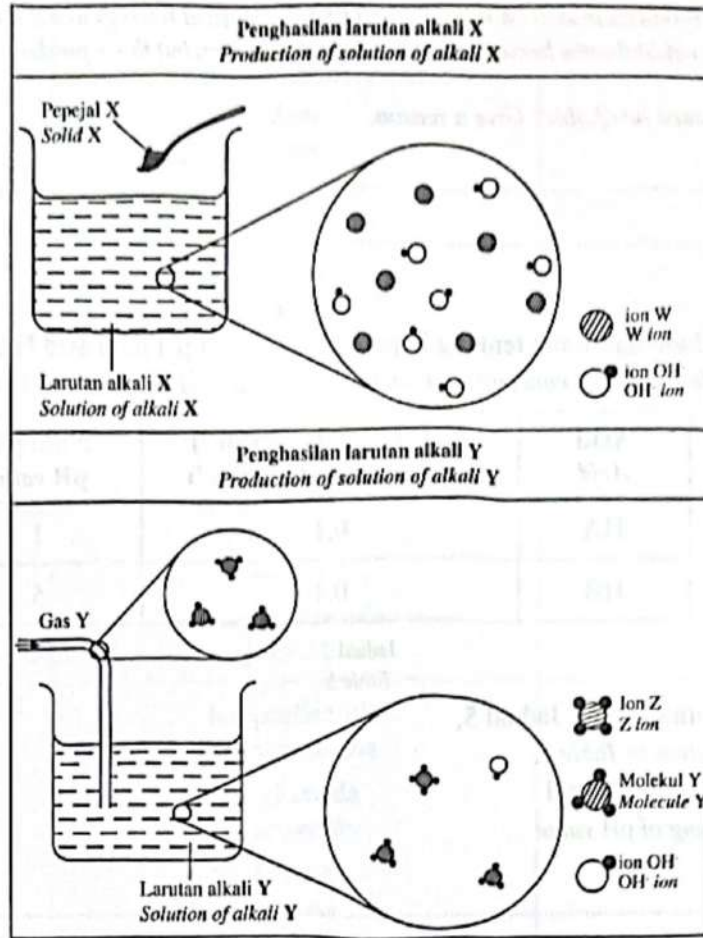
[3 markah]

[3 marks]

[Lihat halaman sebelah

SULIT

- (b) Rajah 6 menunjukkan penghasilan dua larutan beralkali X dan Y. Larutan alkali X terhasil apabila pepejal X dilarutkan ke dalam air manakala larutan alkali Y terhasil apabila gas Y dilarutkan ke dalam air.
 Diagram 6 shows a production of two alkaline solutions, X and Y. Solution of alkali X is produced when solid X is dissolved in water while solution of alkali Y is produced when gas Y is dissolved in water.



Rajah 6
 Diagram 6

Berdasarkan Rajah 6, terangkan perbezaan kekuatan alkali bagi larutan alkali X dan larutan alkali Y.
 Based on Diagram 6, explain the difference in the strength of alkalis for solution of alkali X and solution of alkali Y.

.....

.....

[2 markah]
 [2 marks]

- (c) Jari seorang petani telah disengat oleh lebah. Petani itu telah menyapu bahan R pada kawasan yang telah disengat. Dia mendapati jarinya semakin membengkak dan sakit tidak berkurangan. Cadangkan **satu** bahan yang sesuai untuk menggantikan bahan R dan nyatakan langkah rawatan untuk mengurangkan kesakitan itu menggunakan konsep peneutralan.
 A farmer's finger has been stung by a bee. The farmer has applied substance R on the area that has been stung. He found that his finger has become more swollen and the pain effect is not subsiding. Suggest **one** suitable substance to replace substance R and state the steps of treatment to reduce the pain using the concept of neutralisation.

.....

.....

[3 markah]
 [3 marks]

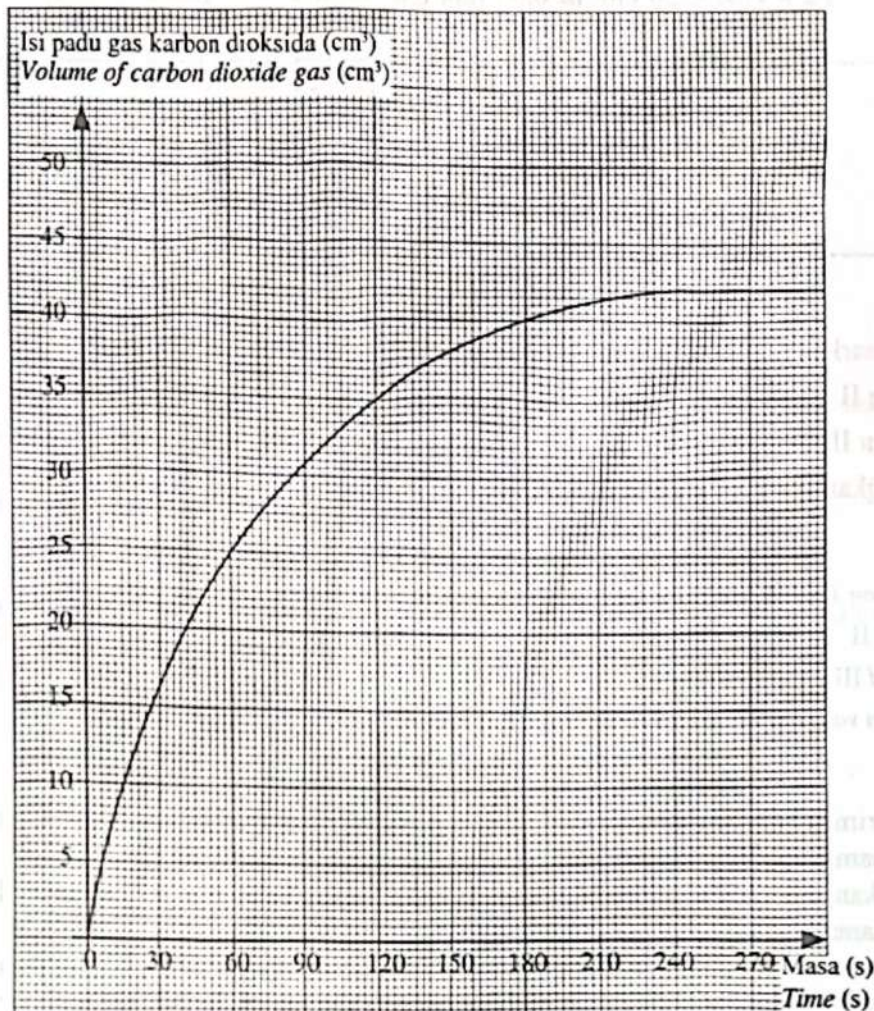
Bahagian B

[20 markah]

Bahagian ini mengandungi dua soalan. Jawab satu soalan.

- 9 (a) Rajah 7 menunjukkan graf isi padu gas karbon dioksida yang terkumpul melawan masa bagi tindak balas antara serbuk kalsium karbonat dan asid hidroklorik cair.

Diagram 7 shows a graph of volume of carbon dioxide gas collected against time for the reaction between calcium carbonate powder and dilute hydrochloric acid.



Rajah 7
Diagram 7

- (i) nyatakan maksud kadar tindak balas dan tuliskan persamaan kimia bagi tindak balas itu.
state the meaning of rate of reaction and write the chemical equation for the reaction.

[3 markah]

[3 marks]

- (ii) Berdasarkan graf dalam Rajah 7, tentukan,
Based on the graph in Diagram 7, determine,
- kadar tindak balas purata dalam minit ketiga
the average rate of reaction in the third minute
 - kadar tindak balas purata bagi keseluruhan tindak balas
the overall average rate of reaction

[4 markah]

[4 marks]

[Lihat halaman sebelah

SULIT

- (b) Jadual 6 menunjukkan maklumat bagi tindak balas antara zink dengan asid nitrik.
Table 6 shows the information about the reaction between zinc and nitric acid.

Eksperimen <i>Experiment</i>	Bahan kimia <i>Chemical substance</i>	Masa untuk mengumpul 20 cm ³ gas (s) <i>Time to collect 20 cm³ of gas (s)</i>
I	2 g zink + 50 cm ³ asid nitrik 0.1 mol dm ⁻³ 2 g zinc + 50 cm ³ of 0.1 mol dm ⁻³ nitric acid	120
II	2 g zink + 50 cm ³ asid nitrik 0.05 mol dm ⁻³ 2 g zinc + 50 cm ³ of 0.05 mol dm ⁻³ nitric acid	180
III	2 g zink + 50 cm ³ asid nitrik 0.05 mol dm ⁻³ + larutan kuprum(II) sulfat 2 g zinc + 50 cm ³ of 0.05 mol dm ⁻³ nitric acid + copper(II) sulphate solution	80

Jadual 6
Table 6

- (i) Berdasarkan Jadual 6, bandingkan kadar tindak balas antara eksperimen:

- I dan II
- II dan III

Terangkan jawapan anda berdasarkan Teori Perlanggaran.

[10 markah]

Based on Table 6, compare the rate of reaction between experiments:

- I and II
- II and III

Explain your answer based on the Collision Theory.

[10 marks]

- (ii) Eksperimen I diulang dengan menggantikan asid nitrik dengan satu asid kuat diprotik berkepekatan yang sama.

Nyatakan apa yang akan berlaku kepada kadar tindak balas dan berikan **satu** alasan. Cadangkan **satu** nama asid kuat diprotik itu.

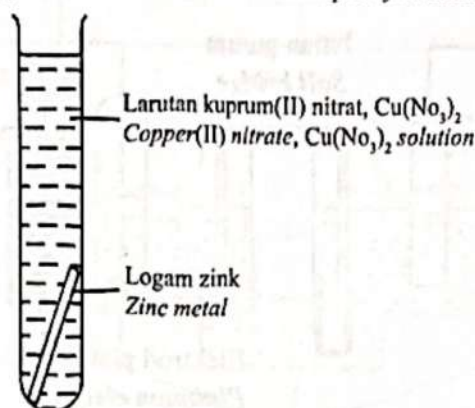
Experiment I is repeated by replacing nitric acid with a strong diprotic acid which has the same concentration. State what will happen to the rate of reaction and give **one** reason. Suggest **one** name for the strong diprotic acid.

[3 markah]

[3 marks]

- 10 (a) Rajah 8.1 menunjukkan susunan radas bagi tindak balas penyerasan antara logam zink dan larutan kuprum(II) nitrat, $\text{Cu}(\text{NO}_3)_2$. Tindak balas penyerasan adalah satu contoh tindak balas redoks.

Diagram 8.1 shows the apparatus set-up for the displacement reaction between zinc metal and copper(II) nitrate, $\text{Cu}(\text{NO}_3)_2$ solution. Displacement reaction is an example of a redox reaction.



Rajah 8.1
Diagram 8.1

Persamaan kimia bagi tindak balas dalam Rajah 8.1 adalah seperti berikut:



Apakah yang dimaksudkan dengan tindak balas redoks? Tentukan agen pengoksidaan, agen penurunan dan nyatakan warna bagi larutan kuprum(II) nitrat, $\text{Cu}(\text{NO}_3)_2$.

[4 markah]

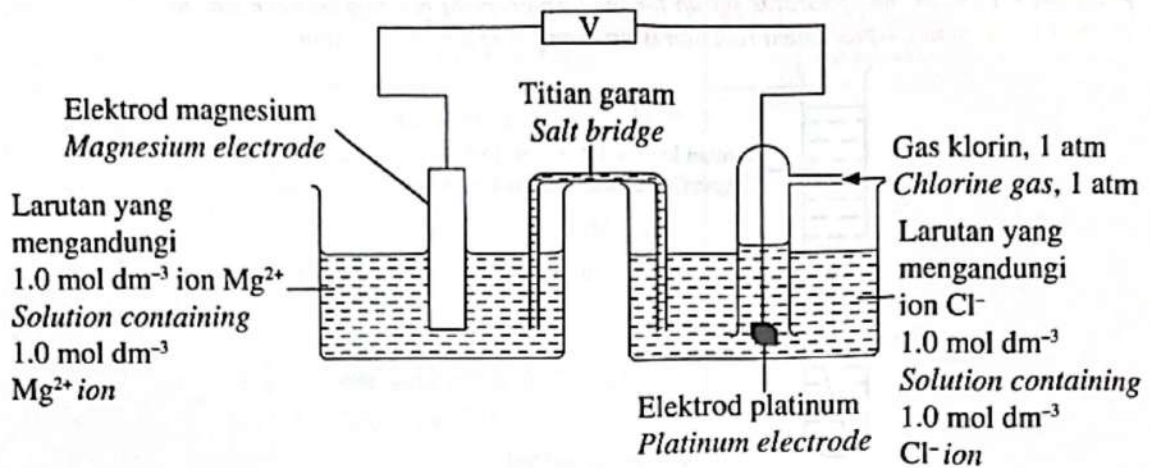
The chemical equation for the reaction in Diagram 8.1 is as follow:



What is meant by redox reaction? Determine the oxidising agent, the reducing agent and state the colour of copper(II) nitrate, $\text{Cu}(\text{NO}_3)_2$ solution.

[4 marks]

- (b) Rajah 8.2 menunjukkan susunan radas satu sel kimia untuk menentukan nilai voltan sel, E_{sel}° .
Diagram 8.2 shows the apparatus set-up of a chemical cell to determine the value of a cell voltage, E_{cell}° .



Rajah 8.2
Diagram 8.2

Jadual 7 menunjukkan nilai keupayaan elektrod piawai sel setengah bagi magnesium dan klorin.
Diagram 7 shows the standard electrode potential values of half-cells for magnesium and chlorine.

Tindak balas sel setengah Reaction of half-cell	E° (V) (298 K)
$\text{Mg}^{2+} + 2\text{e}^{-} \rightleftharpoons \text{Mg}$	-2.38
$\text{Cl}_2 + 2\text{e}^{-} \rightleftharpoons 2\text{Cl}^{-}$	+1.36

Jadual 7
Table 7

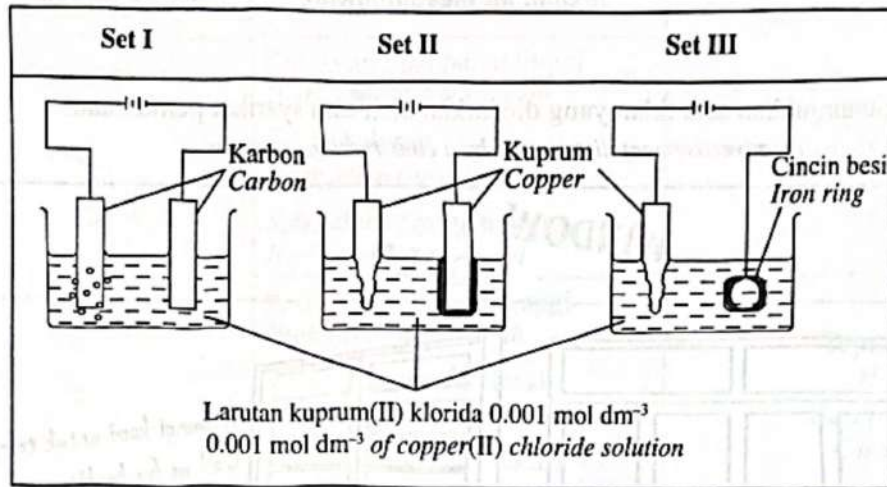
Berdasarkan Rajah 8.2 dan Jadual 7,
Based on Diagram 8.2 and Table 7,

- kenal pasti terminal negatif dan terminal positif
identify the negative terminal and the positive terminal
- tulis persamaan ion keseluruhan dan notasi sel bagi sel kimia itu.
write the overall ionic equation and cell notation for the chemical cell.

[6 markah]
[6 marks]

(c) Rajah 8.3 menunjukkan tiga set eksperimen yang dijalankan untuk mengkaji hasil yang terbentuk di anod dalam elektrolisis larutan kuprum(II) klorida.

Diagram 8.3 shows three sets of experiments conducted to study the products formed at the anodes in the electrolysis of copper(II) chloride solution.



Rajah 8.3
Diagram 8.3

Berdasarkan maklumat dalam Rajah 8.3,
Based on the information in Diagram 8.3,

- (i) senaraikan semua ion yang hadir dalam larutan kuprum(II) klorida
list all ions present in copper(II) chloride solution
- (ii) tulis setengah persamaan yang berlaku di anod bagi Set I dan Set III.
Bandingkan pemerhatian pada warna larutan dalam Set I dan Set III.
write the half equation that occurs at the anodes for Set I and Set III.
Compare the observation in colour of solutions in Set I and Set III.
- (iii) nyatakan hasil yang terbentuk di anod bagi Set I, Set II dan Set III.
Jika kepekatan larutan kuprum(II) klorida dalam Set I ditukarkan kepada 1.0 mol dm^{-3} , nyatakan hasil yang akan terbentuk di anod.
state the products formed at anodes for Set I, Set II and Set III.
If the concentration of copper(II) chloride solution in Set I is changed to 1.0 mol dm^{-3} , state the product formed at the anode.

[10 markah]
[10 marks]

SPM 2024

Bahagian C

[20 markah]

Soalan ini mesti dijawab.

- 11 (a) Rajah 9.1 menunjukkan satu iklan yang diedarkan oleh satu syarikat pembinaan.
Diagram 9.1 shows an advertisement distributed by a construction company.

WINDOW WORLD

Pasang
SMART WINDOW FILM
di bangunan anda!

Install
SMART WINDOW FILM
in your buildings!

Kami di Window World komited untuk melengkapi bangunan anda dengan tingkap kaca fotokromik kami. Dijamin akan mengurangkan pendedahan anda terhadap sinaran UV!

We at Window World are committed to complete your buildings with our photochromic glass window. Guaranteed to reduce your exposure towards UV rays!

Hubungi kami untuk tempahan
Call us for bookings

Rajah 9.1
Diagram 9.1

Berdasarkan Rajah 9.1, apakah bahan yang digunakan dalam tingkap kaca tersebut yang dapat mengurangkan sinaran UV? Terangkan bagaimana bahan itu berfungsi.
Based on Diagram 9.1, what are the substances used in the glass windows that could reduce the UV rays? Explain how the substances work.

[3 markah]
[3 marks]

- (b) Jadual 8 menunjukkan perbandingan sifat beberapa jenis bahan komposit dan kegunaannya.
Table 8 shows the comparison of properties for a few composite materials and their uses.

Jenis bahan komposit Type of composite materials	Sifat Properties	Kegunaan Uses
A	Kekuatan mampatan tinggi High compression strength Tahan kakisan Resistant to corrosion Kekuatan regangan tinggi High stretching strength	Jambatan Bridge Bangunan Building
B	Kekuatan regangan tinggi High stretching strength Tahan kakisan dan lasak Resistant to corrosion and durable Penebat haba dan elektrik Heat and electrical insulator	Topi keledar Helmet Bamper kereta Car bumper
C	Kekuatan mampatan tinggi High compression strength Fleksibel Flexible	Perkabelan rangkaian komputer Computer network cables Kamera video Video camera

Jadual 8
Table 8

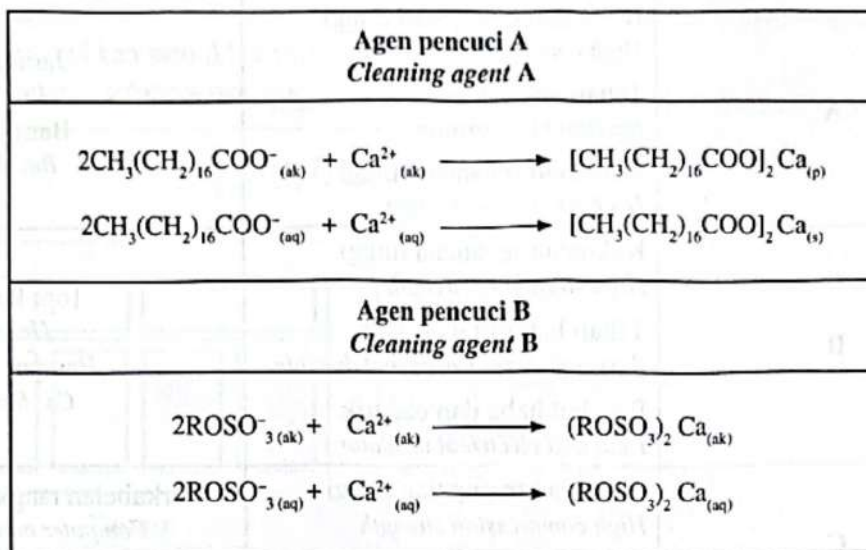
Berdasarkan Jadual 8, nyatakan jenis bahan komposit A, bahan komposit B dan bahan komposit C. Pilih salah satu daripada bahan komposit tersebut dan nyatakan komponen asal bahan berkenaan.
Based on Table 8, state the type of composite materials, A, B and C. Choose one of the composite materials and state the original components of the material.

[5 markah]
[5 marks]

- (c) Air liat ialah air yang mengandungi ion kalsium, Ca^{2+} dan ion magnesium, Mg^{2+} .
 Persamaan kimia pada Rajah 9.2 menunjukkan hasil tindak balas antara agen pencuci A dan agen pencuci B dengan ion kalsium, Ca^{2+} .

Hard water is water that contains calcium ion, Ca^{2+} and magnesium ion, Mg^{2+} .

The chemical equation in Diagram 9.2 shows the products for the reactions between cleaning agent A and cleaning agent B with calcium ion, Ca^{2+} .



Rajah 9.2
Diagram 9.2

Berdasarkan maklumat pada Rajah 9.2, pilih agen pencuci yang lebih berkesan untuk mencuci pakaian dalam air liat dan terangkan jawapan anda.

Based on the information in Diagram 9.2, choose a more effective cleaning agent to wash clothes in hard water and explain your answer.

[4 markah]
[4 marks]

- (d) Kaji pernyataan berikut.

Study the following statement.

"Alam Flora mensasarkan kutipan 500 tan minyak masak terpakai"
 "Alam Flora aims to collect 500 tonnes of used cooking oil"

Sinar Harian

Minyak masak terpakai boleh diproses bagi pembuatan sabun untuk menjana pendapatan. Berdasarkan pernyataan tersebut, cadangkan satu alkali yang boleh digunakan untuk menghasilkan sabun buku. Huraikan kaedah untuk menghasilkan sabun menggunakan alkali itu dengan minyak terpakai.

Used cooking oil can be processed for the manufacturing of soap to earn income. Based on the statement, suggest one alkali that can be used to produce soap bar. Describe the method to produce the soap by using the alkali with used cooking oil.

[8 markah]
[8 marks]