

4541/1
CHEMISTRY
Kertas 1
Ogos
2011
1 ¼ jam



BAHAGIAN PENGURUSAN
SEKOLAH BERASRAMA PENUH DAN SEKOLAH KECEMERLANGAN
KEMENTERIAN PELAJARAN MALAYSIA

PEPERIKSAAN PERCUBAAN
SIJIL PELAJARAN MALAYSIA 2011

CHEMISTRY
Kertas 1

Satu jam lima belas minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. Kertas soalan ini mengandungi **50** soalan.
2. Jawab **semua** soalan
3. Tiap-tiap soalan diikuti oleh empat pilihan jawapan, iaitu **A, B, C** dan **D**. Bagi setiap soalan, pilih **satu jawapan sahaja**. Hitamkan jawapan anda pada kertas jawapan objektif yang disediakan.
4. Jika anda hendak menukar jawapan, padamkan tanda yang telah dibuat, kemudian hitamkan jawapan yang baru.
5. Rajah yang mengiringi soalan tidak dilukiskan mengikut skala kecuali dinyatakan
6. Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogramkan.

Kertas soalan ini mengandungi **29** halaman bercetak

- 1 What is the first step in a scientific investigation?
Apakah langkah pertama dalam suatu penyiasatan sains?
- A Making a hypothesis
Membuat hipotesis
 - B Making an observation
Membuat pemerhatian
 - C Identifying the problem
Mengenal pasti masalah
 - D Planning an experiment
Merancang eksperimen
- 2 Given the formulae for aluminium ion is Al^{3+} and sulphate ion is SO_4^{2-} . Choose the correct chemical formula of aluminium sulphate.
Diberi formula ion aluminium ialah Al^{3+} dan ion sulfat ialah SO_4^{2-} . Pilih formula kimia yang betul bagi aluminium sulfat.
- A $\text{Al}(\text{SO}_4)_3$
 - B $\text{Al}_2(\text{SO}_4)_3$
 - C $\text{Al}_3(\text{SO}_4)_2$
 - D AlSO_4
- 3 Elements are arranged in the modern Periodic Table based on their
Unsur-unsur disusun dalam Jadual Berkala moden berdasarkan
- A atomic radius
jejari atom
 - B nucleon number
nombor nukleon
 - C number of protons
bilangan proton
 - D number of neutrons
bilangan neutron

4 Which substance is an ionic compound?
Bahan manakah adalah sebatian ionik?

- A Ammonia, NH_3
Ammonia, NH_3
- B Ethanol, $\text{C}_2\text{H}_5\text{OH}$
Etanol, $\text{C}_2\text{H}_5\text{OH}$
- C Nitrogen dioxide, NO_2
Nitrogen dioksida, NO_2
- D Magnesium oxide, MgO
Magnesium oksida, MgO

5 Diagram 1 shows the set up of the apparatus for electrolysis
Rajah 1 menunjukkan susunan radas yang digunakan dalam elektrolisis

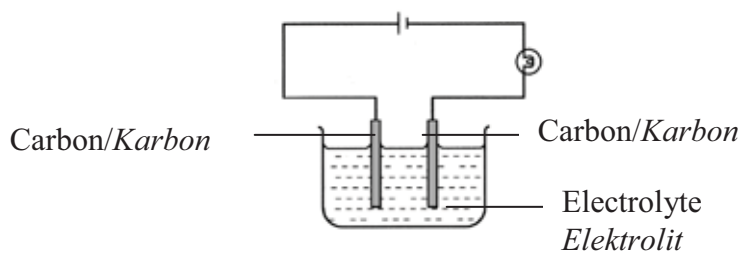


Diagram 1
Rajah 1

Which of the following compound can be used as an electrolyte?
Antara sebatian berikut yang manakah boleh digunakan sebagai elektrolit.

- A Ammonia solution
Larutan ammonia
- B Glucose solution
Larutan glukosa
- C Naphthalene
Naftalena
- D Ethanol
Etanol

- 6 Which of the following is true of the pH of an acid?
Antara berikut yang manakah benar tentang pH sesuatu asid?
- A The more dilute the acid, the higher its pH
Lebih cair asid, lebih tinggi nilai pHnya
 - B The stronger the acid, the higher its pH
Lebih kuat asid, lebih tinggi nilai pHnya
 - C The higher the degree of dissociation, the higher its pH
Lebih tinggi darjah penguraian, lebih tinggi nilai pHnya
 - D The higher the concentration of hydrogen ions, the higher its pH
Lebih tinggi kepekatan ion hydrogen, lebih tinggi nilai pHnya
- 7 Which of the following is a salt and soluble in water?
Antara berikut yang manakah satu garam dan larut dalam air?
- A Sodium hydroxide
Natrium hidroksida
 - B Aluminium oxide
Aluminium oksida
 - C Magnesium nitrate
Magnesium nitrat
 - D Calcium carbonate
Kalsium karbonat
- 8 Which of the following is a fast reaction?
Antara berikut yang manakah tindak balas berlaku cepat?
- A Precipitation reaction
Tindak balas pemendakan
 - B Photosynthesis
Fotosentesis
 - C Fermentation
Penapaian
 - D Rusting
Pengaratan

- 9 The equation in Diagram 2 represents the reaction in the industrial preparation of ammonia.

Persamaan di dalam Rajah 2 mewakili tindak balas penghasilan ammonia dalam industri.

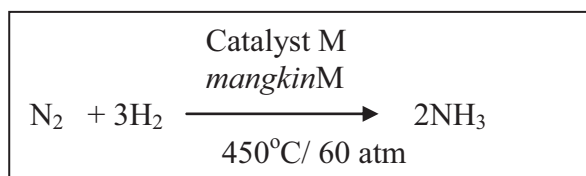


Diagram 2
Rajah 2

What is M?
Apakah M?

- A Iron
Ferum
- B Nickel
Nikel
- C Copper(II) oxide
Kuprum(II) oksida
- D Manganese(IV) oxide
Mangan(IV) oksida
- 10 Which of the following pairs of homologous series and general formula is correct?
Antara berikut yang manakah pasangan siri homologus dan formula umumnya betul?

	Homologous series <i>Siri homologus</i>	General formula <i>Formula umum</i>
A	Alkane <i>Alkana</i>	C_nH_{n+2}
B	Alkene <i>alkena</i>	$\text{C}_n\text{H}_{2n+1}$
C	Alcohol <i>alkohol</i>	$\text{C}_n\text{H}_{2n+1}\text{OH}$
D	Carboxylic acid <i>Asid karboksilik</i>	$\text{C}_n\text{H}_{n+1}\text{COOH}$

- 11 The following is the half equation of a reaction.
Berikut adalah setengah persamaan bagi satu tindak balas.



What is meant by reduction reaction based on the equation?

Apakah yang dimaksudkan dengan tindak balas penurunan berdasarkan persamaan itu?

- A Electrons are received by chlorine
Elektron diterima oleh klorin
- B Electrons are donated by chlorine
Elektron diderma oleh klorin
- C Electrons are received by chloride ions
Elektron diterima oleh ion klorida
- D Electrons are donated by chloride ions
Elektron diderma oleh ion klorida
- 12 Diagram 3 shows the energy profile for the reaction between X and Y to produce Z.
Rajah 3 menunjukkan profil tenaga bagi satu tindak balas antara X dan Y menghasilkan Z.

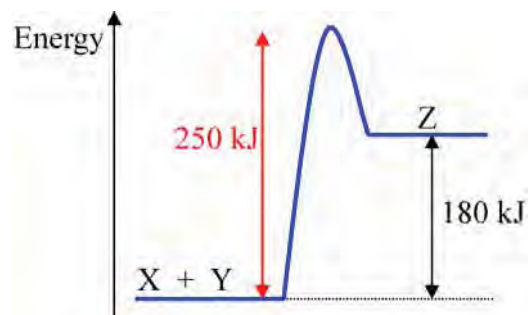


Diagram 3
Rajah 3

What is the activation energy of the reaction and the type of reaction?

Apakah tenaga pengaktifan tindak balas dan jenis tindakbalas itu?

	Activation energy / kJ <i>Tenaga pengaktifan / kJ</i>	Types of reaction <i>Jenis tindak balas</i>
A	250	Exothermic <i>Eksotermik</i>
B	250	Endothermic <i>Endotermik</i>
C	189	Exothermic <i>Eksotermik</i>
D	180	Endothermic <i>Endotermik</i>

- 13 Diagram 4 shows the structural formula of an organic compound.
Rajah 4 menunjukkan formula struktur bagi satu sebatian organik.

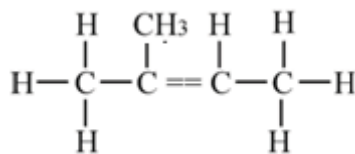


Diagram 4
Rajah 4

What is the IUPAC name for this compound?
Apakah nama IUPAC bagi sebatian ini?

- A 2-pentene
2-pentena
- B 2-methyl-1-butene
2-metil-1-butena
- C 2-methyl-2-butene
2-metil-2-butena
- D 3-methyl-3-butene
3-metil-2-butena
- 14 Which of the following shows the correct type of particle for each substance?
Antara berikut, yang manakah menunjukkan jenis zarah yang betul bagi setiap bahan?

	Atom <i>Atom</i>	Molecule <i>Molekul</i>
A	Carbon <i>Karbon</i>	Carbon dioxide <i>Karbon dioksida</i>
B	Sulphur dioxide <i>Sulfur dioksida</i>	Sulphuric acid <i>Asid sulfurik</i>
C	Sodium <i>Natrium</i>	Sodium chloride <i>Natrium klorida</i>
D	Silicon dioxide <i>Silikon dioksida</i>	Silicon <i>Silikon</i>

- 15 Diagram 5 shows the set-up of apparatus to determine the empirical formula of a metal oxide.

Rajah 5 menunjukkan susunan radas untuk menentukan satu formula empirik logam oksida.

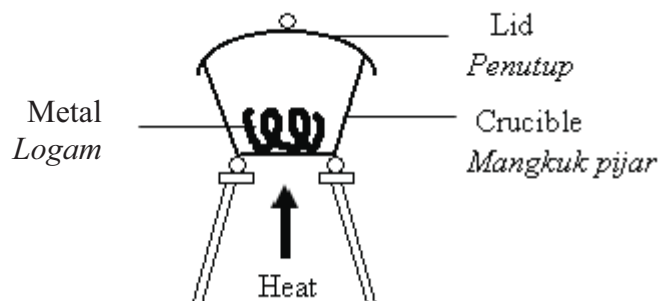


Diagram 5
Rajah 5

Which of the following metal is suitable to be used in the experiment?

Antara logam berikut yang manakah sesuai digunakan dalam eksperimen itu?

- A Lead
Plumbum
- B Copper
Kuprum
- C Aluminium
Aluminium
- D Stanum
Tin
- 16 Diagram 6 shows a Periodic Table with four elements represented by letters A, B, C and D. Which of these elements has an electron arrangement of 2.8?

Rajah 6 menunjukkan empat unsur yang diwakili oleh A,B,C dan D dalam Jadual Berkala. Antara unsur berikut yang manakah mempunyai susunan elektron 2.8?

1	2		13	14	15	16	17	18
A								D
							C	
	B							

Diagram 6
Rajah 6

- 17 What ions are present in sodium sulphate solution?
Apakah ion-ion yang hadir dalam larutan natrium sulfat?

- A Na^+ , SO_4^{2-}
 B Na^+ , S^{2-} , H^+ , OH^-
 C Na^+ , SO_4^{2-} , H^+ , O^{2-}
 D Na^+ , SO_4^{2-} , H^+ , OH^-

- 18 Copper(II) sulphate solution is electrolysed using copper electrodes. What can be observed at the anode and cathode after 30 minutes?

Larutan kuprum(II) sulfat dielektrolisiskan menggunakan elektrod kuprum. Apakah yang diperhatikan pada anod dan katod selepas 30 minit?

	Anode <i>Anod</i>	Cathode <i>Katod</i>
A	Copper plate becomes thinner <i>Plat kuprum menjadi nipis</i>	Copper plate becomes thicker <i>Plat kuprum menjadi tebal</i>
B	Copper plate becomes thinner <i>Plat kuprum menjadi nipis</i>	Gas bubbles are released <i>Gelembung-gelembung gas terbebas</i>
C	Copper plate becomes thicker <i>Plat kuprum menjadi tebal</i>	Copper plate becomes thinner <i>Plat kuprum menjadi nipis</i>
D	Gas bubbles are released <i>Gelembung-gelembung gas terbebas</i>	Copper plate becomes thicker <i>Plat kuprum menjadi tebal</i>

- 19 Which of the following properties is **true** about alkali?
*Antara berikut, yang manakah **benar** tentang alkali?*
- I Soluble in water
Larut dalam air
 - II Alkali is not corrosive
Alkali tidak menghakis
 - III Changes red litmus paper to blue
Menukarkan warna kertas litmus merah ke biru
 - IV Has pH more than 7
Mempunyai nilai pH lebih daripada 7
- A I, II and III
I, II dan III
- B I, II and IV
I, II dan IV
- C I, III and IV
I, III dan IV
- D II, III and IV
II, III dan IV
- 20 Which of the following substances are suitable to prepare copper(II) chloride?
Antara bahan berikut yang manakah sesuai untuk menyediakan kuprum(II) klorida?
- I Copper metal and hydrochloric acid
Logam kuprum dan asid hidroklorik
 - II Copper(II) nitrate and sodium chloride
Kuprum(II) nitrat dan natrium klorida
 - III Copper(II) oxide and hydrochloric acid
Kuprum(II) oksida dan asid hidroklorik
 - IV Copper(II) carbonate and hydrochloric acid
Kuprum(II) karbonat dan asid hidroklorik
- A I and II
I dan II
- B III and IV
III dan IV
- C I, III and IV
I, III dan IV
- D I, II, III and IV
I, II, III dan IV

- 21 Diagram 7 shows the structural formula of a polymer
Rajah 7 menunjukkan formula struktur satu polimer.

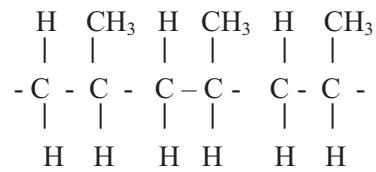
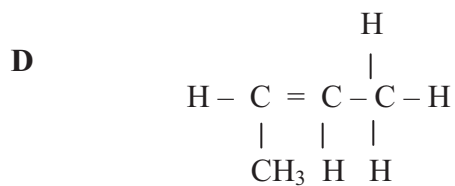
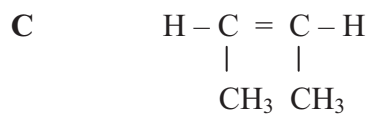
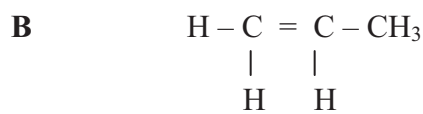
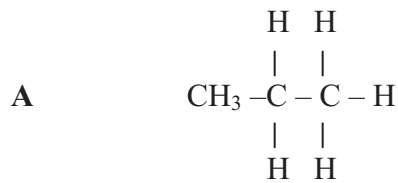


Diagram 7
Rajah 7

Which of the following is the structural formula for its monomer?
Antara berikut yang manakah formula struktur bagi monomernya?



- 22 Diagram 8 show the apparatus set up used to study the rate of reaction of calcium carbonate and hydrochloric acid
Rajah 8 menunjukkan susunan radas untuk mengkaji kadar tindak balas antara kalsium karbonat dengan asid hidroklorik

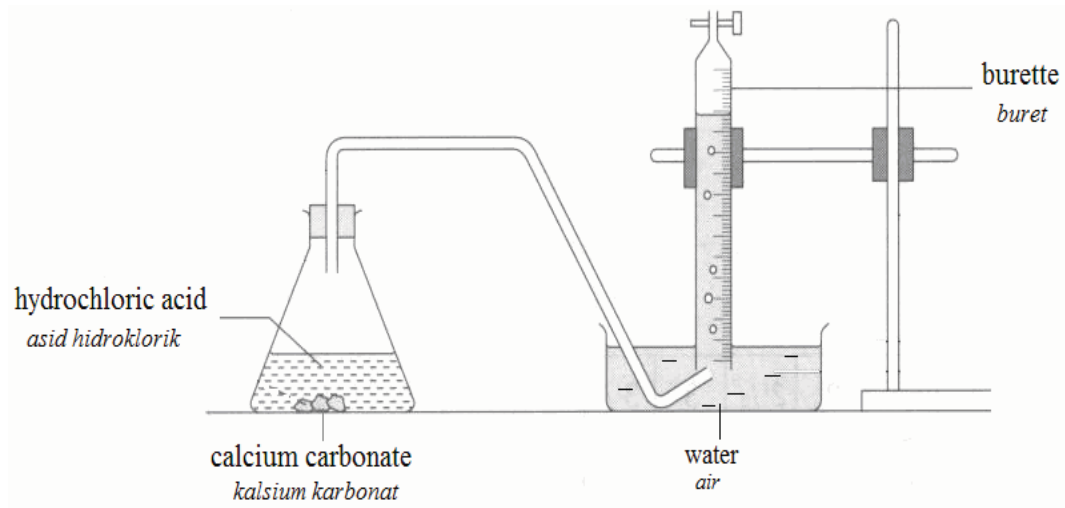


Diagram 8
Rajah 8

The rate of the above reaction can be increased by
Kadar bagi tindak balas di atas boleh ditingkatkan dengan

- A Grinding the marble chips
Menumbuk halus kalsium karbonat
- B Lowering the temperature of hydrochloric acid
Menurunkan suhu asid hidroklorik
- C Using a larger flask
Menggunakan kelalang yang lebih besar
- D Adding water to hydrochloric acid
Menambahkan air ke dalam asid

- 23 Diagram 9 shows the apparatus set up to determine the position of carbon in the Reactivity Series of Metals..

Rajah 9 menunjukkan susunan radas untuk menentukan kedudukan karbon dalam Siri Kereaktifan Logam.

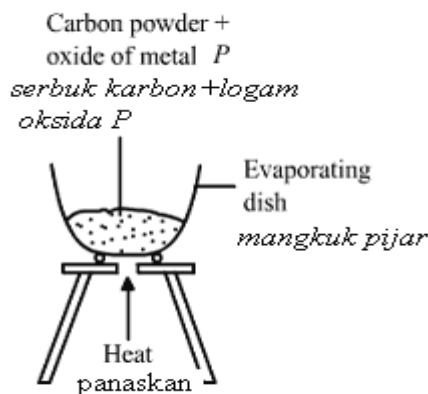


Diagram 9
Rajah 9

Excess carbon powder is mixed thoroughly with the powder oxide of metal *P* and then heated strongly. The experiment is repeated with oxides of metals *Q* and *R*. The following observations are obtained ,

Serbuk karbon yang berlebihan digaul rata bersama dengan serbuk oksida logam *P* dan seterusnya dipanaskan dengan kuat. Eksperimen diulang menggunakan oksida logam *P* dan oksida logam *R*. Pemerhatian berikut diperolehi,

Mixture / Campuran	Observation / Pemerhatian
Carbon + <i>P</i> metal oxide Karbon + oksida logam <i>P</i>	Burns brightly, grey powder is formed Menyala dengan terang ,serbuk kelabu terhasil
Carbon + <i>Q</i> metal oxide Karbon + oksida logam <i>Q</i>	Glow faintly, grey powder is formed Membara dengan malap, serbuk kelabu terhasil
Carbon + <i>R</i> metal oxide Karbon+ oksida logam <i>R</i>	No change Tiada perubahan

The position of carbon with respect to the metals *P*, *Q* and *R* in the reactivity series of metal in **descending order** is

Kedudukan karbon berbanding logam-logam *P*,*Q* dan *R* dalam Siri Kereaktifan Logam dalam turutan menurun ialah

- A P, Q, R, Carbon
- B P, Q, Carbon, R
- C Carbon, R, Q, P
- D R, Carbon, Q, P

- 24 A carbon compound Q has the characteristics below
- Colourless the brown colour of bromine water
 - Colourless the purple colour of acidified potassium manganate(VII)

What is Q?

- A Hexane
heksana
- B Hexene
heksena
- C Ethanoic acid
Asid etanoik
- D Ethyl ethanoate
Etil etanoat
- 25 Diagram 10 shows an energy level diagram for the displacement reaction
Rajah 10 menunjukkan rajah aras tenaga bagi satu tindak balas penyesaran

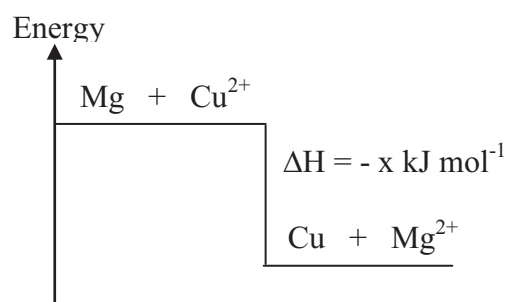


Diagram 10
Rajah 10

Which statement can be deduced from the Diagram 10?

Pernyataan manakah yang boleh dirumuskan daripada Rajah 10?

- A The heat of displacement is - x kJ mol⁻¹
Haba penyesaran ialah - x kJ mol⁻¹
- B x kJ of energy is needed for the reaction
x kJ tenaga diperlukan untuk tindak balas ini
- C The products contain more energy than the reactants
Hasil tindak balas mengandungi lebih banyak tenaga daripada bahan tindak balas
- D The temperature at the end of the reaction is lower than that at the beginning of the reaction
Suhu akhir tindak balas lebih rendah daripada suhu awal tindak balas

- 26 Why detergents more effective than soaps?
Kenapakah detergen lebih berkesan berbanding dengan sabun?
- A Detergents are biodegradable whereas soaps are non biodegradable.
Detergen boleh terbiodegradasi manakala sabun tidak terbiodegradasi.
- B Detergents reduce the surface tension of water, whereas soaps do not.
Detergen merendahkan ketegangan permukaan air manakala sabun tidak merendahkan ketegangan permukaan air.
- C Detergents do not form scum in hard water, whereas soaps form scum.
Detergen tidak membentuk kekat didalam air liat manakala sabun membentuk kekat.
- D Detergents are soluble in grease, whereas soaps are insoluble in grease.
Detergen larut dalam gris manakala sabun tidak larut dalam gris.
- 27 Table 1 shows the number of neutrons for bromine isotopes.
Jadual 1 menunjukkan bilangan neutron bagi isotop-isotop bromin.

Isotope <i>Isotop</i>	Number of neutrons <i>Bilangan neutron</i>
Bromine-79	44
Bromine-81	X

Table 1
Jadual 1

What is the value of x?
Apakah nilai x?

- A 35
B 37
C 44
D 46

- 28 In an experiment, 24 g of element X react with 32 g sulphur to form a compound.
What is the empirical formula of that compound?
[Relative atomic mass ; X = 6, S = 32]
- Dalam satu eksperimen, didapati 24 g unsur X bertindak balas dengan sulfur membentuk sebatian.
Apakah formula empirik sebatian itu?
[Jisim atom relatif; X = 6, S = 32]*
- A XS
- B X₂S
- C X₂S₃
- D X₄S
- 29 Element X is below potassium in the Periodic Table. We can predict that
Unsur X berada di bawah kalium dalam Jadual Berkala. Boleh diramalkan bahawa
- A Element X is less electropositive than potassium
Unsur X adalah kurang elektropositif daripada kalium
- B The size of atom X is smaller than potassium
Saiz atom X adalah lebih kecil daripada kalium
- C Atom of element X has more valence electrons than potassium
Atom unsur X mempunyai lebih banyak bilangan elektron valens daripada kalium
- D Element X reacts more vigorously than potassium in oxygen
Unsur X bertindak balas lebih cergas berbanding kalium dalam oksigen
- 30 Which statement explains why ionic compound has high melting point?
Pernyataan manakah menerangkan mengapa sebatian ion mempunyai takat lebur yang tinggi?
- A Covalent bond between atoms is strong.
Ikatan kovalen antara atom-atom adalah kuat.
- B Electrostatic force between ions is strong.
Daya elektrostatik antara ion-ion adalah kuat.
- C There are free moving ions in the compound.
Terdapat ion-ion yang bebas bergerak dalam sebatian itu.
- D More energy is needed to overcome the forces between molecules.
Lebih tenaga diperlukan untuk mengatasi daya antara molekul.

- 31 Table 2 shows the observation of electrolysis of a substance using carbon electrode .
Jadual 2 menunjukkan pemerhatian bagi elektrolisis suatu bahan menggunakan elektrod karbon.

Electrode <i>Elektrod</i>	Observation <i>Pemerhatian</i>
Anode <i>Anod</i>	A greenish-yellow gas released <i>Gas berwarna kuning kehijauan terbebas</i>
Cathode <i>Katod</i>	A colorless gas which burns with a 'pop' sound is released <i>Gas yang tidak berwarna dan terbakar dengan bunyi pop terbebas</i>

Table 2

Jadual 2

The electrolyte maybe

Elektrolit itu mungkin

- A Dilute hydrochloric acid
Asid hidroklorik cair
- B Concentrated potassium chloride solution.
Larutan kalium klorida pekat
- C Copper (II) chloride solution.
Larutan kuprum(II) klorida
- D Concentrated magnesium bromide solution
Larutan magnesium bromida pekat.
- 32 Acid rain causes the land to become acidic. Farmers neutralize acidity in the soil by adding
Hujan asid menyebabkan tanah menjadi berasid. Petani meneutralkan keasidan tanah dengan menambahkan
- A Lime
Kapur
- B Sulphur
Sulfur
- C Zinc nitrate
Zink nitrat
- D Ammonium sulphate
Ammonium sulfat

- 33 Diagram 11 shows the apparatus set-up for the heating salt J.
Rajah 11 menunjukkan susunan radas bagi pemanasan garam J.

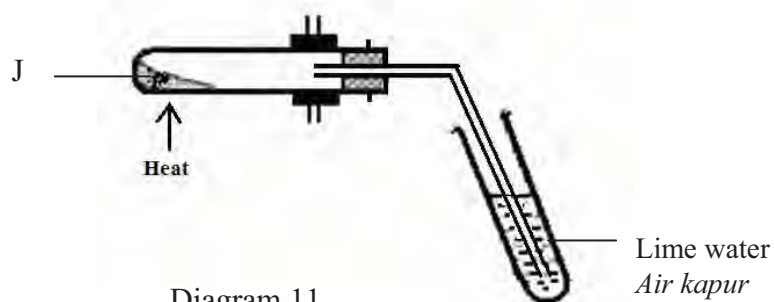


Diagram 11
Rajah 11

When J is heated, the lime water become milky and the hot residue is brown but turns yellow on cooling.

What is J?

Apabila J dipanaskan, air kapur menjadi keruh dan baki panas berwarna perang tetapi berubah kuning semasa sejuk.

Apakah J?

- A Lead(II) oxide
Plumbum(II) oxide
- B Zinc carbonate
Zink karbonat
- C Lead(II) carbonate
Plumbum(II) karbonat
- D Lead(II) nitrate
Plumbum(II) nitrat

- 34 A substance has the following properties:
Suatu bahan mempunyai ciri-ciri berikut:

- Hard and opaque
Keras dan tidak lutcahaya
- Good insulator of heat and electricity
Penebat haba dan elektrik yang baik
- Inert towards chemicals
Lengai terhadap bahan kimia

Which of following substances has the above properties?

Antara bahan-bahan berikut yang manakah mempunyai ciri-ciri seperti di atas?

- A Ceramics
Seramik
- B Glass
Kaca
- C Metal
Logam
- D Polymer
Polimer

- 35 Table 3 shows the volume of oxygen gas released from the decomposition of hydrogen peroxide:

Jadual 3 menunjukkan isipadu gas oksigen yang terbebas daripada penguraian hidrogen peroksida:

Time / minute <i>Masa / minit</i>	0	1	2	3	4	5	6
Volume of gas / cm³ <i>Isipadu gas / cm³</i>	0	5	10	13	15	15	15

Table 3

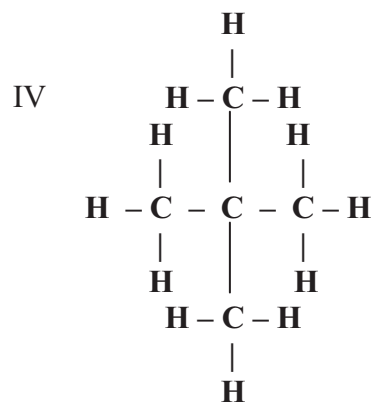
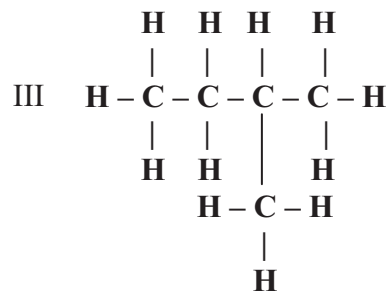
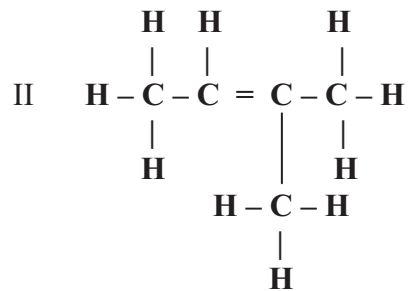
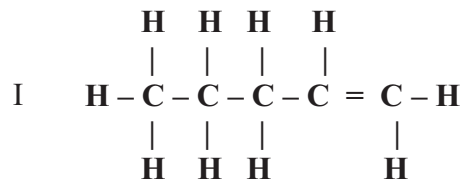
Jadual 3

What is the average rate of decomposition of hydrogen peroxide for the first four minutes?

Berapakah kadar penguraian hidrogen peroksida bagi empat minit yang pertama?

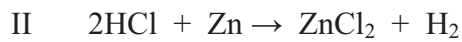
- A 2.50 cm³ min⁻¹
- B 3.00 cm³ min⁻¹
- C 3.75 cm³ min⁻¹
- D 15.00 cm³ min⁻¹

- 36 Which of the following are isomers of pentane
Antara berikut yang manakah merupakan isomer bagi pentana



- A I and II
 I dan II
- B I and III
 I dan III
- C III and IV
 III dan IV
- D II, III and IV
 II, III dan IV

- 37 Which of the following equations represent a redox reaction?
Antara persamaan beriku, yang manakah mewakili tindak balas redok?



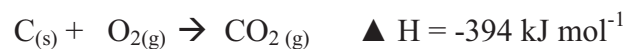
A I and II
I dan II

B II and IV
II dan IV

C I and III
I dan III

D III and IV
III dan IV

- 38 Carbon burns in oxygen in a reaction as shown in the equation below.
Karbon terbakar dalam oksigen seperti ditunjukkan dalam persamaan dibawah



What is the mass of carbon that must be burnt completely to produce 78.8 kJ of heat?
Berapakah jisim karbon yang mesti terbakar untuk menghasilkan 78.8 kJ haba?

A 0.2 g

B 1.2 g

C 2.4 g

D 6.0 g

- 39 Which of the following can be used to cure headaches?
Antara berikut yang manakah dapat diguna untuk merawat sakit kepala?

A Cortisone
Kortison

B Streptomycin
Streptomisin

C Paracetamol
Parasetamol

D Barbiturates
Barbiturat

- 40 Diagram 12 shows the electron arrangement of a G^{2+} ion.
Rajah 12 menunjukkan susunan elektron bagi suatu ion G^{2+} .

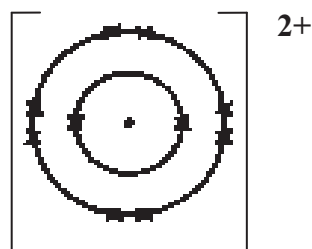
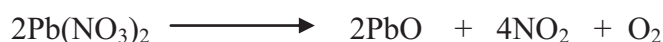


Diagram 12
Rajah 12

G^{2+} ion contains 12 neutrons.
What is the nucleon number of atom G?
*Ion G^{2+} mengandungi 12 neutron.
Apakah nombor nukleon atom G?*

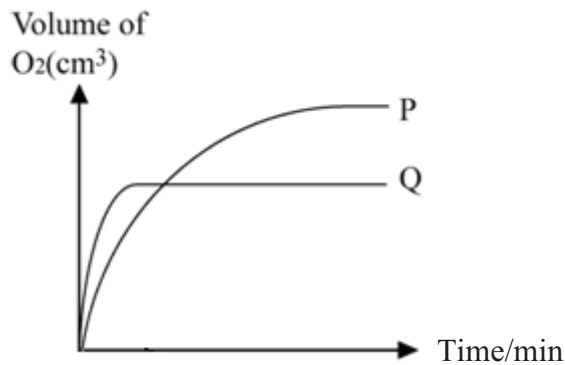
- A 10
B 12
C 20
D 24
- 41 The following equation shows the decomposition reaction of lead(II) nitrate when heated at room temperature and pressure.
Persamaan berikut menunjukkan tindak balas penguraian plumbum(II) nitrat apabila dipanaskan pada suhu dan tekanan bilik.



Which of the following is true when 0.1 mol of lead(II) nitrate is decomposed?
[Relative formula mass : $\text{PbO} = 223$ and 1 mol gas occupies the volume of 24 dm^3 at room temperature and pressure]
*Antara yang berikut, yang manakah benar apabila 1 mol plumbum(II) nitrat terurai?
[Jisim formula relatif: $\text{PbO} = 223$ dan 1 mol gas menepati isipadu sebanyak 24 dm^3 pada suhu dan tekanan bilik.]*

- A 44.6 g of lead(II) oxide is formed.
44.6 g plumbum(II) oksida terbentuk.
- B 4800 cm^3 of nitrogen dioxide is given off.
 4800 cm^3 gas nitrogen dioksida terbebas
- C 2.4 dm^3 of oxygen gases is given off.
 2.4 dm^3 gas oksigen terbebas.
- D 4.46 g of lead(II) oxide is formed.
4.46 g plumbum(II) oksida terbentuk.

- 42 The rate of catalytic decomposition of 20 cm^3 of 1.0 mol dm^{-3} of hydrogen peroxide is shown in curve Q.
Kadar penguraian bermangkin 20 cm^3 1.0 mol dm^{-3} hidrogen peroksida ditunjukkan sebagai lengkung Q.



Which of the following changes to the experiment will produce curve P?
Yang mana satukah perubahan terhadap eksperimen berikut yang menghasilkan lengkung P?

- A** Cool the hydrogen peroxide solution to lower temperature.
Sejukkan larutan hidrogen peroksida ke suhu yang lebih rendah
- B** Repeat the experiment by using 50 cm^3 of 0.5 mol dm^{-3} of hydrogen peroxide solution.
Ulang eksperimen dengan menggunakan 50 cm^3 0.5 mol dm^{-3} larutan hidrogen peroksida
- C** Repeat the experiment by using 20 cm^3 of 1.5 mol dm^{-3} of hydrogen peroxide solution.
Ulang eksperimen dengan menggunakan 20 cm^3 1.5 mol dm^{-3} larutan hidrogen peroksida
- D** Adding more catalyst to the 20 cm^3 of 1.0 mol dm^{-3} of hydrogen peroxide solution.
Tambah lebih banyak mangkin kepada 20 cm^3 1.0 mol dm^{-3} larutan hidrogen peroksida

43 Table 4 shows the result of an experiment for three simple voltaic cells.

Jadual 4 menunjukkan keputusan suatu eksperimen bagi tiga sel ringkas.

Positive terminal	Negative terminal	Voltage (V)
W	X	0.3
Y	X	0.8
X	Z	1.9

Table 4
Jadual 4

The arrangement of the metals in the electrochemical series in descending order of electropositivity is

Susunan logam-logam mengikut keelektropositifan dalam siri elektrokimia mengikut urutan menurun adalah

- A W, Z, X, Y
- B Y, W, X, Z
- C Y, W, Z, X
- D Z, X, W, Y

- 44 Diagram 13 shows the standard representation for the atoms of two elements, X and Y.
Rajah 13 menunjukkan perwakilan piawai atom bagi dua unsur, X dan Y.

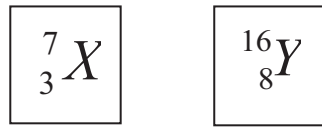
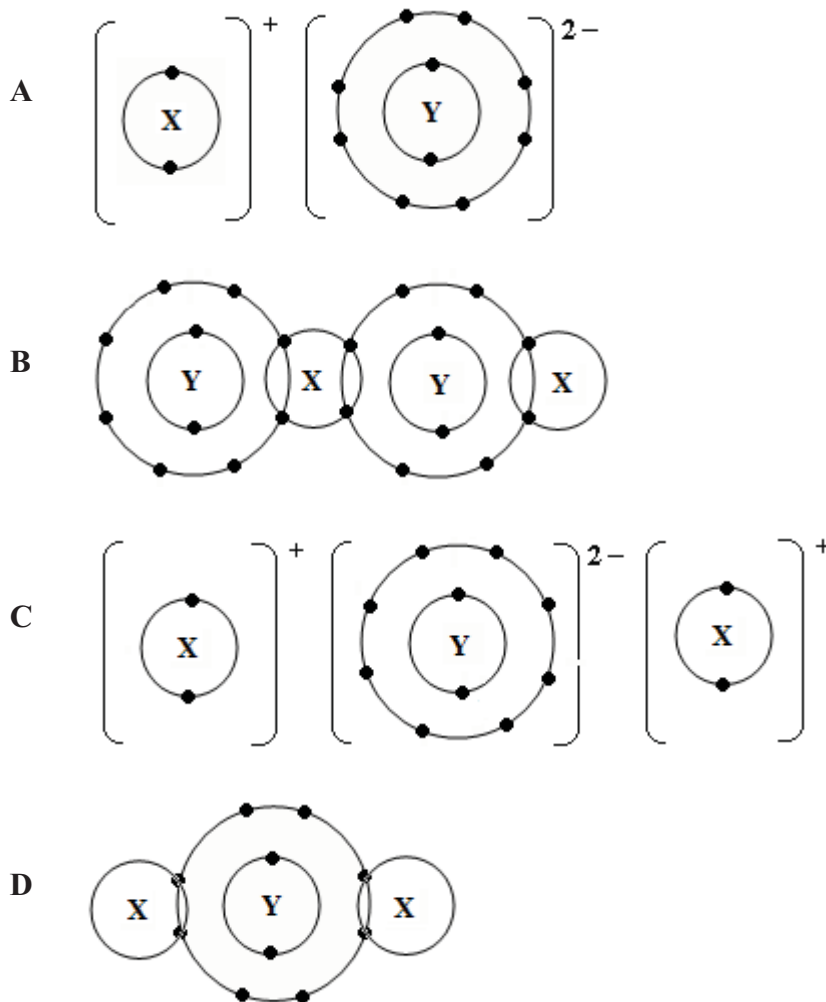


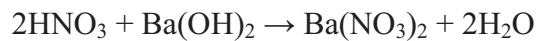
Diagram 13
Rajah 13

Which of the following represents the electron arrangement for a compound formed when element X reacts with element Y?

Antara berikut, yang manakah mewakili susunan elektron bagi satu sebatian yang terbentuk apabila unsur X bertindak balas dengan unsur Y?



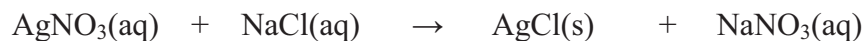
- 45 The equation represents a neutralisation reaction.
Persamaan mewakili satu tindak balas peneutralan



10.0 cm³ of barium hydroxide solution 0.1 mol dm⁻³ is titrated with nitric acid 0.1 mol dm⁻³. If the initial reading of the burette is 10.00 cm³, what is the final reading of the burette?

10.0 cm³ larutan barium hidroksida 0.1 mol dm⁻³ dititrat dengan asid nitrik 0.1 mol dm⁻³. Jika bacaan awal buret ialah 10.00 cm³, berapakah bacaan akhir buret?

- A 20.00 cm³
B 30.00 cm³
C 40.00 cm³
D 50.00 cm³
- 46 The following equation shows the reaction between silver nitrate and sodium chloride.
Persamaan berikut menunjukkan tindak balas antara argentum nitrat dan natrium klorida



What is the mass of the insoluble salt produced when 50 cm³ 1.0 mol dm⁻³ silver nitrate reacts with 50 cm³ 2.0 mol dm⁻³ sodium chloride?

[Relative atomic mass : N = 14, O = 16, Na = 23, Cl = 35.5, Ag = 108]

Berapakah jisim garam taklarut yang terhasil apabila 50 cm³ 1.0 mol dm⁻³ argentum nitrat bertindak balas 50 cm³ 2.0 mol dm⁻³ natrium klorida?

[Jisim atom relatif : N = 14, O = 16, Na = 23, Cl = 35.5, Ag = 108]

- A 8.50 g
B 4.25 g
C 7.175 g
D 14.35 g

- 47 Which of the following reactions needs a catalyst for the production of sulphuric acid by Contact Process?
Antara tindak balas berikut yang manakah memerlukan mangkin untuk penghasilan asid sulfurik melalui Proses Sentuh?

- A $S + O_2 \rightarrow SO_2$
B $2SO_2 + O_2 \rightarrow 2SO_3$
C $SO_3 + H_2S_2O_7 \rightarrow H_2S_2O_7$
D $H_2S_2O_7 + H_2O \rightarrow 2H_2SO_4$

- 48 The following information shows the effect of a particular factor on the rate of reaction.
Maklumat berikut menunjukkan kesan suatu faktor yang mempengaruhi kadar tindak balas.

- Particles have high kinetic energy
Zarah mempunyai tenaga kinetik yang tinggi
- Numbers of particles with activation energy increases
Bilangan zarah yang mempunyai tenaga pengaktifan bertambah
- Frequency of collision between particles increases
Frekuensi perlanggaran antara zarah bertambah
- Frequency of effective collision increases
Frekuensi perlanggaran efektif bertambah

Which of the following can cause the above effect?
Manakah antara berikut memberikan kesan seperti di atas?

- A Increasing total surface area of reactants.
Menambah jumlah luas permukaan bahan tindak balas
- B Increasing the concentration of reactants.
Menambah kepekatan bahan tindak balas
- C Adding a catalyst.
Menambah mangkin
- D Increasing temperature of reactants
Menaikkan suhu bahan tindak balas

- 49 Diagram 14 shows the apparatus arrangement to investigate the oxidation and reduction in terms of the transfer of electron at a distance.

Rajah 14 menunjukkan susunan radas bagi mengkaji pengoksidaan dan penurunan berdasarkan pemindahan elektron pada satu jarak.

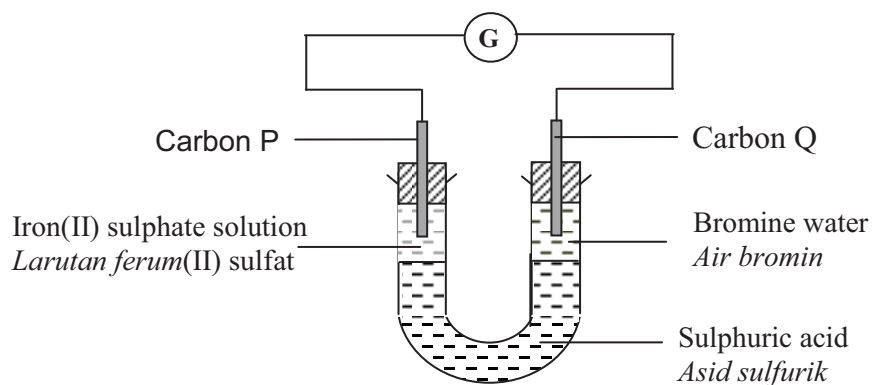


Diagram 14
Rajah 14

Which of the following represents the half equation for reaction occurs at P and Q electrode.

Antara berikut yang manakah mewakili persamaan setengah bagi tindak balas yang berlaku di elektrod P dan Q.

	P	Q
A	$\text{Fe}^{2+} \rightarrow \text{Fe}^{3+} + e$	$\text{Br}_2 + 2e \rightarrow 2\text{Br}^-$
B	$\text{Fe}^{2+} \rightarrow \text{Fe}^{3+} + e$	$\text{C} + 4e \rightarrow \text{C}^{4-}$
C	$2\text{SO}_4^{2-} \rightarrow \text{S}_2\text{O}_8^{2-} + 2e$	$\text{Br}_2 + 2e \rightarrow 2\text{Br}^-$
D	$\text{Fe} \rightarrow \text{Fe}^{2+} + 2e$	$2\text{Br}^- \rightarrow \text{Br}_2 + 2e$

- 50 The following equation shows a combustion reaction on propanol?
Persamaan berikut menunjukkan tindak balas pembakaran propanol



What are the values of w, x, y and z?
Apakah nilai w, x, y dan z?

	w	x	y	z
A	1	9	3	4
B	1	5	3	4
C	2	9	6	8
D	2	5	6	8

END OF QUESTION PAPER
KERTAS SOALAN TAMAT

Nama :

Tingkatan:

SULIT
4541/2
CHEMISTRY
Kertas 2
Ogos 2011
2 ½ jam



**BAHAGIAN PENGURUSAN
SEKOLAH BERASRAMA PENUH DAN SEKOLAH KECEMERLANGAN
KEMENTERIAN PELAJARAN MALAYSIA**

**PEPERIKSAAN PERCUBAAN
SIJIL PELAJARAN MALAYSIA 2011**

**CHEMISTRY
Kertas 2**

Dua jam tiga puluh minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. *Tulis Nama dan Tingkatan anda pada ruangan yang disediakan*
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>			
Bahagian	Soalan	Markah penuh	Markah diperoleh
A	1	9	
	2	9	
	3	10	
	4	10	
	5	11	
	6	11	
B	7	20	
	8	20	
C	9	20	
	10	20	
Jumlah			

Kertas soalan ini mengandungi 23 halaman bercetak

Section A
Bahagian A

[60 marks]
[60 markah]

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

- 1 Table 1 shows the particulars of four different types of manufacture substances in the industries

Rajah 1 menunjukkan butiran tentang empat jenis bahan buatan dalam industri.

Manufactured products <i>Bahan buatan</i>	Name of products <i>Nama hasil</i>	Components <i>Kompenan</i>
Alloy <i>Aloi</i>	Brass <i>Loyang</i>	copper and X <i>kuprum dan X</i>
Glass <i>Kaca</i>	Lead glass <i>Kaca plumbum</i>	Y, sodium oxide and lead. <i>Y, natrium oksida dan plumbum</i>
Composite material <i>Bahan komposit</i>	Reinforced concrete <i>Konkrit yang diperkukuhkan</i>	Concrete (cement, sand and small pebbles) and Z <i>Konkrit (simen, pasir dan batu kerikil) dan Z</i>
Polymer <i>Polimer</i>	P	vinyl chloride <i>vinil klorida</i>

Table 1
Jadual 1

- (a) (i) State the name of element X in brass.
Nyatakan nama bagi unsur X dalam loyang

.....
[1 mark]

- (ii) Describe how the present of element X increases the hardness of brass.
Terangkan bagaimana kehadiran unsur X meningkatkan kekerasan loyang.

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

- (iii) Z is an example of another alloy that is used to manufacture reinforced concrete.
What is Z?
Z adalah satu contoh lain aloi yang digunakan dalam pembuatan konkrit yang diperkukuhkan.
Apakah Z ?

.....
[1 mark]

- (b) Substance Y is part of components in borosilicate glass.
Bahan Y adalah sebahagian daripada komponen dalam kaca borosilikat.

- (i) State the name of substance Y.
Nyatakan nama bagi bahan Y itu.

.....
[1 mark]

- (ii) Borosilicate glass is usually used as laboratory glassware.
State one characteristic of borosilicate glass compare to the other types of glasses.
Kaca borosilikat lazimnya digunakan sebagai peralatan makmal.
Nyatakan satu sifat kaca borosilikat berbanding dengan kaca jenis yang lain

.....
[1 mark]

- (c) The chemical formula of monomer P is C_2H_3Cl .
Formula kimia bagi monomer P ialah C_2H_3Cl .

- (i) Draw the structural formula of monomer P.
Lukiskan formula struktur bagi monomer P.

[1 mark]

- (ii) State the name of compound P.
Nyatakan nama bagi sebatian P.

.....
[1 mark]

- (iii) State the name of process that change monomer to polymer.
Nyatakan nama bagi proses untuk menukar monomer kepada polimer.

.....
[1 mark]

- 2 Table 2 shows the elements in period 3 of the Periodic Table of elements.

Jadual 2 menunjukkan unsur-unsur dalam kala 3 bagi Jadual Berkala Unsur

Element <i>Unsur</i>	Na	Mg	Al	Si	P	S	Cl	Ar
Proton number <i>Nombor proton</i>	11	12	13	14	15	16	17	18

Table 2.1
Jadual 2.1

- (a) What is meant by *period*?

Apakah yang dimaksudkan dengan kala?

.....
[1 mark]

- (b) Why these elements are place in period 3?

Mengapakah unsur-unsur ini terletak dalam kala 3?

.....
[1 mark]

- (c) Sodium and chlorine can react with water to form a solution.

Natrium dan klorin boleh bertindak balas dengan air membentuk suatu larutan.

- (i) Write the chemical equation for the reaction of chlorine with water in Table 2.2.

Tulis persamaan kimia bagi tindak balas klorin dengan air dalam Jadual 2.2

[2 marks]

Element <i>Unsur</i>	Chemical equation <i>Persamaan kimia</i>	Colour change of litmus paper when dip into the solution <i>Perubahan warna kertas litmus apabila dicelupkan ke dalam larutan</i>
Sodium <i>Natrium</i>	$2\text{Na} + 2\text{H}_2\text{O} \rightarrow 2\text{NaOH} + \text{H}_2$
Chlorine <i>Klorin</i>

Table 2.2
Jadual 2.2

(ii) Litmus paper is placed into the solution formed.

State the colour change of the litmus paper in Table 2.2

Kertas litmus dimasukkan ke dalam larutan yang terhasil.

Nyatakan perubahan warna kertas litmus dalam Jadual 2.2

[2 marks]

(d) (i) State the changes in the atomic size of the elements across period from left to right.

Nyatakan perubahan saiz atom bagi unsur-unsur ini merentasi kala dari kiri ke kanan.

.....
[1 mark]

Explain your answer in (d)(i)
Terangkan jawapan anda di (d)(i).

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

3. Diagram 3 shows the apparatus set-up of a chemical cell.
Rajah 3 menunjukkan susunan radas bagi sel kimia.

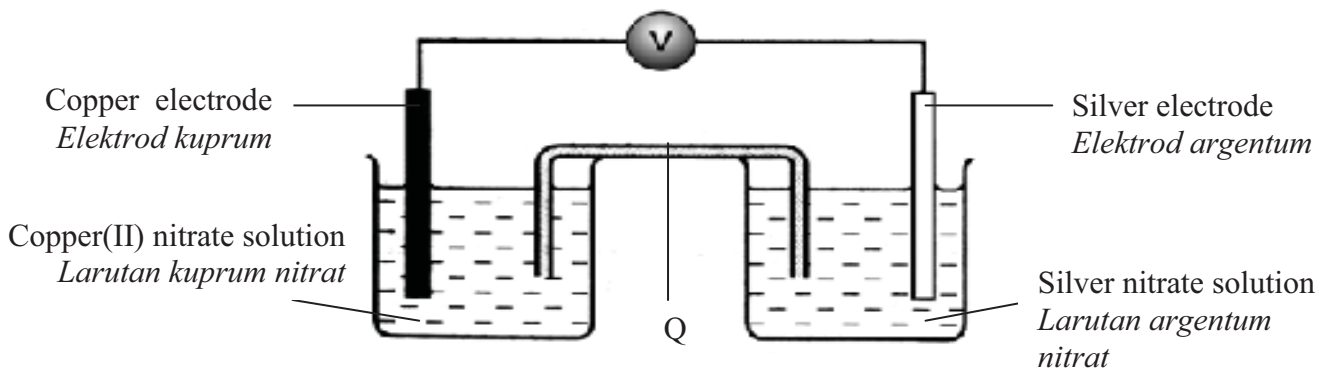


Diagram 3
Rajah 3

(a) What is the process that takes place at copper electrode?
Apakah proses yang berlaku di elektrod kuprum?

.....
 [1 mark]

(b) (i) State the function of Q.
Nyatakan fungsi Q.

.....
 [1 mark]

(ii) Name a chemical substance that can be used as Q.
Namakan satu bahan kimia yang boleh digunakan sebagai Q.

.....
 [1mark]

(c) In Diagram 3, mark the direction of the electron flow.
Dalam Rajah 3, tandakan arah pengaliran elektron .

[1 mark]

(d) State the colour change of copper(II) nitrate solution . Give a reason for your answer.
Nyatakan perubahan warna larutan kuprum(II) nitrat. Berikan satu sebab bagi jawapan anda.

.....

 [2 marks]

- (e) Write the half equation for the reaction at the negative terminal.
Tuliskan setengah persamaan bagi tindak balas di terminal negatif.

.....
[2 marks]

- (f) If copper electrode and copper(II) nitrate solution are replaced with zinc electrode and zinc nitrate solution,
Jika elektrod kuprum dan larutan kuprum(II) nitrat digantikan dengan elektrod zink dan larutan zink nitrat,

- (i) what happened to the voltmeter reading?
apakah yang berlaku kepada bacaan voltmeter?

.....
[1 mark]

- (ii) give a reason for your answer.
beri satu sebab bagi jawapan anda.

.....
[1 mark]

4. The following information is about a sample of compound Q.
Maklumat berikut adalah berkaitan dengan satu sampel sebatian Q.

<p>❖ Black solid <i>Pepejal berwarna hitam</i></p> <p>❖ Contains 2.56g copper and 0.64g oxygen <i>Mengandungi 2.56g kuprum dan 0.64g oksigen.</i></p>

- (a) What is the meaning of empirical formula?
Apakah maksud formula empirik?

.....
 [1 mark]

- (b) Diagram 4 shows an incomplete equation which is one of the steps involved in determining the empirical formula.

Complete this equation.

Rajah 4 menunjukkan persamaan tak lengkap yang merupakan satu daripada langkah dalam menentukan formula empirik.

Lengkapkan persamaan itu.

<p>Number of mole = $\frac{\quad\quad\quad}{\text{Relative atomic mass}}$</p>
<p><i>Bilangan mol = $\frac{\quad\quad\quad}{\text{Jisim atom relatif}}$</i></p>

Diagram 4
Rajah 4

[1 mark]

- (c) Based on the information of the sample of compound Q, calculate

[Relative atomic mass : Cu = 64 ; O = 16]

Berdasarkan maklumat tentang sampel sebatian Q, hitungkan

[Jisim atom relatif : Cu = 64 ; O = 16]

- (i) Number of mole of copper =
Bilangan mol kuprum

[1 mark]

- (ii) Number of mole of oxygen =
Bilangan mol oksigen

[1 mark]

(d) Determine the empirical formula of the compound Q.

Tentukan formula empirik bagi sebatian Q.

.....
[1 mark]

(e) Compound Q reacts completely with hydrogen gas to form copper and compound R.

Sebatian Q bertindakbalas lengkap dengan gas hydrogen untuk menghasilkan kuprum dan sebatian R.

(i) Name two substances that can be used to prepare hydrogen gas.

Namakan dua bahan yang digunakan untuk menyediakan gas hidrogen.

.....
[1 mark]

(ii) Write a balanced chemical equation for the reaction that takes place.

Tulis persamaan kimia yang seimbang bagi tindak balas itu.

.....
[2 marks]

(iii) State one observation for the reaction.

Nyatakan satu pemerhatian bagi tindakbalas itu.

.....
[1 mark]

(iv) Name compound R

Namakan sebatian R.

.....
[1 mark]

5. A student carried out two experiments to investigate the effects of the factor influencing the rate of reaction. Table 5 shows the results of the experiments.

Seorang pelajar menjalankan dua eksperimen untuk mengkaji kesan faktor yang mempengaruhi kadar tindak balas. Jadual 5 menunjukkan keputusan bagi eksperimen itu.

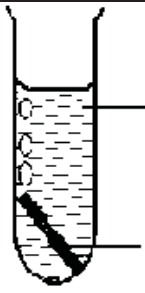
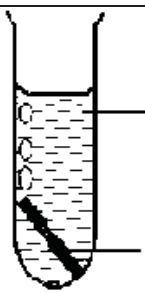
Experiment <i>Eksperimen</i>	Set up of the apparatus <i>Susunan radas</i>	Temperature / °C <i>Suhu / °C</i>	Time taken for all the magnesium to dissolve / s <i>Masa yang diambil untuk semua magnesium melarut / s</i>
I	 <p>Excess hydrochloric acid <i>Asid hidroklorik berlebihan</i></p> <p>0.24 g magnesium ribbon <i>0.24 g pita magnesium</i></p>	30	50
II	 <p>Excess hydrochloric acid <i>Asid hidroklorik berlebihan</i></p> <p>0.24 g magnesium ribbon <i>0.24 g pita magnesium</i></p>	40	20

Diagram 5
Rajah 5

- (a) (i) What is the factor that influences the rate of reaction in both experiment.

Apakah faktor yang mempengaruhi kadar tindak balas dalam kedua-dua eksperimen.

.....
[1 mark]

- (ii) Calculate the maximum volume of hydrogen gas produced.

[Relative atomic mass : Mg = 24 ; molar gas volume = 24 dm³ mol⁻¹ at room condition]

Hitung isipadu maksimum gas hidrogen yang terhasil.

[Jisim atom relatif : Mg = 24 ; isipadu molar gas : 24 dm³ mol⁻¹ pada keadaan bilik]

[2 marks]

(b) Calculate the average rate of reaction in
Hitung kadar tindak balas purata dalam

(i) Experiment I :
Eksperimen I

(ii) Experiment II :
Eksperimen II

[2 marks]

(c) (i) Compare the rate of reaction between Experiment I and Experiment II.
Bandungkan kadar tindak balas bagi Eksperimen I dan Eksperimen II.

.....
[1 mark]

(ii) Explain the answer in (c)(i) with reference to the collision theory.
Jelaskan jawapan di (c)(i) dengan merujuk kepada teori perlanggaran.

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

(d) Sketch the graphs for the volume of hydrogen gas against time for Experiment I and Experiment II on the same axes.
Lakarkan graf isipadu gas hydrogen melawan masa bagi Eksperimen I dan Eksperimen II pada paksi yang sama.

[2 marks]

6. A student carried out an experiment to determine the value of heat of displacement. Diagram 6 shows the set up of the apparatus used in the experiment.
 Seorang pelajar telah menjalankan satu eksperimen untuk menentukan nilai haba penyesaran.
 Rajah 6 menunjukkan susunan radas yang digunakan dalam eksperimen itu.

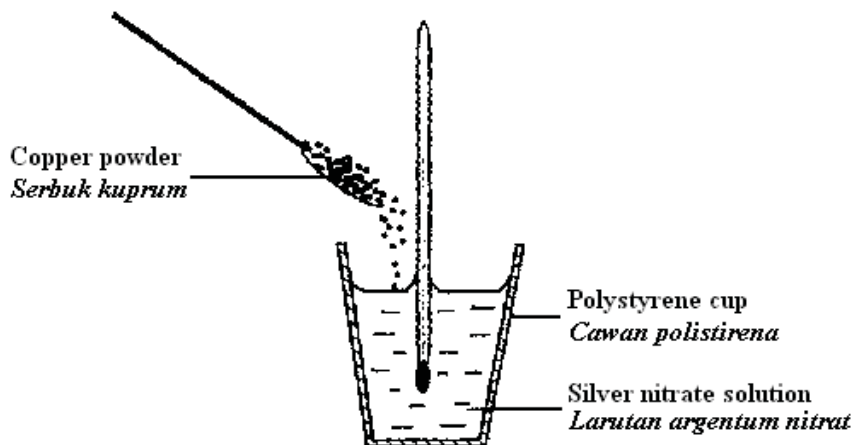


Diagram 6
 Rajah 6

- (a) Why is a polystyrene cup used in the experiment?

Mengapakah cawan polistirena digunakan dalam eksperimen itu?

.....
 [1 mark]

- (b) (i) State one observation in the experiment.

Nyatakan satu pemerhatian dalam eksperimen itu.

.....
 [1 mark]

- (ii) State one reason for the observation in (b)(i).

Nyatakan satu sebab bagi pemerhatian di (b)(i).

.....
 [1 mark]

- (iii) State the name of the substance that is oxidised during the reaction.

Explain your answer in terms of the change in oxidation number.

Nyatakan nama bahan yang mengalami pengoksidaan dalam tindak balas ini.

Terangkan jawapan anda berdasarkan perubahan nombor pengoksidaan.

.....
 [2 marks]

- (c) In this experiment, excess copper is added to 100 cm^3 of 0.5 mol dm^{-3} silver nitrate solution. The heat of displacement in this experiment is -105 kJmol^{-1} .
[Specific heat capacity of the solution is $4.2 \text{ Jg}^{-1}\text{C}^{-1}$; the density of the solution is 1.0 gcm^{-3}]

Dalam eksperimen ini, zink berlebihan ditambah kepada 100 cm^3 larutan kuprum(II)sulfat 0.5 mol dm^{-3} . Haba penyesaran dalam eksperimen itu ialah -105 kJmol^{-1} .

[Muatan haba tentu larutan ialah $4.2 \text{ Jg}^{-1}\text{C}^{-1}$ dan ketumpatan larutan ialah 1.0 gcm^{-3}]

- (i) Calculate the heat energy released in this experiment.

Hitung tenaga haba yang dibebaskan dalam eksperimen ini.

[2 marks]

- (ii) Calculate the temperature change in this experiment.

Hitung perubahan suhu dalam eksperimen ini.

[1 mark]

- (d) Draw the energy level diagram for the reaction.

Lukiskan gambar rajah aras tenaga bagi tindakbalas itu.

[3 marks]

Section B
Bahagian B

[20 marks]

[20 markah]

Answer any **one** questions from this section.
*Jawab mana-mana **satu** soalan daripada bahagian ini*

7. (a) Carbon-14 is one isotope of carbon. It has 8 neutrons.
(i) Draw and describe the atomic structure of carbon-14.

*Karbon-14 adalah satu isotop karbon. Ia mempunyai 8 neutron.
Lukis dan huraikan struktur atom bagi karbon-14.*

[4 marks]

- (ii) Give one example of another isotope of carbon.
State the number of neutron in the isotope.
Write the symbol of the isotope in the form



*Berikan satu contoh lain isotop karbon.
Nyatakan bilangan neutron dalam isotop itu.
Tuliskan symbol bagi isotop itu dalam bentuk*



[3 marks]

- (b) Diagram 7 shows the set-up of apparatus to determine the melting point of naphthalene.

Rajah 7 menunjukkan susunan radas untuk menentukan takat lebur naftalena.

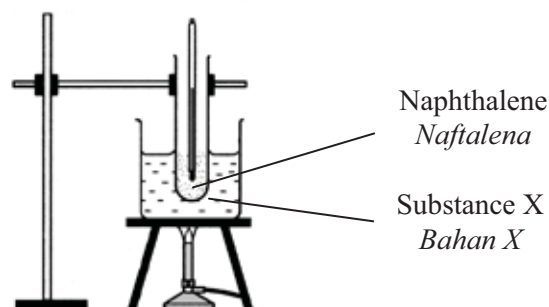


Diagram 7
Rajah 7

Table 7 shows the melting point and boiling point of naphthalene, substance P and substance Q.

Jadual 7 menunjukkan takat lebur dan takat didih bagi naftalena, bahan P dan bahan Q.

Substance Bahan	Melting point Takat lebur ($^{\circ}\text{C}$)	Boiling point Takat didih($^{\circ}\text{C}$)
Naphthalene Naftalena	80	218
P	0	100
Q	-97	65

Table 7
Jadual 7

(i) Which substance P or Q is suitable to be used as substance X in Diagram 7?

Explain your answer.

Bahan yang manakah P atau Q adalah sesuai digunakan sebagai bahan X dalam Rajah 7?

Terangkan jawapan anda.

[2 marks]

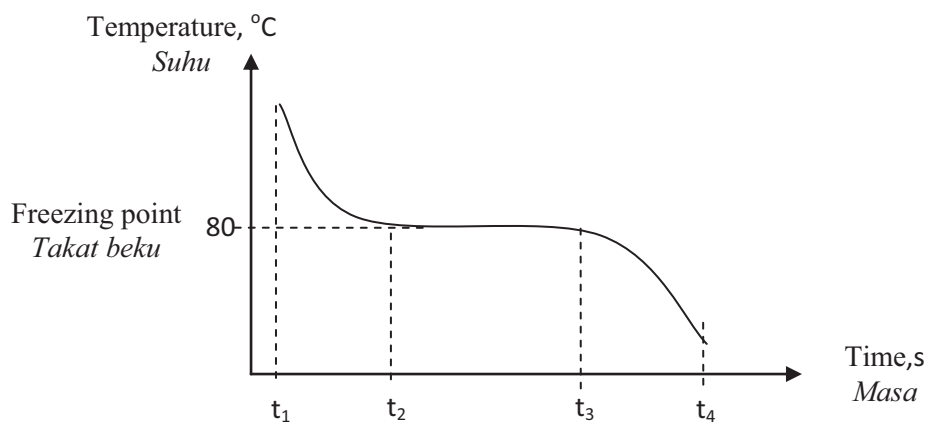
(ii) Explain why naphthalene is not heated directly with a bunsen burner.

Terangkan mengapa naftalena tidak dipanaskan secara terus dengan penunu bunsen.

[1 mark]

(c) Graph 7 shows the cooling curve of naphthalene.

Graf 7 menunjukkan lengkung penyejukan bagi naftalena.



Graph 7
Graf 7

Describe Graph 7 in terms of states of matter, particle arrangements and changes in energy.

Huraikan graf 7 dari segi keadaan jirim, susunan zarah dan perubahan tenaga yang berlaku semasa proses penyejukan.

[10 marks]

8. (a) Diagram 8 shows the apparatus set up of Experiment I, Experiment II and the observations when copper(II) oxide is added into hydrochloric acid in two different solvents.

Rajah 8 menunjukkan susunan radas bagi Eksperimen I, Eksperimen II dan pemerhatian apabila kuprum(II) oksida ditambah ke dalam asid hidroklorik dalam dua pelarut yang berlainan

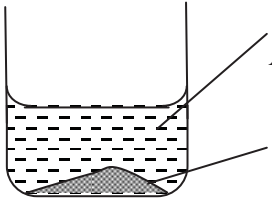
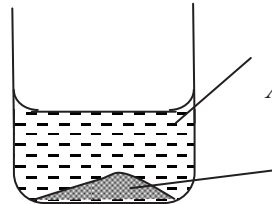
Experiment <i>Eksperimen</i>	Apparatus set up <i>Susunan radas</i>	Observation <i>Pemerhatian</i>
I	 <p>Hydrochloric acid in solvent X <i>Asid hidroklorik dalam pelarut X</i></p> <p>Copper(II) oxide <i>Kuprum(II) oksida</i></p>	<ul style="list-style-type: none"> - Black solid dissolves <i>Pepejal hitam larut</i> - Colourless solution turns blue <i>Larutan tanpa warna menjadi biru</i>
II	 <p>Hydrochloric acid in solvent Y <i>Asid hidroklorik dalam pelarut Y</i></p> <p>Copper(II) oxide <i>Kuprum(II) oksida</i></p>	<ul style="list-style-type: none"> - No change <i>Tiada perubahan</i>

Diagram 8
Rajah 8

Based on the information in Diagram 8
Berdasarkan maklumat dalam Rajah 8

- (i) Name one suitable example of each solvent X and solvent Y.
Namakan satu contoh yang sesuai bagi setiap pelarut X dan pelarut Y. [2 marks]
- (ii) Compare observations in Experiment I and Experiment II. Explain your answer and include an ionic equation that involved.
Banding pemerhatian dalam Eksperimen I dan Eksperimen II. Terangkan jawapan anda dan sertakan persamaan ion yang terlibat. [8 marks]

(iii) Referring to the observation in Experiment I,

- state the type of reaction that occur
- write the chemical equation for the reaction between hydrochloric acid and copper(II) oxide
- calculate the mass of copper(II) oxide needed to react completely with 50 cm^3 of 1.0 mol dm^{-3} of hydrochloric acid
[Relative atomic mass : Cu = 64, O = 16]

Merujuk kepada pemerhatian dalam Eksperimen I,

- *nyatakan jenis tindakbalas yang berlaku*
- *tulis persamaan kimia bagi tindak balas antara asid hidroklorik dan kuprum(II) oksida*
- *Hitungkan jisim kuprum(II) oksida yang diperlukan untuk bertindakbalas lengkap dengan 50 cm^3 asid hidroklorik 1.0 mol dm^{-3}*
[Jisim atom relatif : Cu = 64, O = 16]

[6 marks]

(b) Table 8 shows the concentrations and pH values of two different alkalis.
Jadual 8 menunjukkan kepekatan dan nilai pH bagi dua alkali yang berlainan.

Alkali <i>Alkali</i>	Concentration /mol dm⁻³ <i>Kepekatan /mol dm⁻³</i>	pH <i>pH</i>
Sodium hydroxide solution <i>Larutan natrium hidroksida</i>	0.1	13
Ammonia aqueous solution <i>Larutan akueus ammonia</i>	0.1	10

Table 8
Jadual 8

Explain why the alkalis in Table 8 have different pH values.
Terangkan mengapa alkali dalam Jadual 8 mempunyai nilai pH yang berlainan.

[4 marks]

Section C
Bahagian C

[20 marks]

[20 markah]

Answer any **one** questions from this section.
*Jawab mana-mana **satu** soalan daripada bahagian ini*

- 9 Diagram 9 shows a series of reactions involving hydrocarbon Y.
Rajah 9 menunjukkan satu siri tindak balas yang melibatkan hidrokarbon Y.

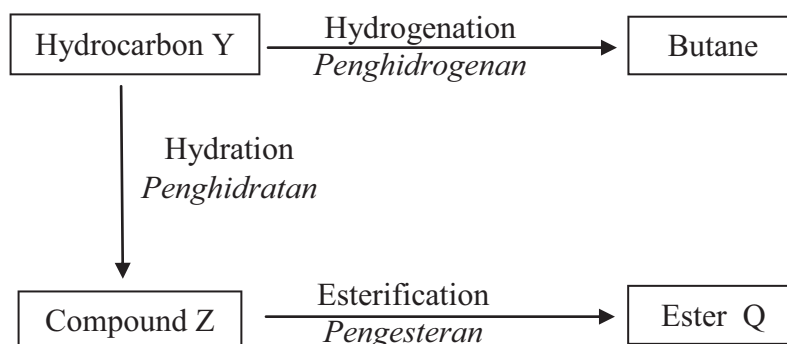


Diagram 9
Rajah 9

- (a) Based on Diagram 9,

- state the general formula,
- state the functional group and
- draw the structural formula

of hydrocarbon Y.

Berdasarkan Rajah 9,

- *nyatakan formula am,*
- *nyatakan kumpulan berfungsi dan*
- *lukiskan formula struktur*

bagi hidrokarbon Y.

[3 marks]

- (b) Write the chemical equation to show the hydration process of hydrocarbon Y.
State the conditions needed for the process that takes place.

*Tuliskan persamaan kimia bagi menunjukkan proses penghidratan hidrokarbon Y.
Nyatakan keadaan yang diperlukan untuk tindak balas tersebut berlaku.*

[3 marks]

- (c) Table 9 shows the result of a chemical test to differentiate between hydrocarbon Y and butane.

Jadual 9 menunjukkan keputusan ujian kimia untuk membezakan antara hidrokarbon Y dan butana.

Procedure <i>Prosedur</i>	Observation <i>Pemerhatian</i>
Bromine water is added to hydrocarbon Y. <i>Air bromin ditambah ke dalam hidrokarbon Y.</i>	Brown bromine water decolourised. <i>Warna perang air bromin dilunturkan</i>
Bromine water is added to butane. <i>Air bromin ditambah ke dalam butana</i>	Brown bromine water remains unchange. <i>Warna perang air bromin tidak berubah.</i>

Table 9
Jadual 9

Explain why there is difference in the observations.

Terangkan mengapa terdapat perbezaan dalam pemerhatian itu.

[4 marks]

- (d) A student intends to prepare an ester Q from the reaction between compound Z and named carboxylic acid.

Describe a laboratory experiment to prepare the ester.

Your answer should include the following :

- A list of material
- Procedure of the experiment
- Observation and chemical equation
- Name of the ester produced

Seorang pelajar berhasrat menyediakan sejenis ester Q daripada tindak balas antara sebatian Z dan sejenis asid karboksilik yang dinamakan.

Huraikan satu eksperimen makmal untuk menyediakan ester tersebut.

Jawapan anda mesti mempunyai perkara berikut :

- *Senarai bahan kimia*
- *Prosedur eksperimen*
- *Pemerhatian dan persamaan kimia.*
- *Nama ester yang terhasil*

[10 marks]

- 10 (a) Iron gates of houses situated near industrial areas becomes rusty faster than those situated far from industrial areas. Explain this phenomenon.

Pagar besi rumah yang berdekatan dengan kawasan industri menjadi berkarat lebih cepat dari yang berada jauh dari kawasan industri. Jelaskan fenomena ini

[2 marks]

- (b) Diagram 10.1 shows the chemical equation for Reaction I and Reaction II.
Rajah 10.1 menunjukkan persamaan kimia bagi Tindak balas I dan Tindak balas II.

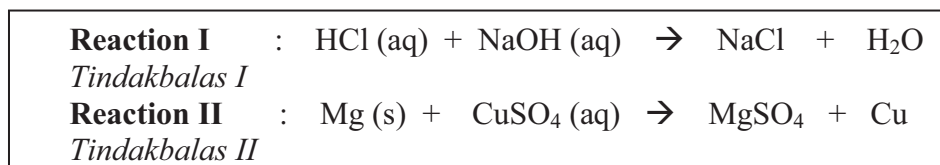


Diagram 10.1
Rajah 10.1

Based on the chemical equations in Diagram 10, determine whether the reaction is redox reaction. Explain your answer.

Berdasarkan tindak balas kimia dalam Rajah 10, tentukan sama ada tindak balas tersebut adalah tindak balas redoks . Jelaskan jawapan anda.

[4 marks]

- (c) Diagram 10.2 shows the changes involving iron, iron(II) ion and iron(III) ions.
Rajah 10.2 menunjukkan perubahan yang melibatkan ferum, ion ferum(II) dan ion ferum(III).

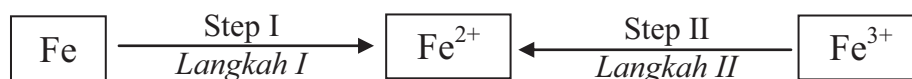


Diagram 10.2
Rajah 10.2

By referring to Diagram 10.2, suggest a suitable chemical substance to carry out the changes in Steps I and II. Your answers should include the observation for each of the step involved.

Dengan merujuk kepada Rajah 10.2, cadangkan bahan kimia yang sesuai untuk melaksanakan penukaran dalam langkah I dan II. Jawapan anda hendaklah disertakan dengan pemerhatian untuk setiap langkah yang terlibat.

[4 marks]

(d) The following statement is about redox reaction.

Pernyataan berikut adalah mengenai tindak balas redoks.

A redox reaction can occur between a reducing agent and oxidising agent without in contact with one another.

Tindakbalas redoks boleh berlaku antara agen penurunan dan agen pengoksidaan tanpa bersentuh antara satu sama lain

By using potassium iodide solution, dilute sulphuric acid and a suitable oxidising agent, describe an experiment to verify the above statement. Your answer should consist of the following :

- ▶ Labeled diagram
- ▶ Procedure
- ▶ Half-equations involved
- ▶ Observations

Dengan menggunakan larutan kalium iodida, asid sulfurik cair dan air bromine, huraikan satu eksperimen untuk mengesahkan pernyataan di atas. Jawapan anda harus mengandungi perkara berikut:

- ▶ *Gambarajah berlabel*
- ▶ *Kaedaaaxh*
- ▶ *Persamaan setengah yang terlibat*
- ▶ *Pemerhatian*

[10 marks]

END OF QUESTION PAPER
KERTAS SOALAN TAMAT

THE PERIODIC TABLE OF ELEMENTS

Proton number	Symbol	Name of element	Relative atomic mass
1	H	Hydrogen	1
2	He	Helium	4
3	Li	Lithium	7
4	Be	Beryllium	9
5	B	Boron	11
6	C	Carbon	12
7	N	Nitrogen	14
8	O	Oxygen	16
9	F	Fluorine	19
10	Ne	Neon	20
11	Na	Sodium	23
12	Mg	Magnesium	24
13	Al	Aluminium	27
14	Si	Silicon	28
15	P	Phosphorus	31
16	S	Sulfur	32
17	Cl	Chlorine	35
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
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
55	Cs	Cesium	133
56	Ba	Barium	137
57	La	Lanthanum	139
58	Ce	Cerium	140
59	Pr	Praseodymium	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	Hb	Holmium	165
68	Er	Erbium	167
69	Tm	Thulium	169
70	Yb	Ytterbium	173
71	Lu	Luettium	175
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
90	Th	Thorium	232
91	Pa	Protactinium	231
92	U	Uranium	238
93	Np	Nepunium	237
94	Pu	Plutonium	244
95	Am	Americium	243
96	Cm	Curium	247
97	Bk	Berkellium	247
98	Cf	Californium	249
99	Es	Einsteinium	254
100	Fm	Fermium	253
101	Md	Mendelevium	258
102	No	Nobelium	259
103	Lr	Lawrensium	260
104	Uup	Ununpentium	260
105	Uuq	Ununquadium	265
106	Uuh	Ununhexium	263
107	Uus	Ununseptium	262
108	Uuo	Ununoctium	265
109	Uue	Unununium	266

Reference: Chang, Raymond (1991). Chemistry. McGraw-Hill, Inc.

INFORMATION FOR CANDIDATES
MAKLUMAT UNTUK CALON

1. This question paper consists of three sections: **Sections A, B and C.**
Kertas soalan ini mengandungi tiga bahagian: Bahagian A, B dan C.
2. Answer **all** questions in Section A. Write your answers for **Section A** in the spaces provided in the question paper.
Jawab semua soalan dalam Bahagian A. Tuliskan jawapan bagi Bahagian A dalam ruang yang disediakan dalam kertas soalan
3. Answer one question from **Section B** and one question from **Section C.**
Write your answers for **Section B** and **Section C** on the 'writing paper' provided by the invigilators.
Answer questions in **Section B** and **Section C** in detail.
You may use equations, diagrams, tables, graphs and other suitable methods to explain your answer.
Jawab satu soalan daripada Bahagian B dan satu soalan daripada Bahagian C. Tuliskan jawapan bagi Bahagian B dan Bahagian C pada helaian tambahan yang dibekalkan oleh pengawas peperiksaan. Jawab Bahagian B dan Bahagian C dengan terperinci. Anda boleh menggunakan persamaan, gambar rajah, jadual, graf dan cara lain yang sesuai untuk menjelaskan jawapan anda
4. Show your working. It may help you to get marks.
Tunjukkan kerja mengira. Ini membantu anda mendapatkan markah.
5. If you wish to change your answer, neatly cross out the answer that you have done. Then write down the new answer.
Sekiranya anda hendak membatalkan sesuatu jawapan, buat garisan di atas jawapan itu.
6. The diagrams in the questions are not drawn to scale unless stated.
Rajah yang mengiringi soalan tidak dilukiskan mengikut skala kecuali dinyatakan
7. Marks allocated for each question or part question are shown in brackets.
Markah yang diperuntukkan bagi setiap soalan atau ceraihan soalan ditunjukkan dalam kurungan
8. The time suggested to answer **Section A** is 90 minutes, **Section B** is 30 minutes and **Section C** is 30 minutes.
Masa yang dicadangkan untuk menjawab Bahagian A ialah 90 minit, Bahagian B ialah 30 minit dan Bahagian C ialah 30 minit
9. You may use a non-programmable scientific calculator.
Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogramkan.
10. Hand in your answer sheets at the end of the examination.
Serahkan semua kertas jawapan anda di akhir peperiksaan

Nama:

Tingkatan

SULIT
4541/3
CHEMISTRY
Paper 3
Ogos
2011
1 ½ jam



BAHAGIAN PENGURUSAN
SEKOLAH BERASRAMA PENUH DAN SEKOLAH KECEMERLANGAN
KEMENTERIAN PELAJARAN MALAYSIA

PEPERIKSAAN PERCUBAAN SPM
SIJIL PELAJARAN MALAYSIA 2011

CHEMISTRY

Kertas 3

Satu jam tiga puluh minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. Tulis **nama** dan **tingkatan** anda pada ruangan 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

Untuk Kegunaan Pemeriksa		
Soalan	Markah Penuh	Markah Diperoleh
1	15	
2	18	
3	17	
Jumlah	50	

Kertas soalan ini mengandungi 11 halaman bercetak.

INFORMATION FOR CANDIDATES
MAKLUMAT UNTUK CALON

1. This question paper consists of three sections: **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 answers for **Question 1** and **Question 2** in the spaces provided in the question paper.
Jawab semua soalan. Tuliskan jawapan bagi Soalan 1 dan Soalan 2 pada ruang yang disediakan dalam kertas soalan ini.
3. Write your answers for **Question 3** on the ‘helaian tambahan’ provided by the invigilators.. You may use equations, diagrams, tables, graphs and other suitable methods to explain your answer.
Tulis jawapan anda bagi Soalan 3 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 diagrams in the questions are not drawn to scale unless stated.
Rajah yang mengiringi soalan tidak dilukiskan mengikut skala kecuali dinyatakan
5. Marks allocated for each question or sub-part of the question are shown in brackets.
Markah yang diperuntukkan bagi setiap soalan atau ceraian 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, kemnudian tulis jawapan yang baru.
8. You may use a non-programmable scientific calculator.
Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogramkan.
9. Tie together your answer sheets with this question paper at the end of the examination.
Ikat semua kertas jawapan anda bersama-sama soalan ini di akhir peperiksaan.

- 1 Two experiments were carried out by a group of students to investigate the effect of the type of electrodes on the product formed during electrolysis.

Dua eksperimen telah dijalankan oleh sekumpulan pelajar untuk menyiasat kesan jenis elektrod terhadap hasil yang terbentuk semasa elektrolisis.

Experiment I

Electrolysis using carbon electrodes and 0.01 mol dm^{-3} copper(II) chloride solution is used as an electrolyte.

Eksperimen I

Elektrolisis menggunakan elektrod karbon dan larutan kuprum(II) klorida, 0.01 mol dm^{-3} digunakan sebagai elektrolit.

Experiment II

Electrolysis using copper electrodes and 0.01 mol dm^{-3} copper(II) chloride solution is used as an electrolyte.

Eksperimen II

Elektrolisis menggunakan elektrod kuprum dan larutan kuprum(II) klorida, 0.01 mol dm^{-3} digunakan sebagai elektrolit.

Diagram 1.1 and Diagram 1.2 show the set-up of the apparatus for both experiments.
Rajah 1.1 dan Rajah 1.2 menunjukkan susunan radas bagi kedua-dua eksperimen.

Experiment I

Eksperimen I

Beginning of experiment

Awal eksperimen.

After 30 minutes

Selepas 30 minit

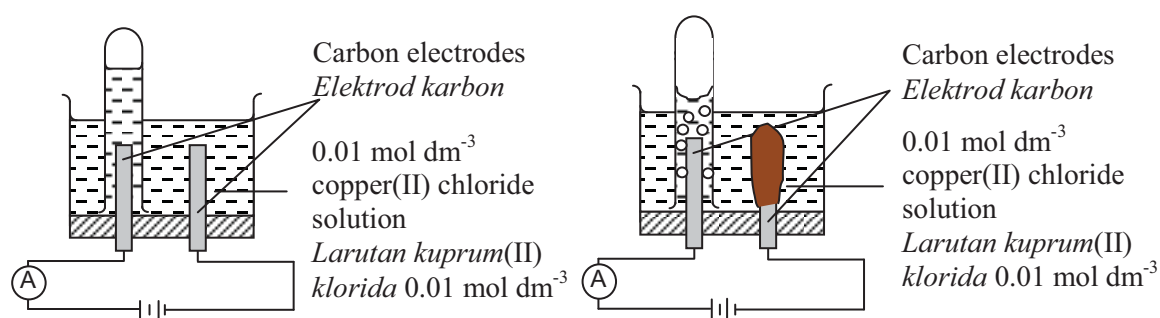


Diagram 1.1

Rajah 1.1

Experiment II
Eksperimen II

Beginning of experiment
Awal eksperimen.

After 30 minutes
Selepas 30 minit

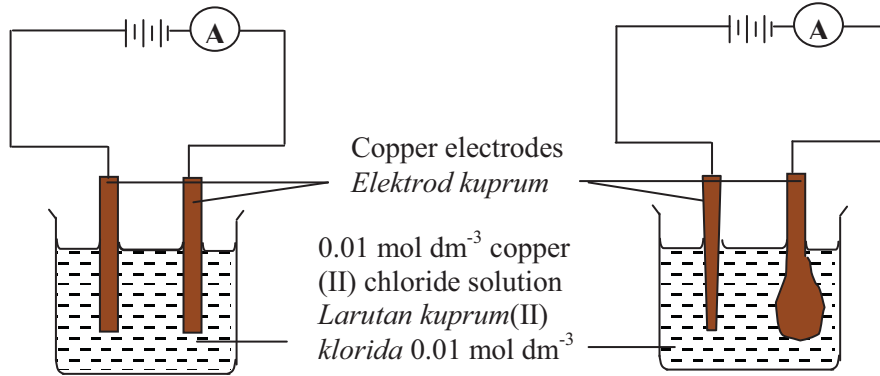


Diagram 1.2
Rajah 1.2

- (a) Complete the Table 1 by stating the observation for both experiments.
Lengkapkan Jadual 1 dengan menyatakan pemerhatian bagi kedua-dua eksperimen.

Experiment <i>Eksperimen</i>	Observation at anode <i>Pemerhatian di anod</i>
I	
II	

Table 1
Jadual 1

- (b) State the inference from the observation in 1(a) for Experiment II.
Nyatakan inferens berdasarkan pemerhatian di 1(a) bagi Eksperimen II.

.....
.....

1(a)
[3 marks]
3

1(b)
[3 marks]
3

(c) State the hypothesis for the experiment.
Nyatakan hipotesis bagi eksperimen tersebut.

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

[3 marks]

*For
examiner's
use*

1(c)

3

(d) Based on the experiment, state
Berdasarkan eksperimen, nyatakan

(i) the manipulated variable.
pemboleh ubah yang dimanipulasikan.

.....

(ii) the responding variable.
pemboleh ubah yang bergerak balas.

.....

(iii) the constant variable.
pemboleh ubah yang ditetapkan.

.....

[3 marks]

1(d)

3

(e) If 0.01 mol dm^{-3} copper(II) chloride solution in Experiment I is replaced by 1.0 mol dm^{-3} copper(II) chloride solution, predict the product formed at the anode.
Jika larutan kuprum(II) klorida, 0.01 mol dm^{-3} dalam Eksperimen I digantikan dengan larutan kuprum(II) klorida, 1.0 mol dm^{-3} , ramalkan produk yang terhasil di anod.

.....
.....

[3 marks]

1(e)

3

Total 1

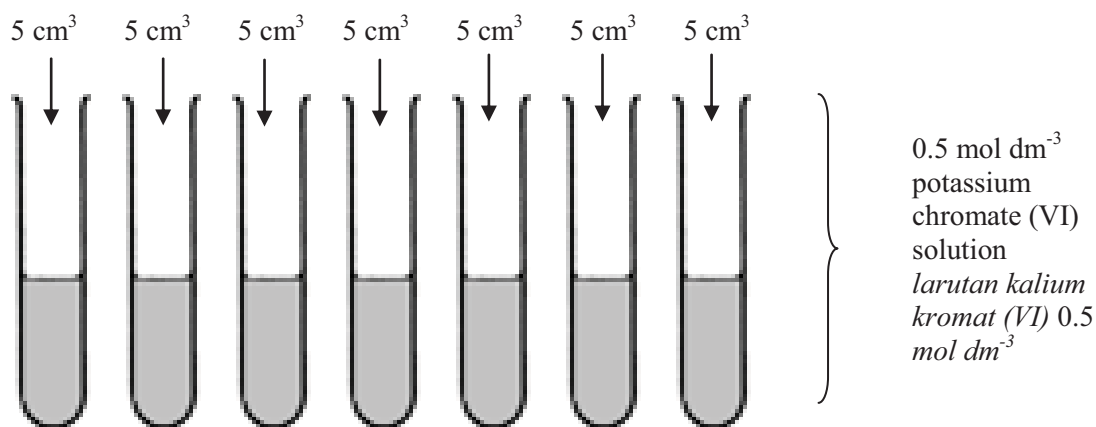
15

2. Diagram 2 shows Step I and Step II in an experiment to construct an ionic equation for the formation of barium chromate(VI).

Rajah 2 menunjukkan langkah I dan II bagi eksperimen untuk membina persamaan ion bagi pembentukan barium kromat(VI).

Step I

Langkah I



Step II

Langkah II

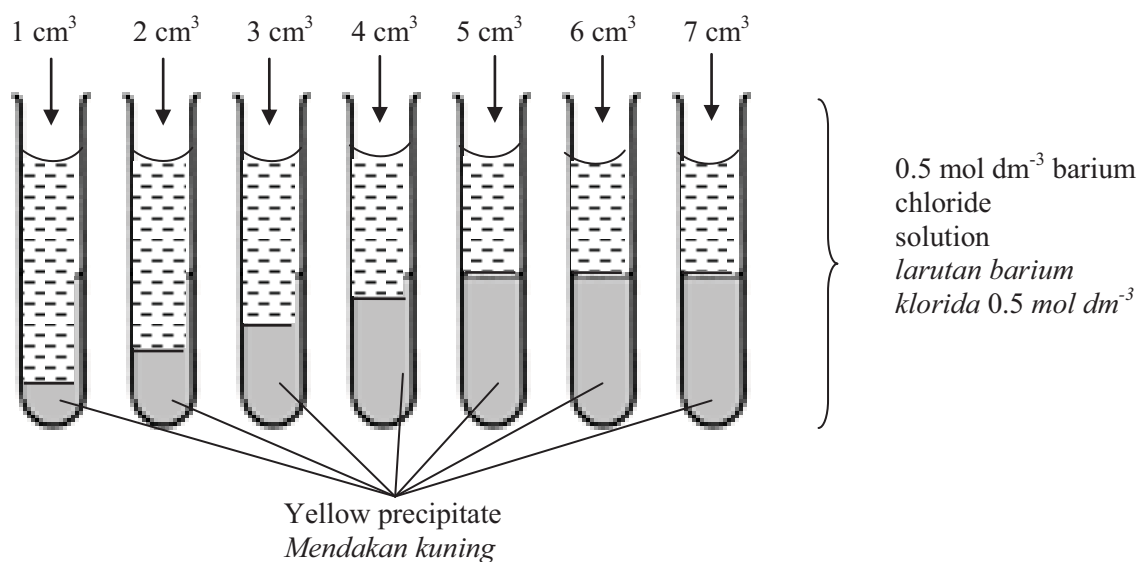


Diagram 2
Rajah 2

0.5 mol dm⁻³ barium chloride, BaCl₂ solution was added to each test-tube containing 5.0 cm³ potassium chromate(VI), K₂CrO₄ solution according to the volumes shown in Step II. Each test tube is stopper and shaken well. Yellow precipitate of barium chromate(VI) is formed.

Larutan barium klorida, BaCl₂ 0.5 mol dm⁻³ ditambah ke dalam setiap tabung uji yang mengandungi 5.0 cm³ larutan kalium kromat (VI), K₂CrO₄ 0.5 mol dm⁻³ mengikut isipadu seperti yang ditunjukkan dalam langkah II. Setiap tabung uji ditutup dan digoncang. Mendakan kuning barium kromat(VI) terbentuk.

Table 2 shows the results for this experiment.

Jadual 2 menunjukkan keputusan eksperimen tersebut.

Test tube <i>Tabung uji</i>	1	2	3	4	5	6	7
Volume of 0.5 mol dm ⁻³ barium chloride solution/cm ³ <i>Isipadu larutan barium klorida 0.5 mol dm⁻³ /cm³</i>	1.0	2.0	3.0	4.0	5.0	6.0	7.0
Height of barium chromate (VI) precipitate/cm <i>Tinggi mendakan barium kromat (VI)/cm</i>							

Table 2

Jadual 2

- (a) Using the ruler, measure the height of yellow precipitate in test tube 1 to 7 and record the height of the precipitate in Table 2.

Dengan menggunakan pembaris, ukur tinggi mendakan kuning yang terdapat dalam tabung uji 1 hingga 7 dan rekodkan tinggi mendakan dalam Jadual 2.

[3 marks]

2(a)

3

- (b) Draw a graph of height of precipitate against volume of barium chloride on the graph paper provided on page 7.

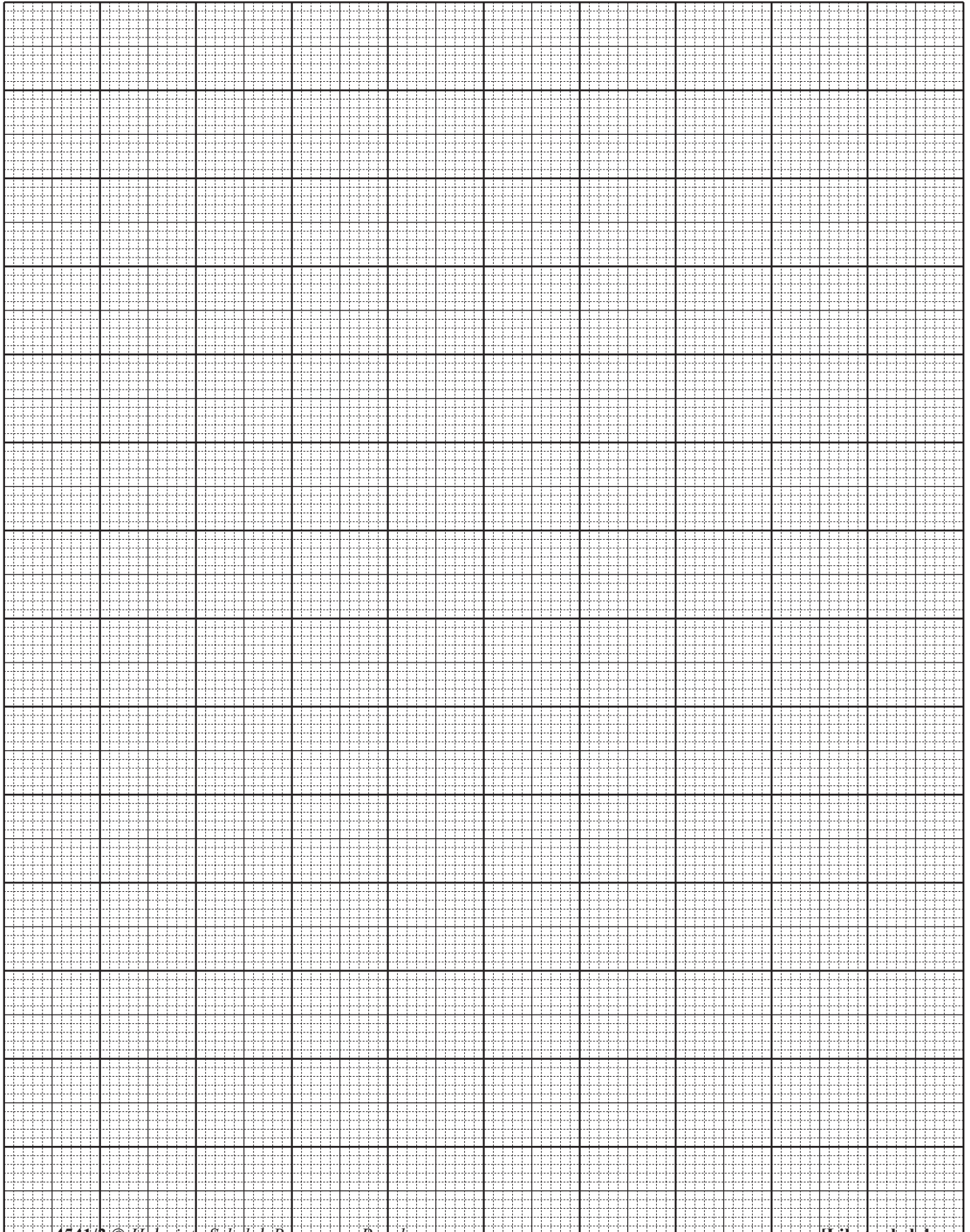
Lukiskan graf tinggi mendakan melawan isipadu larutan barium klorida pada kertas graf yang disediakan di muka surat 7.

[3 marks]

2(b)

3

Question 2(b)



For
examiner's
use

- (c) Based on the table above, state the volume of barium chloride solution 0.5 mol dm^{-3} for reacts completely with 5 cm^3 of potassium chromate(VI) solution and calculate the number of mole of barium chloride solution is needed to reacts completely with 1 mole potassium chromate(VI) solution.

Berdasarkan jadual di atas, berapakah isipadu larutan barium klorida 0.5 mol dm^{-3} yang diperlukan untuk bertindak balas lengkap dengan 5 cm^3 larutan kalium kromat(VI) 0.5 mol dm^{-3} dan hitungkan bilangan mol larutan barium klorida yang diperlukan untuk bertindak balas lengkap dengan 1 mol larutan kalium kromat(VI).

[3 marks]

2(c)

3

- (d) Write an ionic equation for the reaction between potassium chromate(VI) solution and barium chloride solution.

Tuliskan persamaan ion bagi tindak balas antara larutan kalium kromat(VI) dengan larutan barium klorida.

.....

[3 marks]

2(d)

3

- (e) Based on this experiment, state the operational definition for the precipitation reaction.

Berdasarkan eksperimen ini,, nyatakan definisi secara operasi bagi tindak balas pemendakan.

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

[3 marks]

2(e)

3

For
examiner's
use

- (f) Classify the following salts into soluble salts and insoluble salts.
Kelaskan garam-garam berikut kepada garam larut dan garam tak larut.

Sodium carbonate, Na_2CO_3 <i>Natrium karbonat, Na_2CO_3</i>	Lead(II)sulphate, PbSO_4 <i>Plumbum (II)sulfat, PbSO_4</i>
Silver chloride, AgCl <i>Argentum klorida, AgCl</i>	Magnesium nitrate, $\text{Mg}(\text{NO}_3)_2$ <i>Magnesium nitrat, $\text{Mg}(\text{NO}_3)_2$</i>

Soluble salts <i>Garam terlarut</i>	Insoluble salts <i>Garam tak terlarut</i>

[3 marks]

2(f)

3

Total 2

18

3. Brazil, the fifth largest country in the world imports no oil, since half its cars run on alcohol fuel made from sugarcane. Diagram 3 shows an alcohol fuel station in Brazil. *Brazil, negara yang kelima besar di dunia tidak mengimport petrol, separuh daripada kereta di negara itu menggunakan bahan api alkohol yang dibuat daripada air tebu. Rajah 3 menunjukkan sebuah stesen bahan api alkohol di Brazil.*



Diagram 3
Rajah 3

Different types of alcohols produce different heat of combustions. The value of the heat of combustion is depended on the number of carbon atoms per alcohol molecule. Plan a laboratory experiment to compare the heat combustion of methanol, ethanol and propan-1-ol.

Jenis-jenis alkohol yang berlainan menghasilkan haba pembakaran yang berlainan. Nilai haba pembakaran adalah bergantung kepada bilangan atom karbon per molekul alkohol. Rancang satu eksperimen makmal untuk membandingkan haba pembakaran bagi metanol, etanol dan propan-1-ol.

Your planning should include the following aspects:

Perancangan anda haruslah mengandungi aspek-aspek berikut:

- (a) Aim of the experiment
Tujuan eksperimen
- (b) All the variables
Semua pembolehubah
- (c) Statement of the hypothesis
Pernyataan hipotesis
- (d) List of substances and apparatus
Senarai bahan dan alat radas
- (e) Procedure of the experiment
Prosedur eksperimen
- (f) Tabulation of data
Penjadualan data

[17 marks]

END OF QUESTION PAPER
KERTAS SOALAN TAMAT

Peraturan Permarkahan
CHEMISTRY 4541
Kertas 1
Ogos
2011



**BAHAGIAN PENGURUSAN
SEKOLAH BERASRAMA PENUH DAN SEKOLAH KECEMERLANGAN
KEMENTERIAN PELAJARAN MALAYSIA**

**PERATURAN PERMARKAHAN
PEPERIKSAAN PERCUBAAN
SIJIL PELAJARAN MALAYSIA 2011**

**CHEMISTRY
TRIAL
2011
MARKING SCHEME

PAPER 1**

**SKEMA KERTAS 1
CHEMISTRY 4541/1**

1	C	26	C
2	B	27	D
3	C	28	D
4	D	29	D
5	A	30	B
6	A	31	B
7	C	32	A
8	A	33	C
9	A	34	A
10	C	35	C
11	A	36	C
12	B	37	B
13	C	38	C
14	A	39	C
15	C	40	D
16	D	41	B
17	D	42	B
18	A	43	D
19	C	44	C
20	B	45	B
21	B	46	C
22	A	47	B
23	D	48	D
24	B	49	A
25	A	50	C

Peraturan Permarkahan
CHEMISTRY 4541
Kertas 2
Ogos
2011



BAHAGIAN PENGURUSAN
SEKOLAH BERASRAMA PENUH DAN SEKOLAH KECEMERLANGAN
KEMENTERIAN PELAJARAN MALAYSIA

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PEPERIKSAAN PERCUBAAN
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**CHEMISTRY
TRIAL
2011
MARKING SCHEME**

PAPER 2

MARKING SCHEME FOR CHEMISTRY PAPER 2

No.	Answer	Mark
1. (a) (i)	Zinc	1
(ii)	1. The presence of X/zinc atoms disrupts the orderly arrangements of copper atoms 2. This reduce the layers of atoms from sliding over one another easily	1 1
(iii)	Steel	1
(b)(i)	Silicon dioxide/silica /sand	1
(ii)	Heat resistant/can withstand with high temperature	1
(c) (i)	$ \begin{array}{cc} \text{H} & \text{Cl} \\ & \\ \text{C} & = & \text{C} \\ & \\ \text{H} & \text{H} \end{array} $	1
(ii)	Polyvinyl chloride/ polychloroethene	1
(iii)	polymerization	1
TOTAL		9

No	Answer	Mark				
2(a)	Horizontal row of elements in the Periodic Table of Elements	1				
(b)	Atoms have 3 shells occupied with electron	1				
(c)(i)	1. Correct formulae of reactants and products 2. Balanced equation $\text{Cl}_2 + \text{H}_2\text{O} \rightarrow \text{HCl} + \text{HOCl}$	1 1				
(ii)	<table border="1" style="width: 100%;"> <tbody> <tr> <td style="width: 20%;">Sodium</td> <td>Red litmus paper blue</td> </tr> <tr> <td>Chlorine</td> <td>Blue litmus paper red</td> </tr> </tbody> </table>	Sodium	Red litmus paper blue	Chlorine	Blue litmus paper red	2
Sodium	Red litmus paper blue					
Chlorine	Blue litmus paper red					

No.	Answer	Mark
(d)(i)	1. Atomic size decrease	1
(ii)	1. Proton number / number of proton / nuclei charge increase 2. Nuclei attraction on valence electron is stronger	2
TOTAL		9

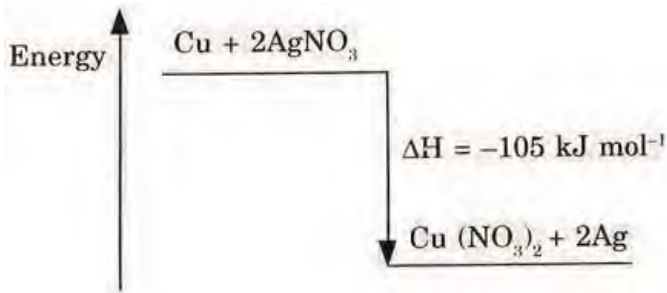
No.	Answer	Mark
3 (a)	Oxidation	1
(b)(i)	To allow the movement / flow of ions	1
(ii)	Potassium nitrate solution [any suitable substance]	1
(c)	From copper electrode to silver electrode	1
(d)	Intensity of blue colour solution increase Because the concentration /number of Cu^{2+} increase	1 1
(e)	$\text{Cu} \longrightarrow \text{Cu}^{2+} + 2\text{e}$ Formula of reactant and product Balanced	1 1
(f)(i)	Increase	1
(ii)	The distance between zinc and silver is further than copper and silver in electrochemical series	1
TOTAL		10

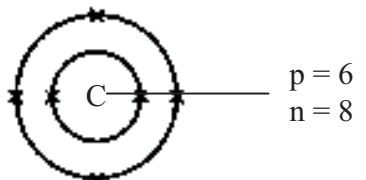
No.	Answer	Mark
4. (a)	A chemical formula that shows the simplest ratio of atom of element in a compound.	1
(b)	Number of mole = $\frac{\text{Mass}}{\text{Relative atomic mass}}$	1
(c)(i)	Num. of mole of copper = $\frac{2.56}{64} / 0.04$	2
(ii)	Num. of mole of oxygen = $\frac{0.64}{16} / 0.04$	
(d)	CuO	1
(e)(i)	Magnesium and hydrochloric acid / Zinc and sulphuric acid	1
(ii)	$\text{CuO} + \text{H}_2 \rightarrow \text{Cu} + \text{H}_2\text{O}$	2
(iii)	Black powder change to brown	1
(iv)	Water	1
	TOTAL	10

No.	Answer	Mark
5(a)(i)	Temperature	1
(ii)	Num. of mole = $\frac{0.24}{24} \text{ mol} / 0.01 \text{ mol}$ Volume of $\text{H}_2 = 0.01 \times 24 \text{ dm}^3 / 0.24 \text{ dm}^3 / 240 \text{ cm}^3$	2
(b)	Average rate of reaction in experiment I = $\frac{240}{50} \text{ cm}^3\text{s}^{-1} / 4.8 \text{ cm}^3\text{s}^{-1}$ Average rate of reaction in experiment II = $\frac{240}{20} \text{ cm}^3\text{s}^{-1} / 12 \text{ cm}^3\text{s}^{-1}$	2
(c)(i)	Rate of reaction of experiment II is higher than experiment I	1

No.	Answer	Mark
(c)(ii)	<ul style="list-style-type: none"> -The temperature of reaction for experiment II is higher than experiment I. -The kinetic energy of the particles of reactants for experiment II is higher than experiment I. -The frequency of effective collisions increases. 	3
(d)		2
TOTAL		11

No.	Answer	Mark
6(a)	To reduce the heat loss to the surroundings	1
(b)(i)	A shiny grey solid is formed / A colourless solution turns blue.	1
(ii)	Silver metal is formed / Copper(II) ions formed.	1
(iii)	Copper Oxidation number increase from 0 to +2	2

No.	Answer	Mark
(c)(i)	Num. of mole = $\frac{0.5 \times 100}{1000} / 0.05 \text{ mol.}$ Heat energy released = $0.05 \times 105 \text{ kJ} / 5.25 \text{ kJ} / 5250 \text{ J}$	2
(ii)	$\theta = \frac{5250}{100 \times 4.2} / 12.5 \text{ }^\circ\text{C}$	1
(d)	 <p>1. Axis with label energy and two level, 2. Correct position of reactants and products, 3. $\Delta H = -105 \text{ kJmol}^{-1}$</p>	1 1 1 3
TOTAL		11

No.	Answer	Mark
7 a (i)	 <p>[Draw and label]</p> <p>[Able to describe the atom Carbon-14]</p> <ul style="list-style-type: none"> • Has nucleus at the centre of the atom • nucleus contains 6 proton and 8 neutron • has 2 shell occupied electron • 4 valence electrons 	1 1 1 1 1 <i>Max</i> 4

No.	Answer			Mark
(ii)	Carbon-12// Carbon-13			1
	6 // 7			1
	12	13		1
	$\begin{matrix} 6 \\ \text{C} \\ 6 \end{matrix}$	//	$\begin{matrix} 6 \\ \text{C} \\ 6 \end{matrix}$3
(b)(i)	P			1
	Boiling point P higher than melting point naphthalene			1
(ii)	Naphthalene is flammable			13
(c)	At time $t_1 - t_2$	At time $t_2 - t_3$	At time $t_3 - t_4$	Mark
	Naphthalene is in liquid state	In liquid and solid state	In solid state	1 + 1+ 1
	The molecules are closely pack	The molecules are closely pack	The molecules are closely pack	1
	The molecules not in orderly arrangement	Some molecules are in orderly arrangement but some are not in orderly arrangement.	The molecules are in orderly arrangement	1 + 1+ 1
	The kinetic energy decrease	The kinetic energy is constant	The kinetic energy decrease	1 + 1+ 1
	TOTAL			

No	Answer	Sub Mark	Mark
8(a)(i)	Solvent X : Water / H ₂ O Solvent Y : Propanone / Methyl benzene / [any organic solvent]	1 1	2
(ii)	1. Hydrochloric in solvent X / water reacts with copper(II) oxide 2. Hydrochloric in solvent Y / propanone does not reacts with copper(II) oxide 3. Acid only shows its acidic properties when dissolve in water 4. In the present of water, hydrochloric acid ionize to form H ⁺ ion 5. The H ⁺ ion causes the hydrochloric acid reacts with copper(II) oxide // 6. $H^+ + CuO \rightarrow Cu^{2+} + H_2O$ 7. Produce copper(II) chloride / Cu ²⁺ ion 8. In propanone, hydrochloric acid exist as molecule // In propanone, H ⁺ ion is not present	1 1 1 1 1 1 1 1	8
(iii)	1. Neutralisation 2. Correct formulae of reactant and product 3. Balanced equation $CuO + 2HCl \rightarrow CuCl_2 + H_2O$ 4. Number of mole of HCl = $\frac{1 \times 50}{1000}$ // 0.05 5. Number of mole of CuO = $\frac{0.05}{2}$ // 0.025 mol 6. Mass of CuO = 0.025 X (64 + 16) g // 2.5 g	1 1 1 1 1 1	6
(b)	1. Sodium hydroxide is a strong alkali // Sodium hydroxide ionises completely in water 2. Ammonia is a weak alkali // ammonia ionises partially in water 3. The concentration of hydroxide ions in sodium hydroxide is higher than in ammonia solution. 4. When the concentration of hydroxide ion is higher, the pH value is higher	1 1 1 1	4
TOTAL		20	

No	Answer	Sub Mark	Mark									
10(a)	Acidic gases released in industries dissolved in rain water / water vapour to form electrolyte which increases the rate of rusting	1 1	2									
(b)	1. Reaction I is not a redox reaction 2. No change in oxidation number for all elements before and after the reaction. // $\text{HCl} + \text{NaOH} \rightarrow \text{H}_2\text{O} + \text{NaCl}$ Oxidation No. +1-1 +1-2 +1 +1 -2 +1 -1 3. Reaction II is a redox reaction 4. Oxidation numbers of magnesium increases (from 0 to +2) and copper decreases (from +1 to 0) // $\text{Mg (s)} + \text{CuSO}_4 \text{ (aq)} \rightarrow \text{MgSO}_4 + \text{Cu}$ Oxidation No. 0 +2 +2 0	1 1 1 1	4									
(c)	<table border="1" data-bbox="328 1066 1106 1485"> <thead> <tr> <th data-bbox="328 1066 496 1115">Step</th> <th data-bbox="496 1066 735 1115">Chemicals used</th> <th data-bbox="735 1066 1106 1115">Observation</th> </tr> </thead> <tbody> <tr> <td data-bbox="328 1115 496 1294">I</td> <td data-bbox="496 1115 735 1294">Any suitable oxidising agent / e.g : Copper(II) sulphate solution</td> <td data-bbox="735 1115 1106 1294">Correct corresponding observation / Blue solution of Copper(II) sulphate solution becomes paler or colourless.</td> </tr> <tr> <td data-bbox="328 1294 496 1485">II</td> <td data-bbox="496 1294 735 1485">Any suitable reducing agent / e.g : zinc powder</td> <td data-bbox="735 1294 1106 1485">Correct corresponding observation / zinc powder dissolves // brown colour of iron(III) ions becomes pale green.</td> </tr> </tbody> </table>	Step	Chemicals used	Observation	I	Any suitable oxidising agent / e.g : Copper(II) sulphate solution	Correct corresponding observation / Blue solution of Copper(II) sulphate solution becomes paler or colourless.	II	Any suitable reducing agent / e.g : zinc powder	Correct corresponding observation / zinc powder dissolves // brown colour of iron(III) ions becomes pale green.	1+1 1+1	4
Step	Chemicals used	Observation										
I	Any suitable oxidising agent / e.g : Copper(II) sulphate solution	Correct corresponding observation / Blue solution of Copper(II) sulphate solution becomes paler or colourless.										
II	Any suitable reducing agent / e.g : zinc powder	Correct corresponding observation / zinc powder dissolves // brown colour of iron(III) ions becomes pale green.										

(d)	<u>Sample answer</u>		
	▶ <u>Labeled diagram</u> :	1	
	1. Functional apparatus		
	2. Label (consists of one reducing agent and one oxidizing agent in solution form separated by a salt bridge)	1	
		1	
	<u>Sample answer</u>	1	
	▶ <u>Procedure</u> :	1	
	3. Filled the “U-tube” with dilute H ₂ SO ₄ until 5 cm from the mouth of each arm	1	
	4. Add potassium iodide solution carefully to one arm and bromine water to another arm until 3 cm height	1	
	5. Immersed the carbon electrodes to each arm and connect to the galvanometer using connecting wire.	1	
6. Record the observation.			
▶ <u>Half-equations involved</u> :	1		
7. Electrode in KI/ Anode : $2 I^- \rightarrow I_2 + 2e$			
8. Electrode in Br ₂ / Cathode : $Br_2 + 2e \rightarrow 2 Br^-$	1	10	
▶ <u>Observation</u> :			
9. Electrode in KI/ Anode : colourless solution of KI becomes brown			
10. Electrode in Br ₂ / Cathode : Brown colour of bromine becomes colourless.			
	TOTAL	20	

END OF MARKING SCHEME

MARKING SCHEME
4541/3 CHEMISTRY
Paper 3

Question	Rubric	Score						
1(a)	Able to state all observations correctly.	3						
	<u>Sample answer:</u>							
	<table border="1" style="width: 100%;"> <thead> <tr> <th>Experiment</th> <th>Observation at anode</th> </tr> </thead> <tbody> <tr> <td>I</td> <td>Bubbles of gas released//effervescence occurs</td> </tr> <tr> <td>II</td> <td>Copper / anode becomes thinner/ dissolved/ smaller.</td> </tr> </tbody> </table>		Experiment	Observation at anode	I	Bubbles of gas released//effervescence occurs	II	Copper / anode becomes thinner/ dissolved/ smaller.
	Experiment		Observation at anode					
	I		Bubbles of gas released//effervescence occurs					
II	Copper / anode becomes thinner/ dissolved/ smaller.							
Able to state one observation correctly								
Able to state an idea of observation.	2							
<u>Sample answer:</u> Experiment I : air bubbles Experiment II : Size decreases	1							
No response or wrong response	0							

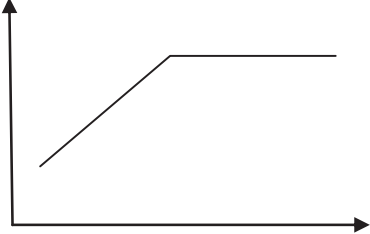
Question	Rubric	Score
1(b)	Able to state the inference correctly based on observation.	3
	<u>Sample answer:</u> Copper (II) ion / Cu^{2+} produced // Copper ionises // Copper released electron // Copper is oxidised.	
	Able to state the inference incorrectly	2
	<u>Sample answer:</u> Atom changed to ion.	
	Able to state an idea of inference	1
<u>Sample answer:</u> Copper changed // ion discharged		
No response or wrong response	0	

Question	Rubric	Score
1(c)	Able to give the hypothesis accurately <u>Sample answer:</u> When copper electrodes are used instead of carbon electrodes, the types of products formed at the electrodes are different// Different electrode/anode produces different products.	3
	Able to give the hypothesis almost accurately <u>Sample answer:</u> Different products produce when different electrode/anode is used.	2
	Able to state an idea of hypothesis <u>Sample answer:</u> Different cells give different products// Electrode change/ affect/ influence product	1
	No response or wrong response	0

Question	Rubric	Score
1(d)	Able to state the three variables correctly <u>Sample answer:</u> Manipulated variable : Type of electrode/anode // copper and carbon Responding variable : Product at the anode // Product of electrolysis Constant variable : Copper(II) sulphate//CuSO ₄ // Electrolyte// Concentration of electrolyte r: Volume	3
	Able to state any two variables correctly	2
	Able to state any one variable correctly	1
	No response or wrong response	0

Question	Rubric	Score
1(e)	Able to predict the product correctly <u>Sample answer:</u> Chlorine gas/ Cl ₂	3
	Able to predict the product less accurately <u>Sample answer:</u> Halogen gas	2
	Able to state an idea of product. <u>Sample answer:</u> Greenish-yellow gas // Bubbles of gas// oxygen	1
	No response given / wrong response	0

Question	Rubric	Score															
2(a)	Able to measure all the height of precipitate accurately with one decimal places . Answer:	3															
	<table border="1"> <thead> <tr> <th>Test tube</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>7</th> </tr> </thead> <tbody> <tr> <td>Height of precipitate</td> <td>0.5 [0.4-0.6]</td> <td>0.9 [0.8-1.0]</td> <td>1.3 [1.2-1.4]</td> <td>1.6 [1.5-1.7]</td> <td>2.0 [1.9-2.1]</td> <td>2.0 [1.9-2.1]</td> <td>2.0 [1.9-2.1]</td> </tr> </tbody> </table>		Test tube	1	2	3	4	5	6	7	Height of precipitate	0.5 [0.4-0.6]	0.9 [0.8-1.0]	1.3 [1.2-1.4]	1.6 [1.5-1.7]	2.0 [1.9-2.1]	2.0 [1.9-2.1]
	Test tube	1	2	3	4	5	6	7									
	Height of precipitate	0.5 [0.4-0.6]	0.9 [0.8-1.0]	1.3 [1.2-1.4]	1.6 [1.5-1.7]	2.0 [1.9-2.1]	2.0 [1.9-2.1]	2.0 [1.9-2.1]									
	Able to write any 5 readings accurately // All readings correctly but without decimal places.	2															
Able to write any 3 readings correctly.	1																
No response given / wrong response	0																

Question	Rubric	Score
2(b)	Able to draw the graph correctly i. Axis x : volume of barium chloride / cm ³ and axis y : height of precipitate/ cm ii. Consistent scale and the graph half of graph paper iii. All the points are transferred correctly iv. Correct curve 	3
	Able to draw the graph incorrectly i. Axis x : volume of barium chloride and axis y : height of precipitate // Inverse axes ii. Consistent scale iii. About 5 points are transferred correctly iv. Correct curve	2
	Able to state an idea to draw the graph i. Draw the axis x and axis y ii. Incorrect curve.	1
	No response or wrong response	0

Question	Rubric	Score
2(c)	Able to state the volume and calculate the number of mol correctly <u>Answer:</u> 1. 5 cm^3 2. No. of mole = $\frac{0.5 \times 5}{1000}$ // 0.0025 mol	3
	Able to state the volume correctly or calculate the number of mol correctly <u>Sample answer:</u> 5 cm^3 // $\frac{0.5 \times 5}{1000}$ // 0.0025 mol	2
	Able to state an idea to calculate <u>Sample answer:</u> 5 // 0.5×5	1
	No response or wrong response	0

Question	Rubric	Score
2(d)	Able to write the ionic equation correctly. <u>Sample answer:</u> $\text{Ba}^{2+} + \text{CrO}_4^{2-} \rightarrow \text{BaCrO}_4$	3
	Able to write the ionic equation incorrectly. <u>Sample answer:</u> $\text{Ba}^{2+} + \text{CrO}_4^{2-}$ // BaCrO_4 // $\text{Ba}^+ + \text{CrO}_4^- \rightarrow \text{BaCrO}_4$	2
	Able to state an idea of writing equation. <u>Sample answer:</u> $\text{BaCl}_2 + \text{K}_2\text{CrO}_4 \rightarrow \text{BaCrO}_4 + 2\text{KCl}$	1
	No response or wrong response	0

Question	Rubric	Score
2(e)	Able to give the meaning of the precipitation reaction correctly. <u>Sample answer:</u> Yellow precipitate is formed when barium chloride solution reacts with potassium chromate (VI) solution.	3
	Able to give the meaning of the rate of reaction less accurately. <u>Sample answer:</u> Yellow precipitate is formed	2
	Able to give an idea of the rate of reaction. <u>Sample answer:</u> Double decomposition reaction	1
	No response given / wrong response	0

Question	Rubric	Score				
2(f)	Able to classify all the salts correctly <u>Sample answer:</u> <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Soluble salts</th> <th>Insoluble salts</th> </tr> </thead> <tbody> <tr> <td>Sodium carbonate, Na₂CO₃ Magnesium nitrate, Mg(NO₃)₂</td> <td>Lead(II)sulphate, PbSO₄ Silver chloride, AgCl</td> </tr> </tbody> </table>	Soluble salts	Insoluble salts	Sodium carbonate, Na ₂ CO ₃ Magnesium nitrate, Mg(NO ₃) ₂	Lead(II)sulphate, PbSO ₄ Silver chloride, AgCl	3
	Soluble salts	Insoluble salts				
	Sodium carbonate, Na ₂ CO ₃ Magnesium nitrate, Mg(NO ₃) ₂	Lead(II)sulphate, PbSO ₄ Silver chloride, AgCl				
	Able to classify any three salts correctly	2				
Able to classify any two salts correctly or give opposite answers <u>Sample answer:</u> <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Insoluble salts</th> <th>Soluble salts</th> </tr> </thead> <tbody> <tr> <td>Sodium carbonate, Na₂CO₃ Magnesium nitrate, Mg(NO₃)₂</td> <td>Lead(II)sulphate, PbSO₄ Silver chloride, AgCl</td> </tr> </tbody> </table>	Insoluble salts	Soluble salts	Sodium carbonate, Na ₂ CO ₃ Magnesium nitrate, Mg(NO ₃) ₂	Lead(II)sulphate, PbSO ₄ Silver chloride, AgCl	1	
Insoluble salts	Soluble salts					
Sodium carbonate, Na ₂ CO ₃ Magnesium nitrate, Mg(NO ₃) ₂	Lead(II)sulphate, PbSO ₄ Silver chloride, AgCl					
No response given / wrong response	0					

Question	Rubric	Score
3 (a)	Able to give the aim of the experiment correctly. <u>Sample answer</u> : To compare the heat of combustion of different alcohols/(methanol, ethanol, propan-1-ol)	2
	Able to give a relevant idea with the problem statement or aim of the experiment. <u>Sample answer</u> : To determine heat release when alcohols is burn// Does alcohol with a higher number of carbon atoms per molecule have a higher heat of combustion?// Does combustion release different quantity of heat?	1
	No response or wrong response	0

Question	Rubric	Score
3(b)	Able to state all variables correctly. <u>Sample answer</u> : Manipulated variable :Different type of alcohols// type of alcohols//methanol, ethanol, propan-1-ol Responding variable :Heat of combustion Controlled variable :Volume of water// copper can// thermometer	3
	Able to state any two variables above correctly.	2
	Able to state any one variable above correctly.	1
	No response or wrong response	0

Question	Rubric	Score
3(c)	Able to give the hypothesis of the experiment accurately. <u>Sample answer :</u> The higher the number of carbon atoms in the alcohol molecules, the higher the heat of combustion	3
	Able to give the hypothesis of the experiment correctly. <u>Sample answer :</u> The heat of combustion increases when the number of carbon per molecule of alcohol increases// Different types of alcohols have different heat of combustion// The larger the size of alcohols molecule, the higher the heat of combustion//when the molar mass of alcohol increases the heat of combustion increases.	2
	Able to give a relevant idea with the hypothesis of the experiment . <u>Sample answer :</u> Size/molar mass of alcohol molecule affect the heat of combustion. Number of carbon atom in alcohol affect the heat released in combustion// Alcohols have different heat of combustion.	1
	No response or wrong response	0

Question	Rubric	Score
3(d)	Able to give the list of the materials and apparatus correctly and completely <u>sample answer:</u> Material: methanol, ethanol, propan-1-ol, water Apparatus :Copper can, tripod stand, thermometer, measuring cylinder, spirit lamp, weighing balance, wooden block, wind shield.	3
	Able to list out all he materials and the apparatus correctly but not completely <u>Sample answer :</u> methanol, ethanol, propan-1-ol, water Copper can, thermometer, spirit lamp, weighing balance.	2
	Able to give an idea about the list of the materials and the apparatus. <u>Sample answer :</u> Thermometer and any one substance	1
	No response or wrong response	0

Question	Rubric	Score
3(e)	Able to state all procedures correctly Sample answer : <ol style="list-style-type: none"> 1. [100 – 250] cm³ of water is measured and pour into a copper can. 2. The initial temperature of water is recorded. 3. The copper can is placed on a tripod stand. 4. A spirit lamp is filled with methanol and the initial mass is weighted and recorded. 5. The spirit lamp is put under the copper can and the wick of the lamp is lighted immediately. 6. The water is stirred with the thermometer until the temperature rises about 30°C. 7. The flame is put off and the highest temperature is recorded. 8. The spirit lamp and its content is weighed immediately and the final mass is recorded 9. Steps 1 to 8 are repeated using ethanol and propan-1-ol to replace methanol 	3
	Able to list down steps 1,2, 4,5,7,8 and 9	2
	Able to list down steps 2, 5 and 7	1
	No response or wrong response	0

Question	Rubric				Score	
3(f)	Able to tabulate the data with the following aspects: (i) Correct titles (ii) Correct unit (iii) Complete list of alcohols				3	
	Types of alcohols	Initial temperature/°C	Highest temperature/°C	Initial mass of spirit lamp/g		Final mass of spirit lamp/g
	Methanol					
	Ethanol					
	Propan-1-ol					

<p>Able to tabulate the data with the following aspects:</p> <p>(i) Correct titles</p> <p>(ii) Complete list of alcohols</p> <p><u>Sample answer:</u></p>					2
Types of alcohols	Initial temperature	Highest temperature	Initial mass of spirit lamp	Final mass of spirit lamp	
Methanol					
Ethanol					
Propan-1-ol					
<p>Able to exhibit the tabulation of data less accurately</p> <p><u>Sample answer:</u></p>					1
Types of alcohols	Initial temperature	Highest temperature			
Methanol					
Ethanol					
No response or wrong response .					0

END OF MARKING SCHEME

RALAT CHEMISTRY PAPER 1

No	Asal (pilihan jawapan)		Pembetulan	
13 m.s.7	A	2-pentene <i>2-pentena</i>	A	Pent-2-ene <i>Pent-2-ena</i>
	B	2-methyl-1-butene <i>2-metil-1-butena</i>	B	2-methylbut-1-ene <i>2-metilbut-1-ena</i>
	C	2-methyl-2-butene <i>2-metil-2-butena</i>	C	2-methylbut-2-ene <i>2-metilbut-2-ena</i>
	D	3-methyl-3-butene <i>3-metil-2-butena</i>	D	3-methylbut-3-ene <i>3-metilbut-2-ena</i>

No	Asal (pilihan jawapan)			Pembetulan		
14 m.s.7		Atom <i>Atom</i>	Molecule <i>Molekul</i>		Substance <i>Bahan</i>	Particle <i>Zarah</i>
	A	Carbon <i>Karbon</i>	Carbon dioxide <i>Karbon dioksida</i>	A	Carbon <i>Karbon</i>	Atom <i>Atom</i>
	B	Sulphur dioxide <i>Sulfur dioksida</i>	Sulphuric acid <i>Asid sulfurik</i>	B	Sulphur dioxide <i>Sulfur dioksida</i>	Ion <i>Ion</i>
	C	Sodium <i>Natrium</i>	Sodium chloride <i>Natrium klorida</i>	C	Sodium <i>Natrium</i>	Molecule <i>Molekul</i>
	D	Silicon dioxide <i>Silikon dioksida</i>	Silicon <i>Silikon</i>	D	Silicon dioxide <i>Silikon dioksida</i>	Ion <i>Ion</i>

No	Asal (soalan)	Pembetulan
24 m.s.14	<p>A carbon compound Q has the characteristics below</p> <ul style="list-style-type: none"> • <u>Colourless</u> the brown colour of bromine water • <u>Colourless</u> the purple colour of acidified potassium manganate(VII) <p>What is Q?</p>	<p>A carbon compound Q has the characteristics below</p> <p><i>Satu sebatian karbon Q mempunyai ciri-ciri berikut</i></p> <ul style="list-style-type: none"> • Decolourise the brown colour of bromine water • Decolourise the purple colour of acidified potassium manganate(VII) • <i>Mennyahwarnakan warna perang air bromin</i> • <i>Mennyahwarnakan warna ungu kalium manganat(VII) berasid</i> <p>What is Q? <i>Apakah Q</i></p>

ERATA

CHEMISTRY PAPER 2
KIMIA KERTAS 2

BAHAGIAN A : MUKA SURAT 2 , SOALAN 1

Asal

Manufactured products <i>Bahan buatan</i>	Name of products <i>Nama hasil</i>	Components <i>Komponen</i>
Glass <i>Kaca</i>	Lead glass <i>Kaca plumbum</i>	Y, sodium oxide and <u>lead</u> , Y, <i>natrium oksida dan <u>plumbum</u></i>

Sepatutnya

Manufactured products <i>Bahan buatan</i>	Name of products <i>Nama hasil</i>	Components <i>Komponen</i>
Glass <i>Kaca</i>	Lead glass <i>Kaca plumbum</i>	Y, sodium oxide and <u>lead(II) oxide</u> Y, <i>natrium oksida dan <u>plumbum(II) oksida</u></i>

BAHAGIAN C : MUKA SURAT 21 , SOALAN 10(d)

Asal

Dengan menggunakan larutan kalium iodida, asid sulfurik cair dan air bromine, huraikan satu eksperimen untuk mengesahkan pernyataan di atas.

Sepatutnya:

Dengan menggunakan larutan kalium iodida, asid sulfurik cair dan agen pengoksidaan yang sesuai, huraikan satu eksperimen untuk mengesahkan pernyataan di atas.

CHEMISTRY PAPER 3 (SOALAN)**RALAT**

<i>RUJUKAN</i>	<i>ASAL</i>	<i>PEMBETULAN</i>
m.s 6 No2 baris 3	Each test tube is <u>stopper</u> and shaken well.	Each test tube is <u>stoppered</u> and shaken well.
m.s 6 no 2 (a)	Using <u>the</u> ruler	Using <u>a</u> ruler
m.s 8 no 2 baris 1	Based on the <u>table</u> above	Based on the <u>graph</u> above,
m.s 8 no 2 (e)	<u>Based on this experiment</u> , state the operational definition for the precipitation <u>reaction</u> . <i>Berdasarkan ekperimen ini,, nyatakan definisi secara operasi bagi tindak balas pemendakan.</i>	State the operational definition for the precipitation of <u>barium chromate (VI)</u> . <i>Nyatakan definisi secara operasi bagi pemendakan barium kromat(VI).</i>

SKEMA PAPER 3

<i>RUJUKAN</i>	<i>ASAL</i>	<i>PEMBETULAN</i>
m.s 5 No. 2 e (Skor 2)	Able to give the meaning of the <u>rate of</u> reaction less accurately	Able to give the meaning of the <u>precipitation</u> reaction less accurately