



PROGRAM GEMPUR KECEMERLANGAN  
SIJIL PELAJARAN MALAYSIA 2015  
ANJURAN BERSAMA  
MAJLIS PENGETUA SEKOLAH MALAYSIA  
NEGERI PERLIS  
DAN  
MAJLIS GURU CEMERLANG NEGERI PERLIS



SIJIL PELAJARAN MALAYSIA 2015

4541/1

KIMIA

Kertas 1

Ogos

1 ¼ jam

Satu jam lima belas minit

---

**JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU**

**Arahan:**

1. *Kertas soalan ini mengandungi 50 soalan.*
2. *Jawab semua soalan.*
3. *Tiap-tiap soalan diikuti oleh empat pilihan jawapan iaitu A, B, C dan D. Bagi tiap-tiap soalan, pilih satu jawapan sahaja. Hitamkan jawapan anda pada kertas jawapan objektif yang disediakan.*

---

Kertas soalan ini mengandungi 30 halaman bercetak.

- 1 Diagram 1 shows the set-up of apparatus for an experiment.  
*Rajah 1 menunjukkan susunan radas bagi suatu eksperimen.*

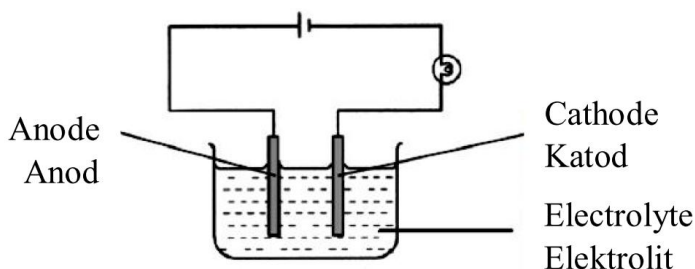


Diagram 1  
*Rajah 1*

Which substances are suitable to use as an electrolyte?  
*Bahan manakah sesuai digunakan sebagai elektrolit?*

- A** Solid naphthalene  
*Pepejal naftalena*
- B** Molten glucose  
*Leburan glukosa*
- C** Sulphuric acid  
*Asid sulfurik*
- D** Pure ethanol  
*Etanol tulen*
- 2 Which of the following is the composition of bronze?  
*Antara yang berikut, manakah komposisi bagi gangsa?*
- A** Copper and tin  
*Kuprum dan timah*
- B** Copper and zinc  
*Kuprum dan zink*
- C** Iron and carbon  
*Ferum dan karbon*
- D** Aluminium and magnesium  
*Aluminium dan magnesium*
- 3 Which cation is present in molten lead(II) iodide?  
*Kation manakah yang terdapat dalam leburan plumbum(II) iodida?*
- A**  $\text{H}^+$
- B**  $\text{I}^-$
- C**  $\text{Pb}^{2+}$
- D**  $\text{OH}^-$

- 4 The heat of precipitation determined in the laboratory is less than theoretical value. Why?

*Haba pemendakan yang dihitung di dalam makmal adalah kurang daripada nilai teori. Mengapa?*

- A Some heat is absorbed by the thermometer.  
*Sebahagian haba diserap oleh termometer.*
- B Chemicals that are used contain impurities.  
*Bahan kimia yang digunakan mengandungi bendasing.*
- C Chemicals react with oxygen in the surrounding.  
*Bahan kimia bertindakbalas dengan oksigen di persekitaran.*
- D Heat is loss to the surrounding.  
*Haba dibebas ke persekitaran*

- 5 Which of the following solution has the lowest pH value?

*Antara larutan berikut, yang manakah mempunyai nilai pH paling rendah?*

- A Ethanoic acid  $0.1 \text{ mol dm}^{-3}$   
*Asid etanoik  $0.1 \text{ mol dm}^{-3}$*
- B Hydrochloric acid  $0.1 \text{ mol dm}^{-3}$   
*Asid hidroklorik  $0.1 \text{ mol dm}^{-3}$*
- C Ammonia solution  $0.1 \text{ mol dm}^{-3}$   
*Larutan ammonia  $0.1 \text{ mol dm}^{-3}$*
- D Sodium hydroxide solution  $0.1 \text{ mol dm}^{-3}$   
*Larutan natrium hidroksida  $0.1 \text{ mol dm}^{-3}$*

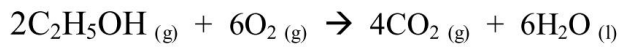
- 6 Which of the following substances can be used to differentiate pentane and pentene?

*Antara bahan berikut, yang manakah boleh digunakan untuk membezakan pentana dan pentena?*

- A Lime water  
*Air kapur*
- B Bromine water  
*Air bromin*
- C Dilute hydrochloric acid  
*Asid hidroklorik cair*
- D Sodium hydroxide solution  
*Larutan natrium hidroksida*

- 7 The following chemical equation represents the complete combustion of ethanol.

*Persamaan kimia berikut mewakili pembakaran lengkap etanol.*



What is the volume of oxygen gas needed to burn 23g of ethanol gas completely at room condition?

*Berapakah isipadu gas oksigen yang diperlukan untuk pembakaran lengkap 23 g gas etanol pada keadaan bilik?*

[1 mole of gas occupies 24 dm<sup>3</sup> at room condition; Relative atomic mass : C, 12 ; H, 1 ; O, 16 ]

*[1 mol gas menempati isipadu sebanyak 24 dm<sup>3</sup> pada keadaan bilik ;*

*Jisim atom relatif : C, 12 ; H, 1 ; O, 16 ]*

- A 12 dm<sup>3</sup>  
B 24 dm<sup>3</sup>  
C 36 dm<sup>3</sup>  
D 48 dm<sup>3</sup>
- 8 Diagram 8 shows a set of cookware usually used in the kitchen.  
*Rajah 8 menunjukkan satu set peralatan memasak yang biasa digunakan.*



Diagram 8  
*Rajah 8*

Which of the following types of glass is suitable for making the cookware?  
*Antara jenis kaca berikut, yang manakah sesuai untuk digunakan bagi membuat peralatan tersebut?*

- A Fused glass  
*Kaca silica terlakur*  
B Soda lime glass  
*Kaca soda kapur*  
C Borosilicate glass  
*Kaca borosilikat*  
D Lead crystal glass  
*Kaca plumbum*

- 9 Diagram 9 shows a factory which produces sulphuric acid. Gas X is produced from this factory affects the quality of the environment.

*Rajah 9 menunjukkan sebuah kilang yang menghasilkan asid sulfurik. Gas X dihasilkan dari kilang ini menjejaskan kualiti alam sekitar.*

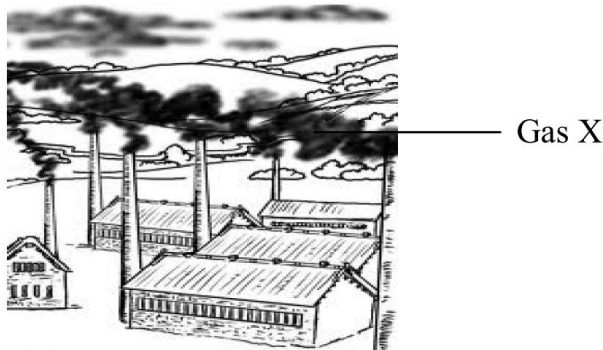


Diagram 9  
*Rajah 9*

Which of the following is gas X?  
*Antara berikut, yang manakah gas X?*

- A Sulphur dioxide  
*Sulfur dioksida*
  - B Carbon monoxide  
*Karbon monoksida*
  - C Nitrogen dioxide  
*Nitrogen dioksida*
  - D Chloroflourocarbon  
*kloroflorokarbon*
- 10 Which of the following substances is acidic?  
*Antara yang berikut, manakah bahan berasid?*
- A Oxygen  
*Oksigen*
  - B Ammonia  
*Ammonia*
  - C Sulphur dioxide  
*Sulfur dioksida*
  - D Ethyl ethanoate  
*Etil etanoat*

- 11 Diagram 11 shows the structural formulae for two hydrocarbons.  
*Rajah 11 menunjukkan formula struktur bagi dua hidrokarbon.*



Diagram 11  
*Rajah 11*

Which properties for both compounds are similiar?  
*Sifat manakah yang sama bagi kedua-dua sebatian?*

- I Density  
*Ketumpatan*
- II Solubility  
*Keterlarutan*
- III Melting point  
*Takat lebur*
- IV Electrical conductivity  
*Kekonduksian elektrik*
- A** I and II  
*I dan II*
- B** I and III  
*I dan III*
- C** II and IV  
*II dan IV*
- D** III and IV  
*III dan IV*

- 12 Diagram 12 shows a blue litmus paper is dipped into glacial ethanoic acid.  
*Rajah 12 menunjukkan kertas litmus biru dicelup ke dalam asid etanoik glasial.*

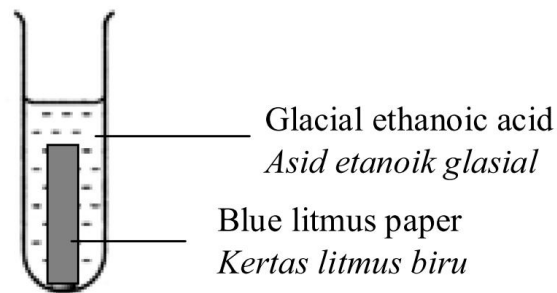


Diagram 11  
*Rajah 12*

Which of the following observations is true when distilled water is added into the test tube?

*Antara pemerhatian berikut, yang manakah benar apabila air suling ditambah ke dalam tabung uji?*

- A Blue litmus paper dissolves  
*Kertas litmus biru larut*
  - B Blue litmus paper decolourises  
*Kertas litmus biru dinyahwarnakan*
  - C Blue litmus paper changes colour  
*Kertas litmus biru berubah warna*
  - D Blue litmus paper doesn't change colour  
*Kertas litmus biru tidak berubah warna*
- 13 A catalyst increases the rate of reaction because it increases  
*Suatu mangkin meningkatkan kadar tindak balas kerana ia meningkatkan*
- A the activation energy.  
*tenaga pengaktifan.*
  - B the number of particles.  
*bilangan zarah.*
  - C the frequency of collisions.  
*frekuensi pelanggaran.*
  - D the frequency of effective collisions.  
*frekuensi pelanggaran berkesan.*

- 14 Diagram 14 shows an advertisement in front of the restaurant.  
*Rajah 14 menunjukkan iklan di hadapan sebuah restoran.*



Lights filled with gas X  
*Lampu diisi dengan gas X*

Diagram 14  
*Rajah 14*

In which group is X located in the Periodic Table of Element?  
*Di dalam kumpulan manakah X terletak dalam Jadual Berkala Unsur?*

- A Group 15  
*Kumpulan 15*
- B Group 16  
*Kumpulan 16*
- C Group 17  
*Kumpulan 17*
- D Group 18  
*Kumpulan 18*



**15** Which of the following is true of an exothermic reaction?  
*Antara yang berikut, yang manakah benar tentang tindak balas eksotermik?*

- A** The container becomes hotter.  
*Bekas itu menjadi panas.*
- B** The temperature of the mixture decreases.  
*Suhu campuran tindak balas menurun.*
- C** Heat energy is absorbed from the surroundings.  
*Tenaga haba diserap dari persekitaran.*
- D** The heat energy is converted to kinetic energy.  
*Tenaga haba ditukar kepada tenaga kinetik.*

**16** Digital communication plays a very important role in modern living. Effective transmission of data, voices and images in a digital format requires a suitable material. What is the material?

*Komunikasi digital memainkan peranan yang sangat penting dalam kehidupan moden. Penghantaran data, suara dan imej secara berkesan dalam format digital memerlukan bahan yang sesuai. Apakah bahan itu?*

- A** Copper  
*Kuprum*
- B** Fibre optic  
*Gentian optik*
- C** Aluminium  
*Aluminium*
- D** Superconductor  
*Superkonduktor*

- 17 Diagram 17 shows the apparatus set-up to prepare a carbon compound.  
*Rajah 17 menunjukkan susunan radas untuk menyediakan suatu sebatian karbon.*

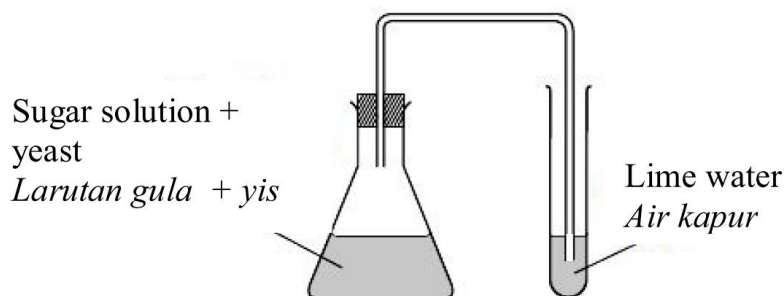


Diagram 17  
*Rajah 17*

Which of the following is true about the carbon compound produced?  
*Antara berikut, yang manakah benar tentang sebatian karbon yang terhasil itu?*

- A** Burn with a sooty flame  
*Terbakar dengan nyalaan berjelaga*
- B** Dissolve in water  
*Larut di dalam air*
- C** Has a double bond in its structural formula  
*Mempunyai satu ikatan ganda dua di dalam formula strukturnya*
- D** Decolourises acidified potassium manganate (VII) solution  
*Melunturkan warna larutan kalium manganat (VII) berasid*
- 18 Substance P reacts with substance Q to form a compound with a fruity smell.  
 What are substance P and Q?  
*Bahan P bertindak balas dengan bahan Q menghasilkan sebatian berbau buah-buahan. Apakah bahan P dan Q?*

	P	Q
<b>A</b>	Hexane <i>Heksana</i>	Ethanoic acid <i>Asid etanoik</i>
<b>B</b>	Hexene <i>Heksena</i>	Nitric acid <i>Asid nitrik</i>
<b>C</b>	Hexanol <i>Heksanol</i>	Ethanoic acid <i>Asid etanoik</i>
<b>D</b>	Hexanoate <i>Heksanoat</i>	Nitric acid <i>Asid nitrik</i>

- 19 The following information shows some characteristics of tuberculosis.  
*Maklumat berikut menunjukkan beberapa ciri mengenai penyakit Tibi.*

- *Suffer from a dry cough and sputum containing blood.*  
*Mengalami batuk kering dan mengeluarkan kahak berdarah*
- *Caused by bacteria*  
*Disebabkan oleh bakteria*

Which of the following can be used to treat tuberculosis?

*Antara berikut, yang manakah dapat digunakan untuk merawat batuk kering?*

- A** Streptomycin  
*Streptomisin*
- B** Paracetamol  
*Parasetamol*
- C** Barbiturate  
*Barbiturat*
- D** Stimulant  
*Stimulan*

- 20 Which of the following does not affect the rate of reaction?

*Antara yang berikut, yang manakah tidak mempengaruhi kadar tindak balas?*

- A** Total surface area of reactant  
*Jumlah luas permukaan bahan tindak balas*
- B** Concentration of solution  
*Kepekatan larutan*
- C** Presence of catalyst  
*Kehadiran mangkin*
- D** Volume of solution  
*Isipadu larutan*

- 21 Diagram 21 shows the energy level diagram for the reaction between silver ions and chloride ions.

*Rajah 21 menunjukkan gambarajah aras tenaga bagi tindak balas antara ion argentum dan ion klorida.*

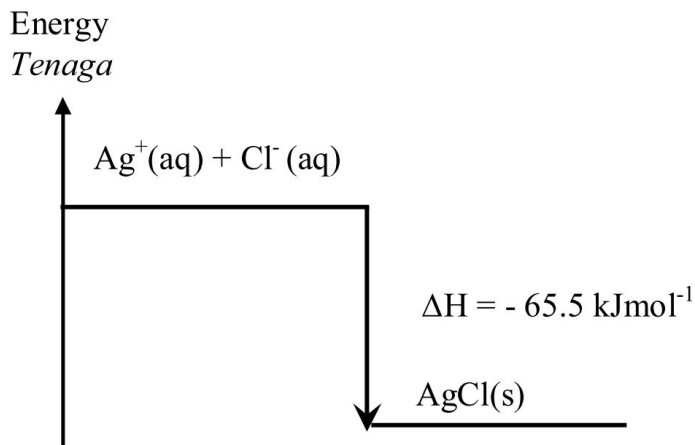


Diagram 21  
Rajah 21

Which of the following statements is true about this reaction?

*Manakah antara berikut adalah benar tentang tindak balas tersebut?*

- A Endothermic reaction occurs  
*Tindak balas endotermik berlaku*
- B The energy content of the product is higher than the reactants  
*Kandungan tenaga hasil tindak balas lebih tinggi daripada bahan tindak balas*
- C 65.5 kJ of heat is absorbed when 1 mol of silver chloride is formed  
*65.5 kJ haba 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 pada akhir tindak balas lebih tinggi daripada suhu awal.*
- 22 Which of the following will react the fastest with hydrochloric acid?  
*Antara berikut, yang manakah akan bertindak paling cepat dengan asid hidroklorik?*
- A Powdered marble at 25 °C  
*Serbuk marmar pada 25 °C*
- B Marble chips at 40 °C  
*Ketulan marmar pada 40 °C*
- C Powdered marble at 40 °C  
*Serbuk marmar pada 40 °C*
- D Marble chips at 25 °C  
*Ketulan marmar pada 25 °C*

- 23 The following information shows the results of an experiment to determine the heat change for the combustion of propanol,  $C_3H_7OH$ .

*Maklumat berikut menunjukkan keputusan bagi satu eksperimen untuk menentukan perubahan haba bagi pembakaran propanol,  $C_3H_7OH$ .*

Volume of water in the copper container =  $300 \text{ cm}^3$   
*Isi padu air dalam bekas kuprum =  $300 \text{ cm}^3$*

Initial temperature of water in the copper container =  $27.5 \text{ }^\circ\text{C}$   
*Suhu awal air dalam bekas kuprum =  $27.5 \text{ }^\circ\text{C}$*

Highest temperature of water in the copper container =  $68.5 \text{ }^\circ\text{C}$   
*Suhu tertinggi air dalam bekas kuprum =  $68.5 \text{ }^\circ\text{C}$*

What is the heat released by the combustion of propanol,  $C_3H_7OH$ ?  
[Specific heat capacity of water =  $4.2 \text{ J g}^{-1} \text{ }^\circ\text{C}^{-1}$ , Water density =  $1 \text{ g cm}^{-3}$  ]

*Berapakah haba yang dibebaskan oleh pembakaran propanol,  $C_3H_7OH$ ?  
[Muatan haba tentu air =  $4.2 \text{ J g}^{-1} \text{ }^\circ\text{C}^{-1}$ , Ketumpatan air =  $1 \text{ g cm}^{-3}$  ]*

- A 34.65 kJ
- B 51.66 kJ
- C 86.31 kJ
- D 120.96 kJ

- 24 The table 24 shows the number of electrons and neutrons for ions  $P^{2-}$ ,  $Q^+$ ,  $R^-$  and  $S^{2+}$ . These letters are not the actual symbols for the elements.

*Jadual 24 menunjukkan bilangan elektron dan bilangan neutron bagi ion  $P^{2-}$ ,  $Q^+$ ,  $R^-$  dan  $S^{2+}$ . Huruf-huruf ini bukanlah simbol sebenar bagi unsur itu.*

Ion	Number of electron <i>Bilangan elektron</i>	Number of neutron <i>Bilangan neutron</i>
$P^{2-}$	10	11
$Q^+$	10	12
$R^-$	18	18
$S^{2+}$	18	20

Table 24  
*Jadual 24*

Which of the following shows the correct nucleon number?

*Antara berikut, yang manakah menunjukkan nombor nukleon yang betul?*

	Atom	Nucleon number <i>Nombor nukleon</i>
<b>A</b>	P	19
<b>B</b>	Q	20
<b>C</b>	R	36
<b>D</b>	S	38

- 25 Egg shell contains a natural ionic compound.  
Other than oxygen, what elements are contained in the ionic compound?  
*Kulit telur mengandungi sebatian ion semula jadi.*  
*Selain oksigen, apakah unsur-unsur yang terkandung dalam sebatian ion itu?*
- A** Calcium and carbon  
*Kalsium dan karbon*
- B** Calcium and hydrogen  
*Kalsium dan hidrogen*
- C** Sodium and carbon  
*Natrium dan karbon*
- D** Sodium and hydrogen  
*Natrium dan hidrogen*
- 26  $60 \text{ cm}^3$  of  $0.2 \text{ mol dm}^{-3}$  sodium hydroxide solution, is titrated with sulphuric acid,  $\text{H}_2\text{SO}_4$ .  
What volume of  $0.5 \text{ mol dm}^{-3}$  sulphuric acid is needed to neutralise the sodium hydroxide solution?  
 *$60 \text{ cm}^3$  larutan natrium hidroksida, NaOH,  $0.2 \text{ mol dm}^{-3}$  dititratkan dengan asid sulfurik,  $\text{H}_2\text{SO}_4$ .*  
*Berapakah isipadu asid sulfurik  $0.5 \text{ mol dm}^{-3}$  yang diperlukan untuk meneutralkan larutan natrium hidroksida ini?*
- A**  $10.0 \text{ cm}^3$
- B**  $12.0 \text{ cm}^3$
- C**  $15.0 \text{ cm}^3$
- D**  $30.0 \text{ cm}^3$

27 Diagram 27 shows the apparatus set-up for an experiment to electroplate an iron key with copper.

Rajah 27 menunjukkan susunan radas bagi satu eksperimen untuk menyadur kunci besi dengan kuprum.

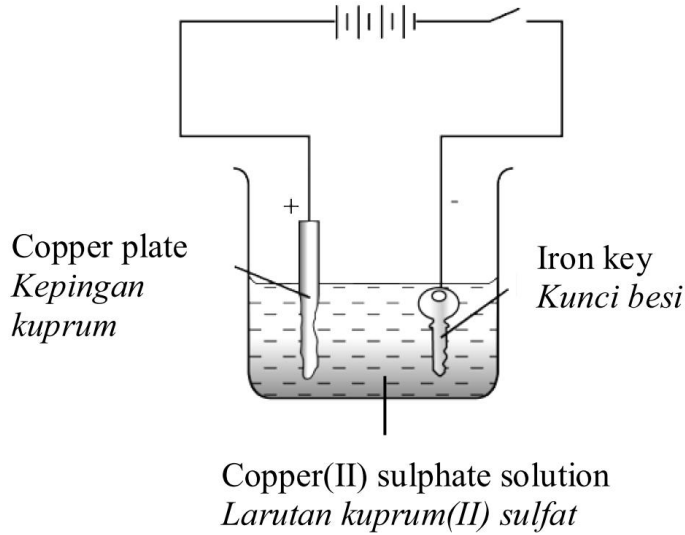


Diagram 27  
Rajah 27

Which half equation represent the reaction at the anode and the cathode?

Setengah persamaan manakah yang mewakili tindak balas di anod dan di katod?

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



28 Diagram 28 shows an apparatus set-up for a chemical cell.

*Rajah 28 menunjukkan susunan radas bagi sel kimia.*

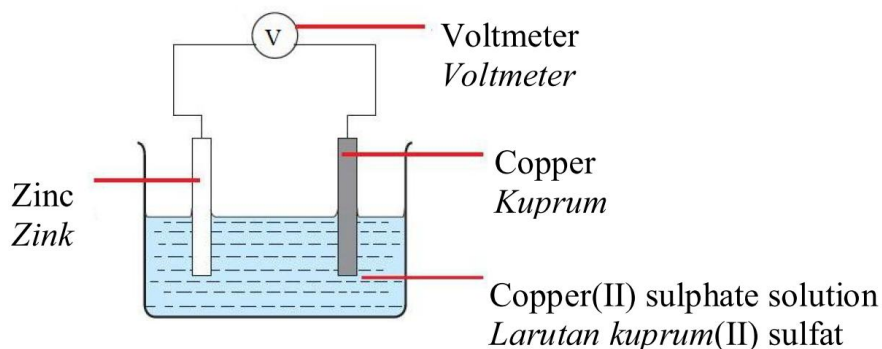


Diagram 28

*Rajah 28*

Which of the following increases the voltmeter reading?

*Antara berikut, yang manakah meningkatkan bacaan voltmeter?*

- A** Use aluminium sulphate solution as the electrolyte.  
*Gunakan larutan aluminium sulfat sebagai elektrolit.*
- B** Reduce the distance between the two metal plate.  
*Kurangkan jarak antara dua kepingan logam.*
- C** Use a wider metal plates.  
*Gunakan kepingan logam yang lebih lebar.*
- D** Substitute the zink with aluminium.  
*Gantikan zink dengan aluminium.*

29 Which of the following is true about hexane and hexene?

*Antara berikut, yang manakah benar tentang heksana dan heksena?*

	Hexane <i>Heksana</i>	Hexene <i>Heksena</i>
<b>A</b>	Soluble in water <i>Larut di dalam air</i>	Insoluble in water <i>Tidak larut di dalam air</i>
<b>B</b>	Produced more soot when it burns <i>Menghasilkan banyak jelaga apabila dibakar</i>	Does not produced soot when it burns <i>Tidak menghasilkan jelaga apabila dibakar</i>
<b>C</b>	React with bromine <i>Bertindak balas dengan bromin</i>	Does not react with bromine <i>Tidak bertindak balas dengan bromin</i>
<b>D</b>	Does not react with acidified potassium manganate(VII) <i>Tidak bertindak balas dengan kalium manganat(VII) berasid</i>	React with acidified potassium manganate(VII) <i>Bertindak balas dengan kalium manganat(VII) berasid</i>

- 30 Diagram 30 shows a simple chemical cell.  
*Rajah 30 menunjukkan satu sel kimia ringkas.*

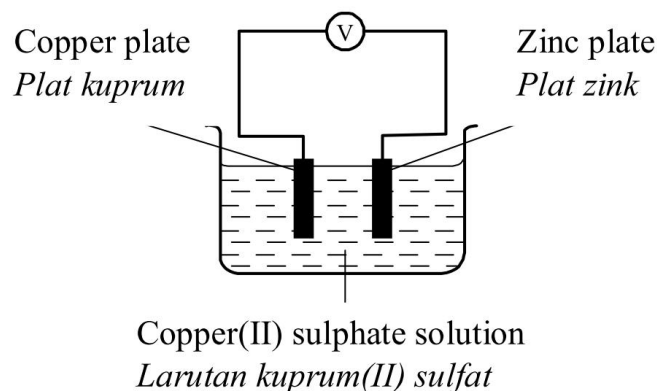


Diagram 30  
*Rajah 30*

Which substance undergoes oxidation in the chemical?  
*Bahan manakah mengalami pengoksidaan dalam sel kimia itu?*

- A** Zinc  
*Zink*
- B** Copper  
*Kuprum*
- C** Copper(II) ions  
*Ion kuprum(II)*
- D** Hydrogen ions  
*Ion hidrogen*
- 31 An acid is a compound that ionises in water to produce hydrogen ions,  $H^+$  or hydroxonium ions,  $H_3O^+$ .  
 Sulphuric acid is a diprotic acid because sulphuric acid molecule
- Asid ialah sebatian yang menghasilkan ion hidrogen,  $H^+$  atau ion hidroksonium,  $H_3O^+$  apabila melarut dalam air.*  
*Asid sulfurik ialah asid diprotik kerana molekul asid sulfurik*
- A** ionise partially in water.  
*mengion separa dalam air.*
- B** ionise completely in water.  
*mengion lengkap dalam air.*
- C** produce one hydrogen ion when dissolved in water.  
*menghasilkan satu ion hidrogen apabila dilarutkan dalam air.*
- D** produce two hydrogen ions when dissolved in water.  
*menghasilkan dua ion hidrogen apabila dilarutkan dalam air.*

- 32 Diagram 32 shows a camera.  
*Rajah 32 menunjukkan sejenis kamera.*

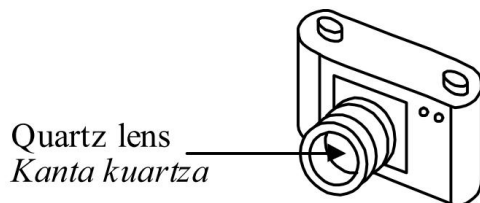


Diagram 32  
*Rajah 32*

What type of glass is used to make the quartz lens?  
*Apakah jenis kaca yang digunakan untuk membuat kanta kuarza?*

- A** Fused glass  
*Kaca silica tertakur*
- B** Soda lime glass  
*Kaca soda kapur*
- C** Borosilicate glass  
*Kaca borosilikat*
- D** Lead crystal glass  
*Kaca plumbum*
- 33 Element W has a proton number of 19 and nucleon number of 39. What is the position of element W in the Periodic Table of element?  
*Nombor proton unsur W ialah 19 dan nombor nukleon ialah 39. Apakah kedudukan unsur W dalam Jadual Berkala?*

	Group <i>Kumpulan</i>	Period <i>Kala</i>
<b>A</b>	1	4
<b>B</b>	2	3
<b>C</b>	17	5
<b>D</b>	18	6

- 34 An element X is located at Group 13 and Period 3 in the Periodic Table of Element. What is the electron arrangement of atom X?  
*Suatu unsur X berada dalam Kumpulan 13 dan kala 3 dalam Jadual Berkala Unsur. Apakah susunan elektron bagi atom X?*

- A. 2.5  
 B. 2.8.3  
 C. 2.8.5  
 D. 2.8.7

- 35 Diagram 35 shows the position of R, S, T and U elements in the Periodic Table of Elements.  
*Rajah 35 menunjukkan kedudukan unsur-unsur R, S, T dan U dalam Jadual Berkala Unsur*

R								U
				T				
		S						

Diagram 35  
 Rajah 35

- Which of the following forms an amphoteric oxide?  
*Antara berikut yang manakah membentuk oksida amfoterik?*

- A. R  
 B. S  
 C. T  
 D. U

- 36 What is the oxidation number of chlorine in the  $\text{ClO}^-$  ion,  $\text{ClO}_3^-$  ion and  $\text{CaCl}_2$ ?  
*Apakah nombor pengoksidaan bagi klorin dalam ion  $\text{ClO}^-$ , ion  $\text{ClO}_3^-$  dan  $\text{CaCl}_2$ ?*

	$\text{ClO}^-$	$\text{ClO}_3^-$	$\text{CaCl}_2$
A.	-1	+3	-2
B.	+1	+5	-1
C.	+1	+3	-1
D.	-1	+5	+1

37 Table 37 shows the property of elements J, K, L and M.

*Jadual 37 menunjukkan sifat bagi unsur J, K, L dan M.*

Element <i>Unsur</i>	Property <i>Sifat</i>
<b>J</b>	React with water to form an acidic solution <i>Bertindak balas dengan air menghasilkan larutan berasid</i>
<b>K</b>	React with water to liberate hydrogen gas <i>Bertindak balas dengan air membebaskan gas hidrogen</i>
<b>L</b>	React with acid to form carbon dioxide gas <i>Bertindak balas dengan asid menghasilkan gas karbon dioksida</i>
<b>M</b>	React with hot iron to form brown solid <i>Bertindak balas dengan ferum yang panas menghasilkan pepejal perang</i>

Table 37

*Jadual 37*

Which of the following elements is an alkali metal?

*Antara unsur-unsur berikut, yang manakah logam alkali?*

- A. J
- B. K
- C. L
- D. M

38 An ionic compound,  $M(OH)_2$ , has a relative formula mass of 98. Find the relative atomic mass of atom M.

[Relative atomic mass of O = 16 and H = 1]

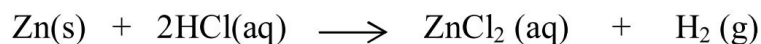
*Satu sebatian ionik,  $M(OH)_2$ , mempunyai jisim formula relatif 98. Cari jisim atom relatif untuk atom M.*

[*Jisim atom relatif bagi O = 16 dan H = 1*]

- A. 64
- B. 128
- C. 207
- D. 414

- 39 The chemical equation shows a reaction between zinc granule and dilute hydrochloric acid.

*Persamaan kimia menunjukkan tindak balas antara butiran zink dan asid hidroklorik cair*



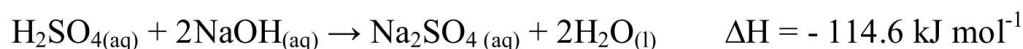
Which of the following would increase the rate of reaction for production hydrogen gas?

*Antara berikut, yang manakah dapat meningkatkan kadar tindak balas bagi penghasilan gas hidrogen?*

- I Increase the temperature of hydrochloric acid  
*Tingkatkan suhu asid hidroklorik*
  - II Decrease the concentration of hydrochloric acid  
*Kurangkan kepekatan asid hidroklorik*
  - III Use zinc powder to replace zinc granule  
*Gunakan serbuk zink bagi menggantikan butiran zink*
  - IV Add copper(II) sulphate solution in the reaction  
*Tambahkan larutan kuprum(II) sulfat kepada tindak balas itu*
- A. I and II  
*I dan II*
  - B. II and III  
*II dan III*
  - C. I, III and IV  
*I, III dan IV*
  - D. II, III and IV  
*II, III dan IV*

40. The thermochemical equation shows the reaction between 250 cm<sup>3</sup> of 1.0 mol dm<sup>-3</sup> sulphuric acid and 200 cm<sup>3</sup> of 2.0 mol dm<sup>-3</sup> sodium hydroxide solution.

*Persamaan termokimia menunjukkan tindak balas antara 250 cm<sup>3</sup> asid sulfurik 1.0 mol dm<sup>-3</sup> dengan 200 cm<sup>3</sup> larutan natrium hidoksida 2.0 mol dm<sup>-3</sup>.*



What is the heat change?

*Berapakah perubahan haba?*

- A. 18.65 kJ  
 B. 28.65 kJ  
 C. 38.65 kJ  
 D. 48.65 kJ
41. Table 41 shows the pH values of four solutions which have the same concentrations.  
*Jadual 41 menunjukkan nilai-nilai pH untuk empat larutan yang mempunyai kepekatan yang sama.*

Solution <i>Larutan</i>	P	Q	R	S
pH value <i>Nilai pH</i>	2	5	7	13

Table 41  
*Jadual 41*

Which of the following two solutions would produce a neutral solution when mixed?

*Antara dua larutan berikut, yang manakah akan menghasilkan satu larutan neutral apabila dicampurkan?*

- A. P and Q  
*P dan Q*  
 B. P and S  
*P dan S*  
 C. R and S  
*R dan S*  
 D. Q and R  
*Q dan R*

42. Diagram 42 shows the curve *P* obtained when 1.0 g of calcium carbonate chips reacted with excess hydrochloric acid at 50 °C.

*Rajah 42 menunjukkan lengkung P yang diperoleh apabila 1.0 g serpihan kalsium karbonat bertindak balas dengan asid hidroklorik berlebihan pada suhu 50 °C.*

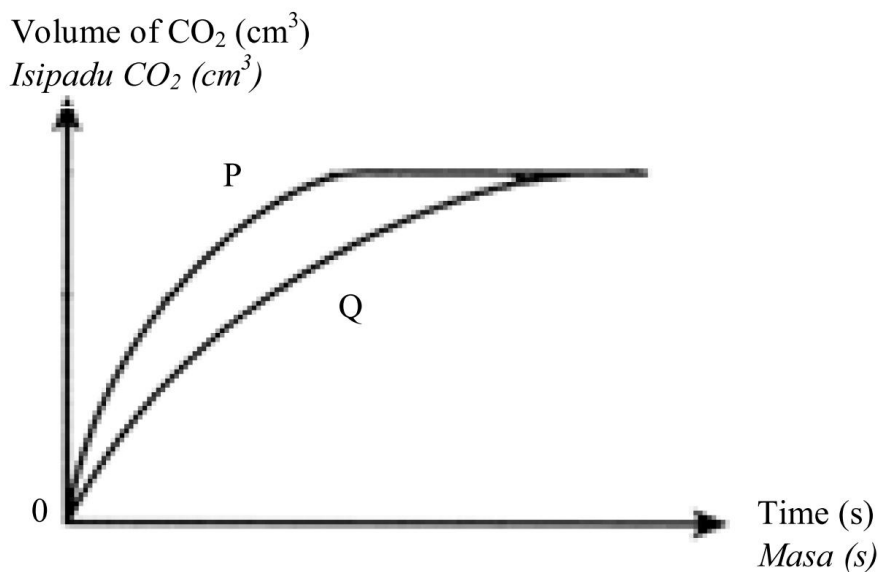


Diagram 42

*Rajah 42*

Which of the following would obtain curve Q?

*Antara yang berikut, yang manakah memperoleh lengkung Q?*

- A. Using 2.0 g of calcium carbonate powder.  
*Gunakan 2.0 g serbuk kalsium karbonat.*
- B. Increasing the temperature of hydrochloric acid to 60 °C.  
*Naikkan suhu asid hidroklorik kepada 60 °C.*
- C. Using 0.5 g of calcium carbonate chips.  
*Gunakan 0.5 g serpihan kalsium karbonat.*
- D. Adding distilled water to the hydrochloric acid.  
*Tambahkan air suling kepada asid hidroklorik.*



43. Diagram 43 shows heating process of P. When P is heated, the lime water remains unchanged.

*Rajah 43 menunjukkan proses pemanasan P. Apabila P dipanaskan, air kapur tidak berubah.*

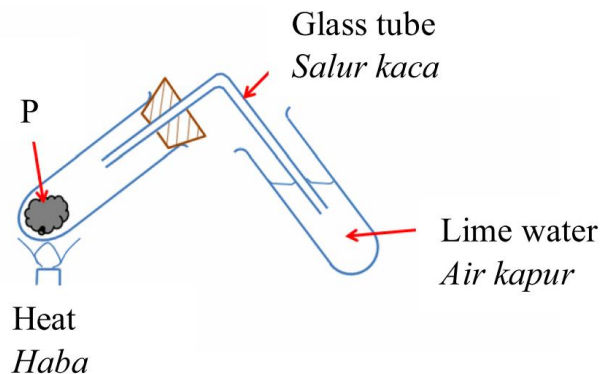


Diagram 43  
Rajah 43

Which of the following compounds is P?

*Antara sebatian berikut, yang manakah P?*

- A. Sodium carbonate  
*Natrium karbonat*
- B. Magnesium carbonate  
*Magnesium karbonat*
- C. Copper(II) carbonate  
*Kuprum karbonat*
- D. Lead(II) carbonate  
*Plumbum karbonat*
44. What is the mass of sodium chloride obtained when  $50.0 \text{ cm}^3$  of  $1.0 \text{ mol dm}^{-3}$  sodium hydroxide reacts with  $50.0 \text{ cm}^3$  of  $1.0 \text{ mol dm}^{-3}$  hydrochloric acid?  
[Relative atomic mass: Na= 23, Cl = 35.5]  
*Berapakah jisim natrium klorida yang diperolehi apabila  $50.0 \text{ cm}^3$  natrium hidroksida  $1.0 \text{ mol dm}^{-3}$  bertindak balas dengan  $50.0 \text{ cm}^3$  asid hidroklorik  $1.0 \text{ mol dm}^{-3}$ ?*  
[Jisim Atom Relatif: Na= 23, Cl = 35.5]
- A. 0.025 g
- B. 0.050 g
- C. 1.463 g
- D. 2.925 g

- 45 9.75 g of element X reacted with 63.5 g of element Y to form a compound with the formula  $XY_2$ . What is the relative atomic mass of element X?.

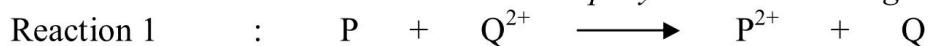
[Given that the relative atomic mass of Y=127]

*9.75 g unsur X bertindak balas dengan 63.5 g unsur Y untuk membentuk satu sebatian yang mempunyai formula  $XY_2$ . Berapakah jisim atom relatif unsur X?*

*[Diberi jisim atom relatif Y=127]*

- A 23
- B 39
- C 40
- D 88

- 46 The following equations represent the displacement reactions between metals P, Q and R.  
*Persamaan berikut mewakili tindak balas penyesaran antara logam P, Q and R.*



*Tindak balas 1*



*Tindak balas 2*

Which of the following statements is **true** about the reaction?

*Antara berikut pernyataan yang manakah **benar** tentang tindak balas itu?*

- A P and R are oxidized to  $P^{2+}$  and  $R^{2+}$   
*P dan R teroksida kepada  $P^{2+}$  and  $R^{2+}$*
- B P and R are oxidising agents  
*P dan R merupakan agen pengoksidaan*
- C The descending sequence of metals reactivity is R, Q, P  
*Susunan menurun kereaktifan logam ialah R, Q, P*
- D  $P^{2+}$  and  $Q^{2+}$  are reducing agents while  $R^{2+}$  is oxidising agent  
 *$P^{2+}$  dan  $Q^{2+}$  merupakan agen penurunan manakala  $R^{2+}$  merupakan agen pengoksidaan*

- 47 Diagram 47 shows the structural formula of pent-1-ene.  
*Rajah 47 menunjukkan formula struktur pent-1-ena.*

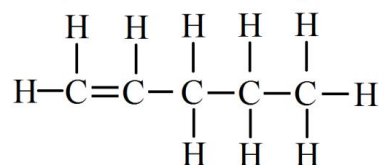


Diagram 47

*Rajah 47*

Which of the following is an isomer of pent-1-ene?

*Antara berikut, yang manakah merupakan isomer bagi pent-1-ena?*

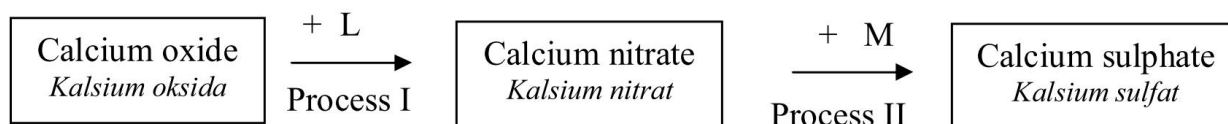
	<b>Structural formula</b> <i>Formula struktur</i>	<b>Name</b> <i>Nama</i>
A.	$  \begin{array}{ccccccc}  & \text{H} & \text{H} & \text{H} & \text{H} & \text{H} & \\  &   &   &   &   &   & \\  \text{H} & -\text{C} & -\text{C} & -\text{C} & =\text{C} & -\text{C} & -\text{H} \\  &   &   & & &   & \\  & \text{H} & \text{H} & & & \text{H} &   \end{array}  $	Pent-3-ene <i>Pent-3-ena</i>
B.	$  \begin{array}{ccccccc}  & & \text{H} & \text{H} & \text{H} & & \\  & &   &   &   & & \\  \text{H} & -\text{C} & =\text{C} & -\text{C} & -\text{C} & -\text{H} \\  &   & &   &   & & \\  \text{H} & -\text{C} & -\text{H} & \text{H} & \text{H} & & \\  &   & & & & & \\  & \text{H} & & & & &   \end{array}  $	1-methylbut-1-ene <i>1-metilbut-1-ena</i>
C.	$  \begin{array}{ccccccc}  & \text{H} & & \text{H} & \text{H} & & \\  &   & &   &   & & \\  \text{H} & -\text{C} & -\text{C} & =\text{C} & -\text{C} & -\text{H} \\  &   &   & &   & & \\  \text{H} & \text{H} & -\text{C} & -\text{H} & \text{H} & & \\  & &   & & & & \\  & & \text{H} & & & &   \end{array}  $	2-methylbut-2-ene <i>2-metilbut-2-ena</i>
D.	$  \begin{array}{ccccccc}  & & \text{H} & & & & \\  & &   & & & & \\  & & \text{H} & -\text{C} & -\text{H} & \text{H} & \\  & & &   & &   & \\  \text{H} & -\text{C} & =\text{C} & -\text{C} & -\text{H} \\  &   & &   & & & \\  & \text{H} & & \text{H} & -\text{C} & -\text{H} \\  & & & &   & & \\  & & & & \text{H} & &   \end{array}  $	2,3-dimethylprop-1-ene <i>2,3-dimetilprop-1-ena</i>

48 Diagram 48 shows two processes to prepare calcium sulphate salt .

L and M are two substances needed in these processes.

*Rajah 48 menunjukkan dua proses penyediaan garam kalsium sulfat.*

*L dan M adalah dua bahan yang diperlukan dalam proses tersebut.*



<b>Steps in Process II</b> <i>Langkah-langkah dalam Proses II</i>	<b>Description</b> <i>Keterangan</i>
S1	Filter the mixture <i>Turaskan campuran</i>
S2	Mix the substances <i>Campurkan kedua-dua bahan</i>
S3	Rinse the residue with distilled water <i>Bilas baki turasan dengan air suling</i>
S4	Dry the salt <i>Keringkan garam tersebut</i>

Diagram 48

*Rajah 48*

What are substances L and M and the correct arrangement for the steps involved in Process II?

*Apakah bahan-bahan L dan M serta susunan yang betul bagi langkah-langkah yang terlibat dalam Proses II?*

	<b>L</b>	<b>M</b>	<b>Steps</b> <i>Langkah - langkah</i>
A	Sodium sulphate <i>Natrium sulfat</i>	Nitric acid <i>Asid nitrik</i>	S1, S2, S3 and S4
B	Nitric acid <i>Asid nitrik</i>	Sodium sulphate <i>Natrium sulfat</i>	S2, S1, S3 and S4
C	Sodium nitrate <i>Natrium nitrat</i>	Sulphuric acid <i>Asid sulfurik</i>	S2, S1, S3 and S4
D	Sulphuric acid <i>Asid sulfurik</i>	Barium sulphate <i>Barium sulfat</i>	S1, S3, S4 and S2

- 49 Diagram 49 shows the apparatus set-up to investigate the reaction between calcium carbonate and hydrogen chloride gas dissolved in two different solvent.

*Rajah 49 menunjukkan susunan radas untuk mengkaji tindak balas di antara kalsium karbonat dengan gas hidrogen klorida yang terlarut di dalam dua pelarut berbeza.*

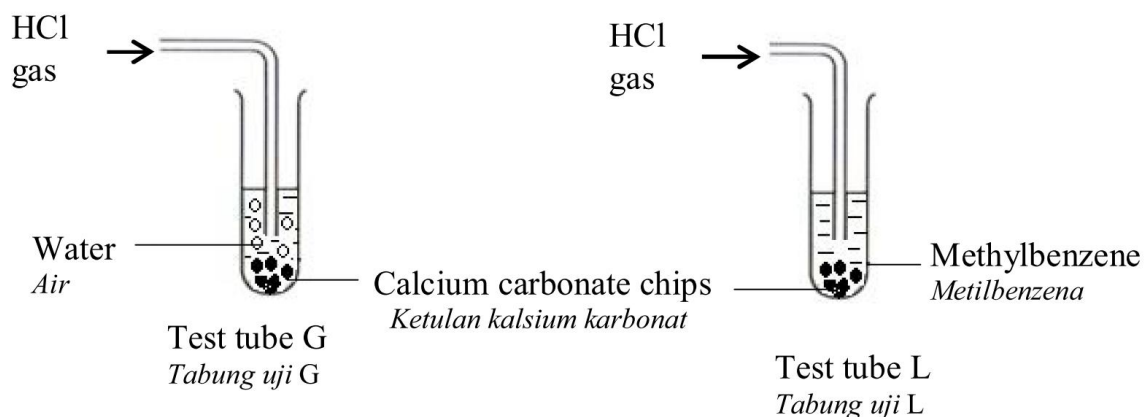


Diagram 49  
*Rajah 49*

Which of the following statements is correct about the reaction in the test tubes?

*Manakah antara pernyataan berikut adalah benar tentang tindak balas dalam tabung uji itu?*

- A Water remains as molecules in test tube G.  
*Air kekal sebagai molekul di dalam tabung uji G.*
- B Hydrogen chloride gas produces hydrogen ions in test tube G.  
*Gas hidrogen klorida menghasilkan ion hidrogen dalam tabung uji G.*
- C Calcium carbonate in test tube L dissolves.  
*Kalsium karbonat dalam tabung uji L melarut.*
- D Hydrogen chloride gas ionizes partially in test tube L  
*Gas hidrogen klorida mengion separa dalam tabung uji L*

- 50 Diagram 50 shows the apparatus set-up of a simple voltaic cell.  
*Rajah 50 menunjukkan susunan radas bagi satu sel kimia ringkas.*

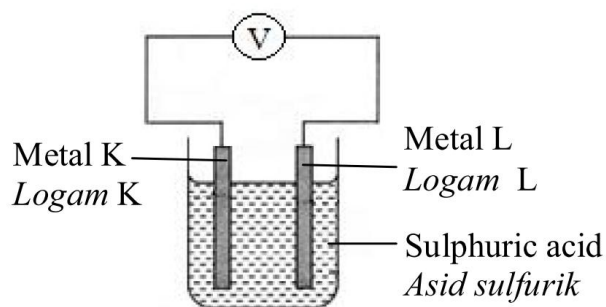


Diagram 50  
*Rajah 50*

Which metals could be used as K and L to produce the highest voltmeter reading?

*Logam manakah yang boleh digunakan sebagai K dan L untuk menghasilkan bacaan voltmeter tertinggi?*

- I Zinc  
*Zink*
  - II Iron  
*Ferum*
  - III Copper  
*Kuprum*
  - IV Aluminium  
*Aluminium*
- 
- 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*

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