

Bahagian A**Section A**

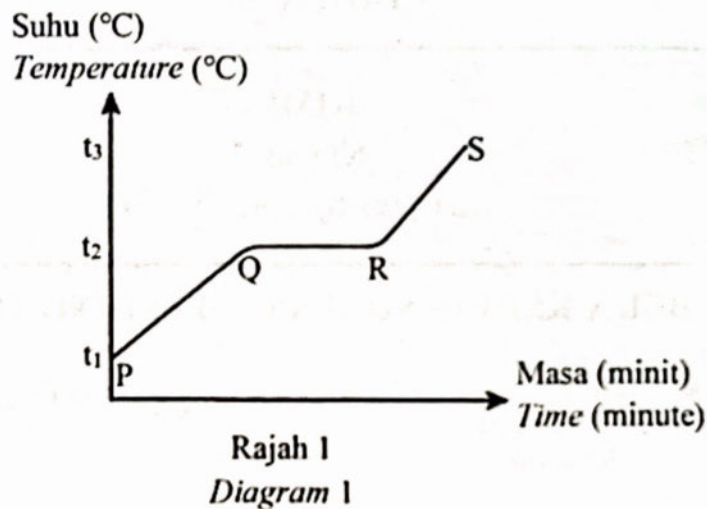
[60 markah]

[60 marks]

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

1. Sekumpulan murid menjalankan eksperimen untuk menentukan takat lebur bagi serbuk asid laurik, $C_{12}H_{24}O_2$.

A group of pupils carried out an experiment to determine the melting point of lauric acid powder, $C_{12}H_{24}O_2$.



Berdasarkan Rajah 1,
Based on Diagram 1,

- (a) nyatakan jenis zarah dalam serbuk asid laurik.
state the type of particles in lauric acid powder.

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

- (b) apakah kaedah yang digunakan untuk memanaskan asid laurik bagi eksperimen ini?
what method is used to heat lauric acid for this experiment?

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

- (c) nyatakan takat lebur asid laurik.
state the melting point of lauric acid.

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

- (d) mengapakah suhu kekal malar di antara Q dan R?
why does the temperature remain constant between Q and R?

.....

 [2 markah / 2 marks]

2. Asid boleh dikelaskan kepada tiga iaitu asid monoprotik, asid diprotik dan asid triprotik.
Acids can be classified into three, which are monoprotic acids, diprotic acids and triprotic acids.

- (a) Namakan satu contoh asid monoprotik kuat.
Name an example of a strong monoprotic acid.

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

- (b) Apakah zarah yang dapat menunjukkan sifat keasidan dalam asid di 2(a)?
What particles can show the acidic properties of the acid in 2(a)?

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

- (c) Mengapakah asid etanoik glasial tidak dapat menunjukkan sifat keasidan?
Why glacial ethanoic acid cannot show acidic properties?

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



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- (d) Asid formik, HCOOH digunakan dalam penggumpalan lateks. Adakah asid formik sejenis asid diprotik? Berikan sebab.

Formic acid, HCOOH is used in coagulation of latex. Is formic acid a type of diprotic acid? Give a reason.

.....

[2 markah / 2 marks]

3. Jadual 3 menunjukkan keputusan eksperimen yang dijalankan untuk menentukan kadar tindak balas antara 20 cm^3 asid sulfurik 0.5 mol dm^{-3} dengan zink berlebihan.

Table 3 shows the result of an experiment to determine the rate of reaction between 20 cm^3 of 0.5 mol dm^{-3} sulphuric acid and excess zinc.

Masa (s) Time (s)	0.0	60.0	120.0	180.0	240.0	300.0	360.0	420.0	480.0	540.0
Isipadu gas (cm^3) Volume of gas (cm^3)	0.00	24.00	40.00	51.00	57.00	64.00	68.00	70.00	70.00	70.00

Jadual 3

Table 3

- (a) Berdasarkan eksperimen ini,

Based on this experiment,

- (i) nyatakan dua faktor yang mungkin mempengaruhi kadar tindak balas.

state two factors that may affect the rate of reaction.

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

- (ii) nyatakan perubahan yang dapat diperhatikan dan diukur.

state the changes that can be observed and measured.

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

- (iii) namakan larutan yang terhasil.

name the solution produced.

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

(b) Hitungkan
Calculate

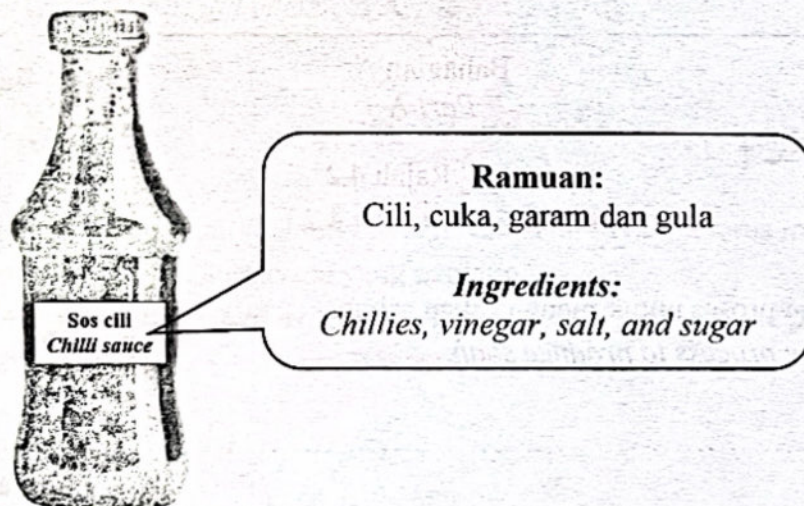
- (i) kadar tindak balas purata keseluruhan.
overall average rate of reaction.

[1 markah / 1 mark]

- (ii) kadar tindak balas purata dalam minit kedua.
average rate of reaction in the second minute.

[1 markah / 1 mark]

4. Rajah 4.1 menunjukkan ramuan yang digunakan dalam pembuatan sos cili.
Diagram 4.1 shows the ingredients used in manufacturing of chilli sauce.



Rajah 4.1
Diagram 4.1

(a) Berdasarkan Rajah 4.1,
Based on Diagram 4.1,

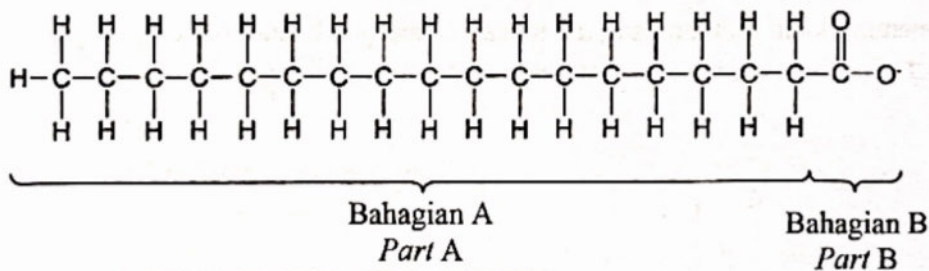
- (i) namakan jenis bahan tambah makanan dalam sos cili.
name the type of food additive in chilli sauce.

[1 markah / 1 mark]

- (ii) mengapakah jenis bahan tambah makanan di 4(a)(i) ditambahkan pada sos cili?
why the type of food additive in 4(a)(i) is added to the chilli sauce?

[1 markah / 1 mark]

- (b) Sabun boleh disediakan daripada sumber semulajadi melalui proses hidrolisis minyak atau lemak oleh alkali. Rajah 4.2 menunjukkan formula struktur bagi anion sabun.
Soap can be prepared from natural sources through the process of hydrolysis of oil or fat by alkalis. Diagram 4.2 shows the structural formula of soap anion.



Rajah 4.2
Diagram 4.2

- (i) Namakan proses untuk menghasikan sabun.
Name the process to produce soap.

[1 markah / 1 mark]

- (ii) Berdasarkan Rajah 4.2, kenal pasti bahagian yang larut dalam gris.
Based on Diagram 4.2, identify the part that dissolves in grease.

[1 markah / 1 mark]



- (c) Rajah 4.3 menunjukkan produk kecantikan yang dibeli oleh Aisyah secara atas talian.
Diagram 4.3 shows the beauty product bought online by Aisyah.



Rajah 4.3
 Diagram 4.3

Selepas seminggu, kulit Aisyah semakin cerah namun merengsa. Aisyah mengambil tindakan untuk menyemak kandungan produk tersebut dalam laman web Bahagian Regulatori Farmasi Negara. Dia mendapati produk tersebut telah ditarik balik dari pasaran kerana mengandungi bahan kimia terlarang X.

After a week, Aisyah's skin is brighter but irritated. Aisyah took action to check the ingredient of the product in the National Pharmaceutical Regulatory Agency website. She found that the product had been withdrawn from the market because it contained harmful chemical X.

- (i) Cadangkan nama bahan kimia terlarang X.
Suggest the name of harmful chemical X.

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

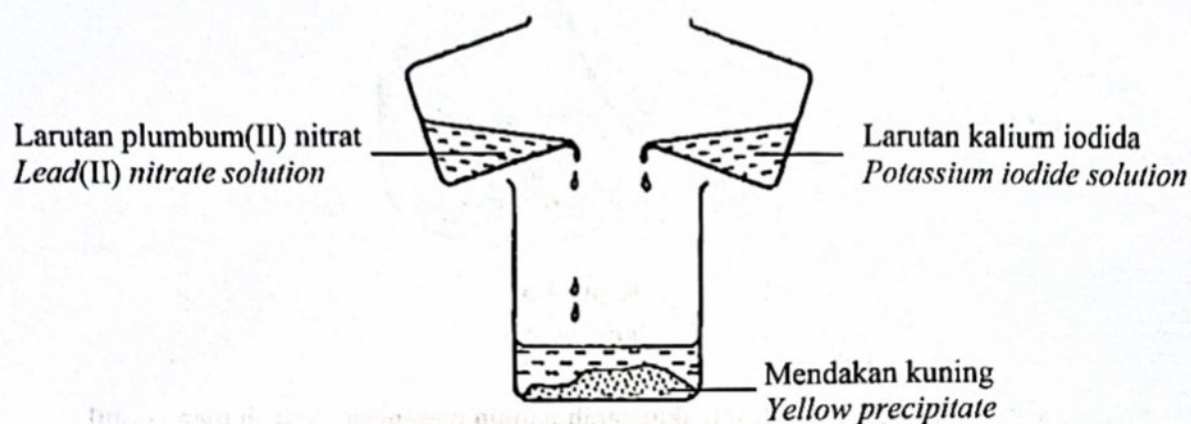
- (ii) Terangkan kesan yang akan dialami oleh Aisyah sekiranya dia terus menggunakan produk tersebut dalam jangka masa yang panjang.
Explain the effects Aisyah will experience if she continues to use the product for a long period of time.

.....

 [2 markah / 2 marks]

5. Rajah 5 menunjukkan tindak balas antara larutan plumbum(II) nitrat dan larutan kalium iodida.

Diagram 5 shows the reaction between lead(II) nitrate solution and potassium iodide solution.



Rajah 5
Diagram 5

Berdasarkan Rajah 5,
Based on Diagram 5,

- (a) tuliskan formula kimia bagi kalium iodida.
write the chemical formula for potassium iodide.

[1 markah / 1 mark]

- (b) namakan mendakan kuning yang terbentuk.
name the yellow precipitate that is formed.

[1 markah / 1 mark]

- (c) tindak balas ini menghasilkan mendakan kuning dan larutan tidak berwarna.
this reaction produces a yellow precipitate and a colourless solution.

- (i) Tulis persamaan kimia bagi tindak balas ini.
Write a chemical equation for the reaction.

[2 markah / 2 marks]

- (ii) Jika 0.25 mol larutan plumbum(II) nitrat digunakan dalam tindak balas tersebut, hitungkan bilangan mol larutan tidak berwarna yang terbentuk.
If 0.25 mol of lead(II) nitrate solution is used in the reaction, calculate the number of moles of colourless solution formed.

[1 markah / 1 mark]

- (d) Jadual 5 menunjukkan maklumat bagi dua jenis baja yang biasa digunakan oleh sepuluh orang petani di kebun masing-masing.
Table 5 shows information for two types of fertilisers commonly used by ten farmers in their respective farms.

Baja Fertiliser	Maklumat Information
Ammonium nitrat <i>Ammonium nitrate</i>	- Formula kimia: NH_4NO_3 <i>Chemical formula: NH_4NO_3</i> - Digunakan oleh tiga orang petani. <i>Used by three farmers</i> - Keadaan pokok <i>Tree conditions:</i> - daun menjadi agak kekuningan (klorosis) <i>leaves become slightly yellow (chlorosis)</i> - ketinggian pokok bertambah dengan perlahan <i>tree height increases slowly</i> - daun bersaiz lebih kecil <i>leaves are smaller in size</i>
Urea <i>Urea</i>	- Formula kimia: $(\text{NH}_2)_2\text{CO}$ <i>Chemical formula: $(\text{NH}_2)_2\text{CO}$</i> - Digunakan oleh tujuh orang petani. <i>Used by seven farmers</i> - Keadaan pokok <i>Tree conditions:</i> - daun berwarna hijau <i>leaves are green</i> - ketinggian pokok bertambah dengan cepat <i>tree height increases rapidly</i> - daun bersaiz lebih besar <i>leaves are larger in size</i>

Jadual 5
Table 5

Jelaskan mengapa lebih ramai petani memilih untuk menggunakan baja urea. Buktikan jawapan anda dengan menunjukkan pengiraan yang berkaitan.

Diberi jisim atom relatif; C=12, H=1, N=14, O=16.

Explain why more farmers choose to use urea fertiliser. Prove your answer by showing relevant calculation.

Given the relative atomic mass; C=12, H=1, N=14, O=16.

Pengiraan:

Calculation:

[3 markah / 3 marks]

6. (a) Aloi J yang ringan tetapi kuat digunakan untuk membuat badan kapal terbang.

Alloy J which is light but strong is used to make body of an aeroplane.

(i) apakah bahan utama yang digunakan dalam penghasilan aloi?

what is the main substance used in the production of alloys?

[1 markah / 1 mark]

(ii) kenal pasti aloi J.

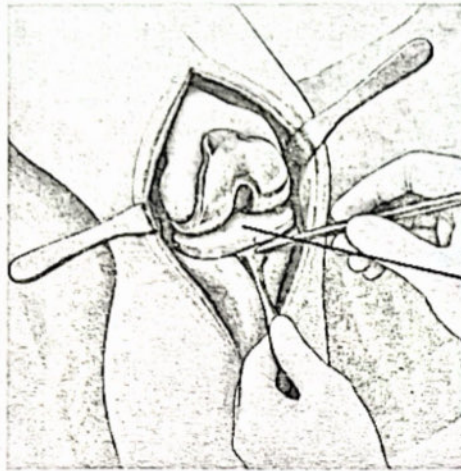
identify alloy J.

[1 markah / 1 mark]

- (b) Rajah 6 menunjukkan komponen pembedahan bagi penggantian tulang lutut manusia. Bahan X yang digunakan merupakan sejenis seramik termaju. Kenal pasti bahan X. Terangkan kelebihan menggunakan bahan X berbanding logam dalam pembuatan implan tulang lutut tersebut berdasarkan sifat kimianya.

Diagram 6 shows the surgical components for a human knee bone replacement.

Substance X used is a type of advanced ceramic. Identify the Substance X. Explain the advantages of using Substance X compared to metal in making the knee bone implant based on its chemical properties.



Rajah 6
Diagram 6

[3 markah / 3 marks]



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- (c) Bahan komposit W dihasilkan daripada gabungan bahan matriks U dan bahan pengukuhan V. Jadual 6 menunjukkan perbandingan sifat bagi bahan matriks U, bahan pengukuhan V dan bahan komposit W.

Composite material W is produced from a combination of matrix substance U and strengthening substance V. Table 6 shows the comparison of properties for matrix substance U, strengthening substance V and composite material W.

Bahan matriks U <i>Matrix substance U</i>	Bahan pengukuhan V <i>Strengthening substance V</i>	Bahan komposit W <i>Composite material W</i>
• Kekuatan regangan rendah <i>Low stretching strength</i> • Kekonduksian haba dan elektrik rendah <i>Low heat and electrical conductivity</i> • Tahan kakisan <i>Resistant to corrosion</i> • Tahan lasak <i>Durable</i>	• Kekuatan regangan tinggi <i>High stretching strength</i> • Kekonduksian haba dan elektrik rendah <i>Low heat and electrical conductivity</i>	• Kekuatan regangan tinggi <i>High stretching strength</i> • Penebat haba dan elektrik <i>Heat and electrical insulator</i> • Tahan kakisan <i>Resistant to corrosion</i> • Tahan lasak <i>Durable</i>

Jadual 6
Table 6

- (i) Kenal pasti bahan matriks U, bahan pengukuhan V dan bahan komposit W.
Identify matrix substance U, strengthening substance V and composite material W.

Bahan matriks U :
Matrix substance U

Bahan pengukuhan V :
Strengthening substance V

Bahan komposit W :
Composite material W

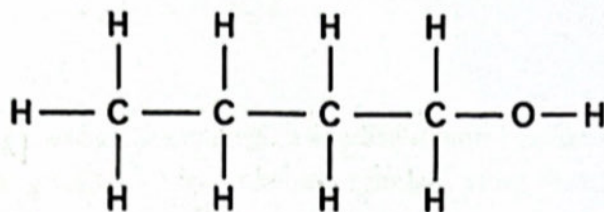
[3 markah / 3 marks]

- (ii) Nyatakan satu kegunaan bahan komposit W dalam kehidupan seharian.
State one use of composite material W in daily life.

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

7. Rajah 7.1 menunjukkan formula struktur bagi satu sebatian karbon Y.

Diagram 7.1 shows the structural formula of carbon compound Y.



Rajah 7.1

Diagram 7.1

- (a) Apakah sebatian karbon?
What is carbon compound?

[1 markah / 1 mark]

- (b) Berdasarkan Rajah 7.1,
Based on Diagram 7.1,

- (i) nyatakan kumpulan berfungsi.
state the functional group.

[1 markah / 1 mark]

- (ii) lukiskan formula struktur satu isomer yang lain.
draw the structural formula of another isomer.

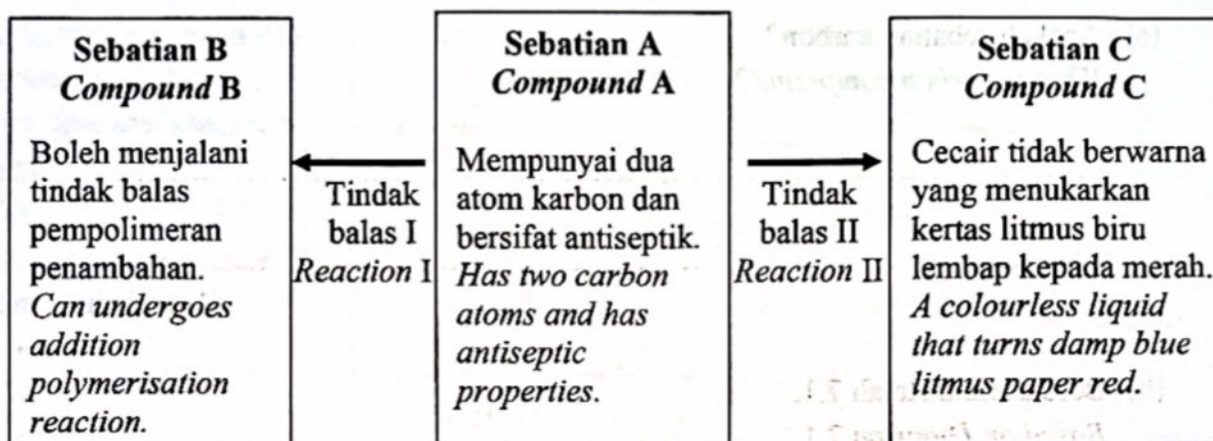
[1 markah / 1 mark]

- (iii) Sebatian Y boleh bertindak balas dengan asid propanoik, tulis persamaan kimia bagi tindak balas ini.
Compound Y can react with propanoic acid, write the chemical equation for this reaction.

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

- (c) Rajah 7.2 menunjukkan satu carta alir bagi tindak balas kimia yang melibatkan Sebatian A.

Diagram 7.2 shows a flow chart for chemical reactions that involved Compound A.



Rajah 7.2

Diagram 7.2

Berdasarkan Rajah 7.2,
Based on Diagram 7.2,

- (i) namakan Tindak balas I.
name Reaction I

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

- (ii) kenal pasti Sebatian B.
identify Substance B.

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

- (iii) nyatakan formula Sebatian C.
state the formula for Compound C.

[1 markah / 1 mark]

- (d) Pemandu yang memandu kenderaan semasa dalam keadaan mabuk boleh dikenakan tindakan undang-undang kerana kebarangkalian yang sangat tinggi untuk mengakibatkan kemalangan jalan raya.

Wajarkah tindakan ini? Berikan satu sebab.

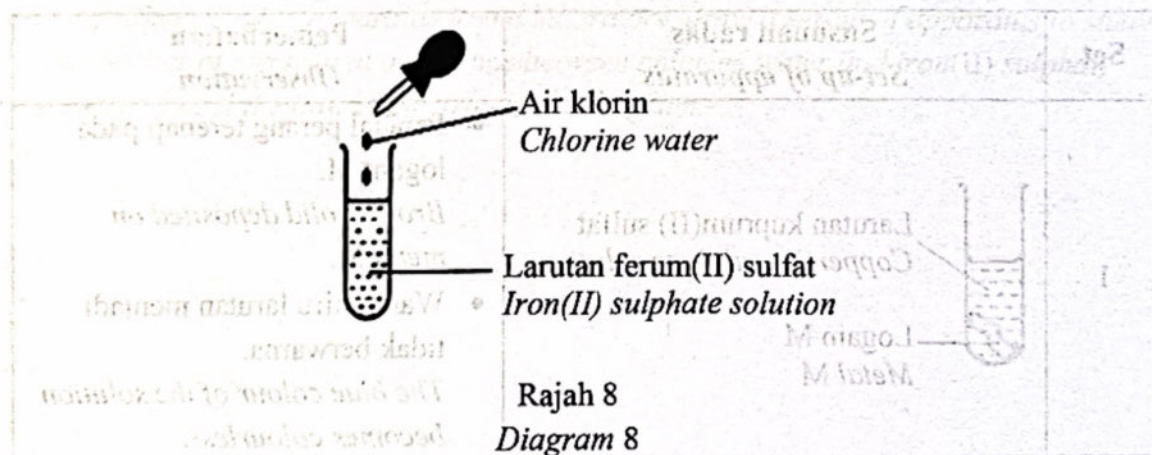
Drivers who drive during inebriation may be subjected to legal action due to a very high probability of causing a road accident.

Is this action justified? Give one reason.

[2 markah / 2 marks]

8. Rajah 8 menunjukkan susunan radas bagi menyiasat suatu tindak balas redoks.

Diagram 8 shows an apparatus set-up to investigate a redox reaction.



- (a) (i) Nyatakan warna bagi larutan ferum(II) sulfat.

State the colour for iron(II) sulphate solution.

[1 markah / 1 mark]

- (ii) Mengapakah eksperimen ini perlu menggunakan larutan ferum(II) sulfat yang baru disediakan?

Why this experiment needs to use freshly prepared iron(II) sulphate solution?

[1 markah / 1 mark]

- (iii) Tulis setengah persamaan bagi:

Write the half equation for:

tindak balas pengoksidaan :

oxidation reaction

tindak balas penurunan :

reduction reaction

[2 markah / 2 marks]

- (b) Jadual 8 menunjukkan maklumat bagi dua set eksperimen untuk mengkaji tindak balas penyesaran kuprum daripada larutan ionnya.

Table 8 shows information for two sets of experiments to study the reaction of displacement of copper from its salt solution.

Set	Susunan radas <i>Set-up of apparatus</i>	Pemerhatian <i>Observation</i>
I	 Larutan kuprum(II) sulfat <i>Copper(II) sulphate solution</i> Logam M <i>Metal M</i>	• Pepejal perang terendap pada logam M. <i>Brown solid deposited on metal M.</i> • Warna biru larutan menjadi tidak berwarna. <i>The blue colour of the solution becomes colourless.</i>
II	 Larutan kuprum(II) sulfat <i>Copper(II) sulphate solution</i> Logam N <i>Metal N</i>	• Tiada endapan perang terbentuk pada logam N. <i>No brown solid deposited on metal N.</i> • Warna biru larutan tidak berubah. <i>The blue colour of the solution remains unchanged.</i>

Jadual 8

Table 8

Terangkan perbezaan pemerhatian bagi kedua-dua set eksperimen tersebut.
Explain the differences in observations for the two sets of experiments.

.....

.....

.....

.....

.....

[3 markah / 3 marks]

- (c) Anda dibekalkan dengan satu galvanometer dan larutan asid sulfurik 1.0 mol dm^{-3} . Dengan menggunakan radas-radas lain yang sesuai di dalam makmal, lukiskan gambar rajah susunan radas untuk mengkaji pemindahan elektron pada suatu jarak antara air klorin dan larutan ferum(II) sulfat. Labelkan pengaliran elektron dalam gambar rajah itu.

You are provided with a voltmeter and 1.0 mol dm^{-3} of sulphuric acid solution. By using other suitable apparatus in the laboratory, draw a set-up of apparatus to study the transfer of electron at a distance between chlorine water and iron(II) sulphate solution. Label the flow of electron in the diagram.

[3 markah / 3 marks]



Bahagian B**Section B****[20 markah]****[20 marks]****Jawab satu soalan dalam bahagian ini.****Answer one question in this section.**

9. (a) Gas klorin berbau sengit, beracun dan berbahaya.

Chlorine gas has a pungent smell, is toxic and dangerous.

- (i) Berikan dua langkah keselamatan ketika mengendalikan klorin dalam makmal.

Give two safety precautions when handling chlorine in the laboratory.

[2 markah / 2 marks]

- (ii) Diberi nombor proton bagi atom klorin ialah 17. Nyatakan kumpulan bagi klorin dalam Jadual Berkala Unsur dan terangkan jawapan anda.

Given the proton number for chlorine atom is 17. State the group of chlorine in the Periodic Table of Elements and explain your answer.

[2 markah / 2 marks]

- (iii) 8.4 g wul besi bertindak balas dengan gas klorin berlebihan dan menghasilkan pepejal perang. Tuliskan persamaan kimia bagi tindak balas tersebut dan hitung jisim pepejal perang yang terbentuk.

[Jisim atom relatif: Fe = 56; Cl = 35.5]

8.4 g of iron wool reacts with excess chlorine gas and produces a brown solid.

Write the chemical equation for the reaction and calculate the mass of the brown solid formed.

[Relative atomic mass: Fe = 56; Cl = 35.5]

[6 markah / 6 marks]

- (b) Jadual 9 menunjukkan keputusan apabila tiga oksida unsur kala 3 ditambah kepada larutan natrium hidroksida dan asid hidroklorik.

Table 9 shows the result when three oxides of elements in period 3 are added to sodium hydroxide solution and hydrochloric acid.

Oksida <i>Oxide</i>	Ditambah kepada natrium hidroksida <i>Added to sodium hydroxide</i>	Ditambah kepada asid hidroklorik <i>Added to hydrochloric acid</i>
R	Tindak balas berlaku <i>Reaction occurs</i>	Tindak balas berlaku <i>Reaction occurs</i>
S	Tiada tindak balas berlaku <i>No reaction occurs</i>	Tindak balas berlaku <i>Reaction occurs</i>
T	Tindak balas berlaku <i>Reaction occurs</i>	Tiada tindak balas berlaku <i>No reaction occurs</i>

Jadual 9

Table 9

Berdasarkan Jadual 9,

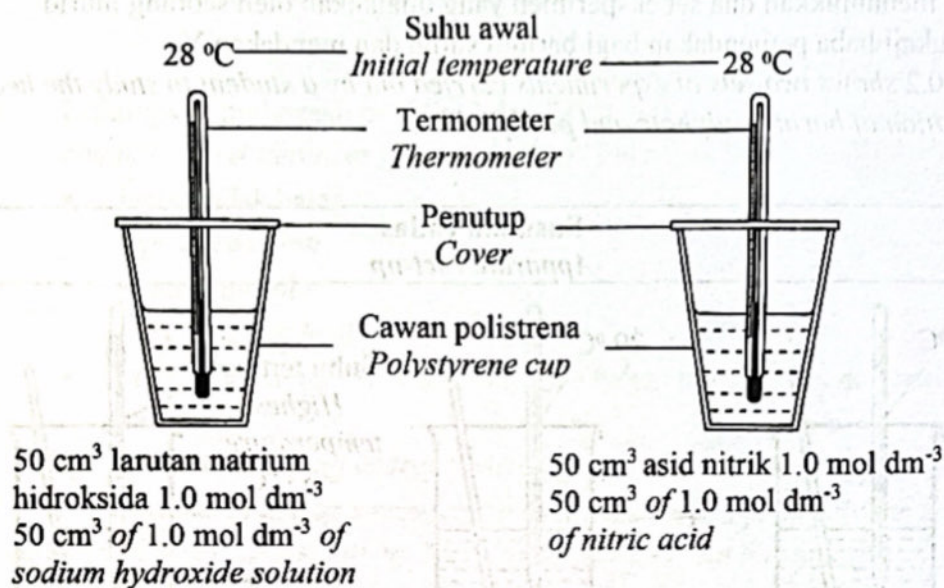
Based on Table 9,

- nyatakan jenis oksida bagi R, S dan T.
state the types of oxides of R, S and T.
- cadangkan unsur R, S dan T.
suggest the elements R, S and T.
- bandingkan keelektronegatifan unsur S dan T. Jelaskan jawapan anda.
compare the electronegativity of elements S and T. Explain your answer.

[10 markah / 10 marks]

10. (a) Rajah 10.1 menunjukkan susunan radas bagi eksperimen untuk menentukan haba tindak balas antara larutan natrium hidroksida dengan asid nitrik.

Diagram 10.1 shows the apparatus set-up of an experiment to determine the heat of reaction between sodium hydroxide solution and nitric acid.



Rajah 10.1
Diagram 10.1

Selepas suhu awal kedua-dua larutan dicatatkan, larutan natrium hidroksida dicampurkan ke dalam asid nitrik. Suhu tertinggi campuran, 34.5 °C dicatatkan.
After the initial temperature of both solutions are recorded, sodium hydroxide solution is mixed into nitric acid. The highest temperature of the mixture, 34.5 °C is recorded.

- Namakan tindak balas yang berlaku dan nyatakan mengapa cawan polistirena digunakan dalam eksperimen ini.
Name the reaction that occurs and state why polystyrene cups are used in this experiment. [2 markah / 2 marks]
- Eksperimen diulang dengan menggantikan larutan natrium hidroksida kepada larutan ammonia dan didapati perubahan haba menjadi lebih rendah. Terangkan mengapa.
The experiment is repeated by replacing the sodium hydroxide solution with ammonia solution and it is found that the heat change is lower. Explain why. [2 markah / 2 marks]
- Hitung haba tindak balas bagi eksperimen dalam Rajah 10.1.
[Muatan haba tentu larutan = 4.2 J g⁻¹ °C⁻¹; ketumpatan larutan = 1 g cm⁻³]
Calculate the heat of reaction for the experiment in Diagram 10.1.
[Specific heat capacity of solution = 4.2 J g⁻¹ °C⁻¹; density of solution = 1 g cm⁻³] [3 markah / 3 marks]

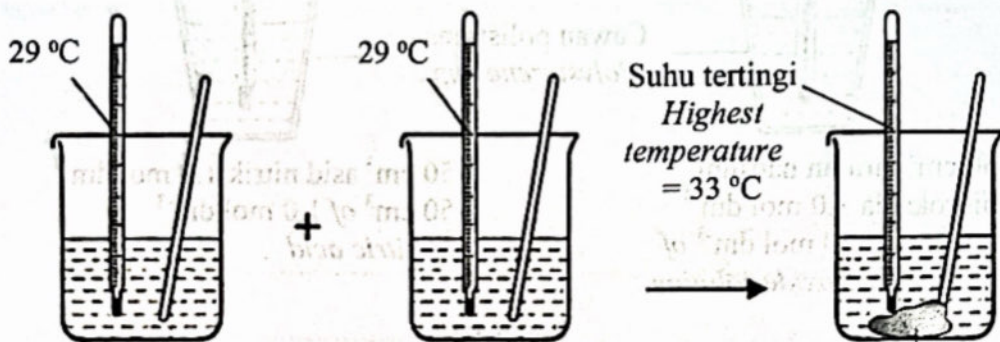
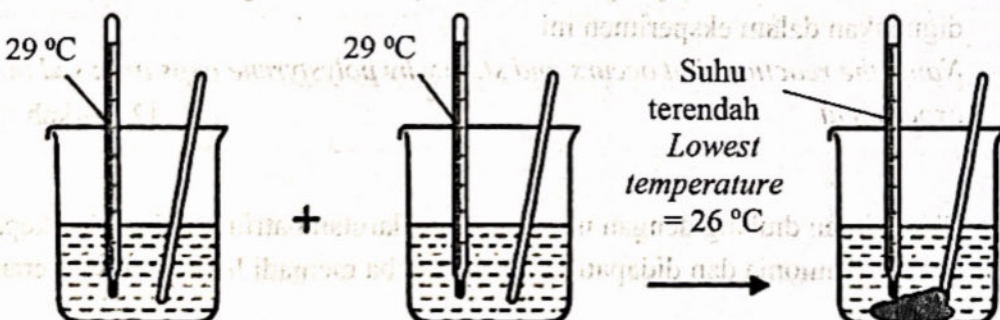
- (iv) Lukis gambar rajah aras tenaga bagi tindak balas yang berlaku dalam Rajah 10.1.

Draw the energy level diagram for the reaction occurred Diagram 10.1.

[3 markah / 3 marks]

- (b) Rajah 10.2 menunjukkan dua set eksperimen yang dijalankan oleh seorang murid untuk mengkaji haba pemendakan bagi barium sulfat dan mendakan Y.

Diagram 10.2 shows two sets of experiments carried out by a student to study the heat of precipitation of barium sulphate and precipitate Y.

Set	Susunan radas Apparatus set-up		
I	 29 °C 29 °C Suhu tertinggi Highest temperature = 33 °C Barium sulfat Barium sulphate 100 cm³ larutan barium klorida 0.1 mol dm⁻³ 100 cm³ of 0.1 mol dm⁻³ barium chloride solution 100 cm³ larutan X sulfat 0.1 mol dm⁻³ 100 cm³ of 0.1 mol dm⁻³ X sulphate solution		
II	 29 °C 29 °C Suhu terendah Lowest temperature = 26 °C Mendakan Y Precipitate Y 100 cm³ larutan kuprum(II) nitrat 0.1 mol dm⁻³ 100 cm³ of 0.1 mol dm⁻³ copper(II) nitrate solution 100 cm³ larutan kalium karbonat 0.1 mol dm⁻³ 100 cm³ of 0.1 mol dm⁻³ potassium carbonate solution		

Rajah 10.2
Diagram 10.2



Berdasarkan Rajah 10.2,
Based on Diagram 10.2,

- (i) cadangkan larutan X sulfat dan mendakan Y.
suggest X sulphate solution and precipitate Y.

[2 markah / 2 marks]

- (ii) bandingkan perbezaan bagi Set I dan Set II dari segi:
compare the differences of Set I and Set II in terms of:

- jenis tindak balas
type of reaction
- perubahan suhu
the change in temperature
- perbezaan jumlah kandungan tenaga bahan tindak balas dan hasil tindak balas
difference in total energy content of reactants and products
- perubahan tenaga semasa pemecahan ikatan dan pembentukan ikatan
energy changes during bond breaking and bond formation

[8 markah / 8 marks]

Bahagian C
Section C
 [20 markah]
 [20 marks]

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

11. (a) Jadual 11.1 menunjukkan nombor proton bagi empat unsur dalam Jadual Berkala iaitu W, X, Y dan Z.

Table 11.1 shows the proton numbers for three elements in the Periodic Table, namely W, X, Y and Z.

Unsur Element	W	X	Y	Z
Nombor proton Proton number	6	8	12	17

Jadual 11.1
 Table 11.1

Berdasarkan Jadual 11.1,
Based on Table 11.1,

- (i) unsur Z cenderung untuk menerima elektron dan membentuk ion yang bercas negatif.

Nyatakan nama bagi ion yang bercas negatif. Tuliskan formula dan susunan elektron bagi ion yang terhasil.

element Z tends to accept electrons and form negatively charged ions.

State the name for the negatively charged ion. Write the formula and the electron arrangement of the ion produced.

[3 markah / 3 marks]

- (ii) unsur X boleh membentuk dua jenis sebatian berbeza dengan unsur W dan unsur Y. Lukiskan susunan elektron bagi setiap jenis sebatian yang terbentuk.

Element X can form two different types of compounds with element W and element Y. Draw the electron arrangement for each type of compound formed.

[4 markah / 4 marks]

- (b) Jadual 11.2 menunjukkan maklumat dua jenis bahan berbeza, Bahan E dan Bahan F.
Table 11.2 shows information about two different types of substances, Substance E and Substance F.

Bahan E Substance E	Bahan F Substance F
• Dapat mengalirkan arus elektrik kerana terdapat ion-ion yang bergerak bebas. <i>Can conduct electricity due to the presence of ions that move freely.</i> • Kekonduksian elektrik semakin bertambah apabila suhu semakin meningkat. <i>Electrical conductivity increases as temperature increases.</i> • Mengalirkan arus elektrik dan mengalami penguraian kepada jujuk unsur-unsurnya. <i>Conduct electricity and undergoes decomposition into their constituent elements.</i>	• Dapat mengalirkan arus elektrik kerana terdapat elektron yang bergerak bebas. <i>Can conduct electricity due to the presence of electrons that move freely.</i> • Kekonduksian elektrik semakin berkurang apabila suhu semakin meningkat. <i>Electrical conductivity decreases as temperature increases.</i> • Mengalirkan arus elektrik tanpa mengalami penguraian. <i>Conduct electricity without undergoing decomposition.</i>

Jadual 11.2

Table 11.2

Berdasarkan maklumat dalam Jadual 11.2, kenal pasti Bahan E dan Bahan F. Namakan satu contoh bagi setiap bahan dan nyatakan jenis ikatan yang wujud dalam Bahan E.

Based on the information in Table 11.2, identify Substance E and Substance F. Name one example for each of the substance and state the type of bond that exist in Substance E.

[5 markah / 5 marks]

(c) Kaji pernyataan berikut.

Study the following statement.

Sebatian ion boleh menghkonduksi arus elektrik dalam keadaan leburan.
Ionic compounds can conduct electricity in the molten state.

Dengan menggunakan serbuk plumbum(II) bromida sebagai contoh, huraikan satu eksperimen untuk membuktikan pernyataan di atas. Huraian anda hendaklah mengandungi:

By using lead(II) bromide powder as an example, describe an experiment to prove the above statement. Your description should include:

- prosedur eksperimen
procedure of the experiment
- persamaan ion keseluruhan bagi eksperimen tersebut
overall ionic equation for the experiment

[8 markah / 8 marks]