

NAMA:

TINGKATAN :

MODUL PENINGKATAN PRESTASI MURID TINGKATAN 5
TAHUN 2024

KIMIA
KERTAS 2
DUA JAM TIGA PULUH MINIT

JANGAN BUKA MODUL INI SEHINGGA DIBERITAHU

Arahan kepada murid

1. *Tulis nama dan tingkatan anda pada ruang yang telah disediakan.*
2. *Kertas soalan ini adalah dalam dwibahasa.*
3. *Soalan dalam Bahasa Melayu mendahului soalan yang sepadan dalam Bahasa Inggeris.*
4. *Jawab semua soalan dalam Bahagian A dan Bahagian C*
5. *Pilih satu soalan sahaja dalam Bahagian B.*
6. *Sila gunakan pen untuk menulis jawapan.*

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

Modul ini mengandungi 36 halaman bercetak

Bahagian A / Section A

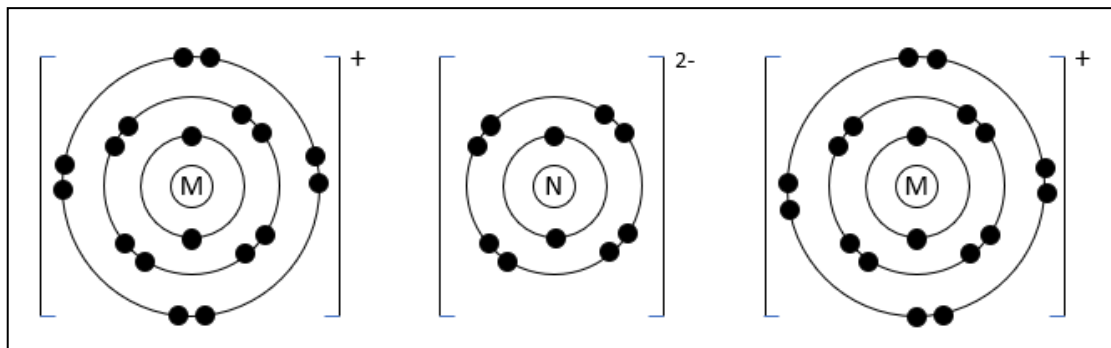
[60 markah / 60 marks]

Jawab **semua** soalan

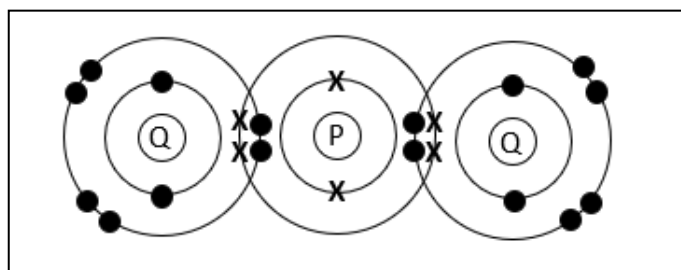
Answer **all** question

1. Rajah 1 menunjukkan susunan elektron bagi dua jenis sebatian yang berbeza.

Diagram 1 shows the electron arrangement of two different types of compounds.



Sebatian A / Compound A



Sebatian B / Compound B

Rajah 1 / Diagram 1

- (a) Apakah tujuan sesuatu atom menderma elektron?

What is the purpose of an atom donating electron?

[1 markah / mark]

- (b) Berdasarkan Rajah 1 :

Based on Diagram 1:

- (i) Tuliskan formula kimia bagi sebatian A.

Write the chemical formula of compound A.

[1 markah / mark]

- (ii) Nyatakan jenis ikatan yang terbentuk dalam sebatian B.
State the type of bond formed in compound B.

[1 markah / mark]

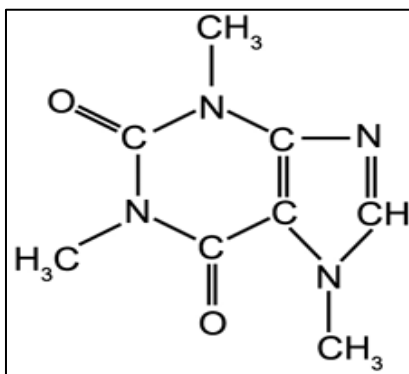
- (iii) Tuliskan susunan elektron bagi atom Q.
Write the electron arrangement of atom Q.

[1 markah / mark]

- (iv) Sebatian yang manakah larut di dalam pelarut organik?
Which compound is soluble in organic solvent?

[1 markah / mark]

2. Rajah 2 menunjukkan formula struktur bagi kafeina.
Diagram 2 shows the structural formula of caffeine.



Rajah 2 / Diagram 2

- (a) Apakah maksud formula molekul?
What is the meaning of molecular formula?

[1 markah / mark]

(b) Berdasarkan Rajah 2,

Based on Diagram 2,

(i) Namakan semua unsur yang terdapat dalam kafeina.

Name all the elements present in caffeine.

[1 markah / mark]

(ii) Tuliskan formula molekul dan formula empirik bagi kafeina.

Write the molecular and empirical formula of caffeine.

Formula molekul bagi kafeina <i>Molecular formula of caffeine</i>	Formula empirik bagi kafeina <i>Empirical formula of caffeine</i>

[2 markah / marks]

(c) Nyatakan jenis zarah yang wujud dalam kafeina.

State the type of particle exist in caffeine.

[1 markah / mark]

3. Jadual 3.1 menunjukkan bilangan proton dan bilangan neutron bagi atom R, S dan T.

Table 3.1 shows the number of proton and the number of neutron of atoms R,S and T.

Atom <i>Atom</i>	Bilangan proton <i>Number of proton</i>	Bilangan neutron <i>Number of neutron</i>
R	12	13
S	14	15
T	14	16

Jadual 3.1 / Table 3.1

(a) Nyatakan tiga zarah subatom dalam suatu atom.

State three subatomic particles in an atom.

[1 markah / mark]

(b) Berdasarkan Jadual 3.1 :

Based on Table 3.1 :

(i) Mengapakah atom S dan T mempunyai sifat kimia yang sama?

Why are atoms S and T have the same chemical properties?

[1 markah / mark]

(ii) Lukiskan susunan elektron bagi ion R.

Draw the electron arrangement of ion R.

[2 markah / marks]

(c) Jadual 3.2 menunjukkan maklumat mengenai klorin. Klorin mengandungi dua isotop. Berdasarkan maklumat yang diberi, hitungkan nombor nukleon isotop Cl-y.

Table 3.2 shows information about chlorine. Chlorine have two isotopes. Based on given information, calculate nucleon number for Cl-y isotope.

[Jisim atom relatif / *Relative atomic mass* : Cl = 35.5]

Isotop <i>Isotope</i>	Kelimpahan semulajadi <i>Natural abundance</i>
Cl-35	75%
Cl-y	25%

Jadual 3.2 / *Table 3.2*

[2 markah / marks]

4. Rajah 4 menunjukkan perwakilan piawai bagi atom-atom unsur X dan Y. Huruf yang digunakan bukan simbol sebenar unsur tersebut.

Diagram 4 shows the standard representation of the atoms of elements X and Y. The letters used are not the actual symbols of the elements.

23 11 X	39 19 Y
-----------------------	-----------------------

Rajah 4 / Diagram 4

- (a) Nyatakan bagaimana unsur-unsur disusun dalam Jadual Berkala Unsur
State how the elements are arranged in the Periodic Table of Elements.

[1 markah / mark]

- (b) Berdasarkan Rajah 4 :
Based on Diagram 4 :

- (i) Kenal pasti kumpulan bagi unsur X dan Y di dalam Jadual Berkala Unsur.
Identify the group of elements X and Y in the Periodic Table of Elements.

[1 markah / mark]

- (ii) Berikan sebab bagi jawapan di 4 (b)(i)
Give a reason for the answer in 4 (b)(i).

[1 markah / mark]

- (c) 0.2 mol unsur Y dimasukkan ke dalam sebuah kelalang kon yang berisi air dan gas yang terbebas dikumpulkan.
0.2 mol of element Y is placed in a conical flask containing water and the liberated gas are collected.

- (i) Tulis persamaan kimia untuk menunjukkan tindak balas ini
Write a chemical equation to show the reaction.

[2 markah / marks]

- (ii) Hitung isipadu maksimum bagi gas yang terbebas.

Calculate the maximum volume of gas liberated.

[Isipadu molar : $24 \text{ dm}^3 \text{ mol}^{-1}$ pada keadaan bilik]

[*Molar volume : $24 \text{ dm}^3 \text{ mol}^{-1}$ at room conditions*]

[2 markah / marks]

- 5 Dua set eksperimen telah dijalankan untuk mengkaji faktor yang mempengaruhi kadar tindak balas. Jadual 5 menunjukkan masa yang diambil bagi mengumpul 40 cm^3 gas hidrogen.

Two sets of experiment are carried out to investigate the factor that affect the rate of reaction. Table 5 shows the time taken to collect 40 cm^3 of hydrogen gas.

Set set	Bahan tindak balas <i>Reactants</i>	Masa yang diambil untuk mengumpul 40 cm^3 gas hidrogen (s) <i>Time taken to collect 40 cm^3 of hydrogen gas (s)</i>
I	Serbuk zink berlebihan + 25 cm^3 asid HX 0.2 mol dm^{-3} <i>Excess zinc powder + 25 cm^3 of 0.2 mol dm^{-3} HX acid</i>	90
II	Serbuk zink berlebihan + 25 cm^3 asid H_2Y 0.2 mol dm^{-3} <i>Excess zinc powder + 25 cm^3 of 0.2 mol dm^{-3} H_2Y acid</i>	40

Jadual 5 / Table 5

- (a) Nyatakan perubahan lain yang boleh diukur selain daripada isi padu gas untuk menentukan kadar tindak balas dalam eksperimen ini.

State another measurable changes besides volume of gas to determine the rate of reaction in this experiment.

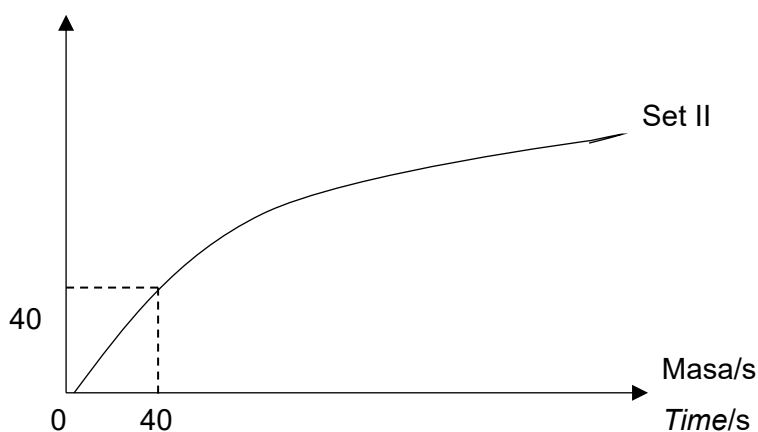
[1 markah / mark]

- (b) Rajah 5 menunjukkan graf isipadu gas hidrogen melawan masa bagi set II.

Diagram 5 shows graph volume of hydrogen gas against time of set II

Isipadu gas hidrogen /cm³

Volume of hydrogen gas / cm³



Rajah 5 / Diagram 5

Lakar dan labelkan lengkung bagi Set I pada paksi yang sama dalam Rajah 5 apabila tindak balas telah lengkap.

Sketch and label the curve of Set I on same axes in Diagram 5 when the reaction completed.

[1 markah / mark]

- (c) (i) Tuliskan persamaan ion bagi eksperimen ini.

Write an ionic equation of this experiment.

[2 markah / marks]

- (ii) Hitung kadar tindak balas purata bagi mengumpul 40 cm^3 gas dalam Set I dan Set II.

Calculate the average rate of reaction to collect 40 cm^3 of gas in Set I and Set II.

Set I :

Set II :

[2 markah / marks]

- (iii) Bandingkan kadar tindak balas bagi Set I dan Set II. Terangkan.

Compare the rate of reaction of Set I and Set II. Explain.

[2 markah / marks]

- 6 Jadual 6 menunjukkan maklumat mengenai sebatian karbon X, Y dan Z apabila bertindak balas dengan larutan kalium manganat(VII), KMnO_4 berasid dan serbuk natrium karbonat.

Table 6 shows information about carbon compound X, Y and Z when undergo reactions with acidified potassium manganate(VII) solution, KMnO_4 and sodium carbonate powder.

Sebatian <i>Compound</i>	Bilangan atom karbon <i>Number of carbon atom</i>	Siri homolog <i>Homologous series</i>	Tindak balas dengan larutan KMnO_4 berasid <i>Reaction with acidified KMnO_4 solution</i>	Tindak balas dengan natrium karbonat <i>Reaction with sodium carbonate</i>
X	4	Alkena <i>Alkene</i>	√	X
Y	3	Asid karboksilik <i>Carboxylic acid</i>	X	√
Z	6	Alkohol <i>Alcohol</i>	√	X

Jadual 6 / Table 6

- (a) Apakah formula am alkena?
What is the general formula of alkene?

[1 markah / mark]

- (b) Berdasarkan Jadual 6, namakan sebatian Z.
Based on Table 6, name compound Z.

[1 markah / mark]

- (c) 0.5 mol sebatian Y bertindak balas dengan serbuk natrium karbonat berlebihan dan menghasilkan natrium propanoat, air dan gas karbon dioksida.

0.5 mol compound Y reacts with excess sodium carbonate powder to form sodium propanoate, water and carbon dioxide gas.

- (i) Tuliskan persamaan kimia bagi tindak balas ini.

Write chemical equation for this reaction.

[2 markah / marks]

- (ii) Hitungkan bilangan molekul gas karbon dioksida yang dihasilkan.

Determine number of molecules of carbon dioxide gas produced.

[Pemalar Avogadro / Avogadro constant : $6.02 \times 10^{23} \text{ mol}^{-1}$]

[2 markah / marks]

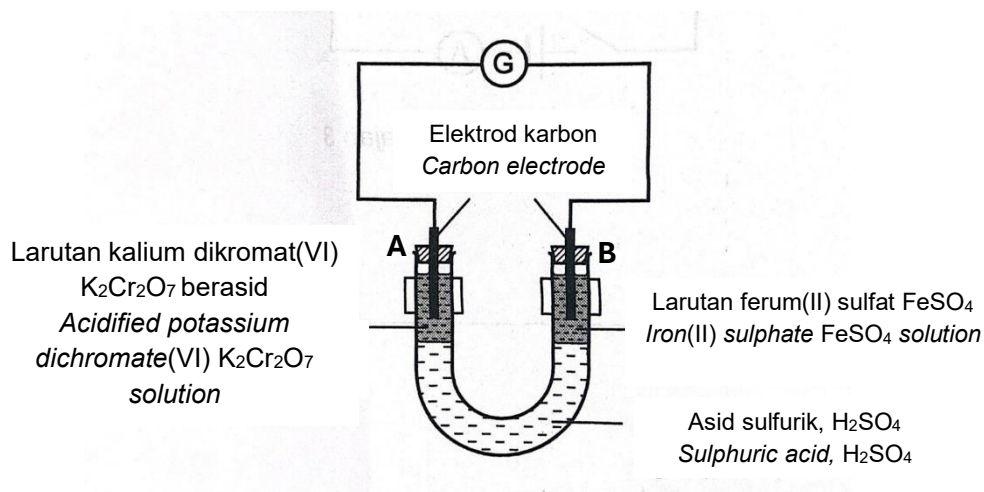
- (d) Nyatakan pemerhatian bagi tindak balas sebatian X dan Z terhadap larutan kalium manganat(VII) berasid dan bandingkan tindak balas yang berlaku dalam sebatian X dan Z.

State the observation for the reaction reactions of compound X and Z toward acidified potassium manganate(VII) solution and compare the reaction occurred in compound X and Z.

[3 markah / marks]

7. Rajah 7 menunjukkan tiub-U berisi larutan ferum(II) sulfat, FeSO_4 dan larutan kalium dikromat(VI), $\text{K}_2\text{Cr}_2\text{O}_7$ berasid.

Diagram 7 shows a U-tube consisting iron(II) sulphate, FeSO_4 solution and acidified potassium dichromate (VI), $\text{K}_2\text{Cr}_2\text{O}_7$ solution.



Rajah 7 / Diagram 7

Berdasarkan Rajah 7,

Based on Diagram 7,

- (a) (i) Kenal pasti anod dan katod

Identify anode and cathode

Anod / Anode :

Katod / Cathode :

[2 markah / marks]

- (ii) Tuliskan persamaan setengah untuk menyokong jawapan anda di 7(a)(i)

Write a half equation to support your answer in 7(a)(i)

Anod / Anode :

Katod / Cathode:

[3 markah / marks]

- (b) Kenal pasti agen penurunan dan cadangkan bahan lain yang boleh menggantikan agen penurunan tersebut.

Identify the reducing agent and suggest another substance that can replace the reducing agent.

[2 markah / marks]

- (c) Tandakan arah pengaliran elektron pada Rajah 7.

Mark the direction of electron flow on Diagram 7.

[1 markah / mark]

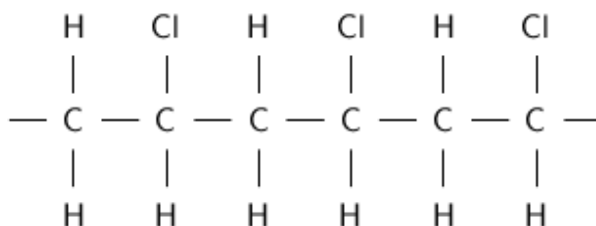
- (d) Murid diminta menjalankan eksperimen yang sama tanpa menggunakan tiub-U. Lukis susunan radas bagi eksperimen tersebut dengan menggunakan radas yang sesuai.

Student asked to carry out the same experiment without using U-tube. Draw the apparatus set-up for the experiment by using a suitable apparatus.

[2 markah / marks]

- 8 Polimer boleh dikelaskan sebagai polimer semulajadi dan polimer sintetik. Rajah 8.1 menunjukkan formula struktur bagi suatu polimer.

Polymer can be classified as natural polymer and synthetic polymer. Diagram 8.1 shows the structural formula of a polymer.



Rajah 8.1 / Diagram 8.1

- (a) Berdasarkan rajah 8.1,
Based on diagram 8.1,
- (i) Nyatakan jenis polimer tersebut.
State the type of the polymer.

[1 markah / mark]

- (ii) Lukis formula struktur monomer bagi polimer dalam Rajah 8.1
Draw the structural formula of the monomer for the polymer in Diagram 8.1

[1 markah / mark]

- (iii) Tuliskan persamaan kimia bagi pembentukan polimer dalam Rajah 8.1
Write chemical equation for the formation of polymer in Diagram 8.1.

[2 markah / marks]

- (iv) Nyatakan **satu** contoh objek yang diperbuat daripada bahan yang sama seperti Rajah 8.1.
*State **one** example of object made from the same material as in Diagram 8.1.*

[1 markah / mark]

- (b) Jadual 8.1 menunjukkan keputusan bagi eksperimen yang dijalankan ke atas lateks.

Table 8.1 shows the results of experiments conducted on latex.

Prosedur <i>Procedure</i>	Pemerhatian <i>Observation</i>
Bahan P ditambahkan kepada lateks. <i>Material P is added into the latex.</i>	Lateks menggumpal dengan cepat. <i>Latex coagulates very quickly.</i>
Bahan Q ditambahkan kepada lateks <i>Material Q is added into the latex</i>	Tiada perubahan <i>No change</i>

Jadual 8.1/ Table 8.1

Berdasarkan Jadual 8.1, cadangkan bahan P dan Q.

Based on Table 8.1, suggest material P and Q.

P :

Q :

[2 markah / marks]

- (c) Jadual 8.2 menunjukkan maklumat bagi dua jenis penyedut minuman yang terdapat dalam suatu restoran diperbuat daripada polimer berbeza.

Table 8.2 shows information on two types of drinking straw in a restaurant made from different polymers.

Penyedut minuman S <i>Drinking straw S</i>	Penyedut minuman T <i>Drinking straw T</i>
 Diperbuat daripada selulosa <i>Made from cellulose</i>	 Diperbuat daripada pecahan petroleum <i>Made from petroleum fraction</i>

Jadual 8.2 / Table 8.2

Anda sebagai pencinta alam sekitar, penyedut minuman manakah menjadi pilihan anda dalam penggunaan kehidupan seharian? Wajarkan jawapan anda.

You as a nature lover, which straw is your choice in daily life usage? Justify your answer.

[3 markah / marks]

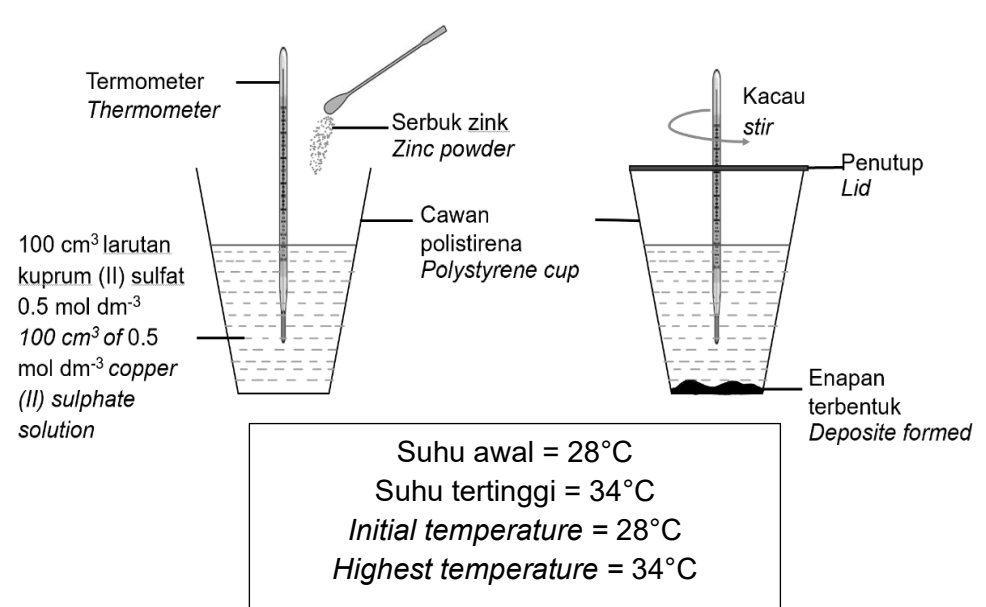
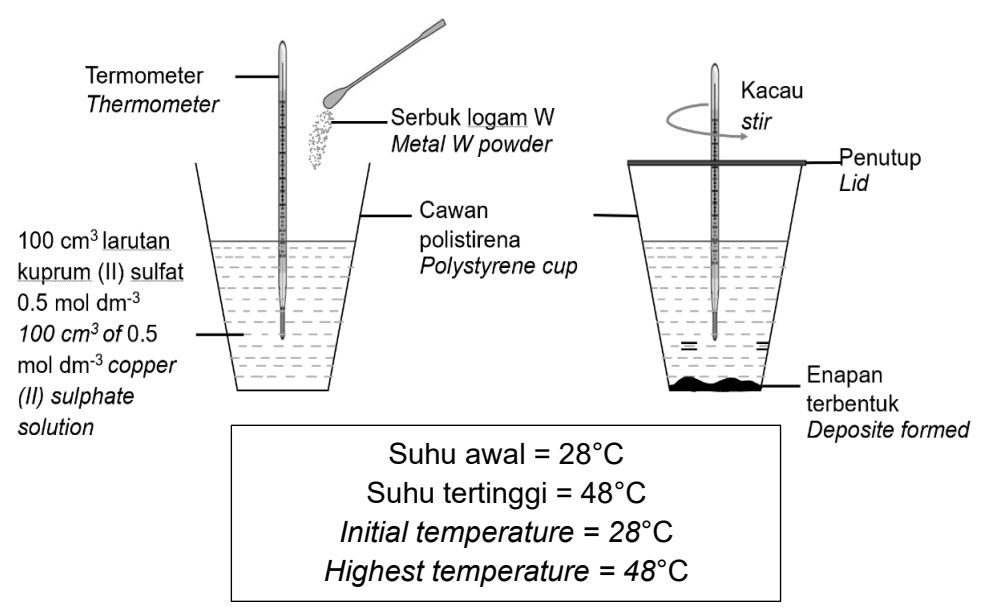
Bahagian B / Section B

[20 markah / 20 marks]

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

*This section consists of **two** questions. Answer only **one** question*

9. Rajah 9 menunjukkan dua set susunan radas eksperimen yang dijalankan oleh seorang pelajar untuk mengkaji haba penyesaran kuprum daripada larutan kuprum(II) sulfat. *Diagram 9 shows two sets of apparatus set up carried out by a student to study the heat of displacement of copper from copper(II) sulphate solution.*

Set	Susunan radas / Apparatus set up
I	 Termometer Thermometer Serbuk zink Zinc powder 100 cm³ larutan kuprum (II) sulfat 0.5 mol dm⁻³ 100 cm³ of 0.5 mol dm⁻³ copper (II) sulphate solution Cawan polistirena Polystyrene cup Kacau stir Penutup Lid Enapan terbentuk Deposit formed Suhu awal = 28°C Suhu tertinggi = 34°C Initial temperature = 28°C Highest temperature = 34°C
II	 Termometer Thermometer Serbuk logam W Metal W powder 100 cm³ larutan kuprum (II) sulfat 0.5 mol dm⁻³ 100 cm³ of 0.5 mol dm⁻³ copper (II) sulphate solution Cawan polistirena Polystyrene cup Kacau stir Penutup Lid Enapan terbentuk Deposit formed Suhu awal = 28°C Suhu tertinggi = 48°C Initial temperature = 28°C Highest temperature = 48°C

Rajah 9 / Diagram 9

- (a) (i) Nyatakan maksud haba penyesaran
State the meaning of heat of displacement.
[1 markah / mark]
- (ii) Berdasarkan perubahan suhu, nyatakan jenis tindak balas bagi Set I
Based on temperature change, state the type of reaction of Set I.
[1 markah / mark]
- (iii) Cadangkan logam W bagi Set II dan nyatakan warna enapan yang terhasil.
Suggest the metal W for Set II and state the colour of the resulting deposit.
[2 markah / marks]
- (iv) Hitungkan haba penyesaran bagi Set I dan Set II.
Calculate the heat of displacement for Set I and Set II.
[Diberi muatan haba tentu bagi larutan, $c = 4.2 \text{ Jg}^{-1}\text{C}^{-1}$]
[Given the specific heat capacity of solution, $c = 4.2 \text{ Jg}^{-1}\text{C}^{-1}$]
[6 markah / marks]

- (b) Jadual 9 menunjukkan data yang diperolehi daripada dua set eksperimen untuk menentukan haba pemendakan.
Table 9 shows the data obtained from two sets of experiment to determine the heat of precipitation.

Set	Eksperimen <i>Experiment</i>	Haba pemendakan (kJ mol^{-1}) <i>Heat of precipitation</i> (kJ mol^{-1})
I	25cm ³ larutan barium klorida 0.5 mol dm ⁻³ + 25cm ³ larutan zink sulfat 0.5 mol dm ⁻³ 25cm ³ of 0.5 mol dm ⁻³ <i>barium chloride solution</i> + 25cm ³ of 0.5 mol dm ⁻³ <i>zinc sulphate solution</i>	- 42.0
II	25cm ³ larutan kalium karbonat 0.5 mol dm ⁻³ + 25cm ³ larutan magnesium klorida 0.5 mol dm ⁻³ 25cm ³ of 0.5 mol dm ⁻³ <i>potassium carbonate solution</i> + 25cm ³ of 0.5 mol dm ⁻³ <i>magnesium chloride solution</i>	+ 23.1

Jadual 9 / Table 9

Berdasarkan Jadual 9,

Based on Table 9,

(i) terangkan perbezaan haba pemendakan bagi Set I dan Set II. Penerangan anda mesti merangkumi :

- Perubahan suhu
- Jumlah kandungan tenaga
- Perubahan tenaga haba semasa pemecahan ikatan dan pembentukan ikatan

Tuliskan persamaan termokimia bagi Set I dan lukiskan gambar rajah aras tenaga bagi Set II.

explain the difference in heat of precipitation for Set I and Set II. Your explanation must include:

- *Change in temperature.*
- *Total energy content*
- *Heat energy change during bond breaking and bond formation.*

Write thermochemical equation for Set I and draw the energy level diagram of Set II.

[7 markah / marks]

(ii) Nilai haba pemendakan semasa eksperimen selalunya lebih rendah berbanding nilai teori. Mengapakah ini berlaku dan apakah yang boleh dilakukan untuk mengurangkan masalah ini.

The value of the heat of precipitation during the experiment of the lower than the theoretical value. Why does this happen and what can be done to reduce this problem.

[3 markah / marks]



Soalan 9 / Question 9

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10. (a) Rajah 10.1 menunjukkan contoh kegunaan seramik.

Diagram 10.1 shows an example of the use of ceramics.



Produk A
Product A



Produk B
Product B

Rajah 10.1 / *Diagram 10.1*

- (i) Berikan satu sifat asas seramik bagi Produk A. Nyatakan jenis seramik bagi Produk B.

Give a basic property of ceramics to produce Product A. State the type of ceramic for Product B.

[2 markah / *marks*]

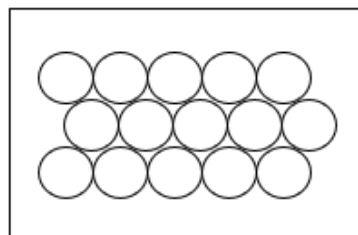
- (ii) Seramik digunakan dalam bidang perubatan secara meluas. Berikan satu contoh dan kegunaannya.

Ceramics are widely used in medical field. Give an example and its use.

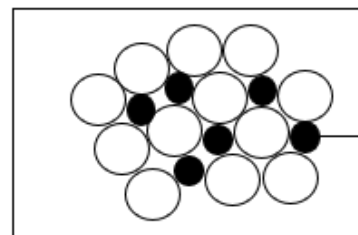
[2 markah / *marks*]

- (b) Rajah 10.2 menunjukkan susunan atom dalam dua jenis bahan, A dan B. Bahan B lebih sesuai daripada bahan A untuk membuat badan kereta.

Diagram 10.2 shows the arrangement of atoms in two types of materials, A and B. Material B is more suitable than material A to make body of car.



Bahan A / *Material A*



Bahan B / *Material B*

Rajah 10.2 / *Diagram 10.2*

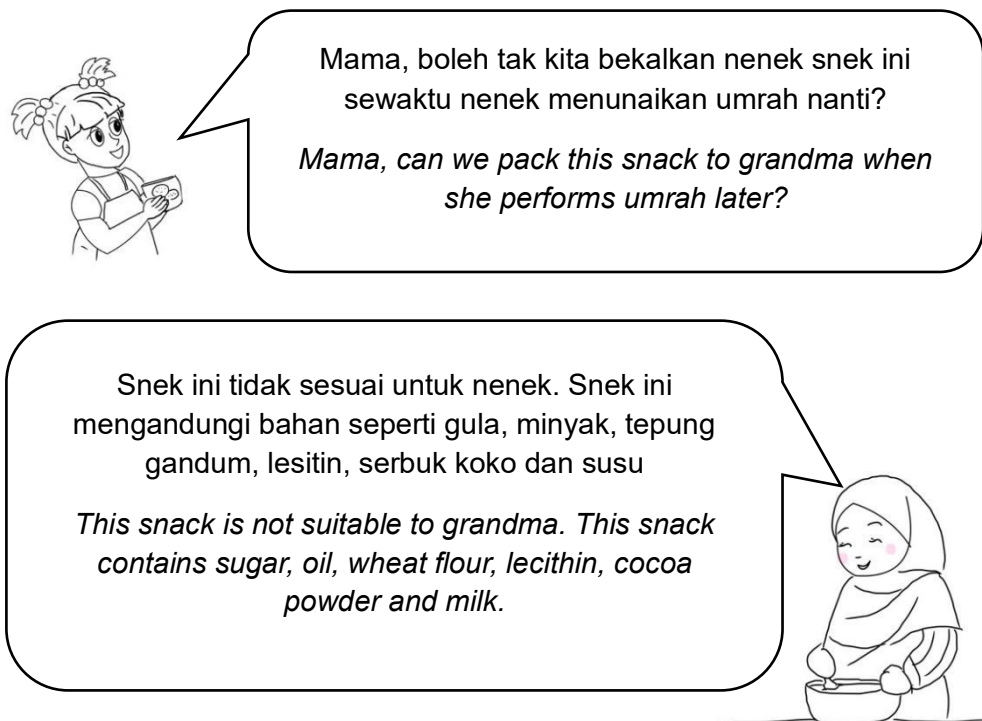
Nyatakan nama bagi bahan B dan atom X. Berdasarkan susunan atom, terangkan mengapa bahan B lebih sesuai untuk membuat badan kereta.

State the name of material B and atom X. Based on atomic arrangement, explain why material B is more suitable to make body of car.

[5 markah / marks]

- (c) Rajah 10.3 menunjukkan perbualan antara Aileen dan ibunya.

Diagram 10.3 shows the conversation between Aileen and her mother.



Rajah 10.3 / Diagram 10.3

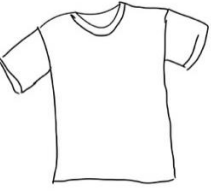
Berdasarkan perbualan di atas, snek tersebut mengandungi beberapa jenis bahan tambah makanan. Nyatakan maksud bahan tambah makanan. Nyatakan satu jenis bahan tambah makanan dalam snek tersebut beserta fungsinya. Sekiranya nenek tersebut menghadapi penyakit diabetes, apakah bahan lain yang boleh menggantikan gula? Terangkan mengapa.

Based on the convsation, the snack contains few type of food additives. State the meaning of food additives. State one type of food additive and its function. If grandma has diabetes, what other ingredient can be used to replace sugar? Explain your answer.

[5 markah / marks]

- (d) Rajah 10.4 menunjukkan pemerhatian apabila menggunakan agen pencuci yang berbeza.

Diagram 10.4 shows the observations when using different cleaning agents.

Set	Agen Pencuci <i>Cleaning Agent</i>	Pemerhatian <i>Observation</i>	
I	Y	 Gris Grease Air liat Hard water Sebelum <i>Before</i>	 Selepas <i>After</i>
II	Z	 Gris Grease Air liat Hard water Sebelum <i>Before</i>	 Selepas <i>After</i>
III	Z + Bahan tambah X Z + <i>Additive</i> X	 Darah Blood Air liat Hard water Sebelum <i>Before</i>	 Selepas <i>After</i>

Rajah 10.3 / *Diagram 10.3*

Berdasarkan maklumat dalam Rajah 10.3,

Based on the information in Diagram 10.3,

- Kenal pasti bahan X, Y dan Z

Identify substance X, Y and Z.

- Terangkan perbezaan pemerhatian antara Set I dan Set II

Explain the differences in observations between Set I and Set II

[6 markah / marks]

Soalan 10 / Question 10

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[illegible]

[illegible]

BAHAGIAN C / Section C

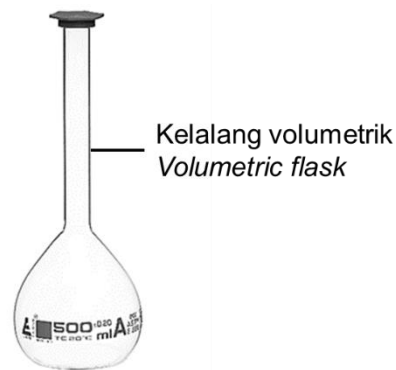
[20 markah / 20 marks]

Jawab soalan dalam bahagian ini.

Answer question in this section.

- 11 (a) Rajah 11.1 menunjukkan satu radas penting yang digunakan dalam penyediaan larutan piawai.

Diagram 11.1 shows the important apparatus used in preparing standard solution.



Rajah 11.1 / Diagram 11.1

Nyatakan maksud larutan piawai. Nyatakan dua parameter yang mesti diukur dengan tepat apabila larutan piawai disediakan dengan menggunakan radas di atas.

State the meaning of standard solution. State two parameters that have to be measured accurately when preparing the standard solution by using the apparatus above.

[3 markah / marks]

- (b) Seorang murid ingin menyediakan 100 cm³ larutan piawai natrium karbonat, Na₂CO₃ 0.5 mol dm⁻³. Kira jisim natrium karbonat, Na₂CO₃ yang diperlukan untuk menyediakan larutan piawai tersebut. Larutan piawai tersebut kemudiannya digunakan untuk menyediakan larutan natrium karbonat, Na₂CO₃ yang lebih cair melalui kaedah pencairan. Tentukan isi padu air suling yang perlu ditambah kepada 50 cm³ larutan piawai itu supaya dapat menghasilkan larutan natrium karbonat, Na₂CO₃ 0.2 mol dm⁻³.

[Jisim atom relatif : Na=23, O=16, C=12]

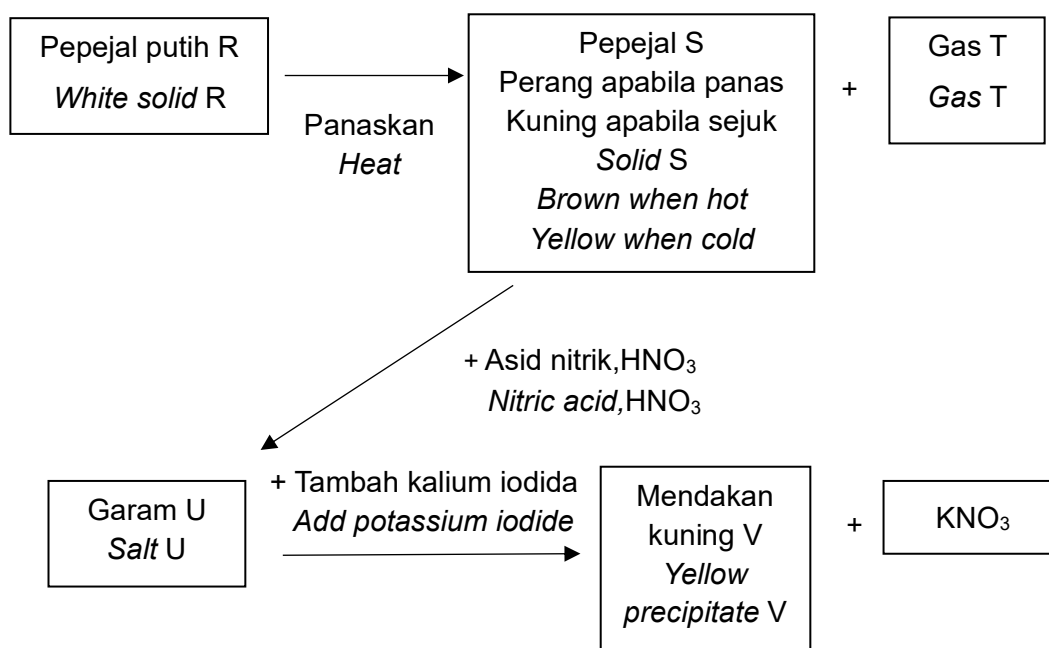
A student wants to prepare 100 cm³ of 0.5 mol dm⁻³ standard solution of sodium carbonate, Na₂CO₃. Calculate the mass of sodium carbonate, Na₂CO₃ needed to prepare the standard solution. The standard solution is then used to prepare a dilute solution of sodium carbonate, Na₂CO₃ by using dilution method. Determine the volume of distilled water needed to add to 50 cm³ of that standard solution so that 0.2 mol dm⁻³ sodium carbonate solution, Na₂CO₃ is produced.

[Relative atomic mass : Na=23, O=16, C=12]

[4 markah / marks]

- (c) Rajah 11.2 di bawah menunjukkan satu carta alir bagi bagi menyediakan mendakan kuning V dari pepejal putih R.

Diagram 11.2 below shows a flow chart to prepare yellow precipitate V from white solid R.



Rajah 11.2 / Diagram 11.2

Pepejal S dan gas T adalah hasil tindakbalas apabila pepejal R dipanaskan. Gas T yang terhasil boleh mengeruhkan air kapur. Berdasarkan Rajah 11.2, kenal pasti pepejal putih R, pepejal S, gas T, garam U dan mendakan kuning V.

Solid S and gas T are the product when solid R is heated. Gas T produced can turns limewater chalky. Based on Diagram 11.2, identify white solid R, solid S, gas T, salt U and yellow precipitate V.

[5 markah / marks]

- (d) Farid mendapati tanaman jagung di ladangnya tidak subur. Pegawai pertanian mengesyorkan penggunaan baja ammonium nitrat untuk mengatasi masalah tersebut.

Anda dikehendaki untuk menyediakan baja ammonium nitrat di dalam makmal. Dengan menggunakan bahan dan radas yang sesuai, rancangkan satu eksperimen untuk menyediakan baja tersebut.

Farid found out that the maize plants in his field were infertile. Agricultural officer recommend the use of ammonium nitrate fertilizer to solve the problem.

You are required to prepare ammonium nitrate fertilizer in the laboratory. By using suitable material and apparatus, plan an experiment to prepare the fertilizer.

[8 markah / marks]

[illegible]

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TAMAT
END
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