

26. Diagram 7 shows the electron arrangement of a compound formed between atom P and Q.  
*Rajah 7 di bawah menunjukkan susunan elektron sebatian yang terbentuk antara atom P dan Q.*

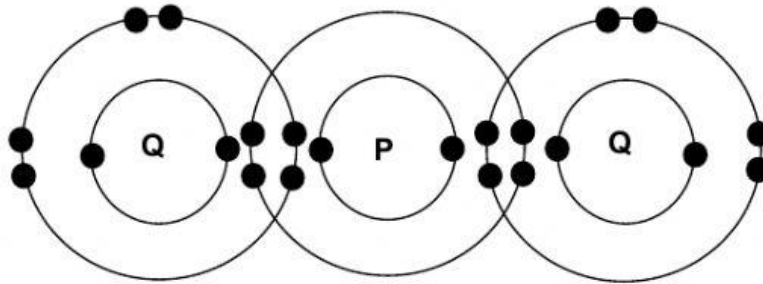


Diagram / Rajah 7

Which of the following statements is **true** about the compound?  
*Antara pernyataan berikut, yang manakah **benar** tentang sebatian itu?*

- A. It is an ionic compound  
*Merupakan sebatian ionik*
- B. The compound is formed by covalent bonds  
*Terbentuk melalui ikatan kovalen*
- C. The compound has high boiling point  
*Mempunyai takat didih yang tinggi*
- D. The compound is formed by electron transfer  
*Terbentuk melalui perpindahan elektron*
27. In the extraction of aluminium by electrolysis of molten aluminium oxide, cryolite is added to the mixture to  
*Dalam pengekstrakan aluminium melalui elektrolisis leburan aluminium oksida, kriolit ditambah ke dalam campuran untuk*
- A. catalyse the electrolysis process  
*memangkinkan proses elektrolisis*
- B. absorb the released oxygen gas  
*menyerap gas oksigen yang dibebaskan*
- C. lower the melting point of aluminium oxide  
*merendahkan takat lebur aluminium oksida*
- D. increase the purity of the aluminium obtained  
*menambah ketulenan aluminium yang diperolehi*

28. Diagram 8 below shows volume and concentration of potassium hydroxide solution and ethanoic acid.  
*Rajah 8 menunjukkan isipadu dan kepekatan bagi larutan kalium hidroksida dan asid etanoik.*

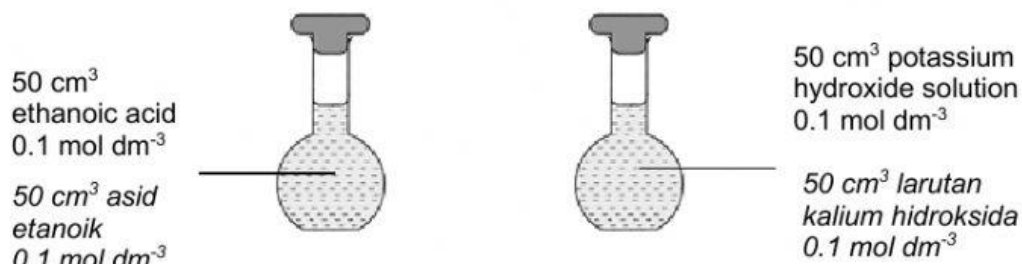
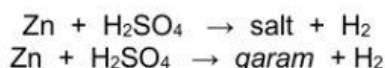


Diagram / Rajah 8

- Which of the following statements are **true** for both solution?  
*Antara pernyataan berikut yang manakah **benar** bagi kedua-dua larutan itu?*

	<b>Potassium hydroxide solution</b> <i>Larutan kalium hidroksida</i>	<b>Ethanoic acid</b> <i>Asid etanoik</i>
A.	Weak alkali <i>Alkali lemah</i>	Weak acid <i>Asid lemah</i>
B.	Low pH value <i>Nilai pH rendah</i>	High pH value <i>Nilai pH tinggi</i>
C.	High degree of ionization <i>Darjah pengionan tinggi</i>	Low degree of ionization <i>Darjah pengionan rendah</i>
D.	Low concentration of hydroxide ion <i>Kepekatan ion hidroksida rendah</i>	Low concentration of hydrogen ion <i>Kepekatan ion hidrogen rendah</i>

29. The following equation represents a reaction between zinc metal and sulphuric acid.  
*Persamaan berikut mewakili tindak balas antara logam zink dan asid sulfurik.*



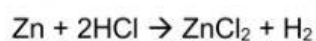
- What is the name of the salt and its solubility in water?  
 Apakah nama bagi garam itu dan keterlarutannya dalam air?

	<b>Name of salt</b> <i>Nama garam</i>	<b>Solubility in water</b> <i>Keterlarutan dalam air</i>
A.	Zinc sulphate <i>Zinc sulfat</i>	Soluble <i>Larut</i>
B.	Zinc oxide <i>Zink oksida</i>	Insoluble <i>Tidak larut</i>
C.	Zinc oxide <i>Zink oksida</i>	Soluble <i>Larut</i>
D.	Zinc sulphate <i>Zinc sulfat</i>	Insoluble <i>Tidak larut</i>

30. Calculate the percentage of nitrogen in ammonium nitrate,  $\text{NH}_4\text{NO}_3$   
*Hitungkan peratus kandungan nitrogen dalam ammonium nitrat,  $\text{NH}_4\text{NO}_3$ .*

Given that the relative atomic mass of H = 1, N = 14, O = 16  
*Diberi bahawa jisim atom relatif H = 1, N = 14, O = 16*

- A. 34.5  
 B. 35.0  
 C. 35.4  
 D. 53.0
31. The following equation shows the reaction between zinc powder and  $25.0 \text{ cm}^3$  of  $1.0 \text{ mol dm}^{-3}$  hydrochloric acid.  
*Persamaan berikut menunjukkan tindak balas antara serbuk zink dengan  $25.0 \text{ cm}^3$  asid hidroklorik  $1.0 \text{ mol dm}^{-3}$ .*



How can the rate of hydrogen gas production be increased?  
*Bagaimanakah kadar penghasilan gas hidrogen boleh ditingkatkan?*

- A. Replace zinc powder with zinc granules  
*Menggantikan serbuk zink dengan ketulan zink*  
 B. Increase the volume of hydrochloric acid  
*Menambahkan isi padu asid hidroklorik*  
 C. Decrease the concentration of hydrochloric acid  
*Mengurangkan kepekatan asid hidroklorik*  
 D. Decrease the activation energy by adding copper(II) sulphate solution  
*Mengurangkan tenaga pengaktifan dengan menambahkan larutan kuprum(II) sulfat*
32. Diagram 9 shows the energy profile diagram of a reaction.  
*Rajah 9 menunjukkan gambar rajah profil tenaga bagi suatu tindak balas.*

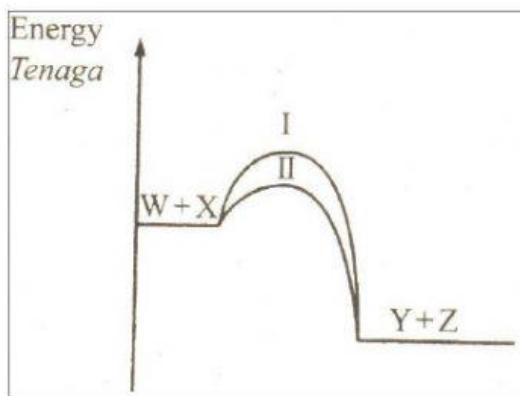


Diagram / Rajah 9

Based on the Collision Theory, which statement explains the changing of curve I to curve II?  
*Berdasarkan Teori Perlanggaran, pernyataan manakah menerangkan perubahan lengkungan I kepada lengkungan II?*

*Berdasarkan Teori Perlanggaran, pernyataan manakah menerangkan perubahan lengkungan I kepada lengkungan II?*

- A. The total surface area of the solid reactants increases  
*Jumlah luas permukaan pepejal bahan tindak balas meningkat*
- B. The kinetic energy of the particles of reactant decreases  
*Tenaga kinetik zarah-zarah bahan tindak balas berkurangan*
- C. The number of mole per unit volume of particles increases  
*Bilangan mol per unit isipadu zarah-zarah meningkat*
- D. The activation energy of the reaction decreases  
*Tenaga pengaktifan tindak balas berkurangan*

33. Diagram 10 shows a conversion of butanol.  
Rajah 10 menunjukkan satu siri perubahan butanol

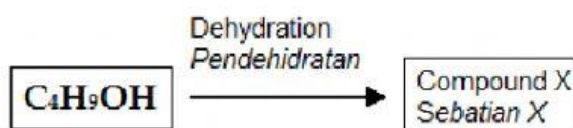


Diagram / Rajah 10

Which of the following is the isomer of compound X?  
*Antara yang berikut, yang manakah isomer bagi sebatian X?*

- I. But-1-ene  
*But-1-ena*
  - II. 2-methylprop-1-ene  
*2-metilprop-1-ena*
  - III. 2-methylpropane  
*2-metilpropana*
  - IV. 2,2-dimethylbutane  
*2,2-dimetilbutana*
- A. I and II  
*I dan II*
  - B. I and IV  
*I dan IV*
  - C. II and III  
*II dan III*
  - D. III and IV  
*III dan IV*
34. 1 mol of alcohol is burnt in excess oxygen.  
Which alcohol produces carbon dioxide and water in a mol ratio of 3:4?  
*1 mol alkohol dibakar dalam oksigen berlebihan.*  
*Alkohol manakah yang menghasilkan karbon dioksida dan air dalam nisbah mol 3:4?*
- A. Methanol  
*Metanol*
  - B. Ethanol  
*Etanol*
  - C. Propanol  
*Propanol*
  - D. Butanol  
*Butanol*

35. A method to control the rusting of underground iron pipelines is through sacrificial protection.

Which of the following is the sacrificial metal?

*Cara mengawal pengurangan saluran paip besi bawah tanah adalah melalui perlindungan korban.*

*Antara yang berikut, yang manakah adalah logam korban?*

- A. Copper  
*Kuprum*
- B. Lead  
*Plumbum*
- C. Tin  
*Stanium*
- D. Zinc  
*Zink*

36. The following equation represents the reaction between magnesium and hydrochloric acid.

*Persamaan kimia berikut mewakili tindak balas antara magnesium dengan asid hidroklorik.*



What is the volume of hydrogen gas produced when 2.4 g of magnesium reacts with hydrochloric acid at standard temperature and pressure (STP)?

[Relative atomic mass : Mg = 24, H = 1; Molar volume of gas at STP = 22.4 dm<sup>3</sup> mol<sup>-1</sup>]

*Berapakah isipadu gas hidrogen yang terhasil apabila 2.4 g magnesium bertindak balas dengan asid hidroklorik pada suhu dan tekanan piawai STP?*

*[Jisim atom relatif : Mg = 24, H = 1 ; Isipadu molar gas pada STP = 22.4 dm<sup>3</sup> mol<sup>-1</sup>]*

- A. 2.24 dm<sup>3</sup>
- B. 1.12 dm<sup>3</sup>
- C. 0.10 dm<sup>3</sup>
- D. 4.48 dm<sup>3</sup>

37. Table 3 shows the composition of glucose.

*Jadual 3 menunjukkan komposisi bagi glukosa.*

Element <i>Unsur</i>	Percentage (%) <i>Peratus (%)</i>
C	40.0
H	6.70
O	53.3

Table / *Jadual 3*

Find the empirical formula of glucose.

[Relative atomic mass : C = 12, H = 1, O = 16]

*Cari formula empirik bagi glukosa.*

[Jisim atom relatif : C = 12, H = 1, O = 16]

- A. CH<sub>2</sub>O
- B. CHO<sub>3</sub>
- C. C<sub>2</sub>HO<sub>2</sub>
- D. C<sub>2</sub>H<sub>2</sub>O<sub>3</sub>

38. Which molecule has triple covalent bond between its atom?  
 [Proton number : H = 1, Cl = 17, O = 16, N = 14]  
*Molekul manakah yang mempunyai ikatan kovalen ganda tiga antara atomnya?*  
 [Nombor proton : H = 1, Cl = 17, O = 16, N = 14]

- A. Hydrogen  
*Hidrogen*  
 B. Chlorine  
*Klorin*  
 C. Nitrogen  
*Nitrogen*  
 D. Oxygen  
*Oksigen*

39. Table 4 shows the observation of electrolysis of a substance using carbon electrodes.  
*Jadual 4 menunjukkan pemerhatian bagi elektrolisis suatu bahan menggunakan elektrod karbon.*

<b>Electrode</b> <b>Elektrod</b>	<b>Observation</b> <b>Pemerhatian</b>
Anode <i>Anod</i>	A greenish-yellow gas is released <i>Gas berwarna kuning kehijauan</i>
Cathode <i>Katod</i>	A colourless gas which burns with a 'pop' sound when tested with a lighted splinter <i>Gas yang tidak berwarna dan terbakar dengan bunyi 'pop' apabila diuji dengan kayu uji bernyala.</i>

Table / *Jadual* 4

The electrolyte maybe  
*Elektrolit itu mungkin*

- A. dilute hydrochloric acid  
*asid hidroklorik cair*  
 B. concentrated potassium chloride solution  
*larutan kalium klorida pekat*  
 C. copper(II) chloride solution  
*larutan kuprum(II) klorida*  
 D. concentrated magnesium bromide solution  
*larutan magnesium bromida pekat*

40. Diagram 11 shows the apparatus set-up to purify copper.  
Rajah 11 menunjukkan susunan radas untuk menuliskan kuprum.

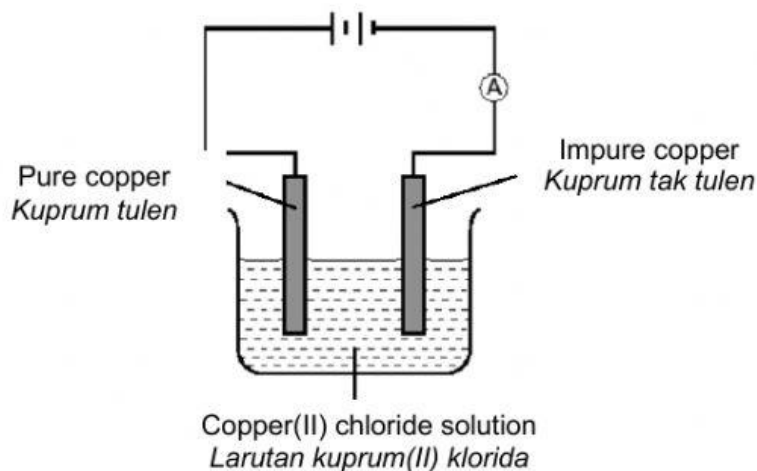
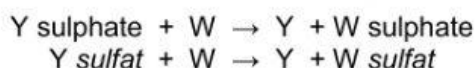
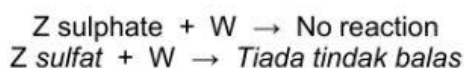
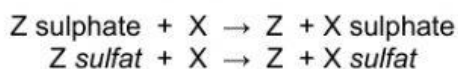


Diagram / Rajah 11

After several minutes, it is found that the copper is not purified. What should be done to ensure purification takes place?

Selepas beberapa minit, didapati kuprum tidak dituliskan. Apakah yang perlu dilakukan untuk memastikan penulenan berlaku?

- A. Use a bigger pure copper  
Gunakan kuprum tulen yang lebih besar
- B. Interchange the terminals in the cell  
Saling tukar terminal pada sel
- C. Increase the concentration of silver nitrate solution  
Tambah kepekatan larutan kuprum(II) klorida
- D. Use silver chloride solution as electrolyte  
Gunakan larutan argentum klorida sebagai elektrolit
41. W, X, Y and Z are four metals. Consider the reactions below involving these metals.  
W, X, Y dan Z terdiri dari empat logam. Pertimbangkan tindak balas-tindak balas di bawah yang melibatkan logam-logam tersebut.



Arrange the metals W, X, Y and Z in decending order of the reactivity.  
Susun kereaktifan logam-logam W, X, Y dan Z mengikut tertib menurun.

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

42. Which of the following solutions have the same number of hydrogen ions,  $H^+$ , as in  $50\text{ cm}^3$  of  $0.1\text{ mol dm}^{-3}$  sulphuric acid,  $H_2SO_4$ ?

*Antara larutan berikut, yang manakah mempunyai bilangan ion hidrogen,  $H^+$ , sama seperti dalam  $50\text{ cm}^3$   $0.1\text{ mol dm}^{-3}$  asid sulfurik,  $H_2SO_4$ ?*

- I  $100\text{ cm}^3$  of  $0.1\text{ mol dm}^{-3}$  hydrochloric acid, HCl  
 *$100\text{ cm}^3$   $0.1\text{ mol dm}^{-3}$  asid hidroklorik, HCl*
- II  $50\text{ cm}^3$  of  $0.2\text{ mol dm}^{-3}$  nitric acid,  $HNO_3$   
 *$50\text{ cm}^3$   $0.2\text{ mol dm}^{-3}$  asid nitrik,  $HNO_3$*
- III  $100\text{ cm}^3$  of  $0.1\text{ mol dm}^{-3}$  ethanoic acid,  $CH_3COOH$   
 *$100\text{ cm}^3$   $0.1\text{ mol dm}^{-3}$  asid etanoik,  $CH_3COOH$*
- IV  $50\text{ cm}^3$  of  $0.1\text{ mol dm}^{-3}$  phosphoric acid,  $H_3PO_4$   
 *$50\text{ cm}^3$   $0.1\text{ mol dm}^{-3}$  asid fosforik,  $H_3PO_4$*

- A. I and II only  
*I dan II sahaja*
- B. I and III only  
*I dan III sahaja*
- C. III and IV only  
*III dan IV sahaja*
- D. I, II and III only  
*I, II dan III sahaja*

43. The following equation represents the reaction between potassium hydroxide solution and dilute sulphuric acid.

*Persamaan berikut mewakili tindak balas antara larutan kalium hidroksida dengan asid sulfurik cair.*



What is the volume of  $0.5\text{ mol dm}^{-3}$  sulphuric acid needed to neutralise  $50\text{ cm}^3$  of  $0.5\text{ mol dm}^{-3}$  potassium hydroxide solution?

*Apakah isi padu  $0.5\text{ mol dm}^{-3}$  asid sulfurik yang diperlukan untuk meneutralkan  $50\text{ cm}^3$  larutan kalium hidroksida  $0.5\text{ mol dm}^{-3}$ ?*

- A.  $12.5\text{ cm}^3$
- B.  $25.0\text{ cm}^3$
- C.  $50.0\text{ cm}^3$
- D.  $75.0\text{ cm}^3$



44. Diagram 12 shows the method of preparing a soluble salt.  
Rajah 12 menunjukkan kaedah penyediaan suatu garam terlarutkan.

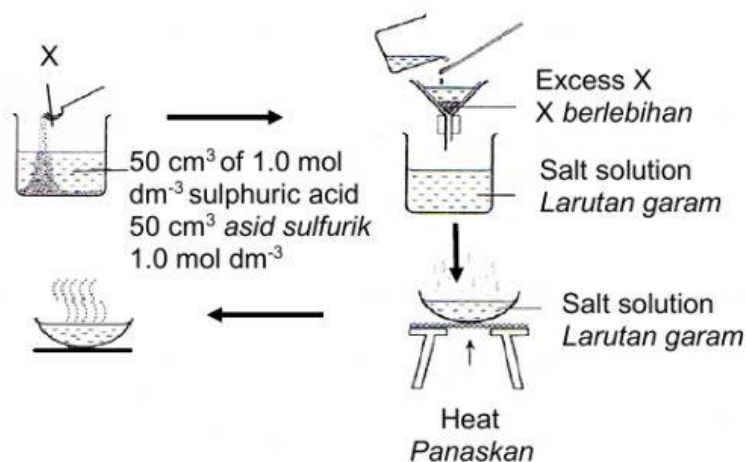


Diagram / Rajah 12

What is X?  
Apakah X?

- A. Copper(II) nitrate  
*Kuprum(II) nitrat*
- B. Copper(II) oxide  
*Kuprum(II) oksida*
- C. Copper(II) chloride  
*Kuprum(II) klorida*
- D. Copper(II) bromide  
*Kuprum(II) bromida*

45. Diagram 13 above shows the arrangement of atoms in brass.  
Rajah 13 di atas menunjukkan susunan atom bagi loyang.

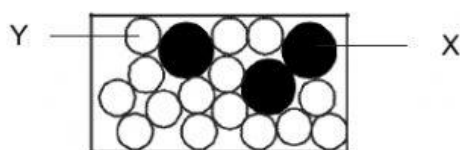


Diagram / Rajah 13

Which of the following could be atoms X and Y?  
Yang manakah berikut mungkin atom X dan Y?

	X	Y
A.	Copper <i>Kuprum</i>	Tin <i>Stanum</i>
B.	Zinc <i>Zink</i>	Copper <i>Kuprum</i>
C.	Iron <i>Ferum</i>	Carbon <i>Karbon</i>
D.	Copper <i>Kuprum</i>	Zinc <i>Zink</i>