

1 Atom Y has 8 protons and 10 neutrons. What is the electron arrangement of atom Y?  
*Atom Y mempunyai 8 proton dan 10 neutron. Apakah susunan elektron atom Y?*

- A 2.8.8
- B 2.8.6
- C 2.8
- D 2.6

2 Diagram 1 shows the set-up of apparatus to determine the empirical formula of magnesium oxide.

*Rajah 1 menunjukkan susunan radas untuk menentukan formula empirik magnesium oksida.*

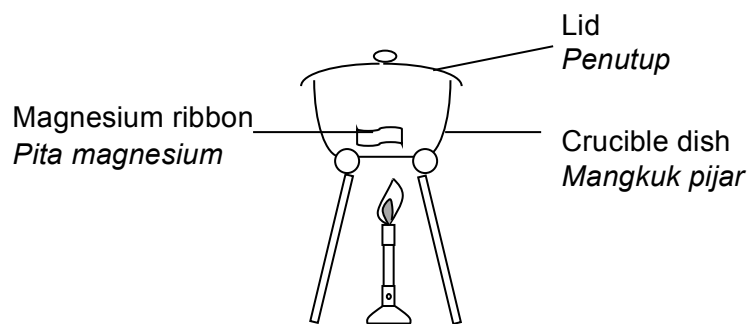


Diagram 1  
*Rajah 1*

Which of the following statements is **true** for the lifting and closing of the lid quickly and occasionally during heating?

*Antara pernyataan berikut yang manakah **benar** bagi penutup diangkat dan ditutup dengan cepat sekali sekala semasa pemanasan?*

- A To avoid the crucible dish from cracking  
*Untuk mengelak mangkuk pijar dari retak*
- B To avoid the white fumes from escaping  
*Untuk mengelak wasap putih daripada terbebas keluar*
- C To avoid the pressure in the crucible dish  
*Untuk mengelak tekanan dalam mangkuk pijar*
- D To avoid water vapour from entering the crucible dish  
*Untuk mengelak wap air daripada memasuki mangkuk pijar*

- 3 Which of the following statement explain why the reactivity of Group 17 elements decreases when going down the group?  
*Pernyataan manakah yang menerangkan mengapa kereaktifan unsur Kumpulan 17 berkurang apabila menuruni kumpulan itu.*
- A The physical state of the elements changes from gas to liquid then to solid at room temperature  
*Keadaan fizik bagi unsur berubah daripada gas kepada cecair dan kemudian kepada keadaan pepejal pada suhu bilik*
- B The attractive force between valence electron and nucleus become weaker  
*Daya tarikan antara elektron valens dengan nukleus semakin lemah*
- C The valence electron gets nearer to the nucleus  
*Elektron valens semakin dekat dengan nucleus*
- D The melting point of the element decrease  
*Takat lebur bagi unsur menurun*
- 4 Compound Y can conducts electricity in aqueous and molten state. It also soluble in water. What is compound Y?  
*Sebatian Y boleh mengkonduksi elektrik dalam keadaan akueus dan leburan. Ia juga larut dalam air. Apakah sebatian Y?*
- A  $\text{SO}_2$
- B  $\text{NH}_3$
- C  $\text{C}_4\text{H}_8$
- D  $\text{ZnCl}_2$
- 5 Which of the following substances can act as an electrolyte?  
*Antara bahan yang berikut, yang manakah boleh bertindak sebagai elektrolit?*
- A Sulphur  
*Sulfur*
- B Glucose  
*Glukosa*
- C Molten acetamide  
*Asetamida lebur*
- D Molten lead (II) bromide  
*Plumbum (II) bromida lebur*
- 6 Which following substances is acidic?  
*Manakah antara bahan berikut adalah berasid?*
- A Ammonia  
*Ammonia*
- B Carbon dioxide  
*Karbon dioksida*
- C Potassium oxide  
*Kalium oksida*
- D Sodium hydroxide  
*Natrium hidroksida*

- 7 Protons, neutrons and electrons are the subatomic particles that make up an atom. Which of the following, is representing the particles.  
*Proton, neutron dan elektron merupakan zarah-zarah subatomik dalam suatu atom. Antara yang berikut, yang manakah mewakili zarah-zarah tersebut.*

	Proton <i>Proton</i>	Neutron <i>Neutron</i>	Electron <i>Elektron</i>
A	Found outside the nucleus <i>Terdapat di luar nukleus</i>	No charge <i>Tiada cas</i>	Smallest mass <i>Jisim yang paling kecil</i>
B	Found inside the nucleus <i>Terdapat di dalam nukleus</i>	Positive charge <i>Bercas positif</i>	Found outside the nucleus <i>Terdapat di luar nukleus</i>
C	Positive charge <i>Bercas positif</i>	In the nucleus of an atom <i>Dalam nucleus suatu atom</i>	Smallest mass <i>Jisim yang paling kecil</i>
D	Positive charge <i>Bercas positif</i>	Found inside the nucleus <i>Terdapat di dalam nukleus</i>	No charge <i>Tiada cas</i>

- 8 Which compound has the empirical formula of  $\text{CH}_3\text{O}$ ?  
 Manakah sebatian yang mempunyai formula empirik  $\text{CH}_3\text{O}$ ?
- A  $\text{CH}_2\text{OHCH}_2\text{OH}$   
 B  $\text{C}_6\text{H}_5\text{COOH}$   
 C  $\text{HCOOC}_2\text{H}_5$   
 D  $\text{CH}_3\text{CHO}$
- 9 What is the term that related to soap preparation process?  
 Apakah istilah yang berkaitan dengan penyediaan sabun?
- A Diffusion  
*Resapan*
- B Sublimation  
*Pemejalwapan*
- C Esterification  
*Pengesteran*
- D Saponification  
*Saponifikasi*

- 10 Which compound is correctly matched with its type of bonds?  
*Sebatian manakah dipadankan dengan betul jenis ikatannya?*

	Substance <i>Bahan</i>	Type of bonds <i>Jenis ikatan</i>
A	Oxygen <i>Oksigen</i>	Ionic <i>Ionik</i>
B	Ammonia <i>Ammonia</i>	Covalent <i>Kovalen</i>
C	Sodium oxide <i>Natrium oksida</i>	Covalent <i>Kovalen</i>
D	Sulphur trioxide <i>Sulphur trioksida</i>	Ionic <i>Ionik</i>

- 11 Which of the following reactants can be used to prepare sodium, potassium and ammonium salt?

*Antara bahan-bahan tindak balas berikut, yang manakah boleh digunakan untuk menyediakan garam natrium, kalium dan ammonium?*

- A Acid and alkali  
*Asid dan alkali*
- B Acid and metal  
*Asid dan logam*
- C Acid and metal oxide  
*Asid dan oksida logam*
- D Acid and metal carbonate  
*Asid dan karbonat logam*

12 Which of the following is the aim of producing an alloy?  
*Yang manakah di antara berikut adalah tujuan menghasilkan aloi?*

I The appearance of metal become more attractive  
*Penampilan logam lebih menarik*

II The metal become stronger and harder  
*Logam menjadi lebih kuat dan keras*

III The metal become more ductile  
*Logam menjadi lebih mulur*

IV The metal become more elastic  
*Logam menjadi lebih kenyal*

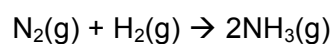
A I and II  
*I dan II*

B I and III  
*I dan III*

C II and III  
*II dan III*

D III and IV  
*III dan IV*

13 The following equation shows the reaction between nitrogen and hydrogen.  
*Persamaan berikut menunjukkan tindak balas antara nitrogen dan hidrogen.*



How is the rate of production of ammonia increased?  
*Bagaimanakah kadar penghasilan ammonia ditingkatkan?*

A By increasing the size of the nitrogen  
*Dengan meningkatkan saiz nitrogen*

B By decreasing the size of the hydrogen  
*Dengan mengurangkan saiz hidrogen*

C By increasing the pressure of both the nitrogen and hydrogen  
*Dengan meningkatkan tekanan kedua-dua nitrogen dan hidrogen*

D By decreasing the pressure of both the nitrogen and hydrogen  
*Dengan mengurangkan tekanan kedua-dua nitrogen dan hidrogen*

14 Which of the following carbon compounds cannot burnt in air?  
*Yang manakah di antara sebatian karbon berikut tidak boleh terbakar dalam udara?*

- I  $C_2H_4$
- II  $C_2H_5OH$
- III  $CH_3COOH$
- IV  $C_2H_5COOCH_3$

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

15 Which of the following is traditional medicines?  
*Manakah antara berikut ialah ubat tradisional?*

- A Codeine  
*Kodein*
- B Penicillin  
*Penisilin*
- C Aloe vera  
*Lidah buaya*
- D Antidepressant  
*Antidepresen*

16 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

- 17 Diagram 2 shows the apparatus set-up to study the transfer of electron at a distance.  
*Rajah 2 menunjukkan susunan radas untuk mengkaji pemindahan elektron pada suatu jarak.*

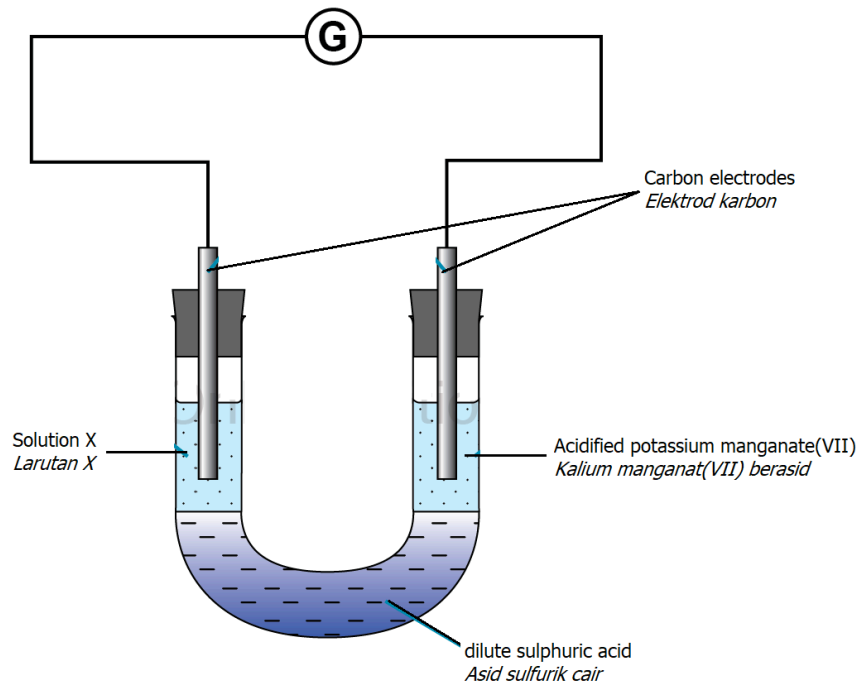


Diagram 2  
*Rajah 2*

It is observed that the pointer of galvanometer deflects. What is solution X?  
*Diperhatikan bahawa jarum penunjuk galvanometer terpesong. Apakah larutan X?*

- A Chlorine water  
*Air klorin*
- B Bromine water  
*Air bromin*
- C Iron(II) sulphate  
*Ferum(II) sulfat*
- D Acidified potassium dichromate(VI) solution  
*Larutan kalium dikromat(VI) berasid*

- 18 What is the meaning of heat of neutralisation?  
*Apakah maksud haba peneutralan?*
- A The heat released when acid react with alkali  
*Haba yang dibebaskan apabila asid bertindak balas dengan alkali*
  - B The heat absorbed when acid react with an alkali  
*Haba yang diserap apabila asid bertindak balas dengan alkali*
  - C The heat change when one mole of water is formed from the reaction between acid and alkali  
*Haba yang berubah apabila satu mol air dihasilkan daripada tindakbalas asid dengan alkali*
  - D The heat change when one mole of salt is formed from the reaction between acid and alkali  
*Haba yang berubah apabila satu mol garam dihasilkan daripada tindakbalas asid dengan alkali*
- 19 Faruq wants to make a homemade strawberry jam which can lasts longer, thick and rich in its flavour. Which substance should be added into the jam?  
*Faruq hendak membuat jem strawberi yang tahan lama, pekat dan kaya dengan rasa strawberi. Apakah bahan yang perlu ditambahkan ke dalam jem tersebut?*
- A Sugar, pectin and synthetic essence  
*Gula, pektin dan perasa tiruan*
  - B Aspartame, gelatine, and salt  
*Aspartame, gelatin dan garam*
  - C Aspartame, pectin, tartrazine  
*Aspartame, pektin, tartrazin*
  - D Sugar, gelatine and lecithin  
*Gula, gelatin dan lecitin*



- 20 Diagram 3 shows the structure formula of a polymer  
*Rajah 3 menunjukkan formula struktur untuk satu polimer*

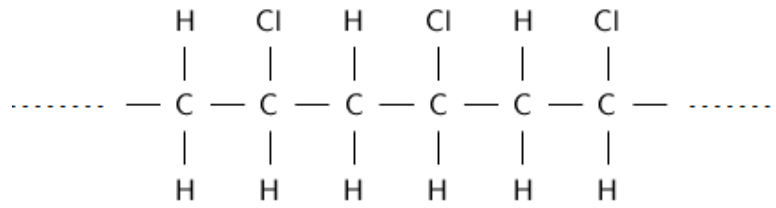
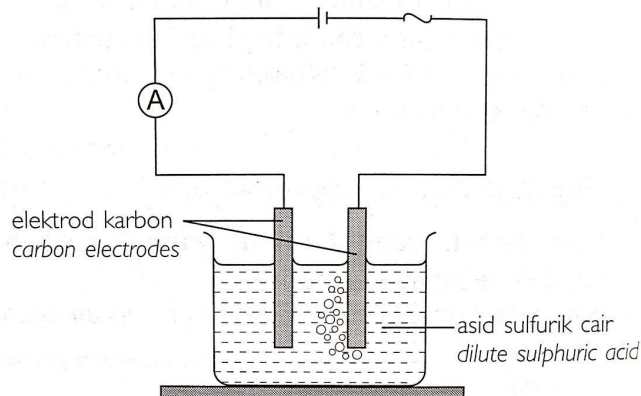


Diagram 3  
*Rajah 3*

Which of the following is the monomer for the polymer above?  
*Yang mana satukah di antara berikut adalah monomer untuk polimer di atas?*

- A Ethene  
*Etena*
- B Propene  
*Propena*
- C Chloroethene  
*Kloroetana*
- D Chloromethene  
*Klorometena*

- 21 Diagram 4 shows the apparatus set up for the electrolysis of dilute sulphuric acid using carbon electrodes.  
*Rajah 4 menunjukkan susunan radas bagi elektrolisis asid sulfurik cair menggunakan elektrod karbon.*



**Diagram 4**  
**Rajah 4**

Which of the following will be observed at the anode?  
*Antara yang berikut, yang manakah akan diperhatikan di anod?*

- A A gas that has a smell  
*Gas yang mempunyai bau*
- B A gas with a brown colour  
*Gas yang berwarna perang*
- C A gas that gives a 'pop' sound  
*Gas yang memberikan bunyi 'pop'*
- D A gas that relights a glowing splinter  
*Gas yang menyalakan kayu uji berbara*
- 22 Which of the following changes in sulfur undergoes reduction?  
*Antara perubahan-perubahan berikut yang manakah sulfur mengalami penurunan?*
- A  $\text{H}_2 + \text{S} \rightarrow \text{H}_2\text{S}$
- B  $2\text{SO}_2 + \text{O}_2 \rightarrow 2\text{SO}_3$
- C  $\text{SO}_3 + \text{H}_2\text{O} \rightarrow \text{H}_2\text{SO}_4$
- D  $\text{SO}_2 + \text{Cl}_2 + 2\text{H}_2\text{O} \rightarrow 4\text{H}^+ + 2\text{Cl}^- + \text{SO}_4^{2-}$
- 23 Bromine-80 has 45 neutrons. What are the proton number and nucleon number of the bromine atom? Represent the atom in the form of  ${}^A_Z\text{X}$ .  
*Bromin-80 mempunyai 45 neutron. Apakah nombor proton dan nombor nucleon bagi atom bromin? Wakilkan atom dalam bentuk  ${}^A_Z\text{X}$ .*

- A  ${}^{35}_{80}\text{Br}$
- B  ${}^{80}_{45}\text{Br}$
- C  ${}^{80}_{35}\text{Br}$
- D  ${}^{45}_{80}\text{Br}$

- 24 Diagram 1 shows the elements in Period 3 of The Periodic Table of Elements.  
*Rajah 1 menunjukkan unsur-unsur dalam Kala 3 dalam Jadual BerkalaUnsur.*

11	12	13	14	15	16	17	18
Na	Mg	Al	Si	P	S	Cl	Ar
23	24	27	28	31	32	35.5	40

Diagram 1  
*Rajah 1*

Why does the electronegativity increase from sodium to argon in the period?  
*Mengapakah keelektronegatifan bertambah daripada natrium kepada argon dalam kala ini?*

- A Size of the atom increase  
*Saiz atom bertambah*
- B The number of valence electron increase  
*Bilangan elektron valens bertambah*
- C The attraction of the nucleus for the electrons in the shell increase  
*Daya tarikan nukleus terhadap elektron dalam petala bertambah*
- D The properties of the elements change from metallic to non-metallic  
*Sifat unsur berubah dari logam kepada bukan logam*
- 25 Compound K has the following properties.  
*Sebatian K mempunyai sifat-sifat berikut.*
- Melting point is 290°C  
*Takat lebur ialah 290°C*
  - Insoluble in ether  
*Tidak larut dalam eter*
  - Lights up the bulb in aqueous state  
*Menyalakan mentol dalam keadaan akueus*

What is compound K?  
*Apakah sebatian K?*

- A Zinc chloride  
*Zink klorida*
- B Napthalene  
*Naftalena*
- C Acetamide  
*Asetamida*
- D Methane  
*Metana*

- 26 Diagram 5 shows the electrolysis of the dilute sulphuric acid using carbon electrodes.  
*Rajah 5 menunjukkan elektrolisis asid sulfurik cair menggunakan elektrod karbon.*

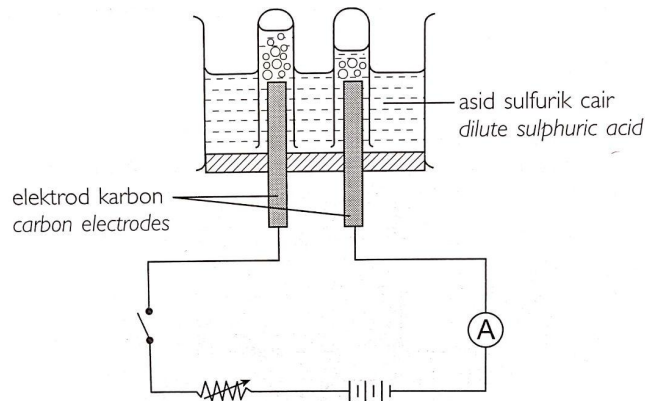


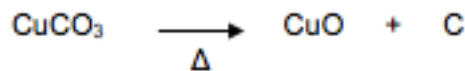
Diagram 5  
*Rajah 5*

Which of the following half-equations represent the reactions that occur at the anode and the cathode?

*Antara setengah persamaan yang berikut, yang manakah mewakili tindak balas yang berlaku di anod dan katod?*

	<b>Anod</b> <i>Anode</i>	<b>Katod</b> <i>Cathode</i>
A	$2\text{H}^+ + 2\text{e}^- \rightarrow \text{H}_2$	$4\text{OH}^- \rightarrow 2\text{H}_2\text{O} + \text{O}_2 + 4\text{e}^-$
B	$4\text{OH}^- \rightarrow 2\text{H}_2\text{O} + \text{O}_2 + 4\text{e}^-$	$2\text{H}^+ + 2\text{e}^- \rightarrow \text{H}_2$
C	$2\text{H}^+ + 2\text{e}^- \rightarrow \text{H}_2$	$\text{SO}_4^{2-} + 2\text{e}^- \rightarrow \text{SO}_2$
D	$\text{SO}_4^{2-} + 2\text{e}^- \rightarrow \text{SO}_2$	$2\text{H}^+ + 2\text{e}^- \rightarrow \text{H}_2$

- 27 The following equation shows the decomposition of copper(II) carbonate when heated strongly.  
*Persamaan berikut menunjukkan tindak balas penguraian kuprum(II) karbonat apabila dipanaskan dengan kuat.*



What is the mass of copper(II) oxide produced when 12.4 g of copper(II) carbonate is decomposed completely?

[Relative atomic mass: C=12; O=16; Cu=64]

*Apakah jisim kuprum(II) oksida yang terhasil apabila 12.4 g kuprum(II) karbonat terurai dengan lengkap?*

[Jisim atom relatif: C=12; O=16; Cu=64]

- A 4.0 g
- B 8.0 g
- C 12.4 g
- D 80.0 g

28 Chlorine-35 and chlorine-37 are isotopes. The number of neutrons of chlorine-35 is 18. Which of the following statements is true?

*Klorin-35 dan klorin-37 merupakan isotop. Bilangan neutron bagi klorin-35 merupakan 18. Antara yang berikut, yang manakah pernyataan adalah benar?*

- A The chlorine-35 atom has 17 neutron.  
Atom klorin-35 mempunyai 17 neutron.
- B The chlorine-37 atom has 37 elektron.  
Atom klorin-37 mempunyai 37 elektron.
- C The chlorine-35 atom has the same number of protons as the chlorine-37 atom.  
Atom klorin-35 mempunyai bilangan proton yang sama dengan atom klorin-37.
- D The chlorine-35 atom has the same number of neutrons as the chlorine-37 atom.  
Atom klorin-35 mempunyai bilangan neutron yang sama dengan atom klorin-37.

29 Diagram 6 shows the arrangement of atoms for atom P and Q  
*Rajah 6 menunjukkan susunan atom untuk atom-atom P dan Q*

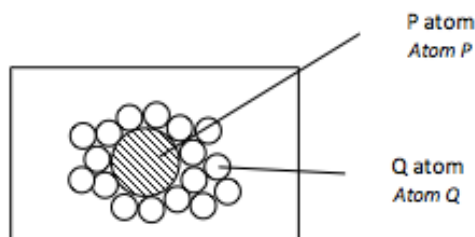


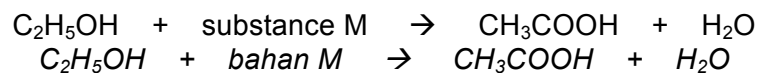
Diagram 6  
*Rajah 6*

Which of the following best explain the diagram?

*Pernyataan yang manakah menerangkan dengan tepat rajah tersebut?*

- A Q atoms are not in orderly arrangement so that the metal will become harder  
*Atom Q tidak tersusun dengan teratur supaya logam menjadi keras*
- B The presence of P atoms between Q atoms will make the metal more ductile  
*Kehadiran atom P di antara atom-atom Q menyebabkan logam itu lebih mudah di tempa*
- C P atom prevent atoms Q from sliding easily  
*Atom P mencegah atom-atom Q dari mengelongsor dengan mudah*
- D P atoms fill the spaces between Q atoms  
*Atom P memenuhi ruangan di antara atom Q*

- 30 A reaction below using substance M to convert ethanol to ethanoic acid  
*Tindak balas di bawah menggunakan bahan M untuk menukarkan etanol kepada asid etanoik*



What is substance M?  
*Apakah bahan M?*

- A Bromine water  
*Air bromin*
  - B Potassium iodide solution  
*Larutan kalium iodida*
  - C Concentrated sulphuric acid  
*Asid sulfurik pekat*
  - D Acidified potassium dichromate (VI) solution  
*Larutan kalium dikromat (VI) berasid*
- 31 Diagram 7 shows the reactivity of few metals and iron.  
*Rajah 7 menunjukkan kereaktifan beberapa logam dan ferum.*

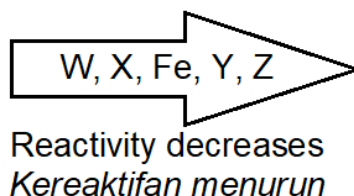


Diagram 7  
*Rajah 7*

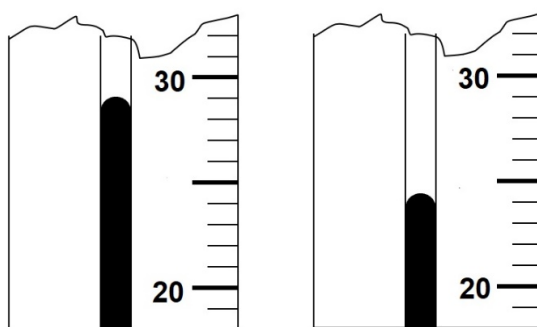
Which pairs of metals cause the rusting of iron the fastest and the slowest?  
*Pasangan logam yang manakah menyebabkan pengurangan ferum paling cepat dan paling lambat?*

	The fastest <i>Paling cepat</i>	The slowest <i>Paling lambat</i>
A	Fe / Z	Fe / X
B	Fe / Z	Fe / W
C	Fe / W	Fe / Z
D	Fe / X	Fe / Z

32 Which of the following produces the highest rate of reaction with solid sodium carbonate?  
*Antara yang berikut, yang manakah menghasilkan kadar tindak balas tertinggi dengan pepejal natrum karbonat?*

- A  $20 \text{ cm}^3$  of  $0.1 \text{ mol dm}^{-3}$  hydrochloric acid  
 *$20 \text{ cm}^3$  asid hidroklorik  $0.1 \text{ mol dm}^{-3}$*
- B  $20 \text{ cm}^3$  of  $0.5 \text{ mol dm}^{-3}$  hydrochloric acid  
 *$20 \text{ cm}^3$  asid hidroklorik  $0.5 \text{ mol dm}^{-3}$*
- C  $20 \text{ cm}^3$  of  $0.8 \text{ mol dm}^{-3}$  hydrochloric acid  
 *$20 \text{ cm}^3$  asid hidroklorik  $0.8 \text{ mol dm}^{-3}$*
- D  $20 \text{ cm}^3$  of  $2.0 \text{ mol dm}^{-3}$  hydrochloric acid  
 *$20 \text{ cm}^3$  asid hidroklorik  $2.0 \text{ mol dm}^{-3}$*

33 Diagram 8 shows the reading of thermometer when ammonium chloride is added to  $100 \text{ cm}^3$  of water.  
*Rajah 8 menunjukkan bacaan termometer apabila ammonium klorida ditambahkan kepada  $100 \text{ cm}^3$  air.*



Temperature of water before  
*Suhu air sebelum*

Temperature of water after  
*Suhu air selepas*

Diagram 8  
*Rajah 8*

Which type of reaction occurs?  
*Apakah jenis tindak balas yang berlaku?*

- A Exothermic  
*Eksotermik*
- B Endothermic  
*Endotermik*
- C Condensation  
*Kodensasi*
- D Neutralisation  
*Peneutralan*

- 34 You are given two aqueous solutions consist of lead(II) ion and aluminium ion.  
Which of the following reagent cannot be used to differentiate both solutions?  
*Anda diberikan dua larutan akues yang mengandungi ion plumbum(II) dan ion aluminium.*  
*Manakah antara bahan kimia berikut tidak boleh digunakan untuk membezakan kedua-dua larutan?*
- A Benzene  
*Benzena*
  - B Dilute nitric acid  
*Asid nitrik cair*
  - C Sodium nitrate solution  
*Larutan natrium nitrat*
  - D Potassium iodide solution  
*Larutan kalium iodida*
- 35 Which of the following is true of weak acid?  
*Manakah yang benar tentang asid lemah?*
- A Unable to neutralise alkali  
*Tidak boleh menutralkan alkali*
  - B The pH value is more than 7  
*Nilai pH lebih dari 7*
  - C Able to change red litmus paper to blue  
*Boleh menukarkan kertas litmus merah kepada biru*
  - D Ionises partially in water to produce hydrogen ions  
*Mengion sebahagian di dalam air untuk menghasilkan ion-ion hidrogen*



- 36 Table 2 shows the melting and boiling points of three compounds.  
*Jadual 2 menunjukkan takat lebur dan takat didih tiga sebatian.*

Compound <i>Sebatian</i>	Melting point (°C) <i>Takat lebur (°C)</i>	Boiling point (°C) <i>Takat didih (°C)</i>
Ethanol, C <sub>2</sub> H <sub>5</sub> OH <i>Etanol, C<sub>2</sub>H<sub>5</sub>OH</i>	-114°C	78°C
Methane, CH <sub>4</sub> <i>Metana, CH<sub>4</sub></i>	-182°C	-162°C
Acetone, (CH <sub>3</sub> ) <sub>2</sub> CO <i>Aseton, (CH<sub>3</sub>)<sub>2</sub>CO</i>	-95°C	56°C

Table 2  
*Jadual 2*

Why these compounds have such value of melting point and boiling point?  
*Mengapakah sebatian-sebatian ini mempunyai nilai takat lebur dan takat didih sedemikian?*

- A They are made up of non metals  
*la terdiri daripada bukan logam*
- B They have weak covalent bonds  
*la mempunyai ikatan kovalen yang lemah*
- C They have weak electrostatic forces of attraction  
*la mempunyai daya tarikan eletrostatik yang lemah*
- D They have weak intermolecular forces of attractiion  
*la mempunyai daya tarikan antara molekul yang lemah*
- 37 U, V and W are three elements in the same period in the Periodic Table. U oxide is amphoteric, V oxide is acidic, and W oxide is basic.  
 Which of the following is the **correct** arrangement of U, V and W in order from left to right in the relevant period ?  
*U, V dan W adalah tiga unsur pada kala yang sama dalam Jadual Berkala. Oksida U bersifat amfoterik, oksida V bersifat asid, dan oksida W bersifat bes.*  
*Yang manakah berikut merupakan susunan U, V dan W yang betul dengan tertib dari kiri ke kanan dalam kala berkenaan ?*
- A W, U, V
- B V, U, W
- C U, W, V
- D U, V, W

- 38 A compound with formula  $X_2CO_3$  has a relative formula mass of 138.  
 What is the relative atomic mass of X?  
 [Relative atomic mass: C = 12 and O = 16]  
*Satu sebatian berformula  $X_2CO_3$  mempunyai jisim formula relatif 138.*  
*Berapakah jisim atom relatif bagi X?*  
*[Jisim atom relatif: C = 12 dan O = 16]*

- A 39
- B 69
- C 78
- D 110

- 39 Table 4 shows the results of experiments using chemical cells.  
*Jadual 4 menunjukkan keputusan eksperimen yang menggunakan sel kimia.*

<b>Pair of metal</b> <i>Pasangan logam</i>	<b>Voltage / V</b> <i>Voltan / V</i>	<b>Negative terminal</b> <i>Terminal negatif</i>
P and Q <i>P dan Q</i>	0.7	Q
R and S <i>R dan S</i>	1.1	S
P and S <i>P dan S</i>	2.7	S

Table 4

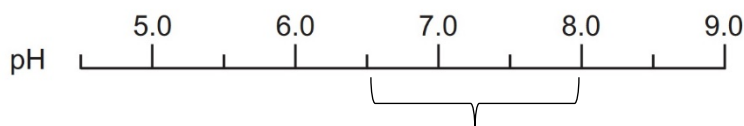
*Jadual 4*

Which of the following shows that the metal in the electrochemical series is in the descending order of electropositivity?

*Antara yang berikut, yang manakah menunjukkan logam dalam siri elektrokimia berada dalam susunan keelektropositifan menurun?*

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

- 40 Diagram 9 shows the soil pH range over which a durian tree grows well.  
*Rajah 9 menunjukkan julat pH yang mana pokok durian tumbuh dengan baik.*  
 The pH value of the soil to be used is 5.5.  
*Nilai pH tanah yang digunakan adalah 5.5.*



Durian tree grows well

*Pokok durian tumbuh dengan baik*

Diagram 9

*Rajah 9*

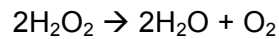
Why is lime added to the soil before planting durian tree?

*Mengapa kapur diletakkan kepada tanah sebelum menanam pokok durian?*

- A The lime reduces the soil acidity of soil  
*Kapur mengurangkan keasidan tanah*
- B The lime supplies nitrogen  
*Kapur membekalkan nitrogen*
- C The lime acts as catalyst  
*Kapur akan bertindak sebagai mangkin*
- D The lime is an indicator  
*Kapur adalah penunjuk*
- 41  $25 \text{ cm}^3$  of  $0.5 \text{ mol dm}^{-3}$  potassium iodide solution, KI is poured into a beaker containing lead(II) nitrate solution,  $\text{Pb}(\text{NO}_3)_2$  in excess. A precipitate is formed immediately. Calculate the maximum mass of precipitate formed and state its colour.  
 *$25 \text{ cm}^3$  larutan kalium iodida, KI dituangkan ke dalam sebuah bikar yang mengandungi larutan plumbum(II) nitrat,  $\text{Pb}(\text{NO}_3)_2$  berlebihan. Satu mendakan terbentuk serta merta. Hitungkan jisim maksimum mendakan yang terbentuk serta nyatakan warnanya.*  
 [Relative atomic mass: Pb = 207, I = 127, K = 39, N = 14, O = 16]  
 [Jisim atom relatif: Pb = 207, I = 127, K = 39, N = 14, O = 16]

	Maximum mass of precipitate(g) <i>Jisim maksimum mendakan(g)</i>	Colour of precipitate <i>Warna mendakan</i>
A	2.88	Yellow <i>Kuning</i>
B	5.76	White <i>Putih</i>
C	8.64	Yellow <i>Kuning</i>
D	11.52	White <i>Putih</i>

- 42 Hydrogen peroxide decomposes as shown by the equation:  
*Hidrogen peroksida terurai berdasarkan persamaan berikut:*



After 2 minutes, the volume of oxygen gas produced is  $100 \text{ cm}^3$ .  
Calculate the average rate of the reaction.

*Selepas 2 minit, isi padu gas oksigen dihasilkan ialah  $100 \text{ cm}^3$ .  
Hitung kadar tindak balas purata.*

- A  $10 \text{ cm}^3 \text{ min}^{-1}$
- B  $15 \text{ cm}^3 \text{ min}^{-1}$
- C  $25 \text{ cm}^3 \text{ min}^{-1}$
- D  $50 \text{ cm}^3 \text{ min}^{-1}$
- 43 Rubber tapper will add sodium hydroxide solution to latex during its collection from rubber trees.  
*Penoreh getah akan menambahkan larutan natrium hidroksida kepada susu getah semasa mengumpulkannya dari pokok getah.*
- Which of the following best explain the situation above?  
*Yang manakah di antara berikut menerangkan situasi di atas dengan tepat?*
- A The solution added to latex will make the rubber can be easily mould  
*Larutan di tambahkan kepada susu getah supaya getah lebih mudah diacu*
- B The hydroxide in the solution neutralise the acid from surrounding  
*Larutan yang mengandungi hidroksida akan meneutralkan asid dari persekitaran*
- C The solution is added the latex so that the latex will become hard  
*Larutan itu di tambahkan kepada susu getah supaya getah menjadi keras.*
- D The solution will make the latex to become elastic  
*Larutan di tambahkan akan menyebabkan getah menjadi kenyal*

- 44 Yogurt is prepared by adding  $20.0 \text{ cm}^3$  of lemon into  $200.0 \text{ cm}^3$  of milk. It is found that the temperature of the yogurt increases by  $2.0 \text{ }^\circ\text{C}$ . What is the total amount of heat released?  
Specific heat capacity of yogurt =  $X \text{ J g}^{-1} \text{ }^\circ\text{C}^{-1}$ . Assume that  $1 \text{ cm}^3$  of solution is equal to  $1 \text{ g}$  of solution.

*Yogurt disediakan dengan mencampurkan  $20.0 \text{ cm}^3$  lemon ke dalam  $200.0 \text{ cm}^3$  susu. Di dapati suhu yogurt meningkat sebanyak  $2.0 \text{ }^\circ\text{C}$ . Apakah jumlah tenaga yang dibebaskan?*

*Kapasiti muatan haba tertentu yogurt =  $X \text{ J g}^{-1} \text{ }^\circ\text{C}^{-1}$ . Anggap  $1 \text{ cm}^3$  larutan sama dengan  $1 \text{ g}$  larutan.*

- A  $40XJ$
- B  $220XJ$
- C  $400XJ$
- D  $440XJ$

- 45 Diagram 10 shows the set-up of apparatus for titration pH unknown diprotic acid,  $\text{H}_2\text{J}$  with sodium hydroxide solution.

*Rajah 10 menunjukkan susunan alat radas bagi pentitratan asid diprotik yang tidak diketahui,  $\text{H}_2\text{J}$  dengan larutan natrium hidroksida.*

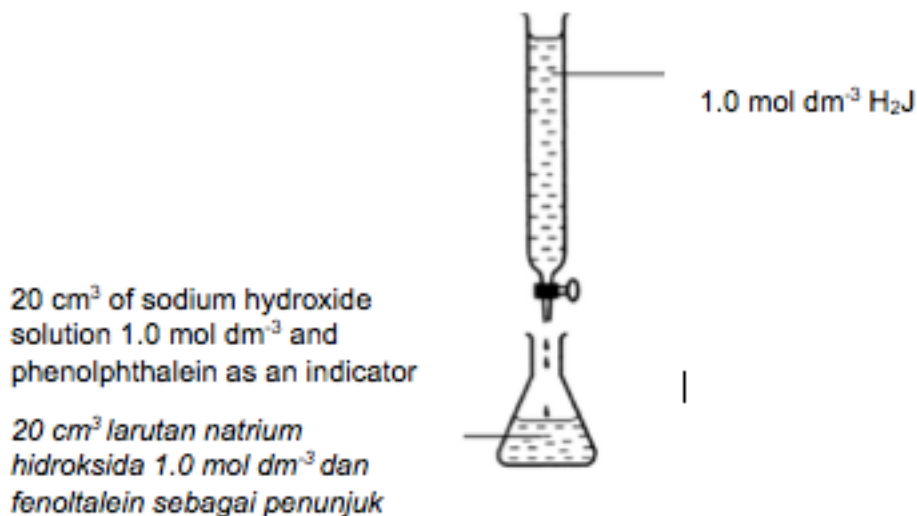


Diagram 10  
Rajah 10

What is the volume of  $\text{H}_2\text{J}$  acid at the end point of titration?  
*Apakah isipadu asid  $\text{H}_2\text{J}$  pada takat akhir pentitratan?*

- A  $10 \text{ cm}^3$
- B  $20 \text{ cm}^3$
- C  $30 \text{ cm}^3$
- D  $40 \text{ cm}^3$

- 46 In the preparation of magnesium chloride salt, 10 g of magnesium carbonate is added into a beaker containing 100 cm<sup>3</sup> of 2 mol dm<sup>-3</sup> hydrochloric acid. After the reaction has completed, the unreacted magnesium carbonate remains at the bottom of the beaker. What is the mass of the unreacted magnesium carbonate?

*Dalam penyediaan garam magnesium klorida, 10 g magnesium karbonat ditambahkan ke dalam sebuah bikar yang mengandungi 100 cm<sup>3</sup> larutan asid hidroklorik 2 mol dm<sup>-3</sup>. Selepas tindak balas telah lengkap, magnesium karbonat yang tidak bertindak balas terbentuk di dasar bikar. Berapakah jisim magnesium karbonat yang tidak bertindak balas itu?*

[Relative atomic mass: Mg = 24, C = 12, O = 16, Cl = 35.5, H = 1]

[Jisim atom relatif: Mg = 24, C = 12, O = 16, Cl = 35.5, H = 1]

- A 0.80 g
- B 1.60 g
- C 8.40 g
- D 9.20 g

- 47 The smell of pineapple is caused by ester in Diagram 11.

*Bau nenas di sebabkan oleh ester dalam Rajah 11.*

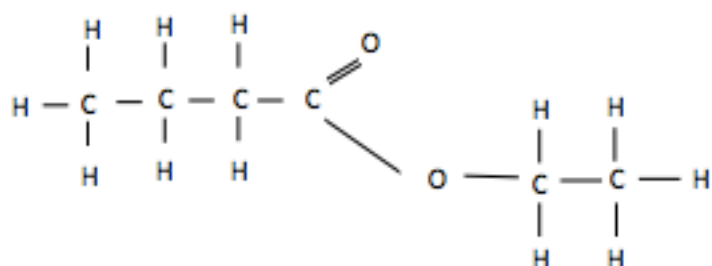


Diagram 11  
Rajah 11

Identify the alcohol and carboxylic acid used to produce ester in pineapple  
*Kenalpasti alkohol dan asid karboksilik yang di gunakan untuk menghasilkan ester dalam nenas*

	Alcohol <i>alkohol</i>	Carboxylic acid <i>Asid karboksilik</i>
A	ethanol <i>etanol</i>	butanoic acid <i>asid butanoik</i>
B	propanol <i>propanol</i>	ethanoic acid <i>asid etanoik</i>
C	butanol <i>butanol</i>	propanoic acid <i>asid propanoik</i>
D	butanol <i>butanol</i>	ethanoic acid <i>asid etanoik</i>

48 What is the reaction occur at anode and cathode when  $0.0001 \text{ mol dm}^{-3}$  sodium chloride solution electrolysed using carbon electrode.

*Apakah tindak balas yang berlaku di anod dan katod apabila larutan natrium klorida  $0.0001 \text{ mol dm}^{-3}$  dielektrolisiskan menggunakan elektrod karbon?*

	Anode <i>Anod</i>	Cathode <i>Katod</i>
A	Oxidation: $2\text{Cl}^- \rightarrow \text{Cl}_2 + 2\text{e}$ <i>Pengoksidaan:</i>	Reduction: $2\text{H}^+ + 2\text{e} \rightarrow \text{H}_2$ <i>Penurunan:</i>
B	Oxidation: $4\text{OH}^- \rightarrow \text{O}_2 + 2\text{H}_2\text{O} + 4\text{e}$ <i>Pengoksidaan:</i>	Reduction: $2\text{H}^+ + 2\text{e} \rightarrow \text{H}_2$ <i>Penurunan:</i>
C	Reduction: $4\text{OH}^- \rightarrow \text{O}_2 + 2\text{H}_2\text{O} + 4\text{e}$ <i>Penurunan:</i>	Oxidation: $\text{Na}^+ + \text{e} \rightarrow \text{Na}$ <i>Pengoksidaan:</i>
D	Reduction: $4\text{OH}^- \rightarrow \text{O}_2 + 2\text{H}_2\text{O} + 4\text{e}$ <i>Penurunan:</i>	Oxidation: $2\text{H}^+ + 2\text{e} \rightarrow \text{H}_2$ <i>Pengoksidaan:</i>

49 Diagram 12 shows energy profile of reaction  
*Rajah 12 menunjukkan profil tenaga suatu tindak balas.*

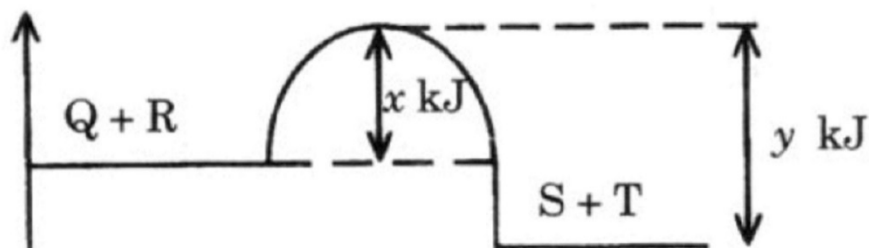
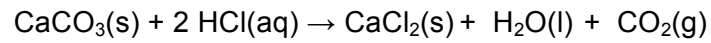


Diagram 12  
*Rajah 12*

Which true about Diagram 12?  
*Manakah benar tentang Rajah 12?*

- A Activation energy is  $y \text{ kJ}$   
*Tenaga pengaktifan adalah  $y \text{ kJ}$*
- B The reaction is endothermic  
*Tindak balas adalah endotermik*
- C Heat of reaction is  $-(x-y) \text{ kJ}$   
*Haba tindak balas adalah  $-(x-y) \text{ kJ}$*
- D  $Y$  value is increases when catalyst is added  
*Nilai  $y$  akan meningkat apabila mangkin ditambahkan.*

- 50 The following equation represents the reaction between calcium carbonate and hydrochloric acid  
*Persamaan berikut mewakili tindak balas antara kalsium karbonat dan asid hidroklorik*



Which of the following factors can increase the rate of this reaction.  
*Antara factor berikut, yang manakah boleh meningkatkan kadar tindak balas ini?*

- A Increase the size of calcium carbonate  
*Meningkatkan saiz kalsium karbonat*
- B Increase the temperature of the mixture  
*Meningkatkan suhu campuran*
- C Decrease the volume of hydrochloric acid  
*Mengurangkan isipadu asid hidroklorik*
- D Decrease the concentration of hydrochloric acid  
*Mengurangkan kepekatan asid hidroklorik*