

NAMA: .....

KELAS: .....



## MODUL JAWAB UNTUK JAYA PAHANG 2025

SIJIL PELAJARAN MALAYSIA

4541/1

KIMIA aDin

Kertas 1 Set 1

1¼ jam

Satu jam lima belas minit

---

**JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU**

1. *Kertas soalan ini adalah dalam dwibahasa*
2. *Soalan dalam Bahasa Melayu mendahului soalan yang sepadan dalam Bahasa Inggeris.*
3. *Calon dikehendaki membaca maklumat di halaman depan kertas soalan ini.*

---

Kertas soalan ini mengandungi 27 halaman bercetak

**MAKLUMAT UNTUK CALON**

1. Kertas soalan ini mengandungi 40 soalan.
2. Jawab **semua** soalan.
3. Jawab dengan menghitamkan ruangan yang betul pada kertas jawapan.
4. Hitamkan **satu** ruangan sahaja bagi setiap soalan.
5. Sekiranya anda hendak menukar jawapan, padamkan tanda yang telah dibuat. Kemudian hitamkan jawapan yang baru.
6. Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.
7. Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram.

**INFORMATION FOR CANDIDATES**

1. *This question paper consists of 40 questions.*
2. *Answer **all** questions.*
3. *Answer each question by blackening the correct space on the answer sheet.*
4. *Blacken only **one** space for each question.*
5. *If you wish to change your answer, erase the blackened mark that you have made. Then blacken the space for the new answer.*
6. *The diagrams in the questions provided are not drawn to scale unless stated.*
7. *You may use a non-programmable scientific calculator.*

1. Di manakah logam berat dan bahan toksik perlu disimpan?  
*Where heavy metals and toxic substance should be stored?*

A Botol gelap  
*Dark bottle*  
B Minyak paraffin  
*Paraffin oil*  
C Bilik yang berkunci  
*Locked room*  
D Tempat yang teduh  
*Shady area*

2. Antara yang berikut yang manakah wujud sebagai molekul?  
*Which of the following substances exist as the molecules?*

A Argon  
*Argon*  
B Ammonia  
*Ammonia*  
C Argentum  
*Silver*  
D Ion Ammonium  
*Ammonium ion*

3. Mengapakah gas helium tidak bertindak balas dengan unsur lain?  
*Why helium gas does not react with other elements?*

A Mempunyai susunan elektron yang oktet  
*Has a stable octet electron arrangement*  
B Mempunyai susunan elektron yang duplet  
*Has a stable duplet electron arrangement*  
C Petala elektron terluarnya mempunyai bilangan elektron yang maksimum  
*The outermost electron shell has the maximum number of electrons*

4. Zink klorida adalah sebatian ion. Bahan manakah yang boleh melarutkan zink klorida?  
*Zink chloride is an ionic compound. Which substance can dissolves zink chloride?*
- A Air  
*Water*
  - B Etanol  
*Ethanol*
  - C Heksana  
*Hexane*
  - D Metilbenzena  
*Methylbenzene*
5. Antara yang berikut, yang manakah benar tentang sifat suatu alkali kuat?  
*Which of the following is true about the properties of a strong alkali?*
- A Rasa masam  
*Tastes sour*
  - B Mengion separa dalam air  
*Ionises partially in water*
  - C Mempunyai kepekatan ion hidrogen yang tinggi  
*Has high concentration of hydrogen ion*
  - D Menunjukkan warna kuning di dalam metil jingga  
*Shows yellow colour in metil jingga*
6. Antara yang berikut, yang manakah akan menghasilkan garam tak terlarutkan?  
*Which of the following will produce an insoluble salt?*
- A Asid sulfurik dan zink  
*Sulphuric acid and zinc*
  - B Asid nitrik dan natrium hidroksida  
*Nitric acid and sodium hydroxide*
  - C Natrium sulfat dan barium nitrat  
*Sodium sulphate and barium nitrate*
  - D Natrium klorida dan kuprum(II) oksida  
*Sodium chloride and copper(II) oxide*

7. Apakah maksud kadar tindak balas merujuk kepada tindak balas antara pita magnesium dengan  $50 \text{ cm}^3$  asid hidroklorik  $1.0 \text{ mol dm}^{-3}$ ?  
*What is the meaning of the reaction rate referring to the reaction between magnesium ribbon and  $50 \text{ cm}^3$  of  $1.0 \text{ mol dm}^{-3}$  hydrochloric acid?*
- A Peningkatan jisim pita magnesium per unit masa  
*Increasing in the mass of the magnesium ribbon per unit time*
  - B Peningkatan kepekatan asid hidroklorik per unit masa  
*Increasing in concentration of hydrochloric acid per unit time*
  - C Peningkatan isi padu gas hidrogen per unit masa  
*Increasing in volume of hydrogen gas per unit time*
  - D Pengurangan isi padu asid hidroklorik per unit masa  
*Decreasing in volume of hydrochloric acid per unit time*
8. Cermin mata Qaseh kelihatan gelap apabila berada di tempat yang panas. Apakah bahan yang ditambah dalam cermin untuk pembuatan lensa kaca tersebut?  
*Qaseh's glasses look dark when they are in a hot place. What material is added to the glasses to make the glass lenses?*
- A Plumbum(II) klorida  
*Lead(II) chloride*
  - B Kuprum(I) klorida  
*Copper(I) chloride*
  - C Kuprum(II) karbonat  
*Copper(II) carbonate*
  - D Argentum(II) klorida  
*Argentum(II) chloride*
9. Apakah proses penghasilan alkohol daripada etena dengan kehadiran asid fosforik sebagai mangkin pada  $300^\circ\text{C}$  dan  $60 \text{ atm}$ ?  
*What is the process for producing alcohol from ethene in the presence of phosphoric acid as a catalyst at  $300^\circ\text{C}$  and  $60 \text{ atm}$ ?*
- A Pendehidratan  
*Dehydration*
  - B Penghidratan  
*Hydration*
  - C Pengoksidaan  
*Oxidation*
  - D Pengesteran  
*Estrification*

10. Antara berikut yang manakah adalah logam yang melambatkan pengaratan ferum?  
*Which of the following is a metal slow down rusting of iron?*

- I      Argentum  
         *Silver*
- II     Zink  
         *Zinc*
- III    Plumbum  
         *Lead*
- IV    Magnesium  
         *Magnesium*

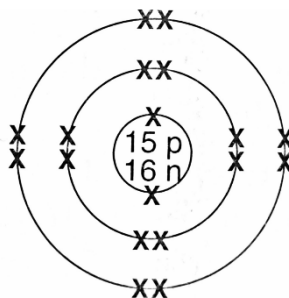
- A      I dan II  
         *I and II*
- B      I dan III  
         *I and III*
- C      II dan IV  
         *II and IV*
- D      III dan IV  
         *III and IV*

11. Berikut adalah merupakan faktor pemilihan bahan api kecuali  
*The following, is a factor in fuel selection except*

- A      Warna bahan api  
         *Colour of fuel*
- B      Mudah didapati  
         *Easily available*
- C      Nilai bahan api  
         *Fuel value*
- D      Kesan terhadap alam sekitar  
         *Impact on the environment*

12. Faktor cuaca dan serangan penyakit pada pokok getah menyebabkan getah sintetik menjadikan pilihan utama industri pembuatan. Antara berikut yang manakah adalah ciri getah sintetik?  
*Weather factors and disease attacks on rubber trees have made synthetic rubber the main choice in the manufacturing industry. Which of the following is a characteristic of synthetic rubber?*
- A Keras  
*hard*
  - B Kurang kenyal  
*Less elastic*
  - C Mudah teroksida  
*Easily oxidised*
  - D Penebat elektrik yang lemah  
*Poor electrical insulator*
13. Kosmetik adalah produk yang digunakan untuk menyerlahkan penampilan diri di samping membersihkan diri. Antara berikut adalah contoh kosmetik rias kecuali  
*Cosmetics are products used to enhance appearance as well as to cleanse oneself. The following are examples of makeup cosmetics except*
- A Bedak  
*Powder*
  - B Gincu  
*Lipstick*
  - C Maskara  
*Mascara*
  - D Minyak wangi  
*Perfume*
14. Seramik digunakan dalam kawasan stesen jana kuasa yang mempunyai voltan tinggi kerana  
*Ceramic is used in power stations area which have high voltage because*
- A Lengai secara kimia  
*Chemically inert*
  - B Konduktor elektrik lemah  
*Weak electrical conductor*
  - C Boleh menyimpan cas  
*Can stored charge*
  - D Mempunyai takat lebur yang tinggi  
*Has high melting point*

15. Rajah 1 menunjukkan susunan elektron bagi unsur X.  
Diagram 1 shows electron arrangement for element X.



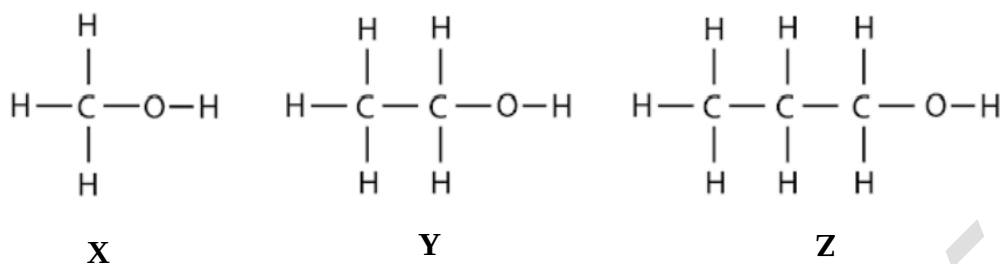
Rajah 1  
Diagram 1

Perwakilan piawai yang manakah mewakili atom bagi unsur X?  
Which standard representation represents atom for element X?

- A  ${}_{15}^{15}\text{X}$   
B  ${}_{15}^{16}\text{X}$   
C  ${}_{15}^{30}\text{X}$   
D  ${}_{15}^{31}\text{X}$
16. Oksida bagi logam Q mempunyai formula kimia  $\text{Q}_2\text{O}_3$  dan kalium fosfat mempunyai formula kimia  $\text{K}_3\text{PO}_4$ . Apakah formula fosfat bagi logam Q ?  
The chemical formula of oxide for metal Q is  $\text{Q}_2\text{O}_3$  and chemical formula of potassium phosphate is  $\text{K}_3\text{PO}_4$ . What is the chemical formula of phosphate of metal Q?
- A  $\text{QPO}_4$   
B  $\text{Q}_2\text{PO}_4$   
C  $\text{Q}_3\text{PO}_4$   
D  $\text{Q}(\text{PO}_4)_3$
17. Sebatian ion aluminium oksida mempunyai formula  $\text{Al}_2\text{O}_3$ . Berapakah bilangan ion yang terdapat dalam 1 mol sebatian itu?  
[Pemalar Avogadro :  $6.02 \times 10^{23} \text{ mol}^{-1}$ ]  
Ionic compound of aluminium oxide has formula  $\text{Al}_2\text{O}_3$ . What is the number of ions in 1 mol of the compound?  
[Avogadro constant :  $6.02 \times 10^{23} \text{ mol}^{-1}$ ]
- A  $1 \times 6.02 \times 10^{23}$   
B  $1 \times 6.02 \times 10^{23} \times 2$   
C  $1 \times 6.02 \times 10^{23} \times 5$



18. Rajah 2 menunjukkan formula struktur bagi molekul X, Y dan Z  
*Diagram 2 shows the structural formula for molecules X, Y and Z.*

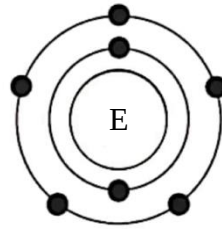


Rajah 2  
*Diagram 2*

Pernyataan manakah benar bagi semua molekul di atas?  
*Which statement is true for all the above molecules?*

- |     |                                                                                                                       |
|-----|-----------------------------------------------------------------------------------------------------------------------|
| I   | X, Y dan Z adalah sebatian bukan hidrokarbon.<br><i>X, Y and Z are non hydrocarbon compounds.</i>                     |
| II  | X, Y dan Z mempunyai sifat kimia yang berbeza.<br><i>X, Y and Z have different chemical properties.</i>               |
| III | X, Y dan Z diwakili oleh satu formula am yang sama.<br><i>X, Y and Z are represented by the same general formula.</i> |
| IV  | X, Y dan Z mempunyai kumpulan berfungsi yang berlainan.<br><i>X, Y and Z have different functional groups.</i>        |
| A   | I dan II<br><i>I and II</i>                                                                                           |
| B   | I dan III<br><i>I and III</i>                                                                                         |
| C   | II dan IV<br><i>II and IV</i>                                                                                         |
| D   | III dan IV<br><i>III and IV</i>                                                                                       |

19. Rajah 3 menunjukkan susunan elektron bagi atom E.  
Diagram 3 shows the electron arrangement for atom E.

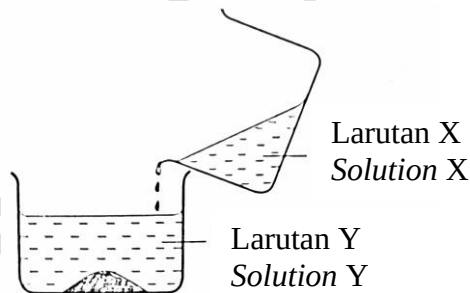


Rajah 3  
Diagram 3

Berapa pasang elektron yang terlibat untuk membentuk molekul E?  
How many pairs of electrons are involved to form molecule E?

- A 2  
B 3  
C 4

20. Rajah 4 menunjukkan mendakan putih terbentuk apabila larutan X ditambahkan ke dalam larutan Y.  
Diagram 4 shows white precipitate formed when solution X is added into solution Y.



Rajah 4  
Diagram 4

Antara yang berikut, yang manakah paling sesuai mewakili larutan X dan larutan Y?  
Which of the following statements is the most suitable to represent solution X and solution Y?

|   | <b>Larutan X</b><br><b>Solution X</b> | <b>Larutan Y</b><br><b>Solution Y</b> |
|---|---------------------------------------|---------------------------------------|
| A | $\text{Fe}(\text{NO}_3)_3$            | $\text{Na}_2\text{CO}_3$              |
| B | $\text{Pb}(\text{NO}_3)_2$            | KI                                    |
| C | $\text{Pb}(\text{NO}_3)_2$            | KCl                                   |
| D | $\text{Cu}(\text{NO}_3)_2$            | $\text{K}_2\text{CO}_3$               |

21. J adalah suatu unsur yang terletak dalam Kala 3 Jadual Berkala Unsur. Jadual 1 menunjukkan pemerhatian bagi oksida J apabila bertindak balas dengan asid nitrik dan larutan natrium hidroksida.

*J is one of the element in Period 3 of the Periodic Table of Elements. Table 1 shows the observation of the oxide of element J reacts with nitric acid and sodium hydroxide solution.*

| <b>Bertindak balas dengan</b><br><i>Reaction with</i> | <b>Pemerhatian</b><br><i>Observation</i>                                                       |
|-------------------------------------------------------|------------------------------------------------------------------------------------------------|
| Asid nitrik<br><i>Nitric acid</i>                     | Larut untuk membentuk larutan tidak berwarna<br><i>Dissolves to form a colourless solution</i> |
| Natrium hidroksida<br><i>Sodium hydroxide</i>         | Larut untuk membentuk larutan tidak berwarna<br><i>Dissolves to form a colourless solution</i> |

Jadual 1

Table 1

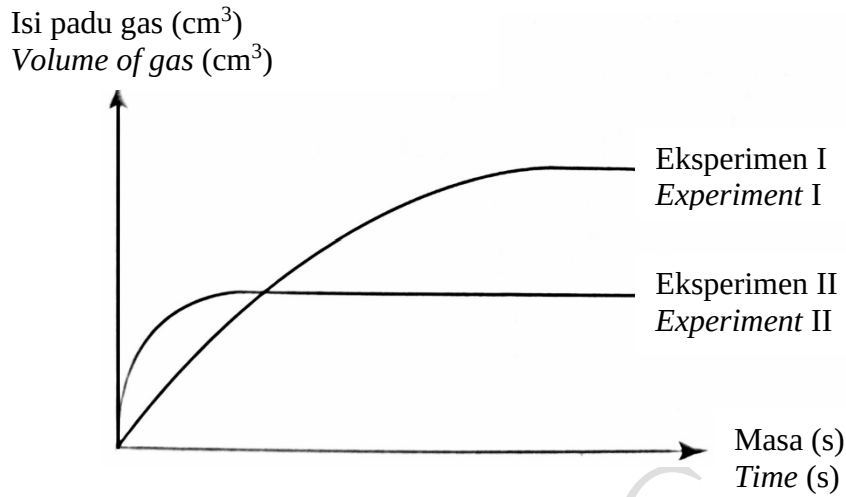
Apakah unsur J?

*What is element J?*

- A Aluminium  
*Aluminium*
- B Fosforus  
*Phosphorus*
- C Klorin  
*Chlorine*
- D Magnesium  
*Magnesium*

22. Rajah 5 menunjukkan graf isi padu gas melawan masa bagi tindak balas antara zink dan asid hidroklorik.

*Diagram 5 shows graph of volume of gas against time for reaction between zinc and hydrochloric acid.*



Rajah 5  
Diagram 5

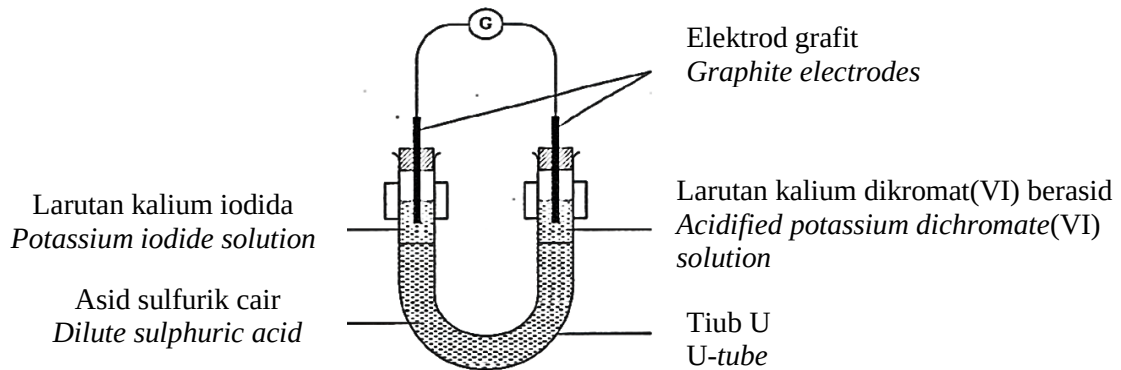
Eksperimen I menggunakan ketulan zink berlebihan dan  $50 \text{ cm}^3$  asid hidroklorik  $1.0 \text{ mol dm}^{-3}$ . Yang manakah sesuai digunakan dalam Eksperimen II?

*Experiment I uses excess granulated zinc and  $50 \text{ cm}^3$  of  $1.0 \text{ mol dm}^{-3}$  of hydrochloric acid. Which is suitable to be used in Experiment II?*

- A Serbuk zink berlebihan dan  $50 \text{ cm}^3$  asid hidroklorik  $1.0 \text{ mol dm}^{-3}$ .  
*Excess zinc powder and  $50 \text{ cm}^3$  of  $1.0 \text{ mol dm}^{-3}$ .*
- B Ketulan zink berlebihan dan  $25 \text{ cm}^3$  asid hidroklorik  $2.0 \text{ mol dm}^{-3}$ .  
*Excess zinc granules and  $25 \text{ cm}^3$  of  $2.0 \text{ mol dm}^{-3}$ .*
- C Ketulan zink berlebihan dan  $50 \text{ cm}^3$  asid hidroklorik  $2.0 \text{ mol dm}^{-3}$ .  
*Excess zinc granules and  $50 \text{ cm}^3$  of  $2.0 \text{ mol dm}^{-3}$ .*
- D Ketulan zink berlebihan,  $25 \text{ cm}^3$  asid hidroklorik  $1.0 \text{ mol dm}^{-3}$  dan mangkin kuprum(II) sulfat.  
*Excess zinc granules,  $25 \text{ cm}^3$  of  $1.0 \text{ mol dm}^{-3}$  hydrochloric acid and copper(II) sulphate as catalyst.*

23. Rajah 6 menunjukkan susunan radas untuk mengkaji pemindahan elektron pada suatu jarak.

*Diagram 6 shows the apparatus set-up to study the transfer of electron at a distance.*



Rajah 6  
Diagram 6

Antara yang berikut, yang manakah perubahan warna bagi kedua-dua larutan itu?  
*Which of the following is the colour change of the two solutions?*

|   | <b>Larutan kalium iodida</b><br><i>Potassium iodide solution</i> | <b>Larutan kalium dikromat(VI) berasid</b><br><i>Acidified potassium dichromate(VI) solution</i> |
|---|------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| A | Perang ke tidak berwarna<br><i>Brown to colourless</i>           | Jingga ke hijau<br><i>Orange to green</i>                                                        |
| B | Perang ke tidak berwarna<br><i>Brown to colourless</i>           | Ungu ke tak berwarna<br><i>Purple to colourless</i>                                              |
| C | Tidak berwarna ke perang<br><i>Colourless to brown</i>           | Jingga ke hijau<br><i>Orange to green</i>                                                        |
| D | Tidak berwarna ke perang<br><i>Colourless to brown</i>           | Ungu ke tak berwarna<br><i>Purple to colourless</i>                                              |

24. Jadual 2 menunjukkan maklumat tentang dua jenis larutan.

*Table 2 shows the information of two different solutions.*

| <b>Jenis larutan</b><br><i>Type of solution</i> | <b>Kepekatan (mol dm<sup>-3</sup>)</b><br><i>Concentration (mol dm<sup>-3</sup>)</i> |
|-------------------------------------------------|--------------------------------------------------------------------------------------|
| Asid nitrik<br><i>Nitric acid</i>               | 1.0                                                                                  |
| Asid fosforik<br><i>Phosphoric acid</i>         | 1.0                                                                                  |

Jadual 2

*Table 2*

Antara berikut, yang manakah benar tentang dua jenis larutan itu?

*Which of the following is correct about the two solutions?*

- I Nilai pH bagi asid nitrik lebih rendah daripada asid fosforik  
*The pH value of nitric acid is lower than phosphoric acid*
- II Darjah penceraian asid fosforik lebih rendah daripada asid nitrik  
*The degree of ionisation of phosphoric acid is lower than nitric acid*
- III Kepekatan ion hidrogen, H<sup>+</sup> ion lebih tinggi dalam asid fosforik  
*The concentration of hydrogen, H<sup>+</sup> ion is higher in phosphoric acid*
- IV Asid fosforik adalah asid kuat manakala asid nitrik adalah asid lemah  
*Phosphoric acid is a strong acid while nitric acid is a weak acid*

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

25. Jadual 3 menunjukkan keadaan bahan tindak balas yang digunakan dalam Eksperimen I dan Eksperimen II.

Table 3 shows the condition of reactants used in Experiment I and Experiment II.

| Eksperimen<br>Experiment | Keadaan bahan tindak balas<br>Condition of reactants                                                                                                                                 |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| I                        | Ketulan zink berlebihan + 50 cm <sup>3</sup> asid hidroklorik 2.0 mol dm <sup>-3</sup><br>Excess zinc granules + 50 cm <sup>3</sup> of 2.0 mol dm <sup>-3</sup> of hydrochloric acid |
| II                       | Serbuk zink berlebihan + 50 cm <sup>3</sup> asid hidroklorik 2.0 mol dm <sup>-3</sup><br>Excess zinc powder + 50 cm <sup>3</sup> of 2.0 mol dm <sup>-3</sup> hydrochloric acid       |

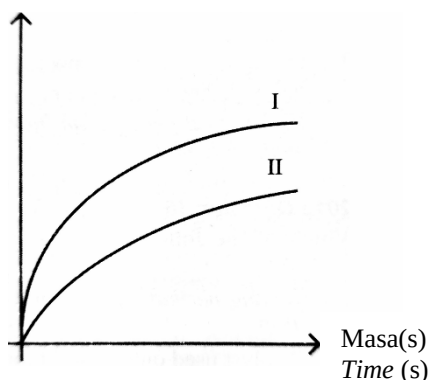
Table 3

Table 3

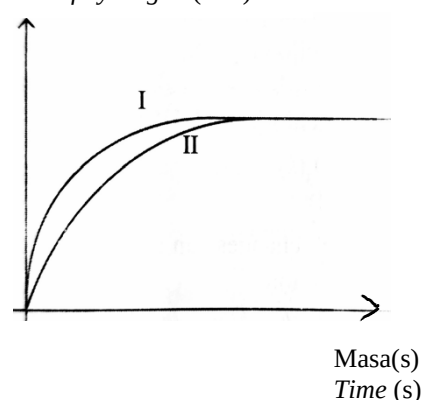
Graf yang manakah yang menunjukkan lengkung yang betul bagi Eksperimen I dan Eksperimen II?

Which graph shows the correct curve for Experiment I and Experiment II?

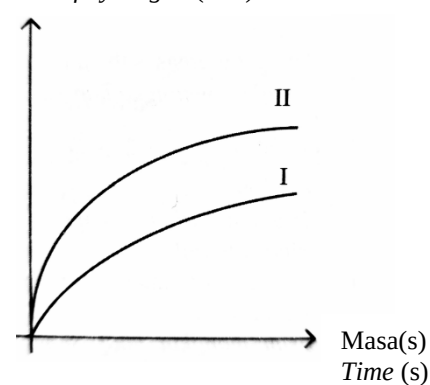
A Isi padu hidrogen (cm<sup>3</sup>)  
Volume of hydrogen (cm<sup>3</sup>)



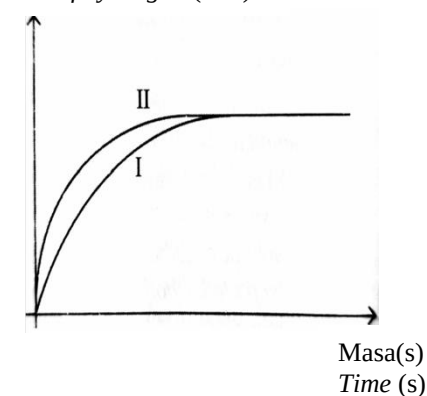
C Isi padu hidrogen (cm<sup>3</sup>)  
Volume of hydrogen (cm<sup>3</sup>)



B Isi padu hidrogen (cm<sup>3</sup>)  
Volume of hydrogen (cm<sup>3</sup>)



D Isi padu hidrogen (cm<sup>3</sup>)  
Volume of hydrogen (cm<sup>3</sup>)

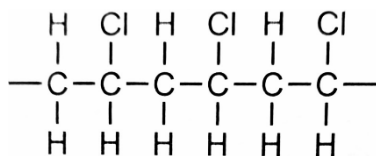


26. Rajah 7 menunjukkan barang hiasan yang dibeli oleh Puan Karmila untuk menghiasi restoran beliau supaya kelihatan lebih cantik. Lampu kristal ini diperbuat daripada kaca. Jenis kaca tersebut sesuai untuk membuat lampu kristal kerana ia
- Diagram 7 shows the decorative item which bought by Puan Kamila to decorate her restaurant so that it looks more attractive. The crystal lamp is made from glass. The type of glass is suitable to make the crystal lamp because it*



Rajah 7  
Diagram 7

- A adalah penebat haba yang baik  
*is a good heat insulator*
- B mempunyai takat lebur yang tinggi  
*has a high melting point*
- C mempunyai indeks biasan yang tinggi  
*has a high refractive index*
- D lebih lutsinar terhadap sinar ultraungu dan inframerah  
*is more transparent towards ultraviolet and infrared rays*
27. Rajah 8 menunjukkan formula struktur bagi polivinil klorida.  
*Diagram 8 shows the structural formula of polyvinyl chloride.*



Rajah 8  
Diagram 8

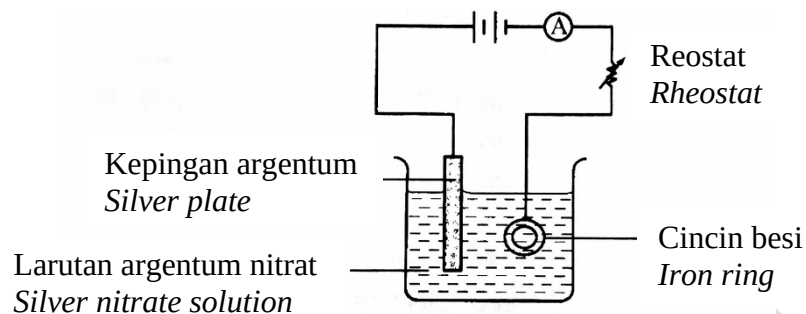
Yang manakah antara berikut merupakan formula molekul monomernya?  
*Which of the following is the molecular formula of its monomer?*

- A  $\text{C}_2\text{H}_4$
- B  $\text{C}_3\text{H}_5\text{Cl}$
- C  $\text{C}_2\text{H}_3\text{Cl}$
- D  $\text{C}_6\text{H}_9\text{Cl}_3$



28. Rajah 9 menunjukkan susunan radas bagi satu eksperimen untuk menyadur sebarang cincin besi dengan argentum.

*Diagram 9 shows the apparatus set-up for an experiment to electroplate an iron ring with silver.*

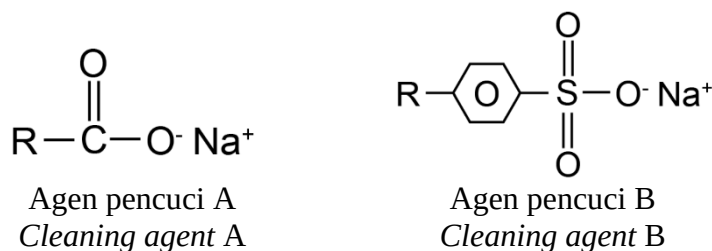


Rajah 9  
Diagram 9

Setengah persamaan manakah yang mewakili tindak balas di anod dan di katod?  
*Which half equations represent the reactions at the anode and the cathode?*

|   | <b>Anod</b><br><b>Anode</b>                                               | <b>Katod</b><br><b>Cathode</b>                       |
|---|---------------------------------------------------------------------------|------------------------------------------------------|
| A | $4\text{OH}^- \rightarrow 2\text{H}_2\text{O} + \text{O}_2 + 4\text{e}^-$ | $\text{Fe}^{2+} + 2\text{e}^- \rightarrow \text{Fe}$ |
| B | $\text{Ag} \rightarrow \text{Ag}^+ + \text{e}^-$                          | $\text{Ag}^+ + \text{e}^- \rightarrow \text{Ag}$     |
| C | $\text{Ag} \rightarrow \text{Ag}^+ + \text{e}^-$                          | $\text{Fe}^{2+} + 2\text{e}^- \rightarrow \text{Fe}$ |
| D | $4\text{OH}^- \rightarrow 2\text{H}_2\text{O} + \text{O}_2 + 4\text{e}^-$ | $\text{Ag}^+ + \text{e}^- \rightarrow \text{Ag}$     |

29. Rajah 10 menunjukkan formula struktur bagi dua jenis agen pencuci.  
Diagram 10 shows the structural formula of two cleaning agents.



Rajah 10  
Diagram 10

Antara yang berikut, pernyataan yang manakah benar?  
Which of the following statements is true?

- A Agen pencuci A membentuk kekat di dalam air liat.  
*Cleaning agent A produces scum in hard water.*
- B Agen pencuci B dapat menanggalkan kotoran darah pada pakaian dengan berkesan.  
*Cleaning agent B can removes the blood stain on the clothes effectively.*
- C Agen pencuci A dapat menanggalkan kotoran bergris pada pakaian dengan berkesan di dalam air liat.  
*Cleaning agent A can removes the grease stain on the clothes effectively in hard water.*
30. Berikut menunjukkan suatu persamaan termokimia bagi tindak balas peneutralan.  
The following shows the thermochemical equations for neutralisation reactions.



Antara pernyataan berikut, yang manakah menerangkan perbezaan haba peneutralan bagi kedua-dua tindak balas tersebut?

Which of the following statements explain the difference of heat of neutralisation for both reactions?

- A Asid etanoik tidak mengion di dalam air  
*Ethanoic acid does not ionise in water*
- B Asid etanoik menghasilkan kepekatan ion hidrogen yang rendah  
*Ethanoic acid produces low concentration of hydrogen ion*
- C Asid etanoik menyerap lebih banyak haba berbanding dengan asid hidroklorik  
*Ethanoic acid absorbs more heat compared to hydrochloric acid*
- D Lebih banyak haba diserap oleh asid etanoik untuk mengion molekul asid dengan lengkap  
*More heat is absorbed by ethanoic acid to ionise the acid molecules completely*

31. Jadual 4 menunjukkan maklumat tentang isotop Q.  
*Table 4 shows an information about isotopes of Q.*

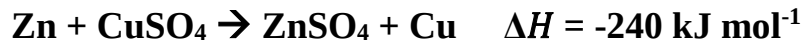
| Isotop<br><i>Isotopes</i> | Kelimpahan semula jadi<br><i>Natural abundance</i> | Jisim isotop<br><i>Mass of isotope</i> |
|---------------------------|----------------------------------------------------|----------------------------------------|
| Q -35                     | 75%                                                | 35                                     |
| Q-y                       | 25%                                                | y                                      |

Jadual 4  
 Table 4

Hitungkan nilai y  
 [Jisim atom relatif Q = 35.5]  
*Calculate value of y*  
 [Relative atomic mass Q = 35.5]

- A 34  
 B 35  
 C 36  
 D 37
32. Dalam satu tindak balas kimia bagi menentukan kadar tindak balas, 1.5 mol serbuk kalsium karbonat bertindak balas dengan asid hidroklorik berlebihan. Selepas 2.0 minit, didapati 0.5 mol kalsium karbonat tidak bertindak balas. Berapakah kadar purata bagi tindak balas itu?  
 [Jisim atom relatif : Ca = 40, C = 12, O = 16]  
*In a chemical reaction to determine a rate of reaction, reaction 1.5 mol of calcium carbonate powder react with hydrochloric acid. After 2.0 minute, 0.5 mol of calcium carbonate unreacted. What is the average rate of the rate of reaction?*  
 [Relative atomic mass : Ca = 40, C = 12, O = 16]
- A  $0.417 \text{ g s}^{-1}$   
 B  $0.750 \text{ g s}^{-1}$   
 C  $0.833 \text{ g s}^{-1}$   
 D  $1.250 \text{ g s}^{-1}$

33. Persamaan termokimia berikut menunjukkan tindak balas antara magnesium dan larutan kuprum(II) sulfat.  
*The following thermochemical equation shows the reaction between magnesium and copper(II) sulphate solution.*



Haba yang dibebaskan apabila  $100 \text{ cm}^3$  larutan kuprum(II) sulfat  $x \text{ mol dm}^{-3}$  bertindak balas dengan serbuk magnesium berlebihan adalah  $4800 \text{ J}$ .

Hitungkan nilai  $x$

[Muatan haba tentu larutan =  $4.2 \text{ J g}^{-1} \text{ }^\circ\text{C}^{-1}$ ]

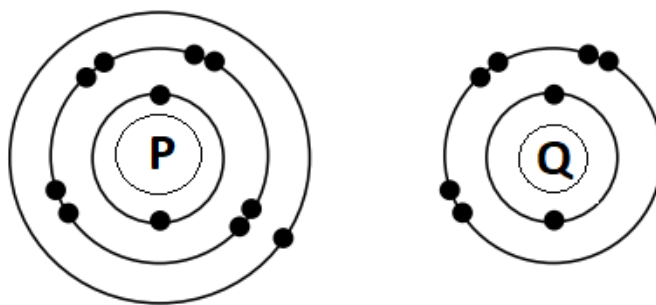
*Heat released when  $100 \text{ cm}^3$  of  $x \text{ mol dm}^{-3}$  copper(II) sulphate solution reacts with excess magnesium powder is  $4800 \text{ J}$ . Calculate the  $x$  value?*

[Specific heat capacity of solution =  $4.2 \text{ J g}^{-1} \text{ }^\circ\text{C}^{-1}$ ]

- A  $0.02 \text{ mol dm}^{-3}$   
B  $0.05 \text{ mol dm}^{-3}$   
C  $0.20 \text{ mol dm}^{-3}$   
D  $0.50 \text{ mol dm}^{-3}$
34. Formula empirik oksida logam adalah  $\text{MO}_2$ . Jika logam oksida mengandungi 60% logam M, berapakah jisim atom relative logam M?  
[Jisim atom relatif O=16]  
*The empirical formula of metal oxide is  $\text{MO}_2$ . If the oxide metal contain 60% of metal M by mass, what is the relative atomic mass of metal M?*  
[Relative atomic mass O=16]

- A 24  
B 40  
C 48  
D 120

35. Rajah 11 menunjukkan susunan elektron bagi atom P dan atom Q.  
*Diagram 11 shows the electron arrangements of atoms P and Q.*



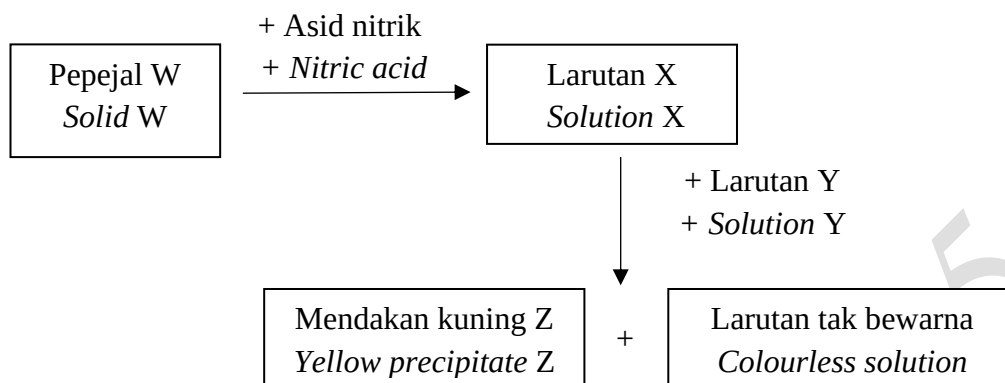
Rajah 11  
Diagram 11

Antara berikut, yang manakah mewakili persamaan kimia bagi pembentukan sebatian bagi atom P dan Q?

*Which of the following chemical equation represent formation of compound for atoms P and Q?*

- A  $P + 2Q \rightarrow PQ_2$   
B  $2P + Q \rightarrow P_2Q$   
C  $P^+ + Q^{2-} \rightarrow P_2Q$   
D  $4P + Q_2 \rightarrow 2P_2Q$

36. Rajah 12 menunjukkan carta alir bagi tindak balas melibatkan garam W.  
 Diagram 12 shows a flow chart for of reaction involving salt W.



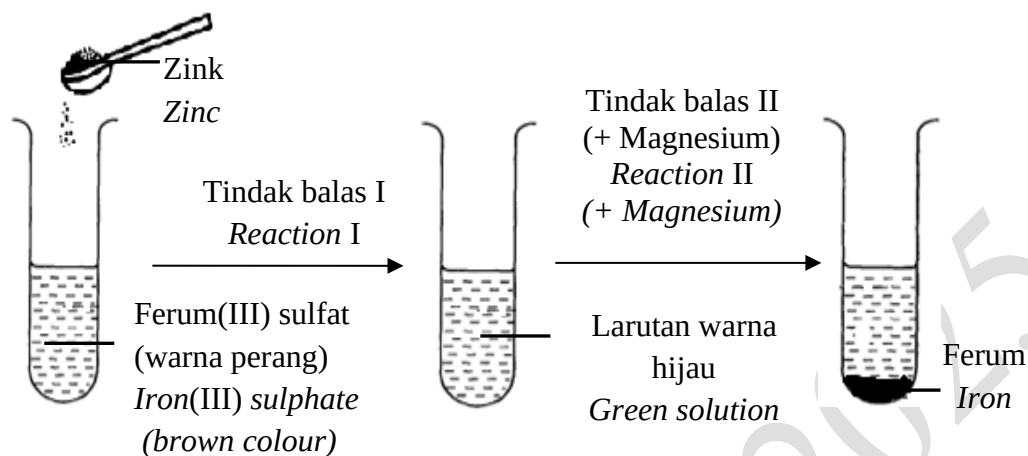
Rajah 12  
 Diagram 12

Nyatakan kation dan anion yang hadir di dalam mendakan kuning Z dan namakan larutan Y.

State cation and anion present in yellow precipitate Z and name a solution Y.

|   | <b>Kation</b><br><i>Cation</i> | <b>Anion</b><br><i>Anion</i> | <b>Larutan Y</b><br><i>Solution Y</i>         |
|---|--------------------------------|------------------------------|-----------------------------------------------|
| A | $\text{Pb}^{2+}$               | $\text{Cl}^-$                | Natrium klorida<br><i>Sodium chloride</i>     |
| B | $\text{Pb}^{2+}$               | $\text{SO}_4^{2-}$           | Kalium sulfat<br><i>Potassium sulphate</i>    |
| C | $\text{Pb}^{2+}$               | $\text{I}^-$                 | Natrium iodide<br><i>Sodium iodide</i>        |
| D | $\text{Pb}^{2+}$               | $\text{CO}_3^{2-}$           | Kalium karbonat<br><i>Potassium carbonate</i> |

37. Rajah 13 menunjukkan beberapa tindak balas melibatkan tindak balas redoks.  
*Rajah 13 shows the several reaction involving a redox reaction.*



Rajah 13  
 Diagram 13

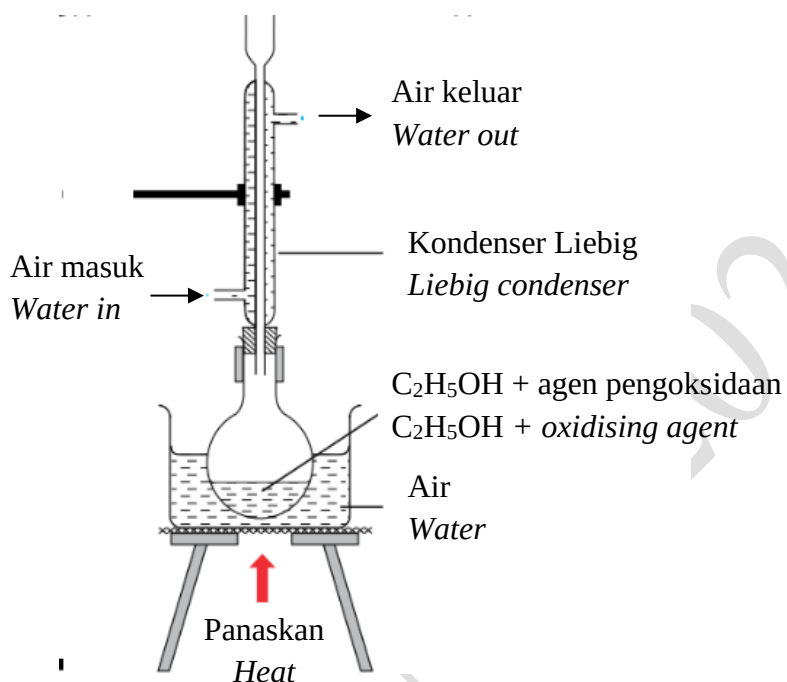
Yang manakah antara berikut mewakili setengah persamaan pengoksidaan bagi tindak balas I dan II?

*Which of the following represent the half equation of oxidation for reactions I and II.*

|   | I                                                      | II                                                     |
|---|--------------------------------------------------------|--------------------------------------------------------|
| A | $\text{Fe}^{2+} \rightarrow \text{Fe}^{3+} + \text{e}$ | $\text{Mg} \rightarrow \text{Mg}^{2+} + 2\text{e}$     |
| B | $\text{Zn} \rightarrow \text{Zn}^{2+} + 2\text{e}$     | $\text{Fe}^{2+} + 2\text{e} \rightarrow \text{Fe}$     |
| C | $\text{Fe}^{2+} \rightarrow \text{Fe}^{3+} + \text{e}$ | $\text{Fe}^{3+} + \text{e} \rightarrow \text{Fe}^{2+}$ |
| D | $\text{Zn} \rightarrow \text{Zn}^{2+} + 2\text{e}$     | $\text{Mg} \rightarrow \text{Mg}^{2+} + 2\text{e}$     |

38. Rajah 14 menunjukkan susunan radas bagi tindak balas kimia bahan Y di dalam makmal.

Diagram 14 shows an apparatus set-up for chemical reaction of substance Y in a laboratory.



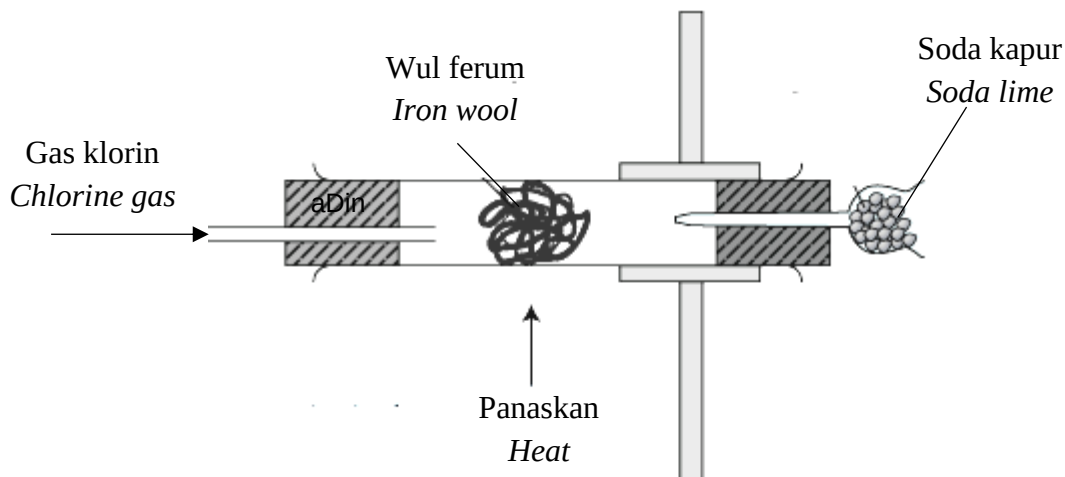
Rajah 14  
Diagram 14

Antara berikut, padanan manakah yang betul bagi tindak balas di atas?  
Which of the following is correct above reaction ?

|   | Hasil tindak balas<br><i>Product</i>    | Persamaan kimia<br><i>Chemical equation</i>                                                                    |
|---|-----------------------------------------|----------------------------------------------------------------------------------------------------------------|
| A | Asid etanoik<br><i>Ethanoic acid</i>    | $\text{C}_2\text{H}_5\text{OH} + [\text{O}] \rightarrow \text{CH}_3\text{COOH}$                                |
| B | Asid propanoik<br><i>Propanoic acid</i> | $\text{C}_2\text{H}_5\text{OH} + [\text{O}] \rightarrow \text{C}_2\text{H}_5\text{COOH}$                       |
| C | Asid etanoik<br><i>Ethanoic acid</i>    | $\text{C}_2\text{H}_5\text{OH} + 2[\text{O}] \rightarrow \text{CH}_3\text{COOH} + \text{H}_2\text{O}$          |
| D | Asid propanoik<br><i>Propanoic acid</i> | $\text{C}_2\text{H}_5\text{OH} + 2[\text{O}] \rightarrow \text{C}_2\text{H}_5\text{COOH} + \text{H}_2\text{O}$ |



39. Rajah 15 menunjukkan susunan radas bagi tindak balas antara gas klorin dan wul ferum. *Diagram 15 shows the set up of apparatus the reaction between chlorine gas and iron wool.*



Rajah 15  
Diagram 15

Berapakah isipadu gas klorin pada suhu bilik jika 3.25 g pepejal perang yang terbentuk?  
[Jisim atom relatif : Fe = 56, Cl = 35.5; Isipadu molar gas :  $24 \text{ dm}^3 \text{ mol}^{-1}$  pada keadaan bilik]

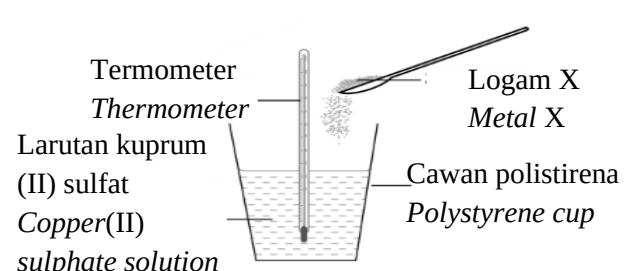
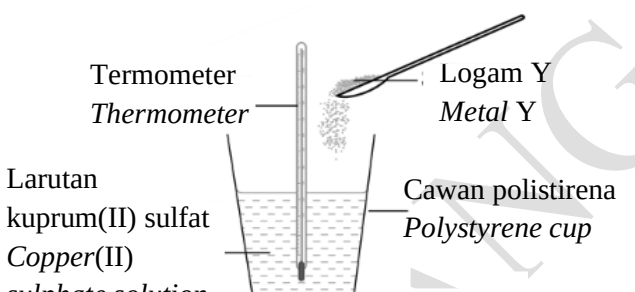
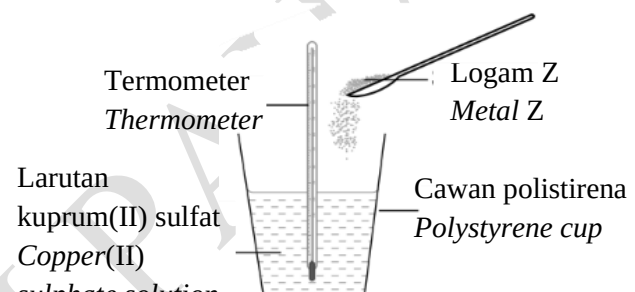
*What is the volume of chlorine gas at room temperature of 3.25 g of brown solid are formed?*

[Relative atomic mass : Fe = 56; Cl = 35.5, Molar volume of gas =  $24 \text{ dm}^3 \text{ mol}^{-1}$  at room temperature]

- A  $0.48 \text{ dm}^3$
- B  $0.72 \text{ dm}^3$
- C  $1.39 \text{ dm}^3$
- D  $2.09 \text{ dm}^3$

40. Rajah 16 menunjukkan tiga set eksperimen yang dijalankan oleh Hazril untuk menentukan haba penyesaran.

*Diagram 16 shows three sets of experiments conducted by Hazril to determine the heat of displacement.*

| Set<br>Set | Susunan radas<br><i>Set up of apparatus</i>                                          | Perubahan suhu (°C)<br><i>Temperature change (°C)</i> |
|------------|--------------------------------------------------------------------------------------|-------------------------------------------------------|
| I          |    | 0.0                                                   |
| II         |   | 3.0                                                   |
| III        |  | 8.0                                                   |

Rajah 16  
Diagram 16

Antara berikut, yang manakah mewakili logam X, Y dan Z.  
*Which of the following represent metal X, Y and Z.*

|   | <b>X</b>                      | <b>Y</b>                      | <b>Z</b>                      |
|---|-------------------------------|-------------------------------|-------------------------------|
| A | Argentum<br><i>Silver</i>     | Zink<br><i>Zinc</i>           | Magnesium<br><i>Magnesium</i> |
| B | Zink<br><i>Zinc</i>           | Argentum<br><i>Silver</i>     | Magnesium<br><i>Magnesium</i> |
| C | Magnesium<br><i>Magnesium</i> | Argentum<br><i>Silver</i>     | Zink<br><i>Zinc</i>           |
| D | Plumbum<br><i>Lead</i>        | Magnesium<br><i>Magnesium</i> | Argentum<br><i>Silver</i>     |

**KERTAS SOALAN TAMAT**  
**END OF QUESTION PAPER**