

SULIT  
4541/1  
Chemistry  
Paper 1  
Ogos  
2008  
1¼ jam

4541/1



**SEKOLAH BERASRAMA PENUH  
BAHAGIAN PENGURUSAN  
SEKOLAH BERASRAMA PENUH/KLUSTER  
KEMENTERIAN PELAJARAN MALAYSIA**

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**PEPERIKSAAN PERCUBAAN SPM TAHUN 2008**

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**KIMIA**

Kertas 1

Satu jam lima belas minit

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**JANGAN BUKA KERTAS SOALAN INI HINGGA DIBERITAHU**

1. *Kertas soalan ini mengandungi 50 soalan.*
2. *Jawab semua soalan*
3. *Jawab dengan menghitamkan ruangan yang betul pada kertas jawapan*
4. *Bagi setiap soalan hitamkan satu ruangan sahaja*
5. *Sekiranya anda hendak menukar jawapan, padamkan tanda yang telah dibuat. Kemudian hitamkan jawapan yang baru.*
6. *Rajah yang mengiringi soalan tidak dilukiskan mengikut skala.*
7. *Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogramkan.*

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Kertas soalan ini mengandungi 22 halaman bercetak

1. Diagram 1 shows the electron arrangement of an atom of element P.  
*Rajah 1 menunjukkan susunan elektron bagi atom unsur P.*

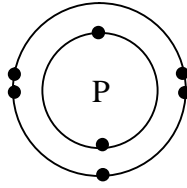


Diagram 1  
*Rajah 1*

- What is the number of valence electrons in atom P ?  
*Berapakah bilangan elektron valen bagi atom P?*
- A 7  
B 6  
C 5  
D 4
2. What are the symbols of the elements of chromium, copper, manganese and potassium?  
*Apakah simbol bagi unsur kromium, kuprum, mangan dan kalium?*

	Chromium <i>Kromium</i>	Copper <i>Kuprum</i>	Manganese <i>Mangan</i>	Potassium <i>Kalium</i>
A	C	Co	Mg	K
B	C	Cu	Mn	P
C	Cr	Co	Mg	P
D	Cr	Cu	Mn	K

3. The following statement is about the arrangement of the elements in the Periodic Table of Elements.  
*Pernyataan berikut adalah mengenai susunan unsur di dalam Jadual Berkala Unsur.*

Elements are arranged in order of increasing atomic mass in The Periodic Table  
*Unsur-unsur disusun mengikut jisim atom menaik dalam Jadual Berkala*

- Which of the following scientists made the above statement?  
*Antara saintis berikut siapakah yang membuat pernyataan di atas?*

- A Meyer  
B Newlands  
C Mendeleev  
D Dobereiner

4. Diagram 2 shows the set-up of the apparatus for electrolysis.  
 Diagram 2 menunjukkan susunan radas bagi elektrolisis.

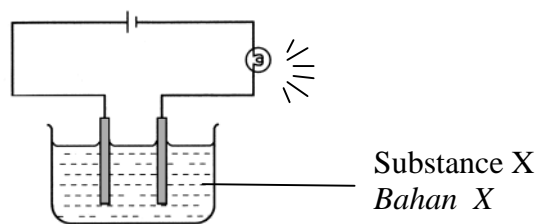


Diagram 2  
 Rajah 2

Which of the following compounds could be used as substance X?  
 Antara berikut, yang manakah boleh digunakan sebagai bahan X?

- A Ethene,  $C_2H_4$   
 Etana,  $C_2H_4$
- B Sodium chloride solution, NaCl  
 Natrium klorida, NaCl
- C Chloromethane,  $CH_3Cl$   
 Klorometana,  $CH_3Cl$
- D Ethyl ethanoate,  $CH_3COOC_2H_5$   
 Etil etanoat,  $CH_3COOC_2H_5$
5. What are the ions present in molten sodium chloride and sodium chloride aqueous solution?  
 Apakah ion-ion yang wujud dalam leburan natrium klorida dan larutan akues natrium klorida?

	Molten sodium chloride <i>Leburan natrium klorida</i>	Sodium chloride aqueous solution <i>Larutan akues natrium klorida</i>
A	$Na^+$ , $H^+$ , $Cl^-$ , $OH^-$	$Na^+$ , $H^+$ , $Cl^-$ ,
B	$Na^+$ , $Cl^-$	$OH^-$ , $Cl^-$
C	$Na^+$ , $Cl^-$	$Na^+$ , $Cl^-$ , $H^+$ , $OH^-$
D	$Na^+$ , $OH^-$	$Na^+$ , $Cl^-$ , $H^+$ , $OH^-$

6. Which of the following solutions can show a pH value of 8?  
 Antara larutan berikut yang manakah boleh menunjukkan nilai pH 8?
- A 0.1 mol  $dm^{-3}$  of ethanoic acid  
 Asid etanoik 0.1 mol  $dm^{-3}$
- B 0.1 mol  $dm^{-3}$  of hydrochloric acid  
 Asid hidroklorik 0.1 mol  $dm^{-3}$
- C 0.1 mol  $dm^{-3}$  of ammonia solution  
 Larutan ammonia 0.1 mol  $dm^{-3}$
- D 0.1 mol  $dm^{-3}$  of sodium hydroxide solution  
 Larutan natrium hidroksida 0.1 mol  $dm^{-3}$

7. Which of the following compounds is a soluble salt?  
*Antara sebatian berikut, yang manakah adalah garam terlarutkan?*

- A Lead(II) iodide  
*Plumbum(II) iodida*  
 B Barium sulphate  
*Barium sulfat*  
 C Calcium chloride  
*Kalsium klorida*  
 D Magnesium carbonate  
*Magnesium karbonat*

8. Diagram 3 shows the stages involved in the Contact Process to produce sulphuric acid.  
*Rajah 3 menunjukkan peringkat yang terlibat dalam Proses Sentuh untuk menghasilkan asid sulfurik.*

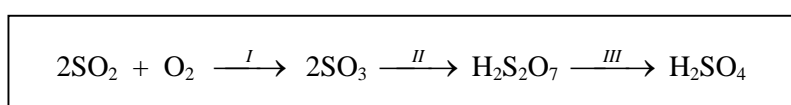


Diagram 3  
*Rajah 3*

- What is the optimum temperature and the catalyst used in stage I?  
*Apakah suhu optimum dan mangkin yang digunakan dalam peringkat I?*

	Temperature / °C <i>Suhu / °C</i>	Catalyst <i>Mangkin</i>
A	450	Vanadium(V) oxide <i>Vanadium(V) oksida</i>
B	200	Vanadium(V) oxide <i>Vanadium(V) oksida</i>
C	450	Iron powder <i>Serbuk besi</i>
D	300	Iron powder <i>Serbuk besi</i>

9. Which of the following compounds is an organic compound?  
*Antara sebatian berikut, yang manakah sebatian organik?*

- A Calcium carbonate, CaCO<sub>3</sub>  
*Kalsium karbonat, CaCO<sub>3</sub>*  
 B Carbonic acid, H<sub>2</sub>CO<sub>3</sub>  
*Asid karbonik, H<sub>2</sub>CO<sub>3</sub>*  
 C Carbon dioxide, CO<sub>2</sub>  
*Karbon dioksida, CO<sub>2</sub>*  
 D Glucose, C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>  
*Glukos, C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>*

10. Diagram 4 shows the graph of volume of carbon dioxide gas against time when 5 g of marble chips is added to 50 cm<sup>3</sup> of 0.2 mol dm<sup>-3</sup> hydrochloric acid.  
*Rajah 4 menunjukkan graf isipadu gas karbon dioksida melawan masa apabila 5g ketulan marmar dimasukkan ke dalam 50 cm<sup>3</sup> asid hidroklorik 0.2 mol dm<sup>-3</sup>.*

Volume of CO<sub>2</sub> gas / cm<sup>3</sup>  
*Isipadu gas CO<sub>2</sub> / cm<sup>3</sup>*

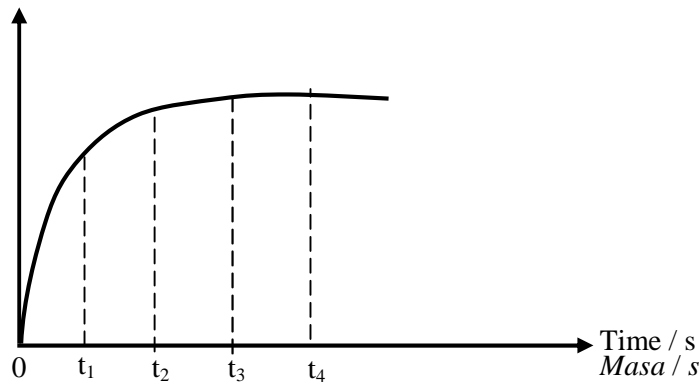
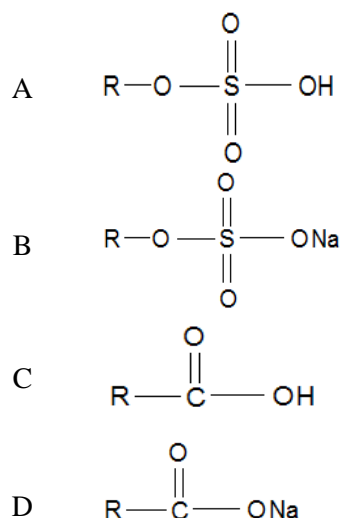


Diagram 4  
*Rajah 4*

- At what time the rate of reaction the highest?  
*Pada masa manakah kadar tindak balas paling tinggi?*
- A t<sub>1</sub>  
 B t<sub>2</sub>  
 C t<sub>3</sub>  
 D t<sub>4</sub>
11. The following ionic equation shows a redox reaction.  
*Persamaan ion di bawah mewakili satu tindak balas redoks.*
- $$2\text{Fe}^{2+} + \text{Br}_2 \rightarrow 2\text{Fe}^{3+} + 2\text{Br}^-$$
- Which of the following is true about the reaction?  
*Antara pernyataan berikut, yang manakah benar berkaitan tindakbalas di atas?*
- A Iron(III) ion, Fe<sup>3+</sup> is reduced  
*Ion ferum(III), Fe<sup>3+</sup> diturunkan*
- B Iron(II) ion, Fe<sup>2+</sup> is oxidised  
*Ion ferum(II), Fe<sup>2+</sup> dioksidakan*
- C Bromine water is a reducing agent  
*Air bromin merupakan agen penurunan*
- D Bromide ion is an oxidising agent  
*Ion bromida merupakan agen pengoksidaan*
12. Which of the following processes absorbs heat energy?  
*Antara proses berikut yang manakah merupakan proses serap tenaga haba?*
- A Combustion of a hydrocarbon  
*Pembakaran hidrokarbon*
- B Neutralisation between acid and alkali  
*Peneutralan antara asid dan alkali*
- C Dissolving sodium hydroxide in water  
*Melarutkan natrium hidroksida dalam air*
- D Breaking the H-H bond in the hydrogen molecule  
*Memecahkan ikatan H-H dalam molekul hidrogen*

13. Which of the following structural formulas is of soap?  
*Antara formula struktur berikut yang manakah bagi sabun?*



14. Atom of element X has a proton number of 13. Where is X located in the Periodic Table of Elements?  
*Atom unsur X mempunyai nombor proton 13. Dimanakah kedudukan X di dalam Jadual Berkala Unsur?*

	Group <i>Kumpulan</i>	Period <i>Kala</i>
A	3	2
B	3	3
C	13	2
D	13	3

15. Which of the following substances is made up of atoms?  
*Antara bahan berikut yang manakah terdiri daripada atom-atom?*
- A Argon  
 B Nitrogen  
 C Chlorine  
 D Ammonia
16. Which of the following physical properties is true of copper(II) chloride?  
*Antara sifat fizik berikut yang manakah benar bagi kuprum(II) klorida?*
- A It is a volatile substance  
*Ia adalah sebatian yang meruap*  
 B It dissolves in organic solvent  
*Ia larut dalam pelarut organik*  
 C It conduct electricity in aqueous solution  
*Ia mengkonduksi elektrik dalam larutan akues*  
 D It burns in oxygen to produce white fumes  
*Ia terbakar dalam oksigen dengan nyalaan putih*

17. Diagram 5 shows the set up of apparatus to determine the empirical formula for metal oxide.  
*Rajah 5 menunjukkan susunan radas untuk menentukan formula empirik oksida logam.*

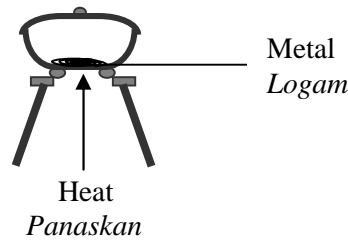


Diagram 5  
*Rajah 5*

- Which of the following metals is most suitable to be used in the diagram?  
*Logam yang manakah yang paling sesuai digunakan dalam rajah itu?*
- A Lead  
*Plumbum*
- B Silver  
*Argentum*
- C Copper  
*Kuprum*
- D Magnesium  
*Magnesium*
18. Which of the following ions form a precipitate that dissolve in excess ammonia solution?  
*Antara ion-ion berikut, yang manakah akan menghasilkan mendakan yang larut dalam larutan ammonia berlebihan?*
- I  $\text{Zn}^{2+}$
- II  $\text{Al}^{3+}$
- III  $\text{Pb}^{2+}$
- IV  $\text{Cu}^{2+}$
- A I and IV only
- B II and IV only
- C I and III only
- D I, II and III only
19. Element X is a reducing agent. Which of the following electron arrangements is for atom X?  
*X adalah agen penurunan. Antara susunan elektron berikut adalah bagi atom unsur X?*
- A 2.8.2
- B 2.8.8
- C 2.8.7
- D 2.8.4

- 20 Diagram 6 shows a metal X spoon dipped in a salt solution inside metal Y container.  
*Rajah 6 menunjukkan sudu logam X direndamkan dalam larutan garam di dalam bekas logam Y*

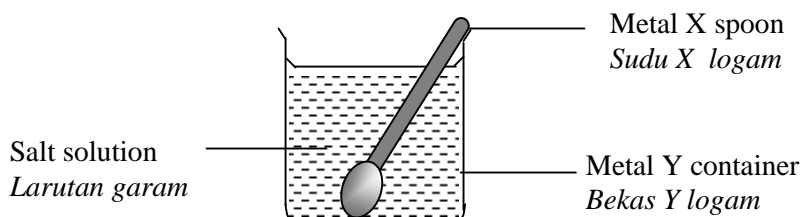


Diagram 6  
*Rajah 6*

If element X is more electropositive than Y, which of the following statements are true about the diagram?

*Jika unsur X lebih elektropositif daripada Y, pernyataan yang manakah betul berkaitan tindak balas di atas?*

- I Metal X spoon undergoes corrosion  
*Sudu X logam mengalami kakisan*
- II Metal Y is oxidised  
*Logam Y teroksida*
- III Mass of metal X spoon decreases  
*Jisim sudu X logam berkurang*
- IV Atom of metal X spoon is ionised  
*Atom sudu X logam mengion*
- A I and III only  
 B II and IV only  
 C I, III and IV only  
 D I, II, III and IV
- 21 Which of the following solutions have the same number of hydrogen ions,  $H^+$ , as in 50  $cm^3$  of 0.1  $mol\ dm^{-3}$  sulphuric acid,  $H_2SO_4$ ?  
*Antara larutan berikut, yang manakah mempunyai bilangan ion hidrogen,  $H^+$ , sama seperti dalam 50  $cm^3$  0.1  $mol\ dm^{-3}$  asid sulfurik,  $H_2SO_4$ ?*
- I 100  $cm^3$  of 0.1  $mol\ dm^{-3}$  hydrochloric acid, HCl  
*100  $cm^3$  0.1  $mol\ dm^{-3}$  asid hidroklorik, HCl*
- II 50  $cm^3$  of 0.2  $mol\ dm^{-3}$  nitric acid,  $HNO_3$   
*50  $cm^3$  0.2  $mol\ dm^{-3}$  asid nitrik,  $HNO_3$*
- III 100  $cm^3$  of 0.1  $mol\ dm^{-3}$  ethanoic acid,  $CH_3COOH$   
*100  $cm^3$  0.1  $mol\ dm^{-3}$  asid etanoik,  $CH_3COOH$*
- IV 50  $cm^3$  of 0.1  $mol\ dm^{-3}$  phosphoric acid,  $H_3PO_4$   
*50  $cm^3$  0.1  $mol\ dm^{-3}$  asid fosforik,  $H_3PO_4$*
- A I and II only  
 B I and III only  
 C III and IV only  
 D I, II and III only

22. Diagram 7 shows molecular structure of a polymer.

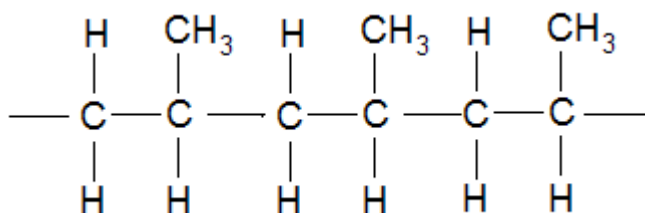


Diagram 7  
Rajah 7

What is the name of the monomer of the polymer in the diagram?  
Apakah nama monomer bagi polimer dalam rajah tersebut?

- A Ethene  
*Etena*
- B Butene  
*Butena*
- C Propene  
*Propena*
- D Chloroethene  
*Kloroetena*
- 23 Table 1 shows the relative atomic mass of helium, carbon, sulphur and copper  
*Jadual 1 menunjukkan jisim atom relatif bagi helium, karbon, sulfur dan kuprum*

Element <i>Unsur</i>	Helium	Carbon	Sulphur	Copper
Relative atomic mass <i>Jisim atom relatif</i>	4	12	32	64

Table 1  
*Jadual 1*

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

[ Avogadro constant =  $6.0 \times 10^{23} \text{ mol}^{-1}$  ]  
[ *Pemalar Avogadro* =  $6.0 \times 10^{23} \text{ mol}^{-1}$  ]

- A Mass of one copper atom is 64 g  
*Jisim satu atom kuprum ialah 64 g*
- B Mass of 1 mol of helium is 8 g  
*Jisim 1 mol gas helium ialah 8 g*
- C 32 g of sulphur contains  $6.02 \times 10^{23}$  sulphur atom  
*32g sulfur mempunyai  $6.02 \times 10^{23}$  atom sulfur*
- D Mass of one sulphur atom is 32 times bigger than one carbon atom  
*Jisim satu atom unsur ialah 32 kali lebih besar daripada jisim satu atom karbon*

24. Diagram 8 shows the energy profile diagram for the following reaction:  
*Rajah 8 menunjukkan gambar rajah aras tenaga bagi tindak balas berikut:*

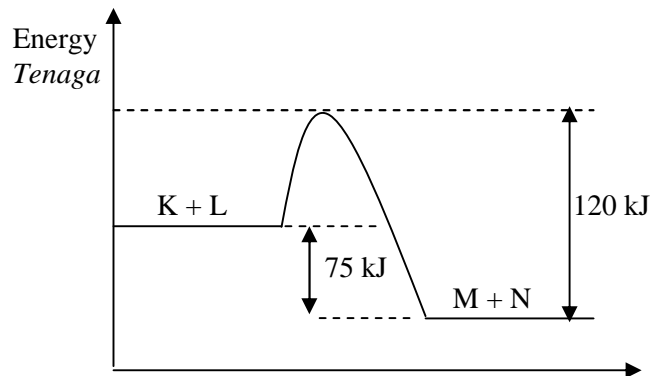
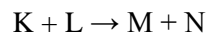


Diagram 8  
*Rajah 8*

- What is the value of the activation energy?  
*Apakah nilai tenaga pengaktifan?*
- A 25 kJ  
 B 45 kJ  
 C 75 kJ  
 D 120 kJ
25. In the saponification process, concentrated sodium hydroxide solution is added to boiling vegetable oils to produce X and soaps. What is X?  
*Dalam process saponifikasi, larutan natrium hidroksida pekat ditambahkan kepada minyak sayuran yang didih untuk menghasilkan X dan sabun. Apakah X?*
- A Ethanol  
*Etanol*  
 B Glycerol  
*Gliserol*  
 C Propanol  
*Propanol*  
 D Butanoic acid  
*Asid butanoik*

26. Diagram 9 shows the energy level diagram for the reaction between silver ions and chloride ions.  
*Rajah 9 menunjukkan gambarajah aras tenaga bagi tindak balas antara ion argentum dengan ion klorida.*

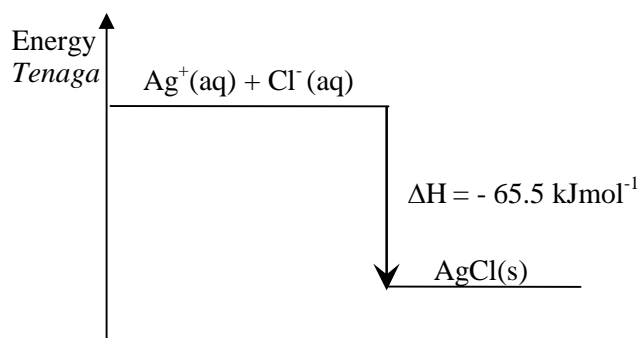


Diagram 9  
*Rajah 9*

- Which of the following statements is true about this reaction?  
*Yang manakah antara pernyataan berikut adalah benar mengenai tindak balas ini?*
- A Endothermic reaction occurs  
*Tidak balas endotermik berlaku*
- B The energy content of the product is higher than the reactants  
*Kandungan tenaga hasil tindak balas adalah lebih tinggi daripada bahan tindak balas*
- C 65 kJ of heat is absorbed when 1 mol of silver chloride is formed  
*65 kJ tenaga diserap apabila 1 mol argentum klorida terbentuk*
- D The final temperature at the end of the reaction is higher than the initial temperature  
*Suhu akhir tindak balas adalah lebih tinggi daripada suhu awal tindak balas*
27. Atom of oxygen-18 has 8 electrons. How many neutrons does an atom of oxygen-18 contain?  
*Atom oksigen-18 mempunyai 8 elektron. Berapakah bilangan neutron bagi atom oksigen-18?*
- A 6  
 B 8  
 C 10  
 D 18
28. The following elements are in Group 17 in the Periodic Table of Elements **except**  
*Unsur-unsur berikut berada dalam Kumpulan 17 dalam Jadual Berkala Unsur **kecuali***
- A bromine  
*bromin*
- B chlorine  
*klorin*
- C helium  
*helium*
- D iodine  
*iodin*

29. The following statement is about  $X^{3+}$  ion.  
*Pernyataan berikut adalah berkaitan ion  $X^{3+}$ .*

$X^{3+}$  ion has 14 neutrons and 10 electrons.  
*Ion  $X^{3+}$  mempunyai 14 neutron dan 10 elektron*

Which of the following proton numbers and nucleon numbers shows for atom X?  
*Yang manakah antara berikut menunjukkan nombor proton dan nombor nukleon bagi atom X?*

	Proton number <i>Nombor proton</i>	Nucleon number <i>Nombor nukleon</i>
A	10	14
B	10	27
C	13	14
D	13	27

30. Diagram 10 shows the electron arrangement of a compound formed between element T and element Q.

*Diagram 10 menunjukkan susunan elektron bagi sebatian yang terbentuk daripada unsur T dan unsur Q.*

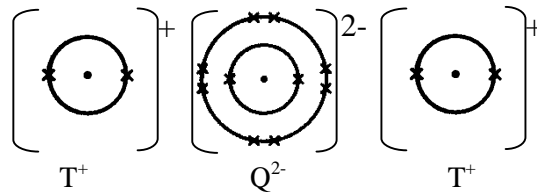


Diagram 10  
*Rajah 10*

What group in the Periodic Table of Elements is element Q located?  
*Apakah kumpulan dalam Jadual Berkala Unsur kedudukan unsur Q?*

- A 2  
 B 8  
 C 16  
 D 18
31. Which of the following pairs of substances is most suitable to prepare copper(II) sulphate salt?  
*Yang manakah antara pasangan bahan kimia berikut paling sesuai untuk menyediakan garam kuprum(II) sulfat?*

- A Copper with dilute sulphuric acid  
*Kuprum dan larutan asid sulfurik cair*
- B Copper(II) chloride with dilute sulphuric acid  
*Kuprum(II) klorida dan larutan asid sulfurik cair*
- C Copper(II) carbonate with dilute sulphuric acid  
*Kuprum(II) karbonat dan larutan asid sulfurik cair*
- D Copper(II) nitrate solution with sodium sulphate solution  
*Larutan kuprum(II) nitrat dan larutan natrium sulfat*

- 32 Diagram 11 shows the set-up of apparatus of an electrolysis process.  
Rajah 11 menunjukkan susunan radas bagi satu proses elektrolisis.

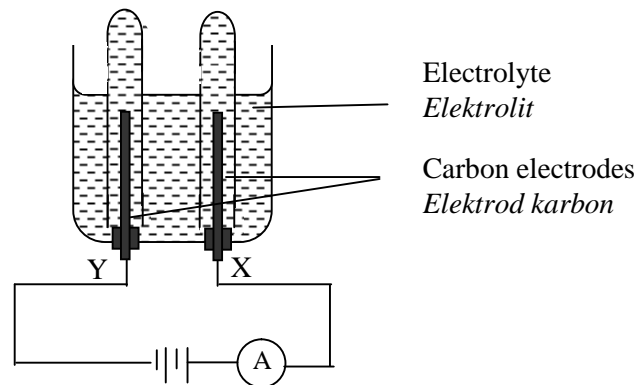
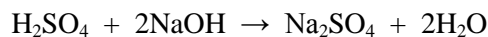


Diagram 11  
Rajah 11

- Which of the following electrolytes produce oxygen gas at electrode X ?  
Antara elektrolit berikut, yang manakah menghasilkan gas oksigen di elektrod X ?
- I 1.0 mol dm<sup>-3</sup> hydrochloric acid  
Asid hidroklorik 1.0 mol dm<sup>-3</sup>
- II 1.0 mol dm<sup>-3</sup> sulphuric acid  
Asid sulfurik 1.0 mol dm<sup>-3</sup>
- III 1.0 mol dm<sup>-3</sup> potassium nitrate solution  
Larutan kalium nitrat 1.0 mol dm<sup>-3</sup>
- IV 1.0 mol dm<sup>-3</sup> potassium bromide  
Larutan kalium bromida 1.0 mol dm<sup>-3</sup>
- A I and II only  
B II and III only  
C III and IV only  
D II, III and IV only
33. The following equation represents the reaction between sodium hydroxide solution and dilute sulphuric acid.  
Persamaan berikut mewakili tindak balas antara larutan natrium hidroksida dengan asid sulfurik cair.



What is the volume of 0.5 mol dm<sup>-3</sup> sulphuric acid needed to neutralise 50 cm<sup>3</sup> of 0.5 mol dm<sup>-3</sup> sodium hydroxide?  
Apakah isipadu 0.5 mol dm<sup>-3</sup> asid sulfurik yang diperlukan untuk meneutralkan 50 cm<sup>3</sup> 0.5 mol dm<sup>-3</sup> natrium hidroksida?

- A 12.5 cm<sup>3</sup>  
B 25.0 cm<sup>3</sup>  
C 50.0 cm<sup>3</sup>  
D 75.0 cm<sup>3</sup>

34. Which of the following statements explains why ceramic is suitable to make an engine block?  
 Yang manakah antara pernyataan berikut menerangkan mengapa seramik sesuai untuk membina blok enjin?

- A Ceramic is chemically inert  
*Seramik adalah lengai secara kimia*
- B Ceramic is an electric conductor  
*Seramik adalah konduktor elektrik*
- C Ceramic can withstand high temperature  
*Seramik boleh tahan suhu yang tinggi*
- D Ceramic has a low specific heat capacity  
*Seramik mempunyai muatan haba tentu yang rendah*

35. Table 3 shows the proton number of elements S, T, U and V.  
 Jadual 3 menunjukkan nombor proton bagi unsur S, T, U dan V.

Element <i>Unsur</i>	S	T	U	V
Proton number <i>Nombor proton</i>	11	14	16	19

Table 3  
 Jadual 3

What is the arrangement of elements S, T, U and V in **ascending** order of atomic size?  
 Apakah susunan saiz atom secara menaik bagi unsur-unsur S, T, U dan V?

- A S, T, U, V
- B S, V, T, U
- C V, U, T, S
- D U, T, S, V
36.  $C_4H_8$  is the molecular formula for isomers X and Y.  
 $C_4H_8$  ialah formula molekul bagi isomer X dan Y.
- Which of the following statements is true of isomers X and Y?  
 Antara pernyataan berikut yang manakah benar tentang X dan Y?
- A X and Y have similar molecular structure  
*X dan Y mempunyai struktur molekul yang sama*
- B X and Y have similar chemical properties  
*X dan Y mempunyai sifat kimia yang sama*
- C X and Y have different relative molecular mass  
*X dan Y mempunyai jisim molekul relatif yang sama*
- D X and Y have similar physical properties  
*X dan Y mempunyai sifat fizik yang sama.*

37. Diagram 12 shows curve X obtained when 8 g of granulated zinc (in excess) is reacted with 50 cm<sup>3</sup> of 1 mol dm<sup>-3</sup> sulphuric acid.  
Rajah 12 menunjukkan lengkung X apabila 8 g ketulan zink (berlebihan) bertindak balas dengan 50 cm<sup>3</sup> asid sulfurik 1 mol dm<sup>-3</sup>.

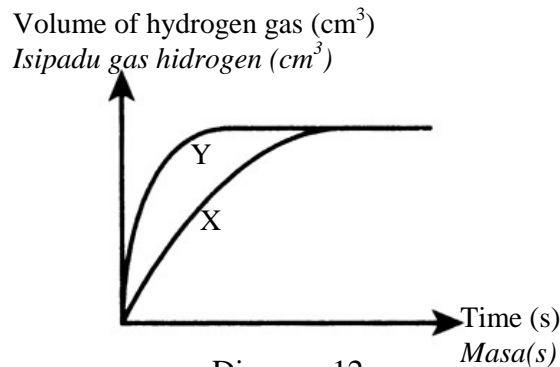


Diagram 12  
Rajah 12

- Which of the following reactions produces curve Y?  
Antara tindak balas berikut yang manakah menghasilkan lengkung Y?
- A 8 g zinc powder + 50 cm<sup>3</sup> of 2 mol dm<sup>-3</sup> sulphuric acid  
8 g serbuk zink + 50 cm<sup>3</sup> of 2 mol dm<sup>-3</sup> sulfurik acid
- B 8 g zinc powder + 50 cm<sup>3</sup> of 1 mol dm<sup>-3</sup> of sulphuric acid  
8 g serbuk zink + 50 cm<sup>3</sup> of 1 mol dm<sup>-3</sup> sulfurik acid
- C 8 g granulated zinc + 100 cm<sup>3</sup> of 1 mol dm<sup>-3</sup> of sulphuric acid  
8 g ketulan zink + 100 cm<sup>3</sup> of 1 mol dm<sup>-3</sup> sulfurik acid
- D 8 g granulated zinc + 50 cm<sup>3</sup> of 2 mol dm<sup>-3</sup> of sulphuric acid  
8 g ketulan zink + 50 cm<sup>3</sup> of 2 mol dm<sup>-3</sup> sulfurik acid
38. The following statements are about atom G and J.  
Pernyataan berikut adalah mengenai atom G dan J.

- Electron arrangement of atom G is 1  
Susunan elektron atom G ialah 1
- Proton number of atom J is 6  
Nombor proton atom J ialah 6

What is the formula of the compound formed between G and J?  
Apakah formula bagi sebatian yang terbentuk antara G dan J?

- A JG  
B JG<sub>2</sub>  
C JG<sub>3</sub>  
D JG<sub>4</sub>

39. Diagram 13 shows the set up of apparatus to investigate the effect of metals X, Y and Z on the rusting of iron

*Rajah 13 menunjukkan susunan radas untuk mengkaji kesan logam X, Y dan Z ke atas pengurangan paku besi*

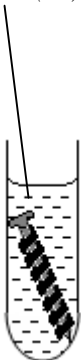

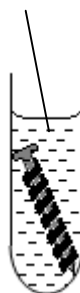
	A	B	C
Experiment	Hot agar solution + potassium hexacyanoferrate(III) <i>Agar-agar panas + kalium heksasianoferrat(III)</i> 	Hot agar solution + potassium hexacyanoferrate(III) <i>Agar-agar panas + kalium heksasianoferrat(III)</i> 	Hot agar solution + potassium hexacyanoferrate(III) <i>Agar-agar panas + kalium heksasianoferrat(III)</i> 
Material <i>Bahan</i>	Iron nail and metal X <i>Paku besi dengan logam X</i>	Iron nail and metal Y <i>Paku besi dengan logam Y</i>	Iron nail and metal Z <i>Paku besi dengan logam Z</i>
Observation <i>Pemerhatian</i>	Small amount of blue spot <i>Sedikit tompok biru</i>	No change <i>Tiada perubahan</i>	A lot of blue spot <i>Banyak tompok biru</i>

Diagram 13  
*Rajah 13*

Which of the following arrangements of metals X, Y and Z is in descending order of their electropositivity ?

*Yang manakah antara berikut adalah susunan logam X, Y dan Z mengikut tertib keelektropositifan menurun ?*

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

40. 7 g of potassium hydroxide is dissolved in distilled water to form 250 cm<sup>3</sup> of solution. What is the molarity of the potassium hydroxide solution?  
[Relative atomic mass: H=1, O=16, K=39]

*7 g kalium hidroksida dilarutkan ke dalam air suling untuk membentuk 250 cm<sup>3</sup> larutan. Apakah kemolaran larutan kalium hidroksida tersebut?  
[Jisim atom relatif: H=1, O=16, K=39]*

- A 0.03 mol dm<sup>-3</sup>  
B 0.05 mol dm<sup>-3</sup>  
C 0.30 mol dm<sup>-3</sup>  
D 0.50 mol dm<sup>-3</sup>

41. Diagram 14 shows the energy level diagram of the displacement reaction between magnesium and iron(II) chloride solution.  
*Rajah 14 menunjukkan gambar rajah aras tenaga bagi tindak balas penyesaran antara magnesium dan larutan ferum(II) sulfat.*

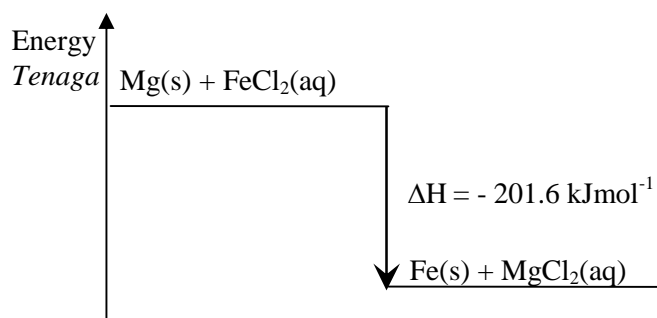


Diagram 14  
*Rajah 14*

What is the increase in temperature if  $50 \text{ cm}^3$  of  $0.25 \text{ mol dm}^{-3}$  iron(II) chloride solution is reacted with excess magnesium,?  
*Berapakah kenaikan suhu, jika  $50 \text{ cm}^3$   $0.25 \text{ mol dm}^{-3}$  larutan ferum(III) klorida ditindak balaskan dengan berlebihan magnesium ?*

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

- A  $12 \text{ }^\circ\text{C}$   
 B  $16 \text{ }^\circ\text{C}$   
 C  $22 \text{ }^\circ\text{C}$   
 D  $24 \text{ }^\circ\text{C}$
42. Table 3 shows the results of an experiment for three chemical cells P, Q and R.  
*Jadual 3 menunjukkan keputusan eksperimen bagi tiga sel kimia P, Q dan R.*

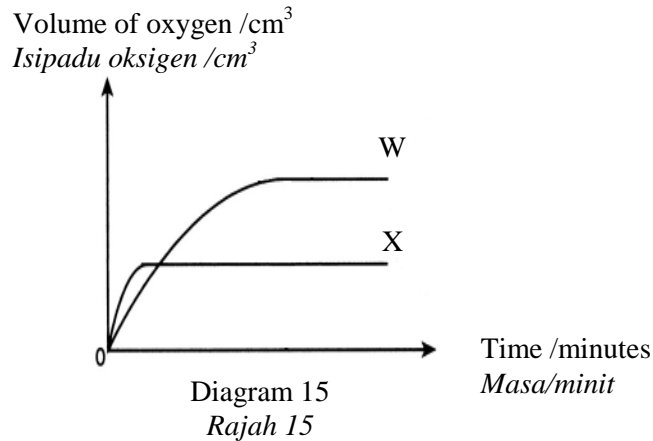
Chemical cell <i>Sel kimia</i>	Pairs of metals <i>Pasangan logam</i>	Voltage (V) <i>Voltan (V)</i>	Negative terminal <i>Terminal negatif</i>
P	X – Y	0.45	X
Q	X – Z	0.60	Z
R	Y – Z	1.05	Z

Table 3  
*Jadual 3*

Which of the following arrangements of metals X, Y and Z is in descending order of electropositivity in the electrochemical series?  
*Antara berikut yang manakah susunan logam X, Y dan Z mengikut tertib elektropositif menurun dalam siri elektrokimia?*

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

43. Diagram 15 shows curve W obtained from the decomposition of  $20 \text{ cm}^3$  of  $0.40 \text{ mol dm}^{-3}$  hydrogen peroxide solution,  $\text{H}_2\text{O}_2$ , using  $0.2 \text{ g}$  of manganese (IV) oxide as catalyst at a temperature of  $30^\circ\text{C}$ .  
Rajah 15 menunjukkan lengkung W terbentuk daripada penguraian  $20 \text{ cm}^3$  larutan hidrogen peroksida  $0.40 \text{ mol dm}^{-3}$ , di mangkinkan oleh mangan(IV) oksida pada suhu  $30^\circ\text{C}$ .



- Which of the following experiments will produce curve X?  
Antara eksperimen berikut yang manakah akan menghasilkan lengkung X?

	Volume of $\text{H}_2\text{O}_2$ , $\text{cm}^3$ Isipadu $\text{H}_2\text{O}_2$ / $\text{cm}^3$	Concentration of $\text{H}_2\text{O}_2$ / $\text{mol dm}^{-3}$ Kepekatan $\text{H}_2\text{O}_2$ / $\text{mol dm}^{-3}$	Temperature $^\circ\text{C}$ Suhu / $^\circ\text{C}$
A	10	0.60	30
B	15	0.20	30
C	20	0.60	40
D	30	0.30	40

44. Table 4 shows the melting and boiling points of substances P, Q, R and S..  
Jadual 4 menunjukkan takat lebur dan takat didih untuk bahan P, Q, R dan S..

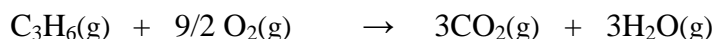
Substance Bahan	Melting point / $^\circ\text{C}$ Takat lebur / $^\circ\text{C}$	Boiling point / $^\circ\text{C}$ Takat didih / $^\circ\text{C}$
P	-59	60
Q	48	130
R	-110	-70
S	128	470

Table 4  
Jadual 4

- Which of the following substances has the highest kinetic energy at room temperature?  
Antara bahan berikut yang manakah mempunyai tenaga kinetic yang paling tinggi pada suhu bilik?

- A P  
B Q  
C R  
D S

45. The following equation shows the complete combustion of propene gas.  
*Persamaan berikut menunjukkan pembakaran gas propene*



Which of the following statements are true when 1 mol of propene gas is burnt completely?

[Relative molecular mass :  $\text{C}_3\text{H}_6 = 42$ ,  $\text{O}_2 = 32$ ,  $\text{CO}_2 = 44$ ,  $\text{H}_2\text{O} = 18$ , Molar volume of gas is  $22.4 \text{ dm}^3 \text{ mol}^{-1}$  at S.T.P.]

*Yang manakah antara pernyataan berikut adalah benar apabila 1 mol gas propene terbakar secara lengkap?*

*[Jisim molekul relatif :  $\text{C}_3\text{H}_6 = 42$ ,  $\text{O}_2 = 32$ ,  $\text{CO}_2 = 44$ ,  $\text{H}_2\text{O} = 18$ , Isi padu molar gas  $22.4 \text{ dm}^3 \text{ mol}^{-1}$  pada S.T.P.]*

- I Complete combustion of 0.1 mol of propene produces 5.4 g of water  
*Pembakaran lengkap 0.1 mol gas propena menghasilkan 5.4 g air*
- II Complete combustion of 1 mol of propene gas produces 2 mol of water  
*Pembakaran lengkap 1 mol gas propene menghasilkan 2 mol air*
- III Complete combustion of 4.2 g of propene requires 14.4 g of oxygen.  
*Pembakaran lengkap 4.2 g gas propena memerlukan 14.4 g gas oksigen*
- IV Complete combustion of 0.1 mol of propene produces  $6.72 \text{ dm}^3$  carbon dioxide gas at s.t.p.  
*Pembakaran lengkap 0.1 mol propena akan menghasilkan  $6.72 \text{ dm}^3$  gas karbon dioksida pada s.t.p*
- A I and II only  
 B I and IV only  
 C II and IV only  
 D I, III and IV
46. Ammonium sulphate,  $(\text{NH}_4)_2\text{SO}_4$  is an example of a fertilizer.  
 Calculate the percentage of nitrogen in 1 mole of ammonium sulphate.  
 [Relative atomic mass: N=14, H=1, S=,32, O=16]
- Ammonium sulfat,  $(\text{NH}_4)_2\text{SO}_4$  adalah satu contoh baja.  
 Hitungkan peratus nitrogen dalam 1 mol ammonium sulfat.  
 [Jisim atom relatif: N=14, H=1, S=,32, O=16]*
- A 12.12 %  
 B 21.21 %  
 C 23.23 %  
 D 31.31 %

47. Diagram 16 shows the preparation of lead(II) chloride salt.  
*Rajah 16 menunjukkan persediaan garam plumbum(II) klorida.*

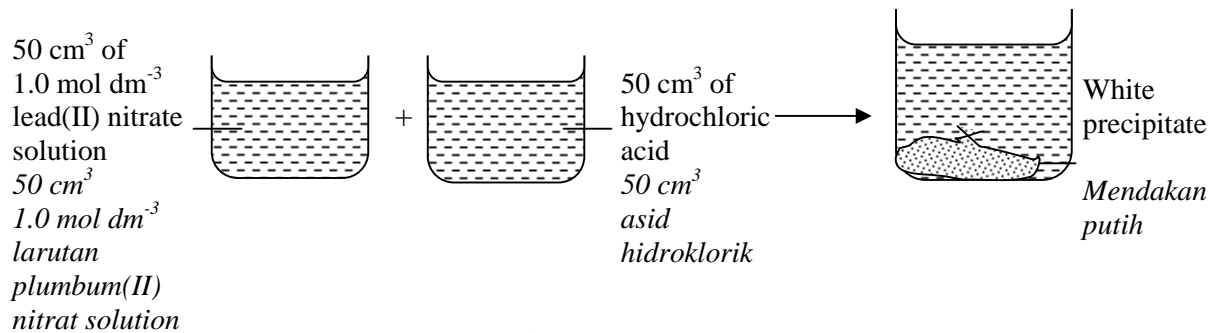


Diagram 16  
*Rajah 16*

- What is the concentration of the hydrochloric acid needed to react completely with lead(II) nitrate solution?  
*Berapakah kepekatan larutan asid hidroklorik yang diperlukan untuk bertindak balas lengkap dengan larutan plumbum(II) nitrat?*
- A 0.5 mol dm<sup>-3</sup>  
 B 1.0 mol dm<sup>-3</sup>  
 C 1.5 mol dm<sup>-3</sup>  
 D 2.0 mol dm<sup>-3</sup>
48. Which of the following food additives can be used to make food stay fresh longer and taste better?  
*Antara bahan tambah makanan berikut yang manakah boleh digunakan untuk mengekalkan kesegaran makanan dan meningkatkan rasanya?*
- A Sodium benzoate and tartrazine  
*Natrium benzoat dan tartrazina*  
 B Sodium benzoate and ascorbic acid  
*Natrium benzoat dan asid askorbik*  
 C Monosodium glutamate and tartrazine  
*Mononatrium glutamat dan tartrazina*  
 D Ascorbic acid and monosodium glutamate  
*Asid askorbik dan mononatrium glutamat*

- 49 Diagram 17 shows the process to produce compound J.  
*Rajah 17 menunjukkan proses menghasilkan sebatian J.*

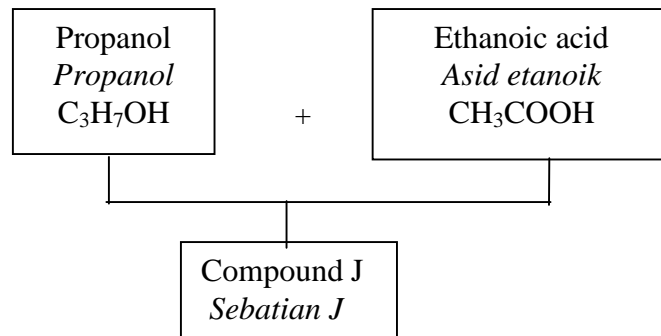


Diagram 17  
*Rajah 17*

- Which of the following structural formulas is of compound J?  
*Antara formula struktur yang manakah bagi sebatian J?*

- A 
$$\begin{array}{c} \text{O} \\ || \\ \text{CH}_3-\text{C}-\text{O}-\text{CH}_2-\text{CH}_3 \end{array}$$
- B 
$$\begin{array}{c} \text{O} \\ || \\ \text{CH}_3-\text{C}-\text{O}-\text{CH}_2-\text{CH}_2-\text{CH}_3 \end{array}$$
- C 
$$\begin{array}{c} \text{O} \\ || \\ \text{CH}_3-\text{CH}_2-\text{C}-\text{O}-\text{CH}_2-\text{CH}_3 \end{array}$$
- D 
$$\begin{array}{c} \text{O} \\ || \\ \text{CH}_3-\text{CH}_2-\text{C}-\text{O}-\text{CH}_2-\text{CH}_2-\text{CH}_3 \end{array}$$

- 50 Diagram 18 shows the set of apparatus of an experiment to investigate electron transfer at a distance.

*Rajah 18 menunjukkan susunan radas satu eksperimen pemindahan elektron pada satu jarak.*

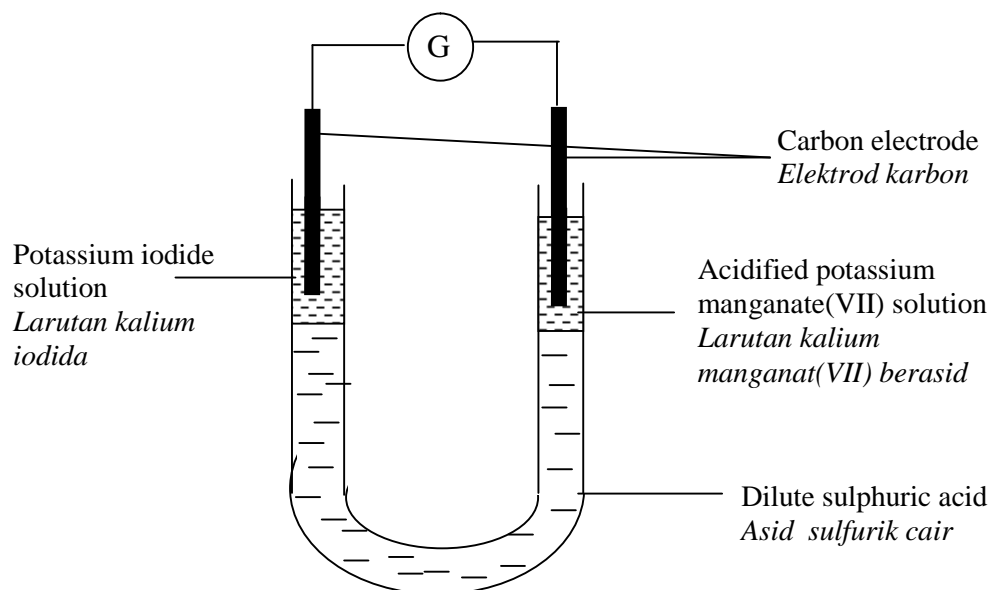


Diagram 18  
*Rajah 18*

Which of the following statements is true about the experiment?

*Antara pernyataan berikut yang manakah benar tentang eksperimen itu?*

- A Iodide ion is the reducing agent  
*Ion iodida bertindak sebagai agen penurunan.*
- B Oxidation number of iodine decreases from 0 to -1  
*Nombor pengoksidaan iodin menurun dari 0 ke -1*
- C Oxidation number of manganese increases from +2 to +7  
*Nombor pengoksidaan mangan bertambah dari +2 ke +7*
- D Electrons flow from potassium iodide solution to acidified potassium manganate(VII) through sulphuric acid  
*Elektron mengalir dari larutan kalium iodida ke larutan kalium manganat(VII) berasid melalui asid sulfurik*

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