

1. Which of the following substances consist of atoms?  
*Antara berikut bahan manakah terdiri daripada atom?*
  - A. Magnesium  
*Magnesium*
  - B. Oxygen  
*Oksigen*
  - C. Lead(II) bromide  
*Plumbum(II) bromida*
  - D. Naphthalene  
*Naftalena*
  
2. Why carbon-12 was chosen as a reference standard for relative atomic mass and relative molecular mass?  
*Mengapakah karbon-12 telah dipilih sebagai rujukan piawai untuk jisim atom relatif dan jisim molekul relatif?*
  - A. Carbon has three isotopes  
*Karbon mempunyai tiga isotop*
  - B. Carbon is non-metal element  
*Karbon merupakan unsur bukan logam*
  - C. Carbon is a solid and easier to be handle  
*Karbon adalah pepejal dan lebih senang dikendalikan*
  - D. Carbon is located in Group 14 in the Periodic Table of Elements  
*Karbon terletak dalam Kumpulan 14 dalam Jadual Berkala Unsur*
  
3. Which of the following particles equal to 1 mole?  
*Antara zarah yang berikut, yang manakah bersamaan dengan 1 mol?*
  - A. The number of atom in 1 g of hydrogen gas  
*Bilangan atom dalam 1 g gas hidrogen*
  - B. The number of molecule in 1 g of hydrogen gas  
*Bilangan molekul dalam 1 g gas hidrogen*
  - C.  $6.02 \times 10^{23}$  of hydrogen atoms in hydrogen gas  
 *$6.02 \times 10^{23}$  atom hidrogen dalam gas hidrogen*
  - D.  $6.02 \times 10^{23}$  of hydrogen molecule in hydrogen gas  
 *$6.02 \times 10^{23}$  molekul hidrogen dalam gas hidrogen*
  
4. Which of the following gases contains 0.4 mol of atoms at room temperature and pressure?  
[1 mol of gas occupies the volume of  $24 \text{ dm}^3$  at room temperature and pressure]  
*Antara gas berikut, yang manakah mengandungi 0.4 mol atom pada suhu dan tekanan bilik?*  
*[1 mol gas menepati isipadu sebanyak  $24 \text{ dm}^3$  pada suhu dan tekanan bilik]*
  - A.  $4.8 \text{ dm}^3$  He
  - B.  $4.8 \text{ dm}^3$  H<sub>2</sub>
  - C.  $4.8 \text{ dm}^3$  SO<sub>3</sub>
  - D.  $4.8 \text{ dm}^3$  CO<sub>2</sub>

5. Which of the following gases exists as a monoatom?

*Antara gas yang berikut, yang manakah wujud sebagai monoatom?*

- A. Neon gas  
*Gas neon*
- B. Oxygen gas  
*Gas oksigen*
- C. Nitrogen gas  
*Gas nitrogen*
- D. Carbon dioxide gas  
*Gas karbon dioksida*

6. Which characteristics is **correct** about elements in Group 1 in the Periodic Table as going down the group?

*Ciri manakah yang **betul** tentang unsur-unsur dalam Kumpulan 1 dalam Jadual Berkala Unsur apabila menuruni kumpulan?*

- A. The tendency to release electron decreases  
*Kecenderungan menerima elektron berkurang*
- B. The reactivity decreases  
*Kereaktifan berkurang*
- C. All are conductor of heat  
*Semua adalah konduktor haba*
- D. All insoluble in water  
*Semua tidak larut dalam air*

7. Table 1 below shows the electron arrangement of four elements W, X, Y and Z.

*Jadual 1 di bawah menunjukkan susunan elektron bagi empat unsur W, X, Y dan Z.*

Element <i>Unsur</i>	Electron arrangement <i>Susunan elektron</i>
W	2.4
X	2.8.2
Y	2.8.6
Z	2.8.8.1

Table / *Jadual* 1

Which of the elements will form an ionic bond with the oxygen atom?

*Unsur-unsur yang manakah akan membentuk ikatan ionik dengan atom oksigen?*

- A. W and Y  
*W dan Y*
- B. W and X  
*W dan X*
- C. Y and Z  
*Y dan Z*
- D. X and Z  
*X dan Z*

8. Table 2 shows the electron arrangement of element Y and element Z.  
*Jadual 2 menunjukkan susunan elektron bagi unsur Y dan unsur Z.*

Element Y <i>Unsur Y</i>	Element Z <i>Unsur Z</i>
2.4	2.6

Table / *Jadual 2*

What is the formula and the type of bond of the compound formed from the reaction between Y and Z?

*Apakah formula dan jenis ikatan bagi sebatian yang terbentuk daripada tindak balas antara Y dan Z?*

	Formula <i>Formula</i>	Type of bond <i>Jenis ikatan</i>
A.	$Y_2Z$	Covalent <i>Kovalen</i>
B.	$Y_2Z$	Ionic <i>Ionik</i>
C.	$YZ_2$	Covalent <i>Kovalen</i>
D.	$YZ_2$	Ionic <i>Ionik</i>

9. Antara yang berikut, yang manakah boleh bertindak sebagai elektrolit?  
*Which of the following substances can act as an electrolyte?*

- A. Mengalirkan haba dalam keadaan lebur sahaja  
*Conducts heat only in the molten state*
- B. Mengalirkan arus elektrik dalam keadaan lebur dan akueus  
*Conducts electricity in the molten and aqueous states*
- C. Mengalirkan arus elektrik dalam keadaan pepejal  
*Conducts electricity in the solid state*
- D. Mengalirkan arus elektrik dalam keadaan cecair sahaja  
*Conducts electricity only in the liquid state.*

10. Which of the following substances is a monoprotic acid?  
*Antara bahan-bahan berikut, yang manakah merupakan asid monoprotik?*

- A. Propanoic acid,  $C_2H_5COOH$   
*Asid propanoik,  $C_2H_5COOH$*
- B. Phosphoric acid,  $H_3PO_4$   
*Asid fosforik,  $H_3PO_4$*
- C. Sulphuric acid,  $H_2SO_4$   
*Asid sulfurik,  $H_2SO_4$*
- D. Carbonic acid,  $H_2CO_3$   
*Asid karbonik,  $H_2CO_3$*

11. Which of the following salts can be prepared by the double decomposition method?  
*Antara garam yang berikut, yang manakah boleh disediakan melalui kaedah penguraian ganda dua?*
- Magnesium sulphate  
*Magnesium sulfat*
  - Ammonium chloride  
*Ammonium klorida*
  - Copper(II) nitrate  
*Kuprum (II) nitrat*
  - Lead (II) iodide  
*Plumbum (II) iodida*
12. Diagram 1 shows the properties and the uses of glass Z .  
*Rajah 1 menunjukkan sifat dan kegunaan kaca Z .*

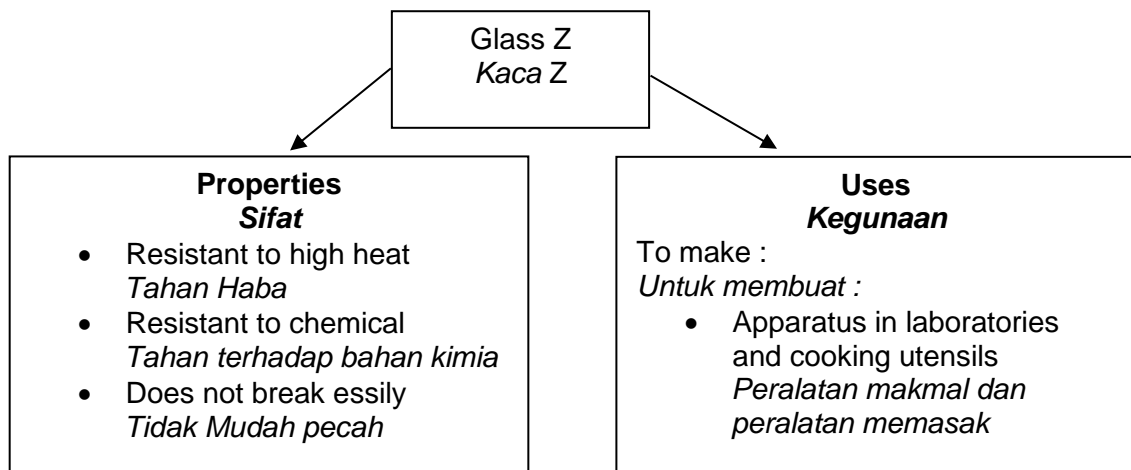


Diagram / Rajah 1

Which of the following is the type of glass Z?  
*Antara berikut yang manakah merupakan jenis kaca Z?*

- Lead glass  
*Kaca plumbum*
- Soda lime glass  
*Kaca soda kapur*
- Borosilicate glass  
*Kaca borosilikat*
- Fused silicate glass  
*Kaca silika terlakur*

13. Which of the following statements is **true** for both methanol and propanol?  
*Pernyataan yang manakah benar bagi kedua-dua metanol dan propanol?*
- A. Have different chemical properties  
*Semua sifat kimia berbeza*
- B. Have similar physical properties  
*Semua sifat fiziknya sama*
- C. Both have same function group  
*Kedua-dua mempunyai kumpulan berfungsi yang sama*
- D. Both have one similar chemical formulae  
*Kedua-dua boleh diwakili oleh satu formula kimia yang sama*
14. What is the general formula of alkenes?  
*Apakah formula am bagi alkena?*
- A.  $C_nH_{2n+2}$
- B.  $C_nH_{2n}$
- C.  $C_nH_{2n+1}OH$
- D.  $C_nH_{2n+1}COOH$
15. Diagram 2 shows a flower that has a pleasant fragrance.  
*Rajah 2 menunjukkan sejenis bunga yang berbau harum.*



Diagram / Rajah 2

What is the name of the substance that gives the pleasant fragrance?  
*Apakah nama bahan yang memberikan haruman itu?*

- A. Benzyl ethanoate  
*Benzil etanoat*
- B. Ethane -1,2 - diol  
*Etana -1,2 - diol*
- C. Ethanoic acid  
*Asid etanoik*
- D. Ethanol  
*Etanol*

16. Which of the following is a redox reaction?  
*Antara berikut, manakah merupakan tindak balas redoks?*
- Displacement reaction  
*Tindak balas penyesaran*
  - Neutralisation reaction  
*Tindak balas peneutralan*
  - Precipitation reaction  
*Tindak balas pemendakan*
  - Substitution reaction  
*Tindak balas penukargantian*
17. Diagram 3 shows the apparatus set-up to study the reactivity of a metal with oxygen. The colour of the product formed is yellow when hot and white when cold.  
*Rajah 3 menunjukkan susunan radas untuk mengkaji kereaktifan suatu logam dengan oksigen. Warna hasil yang terbentuk adalah kuning apabila panas dan putih apabila sejuk.*

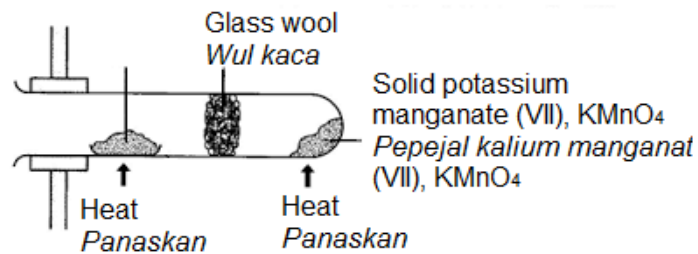


Diagram / Rajah 3

What is the metal?  
*Apakah logam itu?*

- Iron  
*Ferum*
- Zinc  
*Zink*
- Lead  
*Plumbum*
- Copper  
*Kuprum*

18. Diagram 4 represents energy level of an endothermic reaction.  
Rajah 4 mewakili aras tenaga satu tindak balas endotermik.

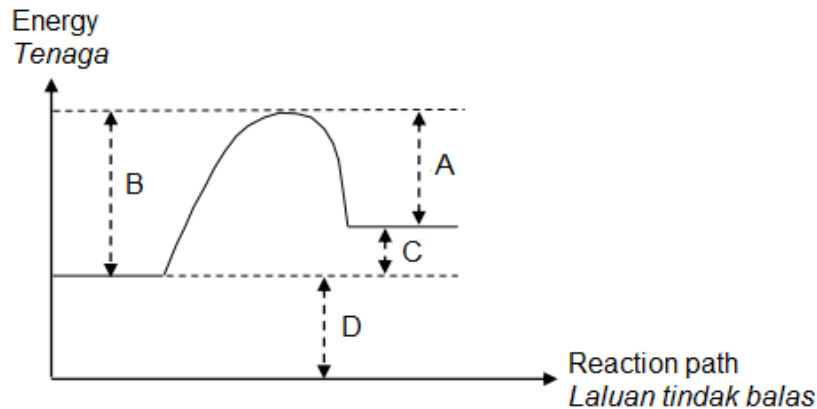


Diagram / Rajah 4

Which of the following A, B, C and D represents the heat change?  
Antara A, B, C dan D yang manakah menunjukkan perubahan tenaga?

19. Which statements are **correct** about soap and detergent?  
Pernyataan manakah yang **betul** tentang sabun dan detergen?

	<b>Soap Sabun</b>	<b>Detergent Detergen</b>
A.	Contains acid <i>Mengandungi asid</i>	Contains alkali <i>Mengandungi alkali</i>
B.	Effective in hard water <i>Berkesan dalam air liat</i>	Less effective in hard water <i>Kurang berkesan dalam air liat</i>
C.	Does not form scum in hard water <i>Tidak membentuk kekat dalam air liat</i>	Form scum in hard water <i>Membentuk kekat dalam air liat</i>
D.	Made from vegetable oil <i>Diperbuat daripada minyak sayuran</i>	Made from petroleum <i>Diperbuat daripada petroleum</i>

20. Diagram 5 shows a part of the label on a bottle of strawberry jam  
*Rajah 5 menunjukkan sebahagian daripada label pada sebotol jem strawberi.*



Diagram / Rajah 5

Which of the following ingredients is an antioxidant in the jam?

*Antara bahan berikut, yang manakah merupakan antioksidan di dalam jem tersebut?*

- A. Sugar  
*Gula*
- B. Pectin  
*Pektin*
- C. Citric acid  
*Asid sitrik*
- D. Ethyl butanoate  
*Etil butanoat*
21. Which of the following pairs of isotope and its use is **correct**?  
*Pasangan yang manakah menunjukkan isotop dan kegunaannya yang betul?*

	<b>Isotope</b> <i>Isotop</i>	<b>Use</b> <i>Kegunaan</i>
A.	Krypton-85 <i>Kripton-85</i>	Diagnose thyroid problem <i>Mendiagnosis masalah tiroid</i>
B.	Iodine-131 <i>Iodin-131</i>	Kills cancer cells <i>Membunuh sel kanser</i>
C.	Cobalt-60 <i>Kobalt-60</i>	Estimates the age of fossils <i>Menganggarkan usia fosil</i>
D.	Sodium-24 <i>Natrium-24</i>	Trace leaks in gas or oil pipes <i>Mengesan kebocoran gas atau saluran paip gas</i>

22. The relative formula mass of  $Y_3(PO_4)_2$  is 310. Find the relative atomic mass of element Y.  
 [Relative atomic mass : O = 16, P = 31]  
*Jisim formula relatif bagi  $Y_3(PO_4)_2$  ialah 310. Tentukan jisim atom relatif bagi unsur Y.*  
*[Jisim atom relatif : O = 16, P = 31]*
- A. 12
- B. 23
- C. 40
- D. 65



23. What is the number of moles of copper(II) nitrate in 56.4 g of copper(II) nitrate,  $\text{Cu}(\text{NO}_3)_2$ ?  
 [Relative atomic mass : O = 16, Cu = 64, N = 14]  
*Berapakah bilangan mol kuprum(II) nitrat dalam 56.4 g kuprum(II) nitrat,  $\text{Cu}(\text{NO}_3)_2$ ?  
 [Jisim atom relatif : O = 16, Cu = 64, N = 14]*
- A. 0.30 mol  
 B. 0.32 mol  
 C. 0.45 mol  
 D. 3.33 mol
24. Diagram 6 shows the electron arrangement of atom T.  
*Rajah 6 menunjukkan susunan elektron bagi atom T.*

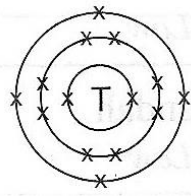


Diagram / Rajah 6

- Atoms T and U are placed in the same period of in the Periodic Table of Element. The atomic radius of atom U is larger than atom T. What is the probable electron arrangement of atom U?  
*Atom T dan U terletak dalam kala yang sama dalam Jadual Berkala Unsur. Jejari atom U lebih besar daripada atom T. Apakah susunan elektron yang mungkin bagi atom U?*
- A. 2.8.2  
 B. 2.8.6  
 C. 2.8.8  
 D. 2.8.8.4
25. Iron and copper are transition metals. Which of the following is the special characteristic of the metals?  
*Ferum dan kuprum ialah logam peralihan. Antara yang berikut, yang manakah merupakan ciri-ciri bagi logam tersebut?*
- A. Soft solid  
*Pepejal lembut*  
 B. Soluble in water  
*Larut dalam air*  
 C. Low melting point  
*Takat lebur rendah*  
 D. Has more than one oxidation number  
*Mempunyai lebih daripada satu nombor pengoksidaan*

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.*

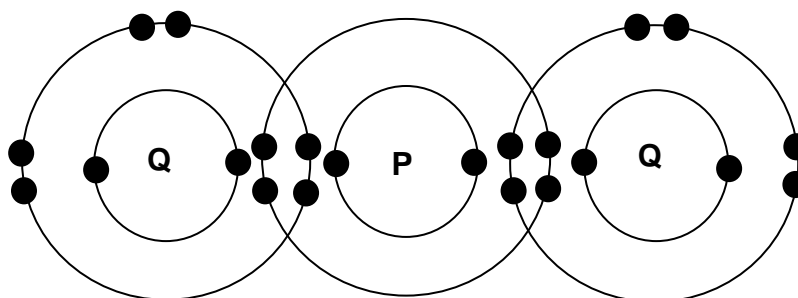


Diagram / Rajah 7

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 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.

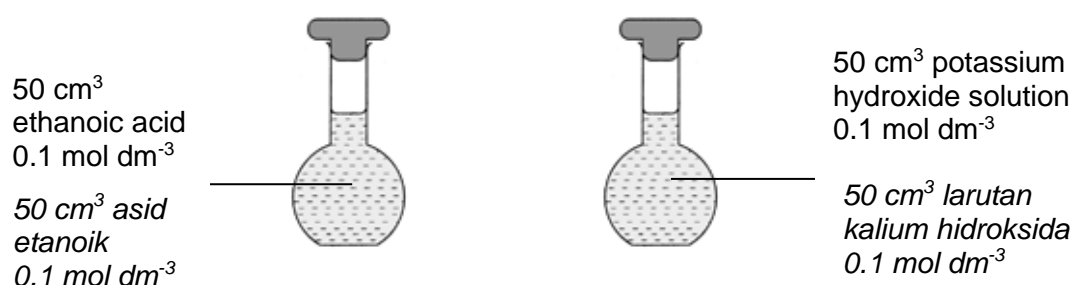


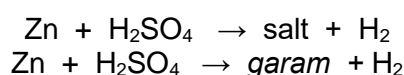
Diagram / Rajah 8

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?

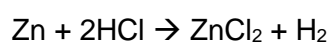
Apakah nama bagi garam itu dan keterlarutannya dalam air?

	<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 gambarajah profil tenaga bagi suatu tindak balas.*

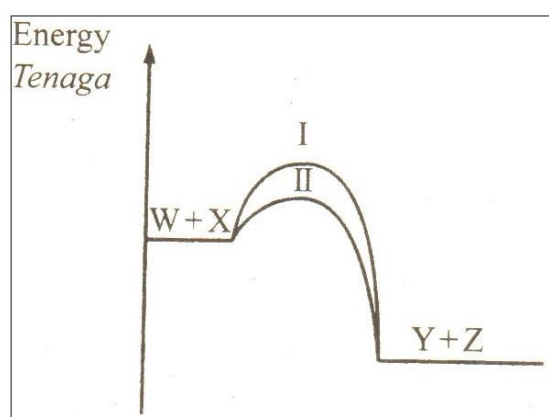


Diagram / Rajah 9

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?*

- 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

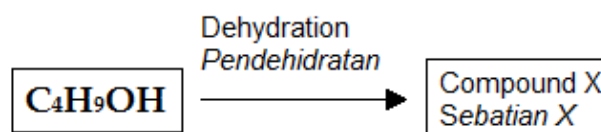


Diagram / Rajah 10

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?

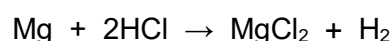
*Cara mengawal pengaratn saluran paip besi bawah tanah adalah melalui perlindungan korban.*

*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> <i>Elektrod</i>	<b>Observation</b> <i>Pemerhatian</i>
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.*

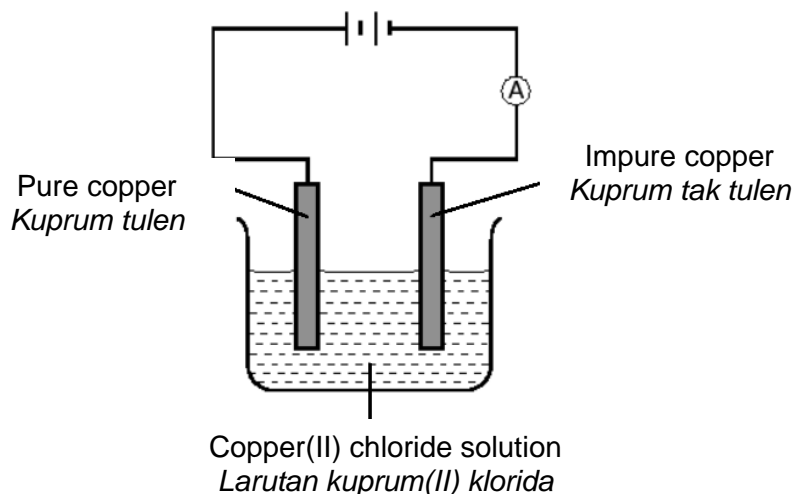
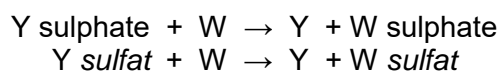
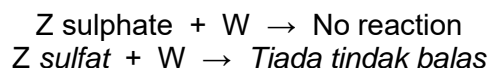
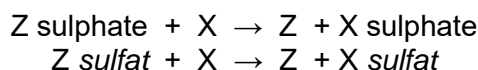


Diagram / Rajah 11

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 descending order of the reactivity.

*Susun kereaktifan logam-logam W, X, Y dan Z mengikut tertib menurun.*

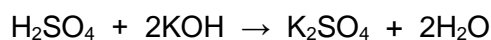
- A. X,W,Z,Y  
 B. X,Z,W,Y  
 C. Y,W,Z,X  
 D. Y,Z,W,X



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.

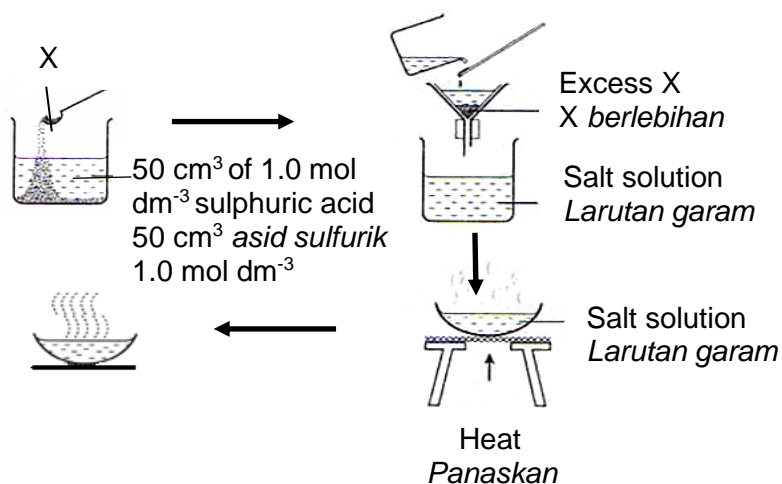


Diagram / Rajah 12

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.

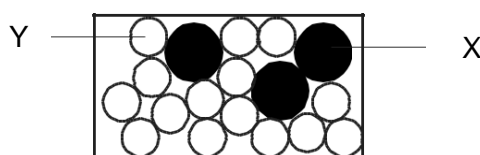


Diagram / Rajah 13

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>Stannum</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>

46. 0.2 mol of zinc powder react with excess dilute hydrochloric acid. After 30 seconds, 0.05 mol of zinc remains as residue.

What is the average rate of the reaction?

*0.2 mol serbuk zink bertindak balas dengan asid hidroklorik cair berlebihan. Selepas 30 saat, didapati 0.05 mol zink tertinggal sebagai baki.*

*Berapakah kadar purata bagi tindak balas itu?*

- A.  $1.7 \times 10^{-3} \text{ mol s}^{-1}$   
 B.  $5.0 \times 10^{-3} \text{ mol s}^{-1}$   
 C.  $6.7 \times 10^{-3} \text{ mol s}^{-1}$   
 D.  $8.3 \times 10^{-3} \text{ mol s}^{-1}$

47. Table 5 shows the results of four reactions involving the heating of metals P, Q, R, S and their oxides.

*Jadual 5 menunjukkan keputusan empat tindak balas yang melibatkan pemanasan logam P, Q, R, S dan oksida mereka.*

<b>Pairs of metal and metal oxide</b> <i>Pasangan logam dan oksida logam</i>	<b>Observation</b> <i>Pemerhatian</i>
Metal P and oxide of Metal Q <i>Logam P dan oksida logam Q</i>	Metal Q is formed <i>Logam Q terbentuk</i>
Metal Q and oxide of Metal R <i>Logam Q dan oksida logam R</i>	Metal R is formed <i>Logam R terbentuk</i>
Metal P and oxide of Metal S <i>Logam P dan oksida logam S</i>	No noticeable <i>Tiada perubahan berlaku</i>
Metal S and oxide of Metal R <i>Logam S dan oksida logam R</i>	Metal R is formed <i>Logam R terbentuk</i>

Table / *Jadual 5*

Which series shows the descending order of reactivity of the metals with oxygen?

*Siri yang manakah menunjukkan kereaktifan logam terhadap oksigen secara menurun?*

- A. P, Q, R, S  
 B. R, P, Q, S  
 C. Q, P, R, S  
 D. S, P, Q, R

48. When  $50.0 \text{ cm}^3$  of  $0.5 \text{ mol dm}^{-3}$  silver nitrate solution is added to  $50.0 \text{ cm}^3$  of  $0.5 \text{ mol dm}^{-3}$  sodium chloride solution, temperature of the mixture rises  $3.4 \text{ }^\circ\text{C}$ .

What is the heat released in the experiment?

[Specific heat capacity of solution,  $c = 4.2 \text{ J g}^{-1} \text{ }^\circ\text{C}^{-1}$ ; Density of solution =  $1 \text{ g cm}^{-3}$ ]

*Apabila  $50.0 \text{ cm}^3$  larutan argentum nitrat  $0.5 \text{ mol dm}^{-3}$  dicampurkan kepada  $50.0 \text{ cm}^3$  larutan natrium klorida  $0.5 \text{ mol dm}^{-3}$ , suhu campuran meningkat sebanyak  $3.4 \text{ }^\circ\text{C}$ .*

*Berapakah haba yang dibebaskan dalam eksperimen itu?*

[Muatan haba tentu,  $c = 4.2 \text{ J g}^{-1} \text{ }^\circ\text{C}^{-1}$ ; Ketumpatan larutan =  $1 \text{ g cm}^{-3}$ ]

- A. 1428 J  
 B. 714 J  
 C. 61.76 J  
 D. 2856 J

49. Diagram 14 shows the energy level diagram of a reaction.  
*Rajah 14 menunjukkan gambarajah aras tenaga bagi satu tindak balas.*

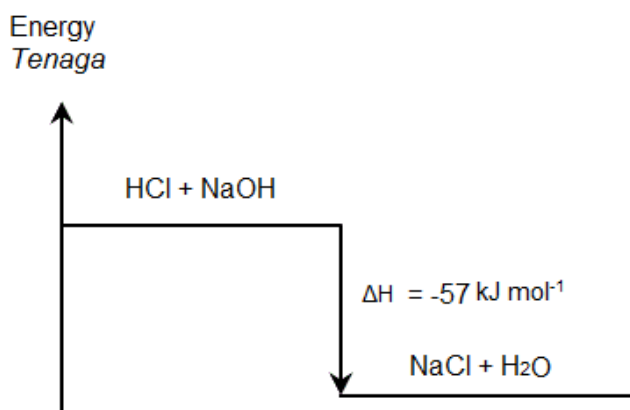


Diagram / *Rajah* 14

Which of the following acids is suitable to replace hydrochloric acid, HCl to obtain the same  $\Delta H$  value?

*Antara berikut, asid yang manakah sesuai menggantikan asid hidroklorik, HCl untuk mendapatkan nilai  $\Delta H$  yang sama?*

- A. Carbonic acid  
*Asid karbonik*
- B. Ethanoic acid  
*Asid etanoik*
- C. Sulphuric acid  
*Asid sulfurik*
- D. Nitric acid  
*Asid nitrik*
50. Which of the following is **true** about the heat of combustion,  $\Delta H$ , for ethanol, propanol and butanol?  
*Antara yang berikut, yang manakah **benar** bagi nilai haba pembakaran,  $\Delta H$ , bagi etanol, propanol dan butanol?*

	<b>Ethanol</b> <i>Etanol</i>	<b>Propanol</b> <i>Propanol</i>	<b>Butanol</b> <i>Butanol</i>
A.	-2015 kJ mol <sup>-1</sup>	-1376 kJ mol <sup>-1</sup>	-725 kJ mol <sup>-1</sup>
B.	-2015 kJ mol <sup>-1</sup>	-2676 kJ mol <sup>-1</sup>	-725 kJ mol <sup>-1</sup>
C.	-2676 kJ mol <sup>-1</sup>	-725 kJ mol <sup>-1</sup>	-1376 kJ mol <sup>-1</sup>
D.	-1376 kJ mol <sup>-1</sup>	-2015 kJ mol <sup>-1</sup>	-2676 kJ mol <sup>-1</sup>

Disediakan oleh,

.....

(Pn Suraya bt Said@Shued)

Disemak & Disahkan oleh,

.....

(Pn Hjh Noor Hayati bt Salleh)  
GK Sains dan Matematik

**END OF QUESTION PAPERS**  
**KERTAS SOALAN TAMAT**