



**PROGRAM GEMPUR KECEMERLANGAN  
SIJIL PELAJARAN MALAYSIA 2017  
ANJURAN BERSAMA  
MAJLIS PENGETUA SEKOLAH MALAYSIA  
NEGERI PERLIS  
DAN  
MAJLIS GURU CEMERLANG NEGERI PERLIS**



**SIJIL PELAJARAN MALAYSIA 2017**

**4541/1**

**KIMIA**

**Kertas 1**

**Ogos**

**1 ¼ jam**

**Satu jam lima belas minit**

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**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.*

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Kertas soalan ini mengandungi 24 halaman bercetak.

- 1 Which reaction has the highest rate of reaction?  
*Tindak balas manakah mempunyai kadar tindak balas yang paling tinggi?*
- A Rusting  
*Pengaratan*
  - B Respiration  
*Respirasi*
  - C Combustion  
*Pembakaran*
  - D Fermentation  
*Penapaian*
- 2 Covalent bond between atoms P and Q is formed when  
*Ikatan kovalen antara atom P dan Q terbentuk apabila*
- A Atom P receives electron from atom Q  
*Atom P menerima elektron dari atom Q*
  - B Atom Q receives electron from atom P  
*Atom Q menerima elektron daripada atom P*
  - C Atom P donates electron to atom Q  
*Atom P menderma elektron kepada atom Q*
  - D Atom P and Q mutually share valence electron  
*Atom P dan atom Q berkongsi elektron valens*
- 3 Which of the following salts is prepared in a laboratory by a titration method?  
*Antara berikut, garam manakah disediakan di dalam makmal melalui kaedah titratan?*
- A Sodium sulphate  
*Natrium sulfat*
  - B Copper(II) nitrate  
*Kuprum(II) nitrat*
  - C Lead(II) chloride  
*Plumbum(II) klorida*
  - D Magnesium nitrate  
*Magnesium nitrat*

- 4 The following information is about the effect of magnesium towards the rusting of iron.  
*Maklumat berikut adalah tentang kesan magnesium terhadap pengurangan ferum.*

Magnesium that is in contact with iron will protect iron from rusting

*Magnesium yang bersentuhan dengan ferum akan melindungi ferum daripada berkarat*

Which of the following is the explanation for the statement?

*Antara berikut, yang manakah merupakan penerangan bagi pernyataan itu?*

- A Magnesium is softer than iron  
*Magnesium lebih lembut daripada ferum*
- B Magnesium is a good heat conductor  
*Magnesium adalah konduktor haba yang baik*
- C Magnesium has a lower melting point  
*Magnesium mempunyai takat lebur yang lebih rendah*
- D Magnesium has more tendency to release electrons  
*Magnesium lebih cenderung untuk membebaskan elektron*
- 5 Diagram 1 shows the electron arrangement of an atom Q.  
*Rajah 1 menunjukkan susunan elektron bagi suatu atom Q.*

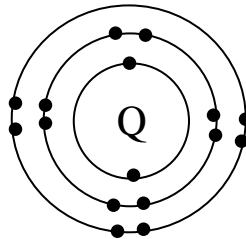


Diagram 1  
*Rajah 1*

What is the valence electron for atom Q?  
*Berapakah elektron valens bagi atom Q?*

- A 4
- B 5
- C 6
- D 7

- 6 A patient is diagnosed of having thyroid cancer.  
Which isotope is used to treat the patient?  
*Seorang pesakit didiagnosiskan mempunyai kanser tiroid.  
Isotop manakah yang digunakan untuk merawat pesakit itu?*
- A Carbon-14  
*Karbon-14*
  - B Sodium-24  
*Natrium-24*
  - C Phosphorus-32  
*Fosforus-32*
  - D Iodine-131  
*Iodin-131*
- 7 Which of the following is the compositions of brass?  
*Antara berikut, yang manakah komposisi yang terdapat dalam loyang?*
- 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*
- 8 Which substance is commonly used to manufacture paint and detergents?  
*Bahan manakah yang lazim digunakan untuk membuat cat dan detergent?*
- A Ethanoic acid  
*Asid etanoik*
  - B Sulphuric acid  
*Asid sulfurik*
  - C Sodium sulphate  
*Natrium sulfat*
  - D Magnesium sulphate  
*Magnesium sulfat*

- 9 Element X has a relative atomic mass of 39 and 20 neutrons. Element Y has the same chemical properties as element X. What is the proton number of element Y?

*Unsur X mempunyai jisim atom relatif 39 dan 20 neutron.*

*Unsur Y mempunyai sifat kimia yang sama dengan unsur X.*

*Berapakah nombor proton bagi unsur Y?*

- A 11
- B 12
- C 19
- D 20

- 10 Compound Q has the following properties. Sebatiian Q mempunyai sifat-sifat berikut.

- Organic compound  
*Sebatiian organik*
- Soluble in water  
*Larut dalam air*
- Has a boiling point of 78°C  
*Mempunyai takat didih 78°C*

What is compound Q?

*Apakah sebatiian Q?*

- A Ethane  
*Etana*
  - B Ethene  
*Etena*
  - C Ethanol  
*Etanol*
  - D Ethanoic acid  
*Asid etanoik*
- 11 Which of the following compound contains element with an oxidation number of +6?  
*Sebatiian yang manakah mengandungi unsur dengan nombor pengoksidaan +6?*
- A SO<sub>2</sub>
  - B NH<sub>3</sub>
  - C KMnO<sub>4</sub>
  - D K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub>

12 Diagram 2 shows the apparatus set-up to investigate a redox reaction.

*Rajah 2 menunjukkan susunan radas untuk mengkaji satu tindak balas redoks.*

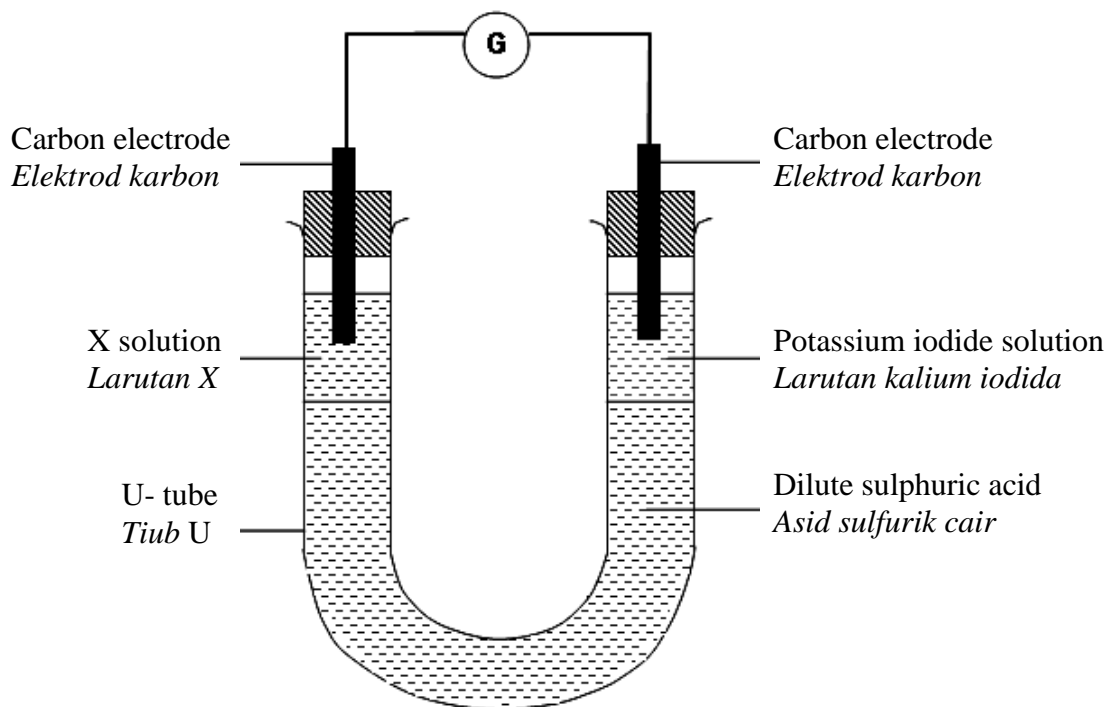


Diagram 2  
*Rajah 2*

The colourless solution of potassium iodide becomes brown solution  
*Larutan tanpa warna kalium iodida menjadi larutan perang.*

Which of the following is the X solution?

*Antara berikut, yang manakah merupakan larutan X?*

- A Chlorine water  
*Air klorin*
- B Iron(II) sulphate  
*Ferum(II) sulfat*
- C Hydrogen sulphide  
*Hidrogen sulfida*
- D Sodium chloride  
*Natrium klorida*

- 13 Diagram 3 shows the standard representation for aluminium atom.  
*Rajah 3 menunjukkan perwakilan piawai bagi atom aluminium.*

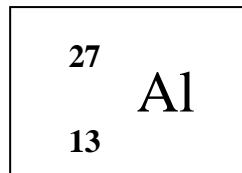


Diagram 3  
*Rajah 3*

- What is the electron arrangement of aluminium atom?  
*Apakah susunan elektron bagi atom aluminium?*
- A 2.8.7  
B 2.8.4  
C 2.8.3  
D 2.8.1
- 14 Which of the following substances is alkaline?  
*Antara bahan berikut, yang manakah bersifat alkali?*
- A Chlorine  
*Klorin*  
B Ammonia  
*Ammonia*  
C Carbon dioxide  
*Karbon dioksida*  
D Hydrogen chloride  
*Hidrogen klorida*
- 15 Which of the following best describes why heat of displacement determined in the laboratory is less than the theoretical value?  
*Antara berikut, yang manakah paling tepat menerangkan mengapa haba penyesaran yang ditentukan di dalam makmal adalah kurang daripada nilai teori?*
- A Heat is loss to surrounding.  
*Haba dibebaskan ke persekitaran.*  
B Some heat is absorbed by the thermometer.  
*Sebahagian haba diserap oleh termometer.*  
C Chemicals that are used contain impurities.  
*Bahan kimia yang digunakan mengandungi bendasing.*  
D Chemicals react with oxygen in the surrounding.  
*Bahan kimia bertindakbalas dengan oksigen di persekitaran*

- 16 Table 1 shows information about five elements.  
*Jadual 1 menunjukkan maklumat tentang lima unsur.*

Element <i>Unsur</i>	J	K	L	M	N
Electron arrangement <i>Susunan elektron</i>	2.4	2.8.1	2.8.3	2.8.6	2.8.7

Table 1  
*Jadual 1*

Each element in the Table 1 can react each other.  
Which of the following formula is covalent compound?  
*Setiap unsur dalam Jadual 1 boleh bertindak balas antara satu sama lain.  
Antara formula yang berikut, yang manakah sebatian kovalen?*

- A  $\text{JM}_2$
- B  $\text{J}_4\text{N}$
- C  $\text{LN}_3$
- D  $\text{KN}$
- 17 Which of the following ions will produce white precipitate that is insoluble in excess aqueous sodium hydroxide solution?  
*Antara ion berikut, yang manakah akan menghasilkan mendakan putih yang tidak larut dalam larutan akueus natrium hidroksida berlebihan?*
- A Magnesium ion,  $\text{Mg}^{2+}$   
*Ion magnesium,  $\text{Mg}^{2+}$*
- B Lead(II) ion,  $\text{Pb}^{2+}$   
*Ion plumbum(II),  $\text{Pb}^{2+}$*
- C Iron(II) ion,  $\text{Fe}^{2+}$   
*Ion ferum(II),  $\text{Fe}^{2+}$*
- D Zinc ion,  $\text{Zn}^{2+}$   
*Ion zink,  $\text{Zn}^{2+}$*



- 18** Which of the following is proposed by Dobereiner about the classification of elements in the development of Periodic Table of Elements?  
*Antara yang berikut, yang manakah pendapat Dobereiner tentang pengelasan unsur dalam perkembangan Jadual Berkala Unsur?*
- A** Elements are classified to groups of gases, metals, non-metals and metal oxides.  
*Unsur dikelas kepada kumpulan berdasarkan gas, logam, bukan logam dan oksida logam.*
- B** Elements are classified to groups of three elements which have the similar chemical properties.  
*Unsur dikelaskan kepada kumpulan yang terdiri daripada tiga unsur yang mempunyai sifat kimia yang serupa.*
- C** Elements are arranged in the increasing order of atomic mass and each of the eighth element in the series has the similar chemical properties as the first element.  
*Unsur disusun mengikut tertib penambahan jisim atom dan setiap unsur kelapan dalam siri itu mempunyai sifat kimia yang serupa dengan unsur pertama.*
- D** Elements are arranged in the increasing order of proton number and elements in a group have the similar chemical properties.  
*Unsur disusun mengikut tertib penambahan nombor proton dan unsur dalam satu kumpulan mempunyai sifat kimia yang serupa.*
- 19** Acid X of concentration  $1.0 \text{ mol dm}^{-3}$  has a pH of 4.  
Which statement is correct about acid X?  
*Asid X dengan kepekatan  $1.0 \text{ mol dm}^{-3}$  mempunyai pH 4.  
Pernyataan yang manakah betul tentang asid X?*
- A** Slightly soluble in water.  
*Larut sedikit dalam air.*
- B** React only with a strong alkali.  
*Hanya bertindak balas dengan alkali kuat.*
- C** The degree of ionisation in water is low.  
*Darjah pengionan dalam air adalah rendah.*
- D** Has high concentration of hydrogen ions.  
*Mempunyai kepekatan ion hidrogen yang tinggi.*

- 20 Diagram 4 shows the elements represented by alphabet J, K, L and M in the Periodic Table of Elements.

J, K, L and M are not the actual symbols of the elements.

*Rajah 4 menunjukkan unsur-unsur yang diwakili oleh huruf J, K, L dan M dalam Jadual Berkala Unsur.*

*J, K, L dan M bukan simbol sebenar unsur.*

		Group Kumpulan																	
		1	2											13	14	15	16	17	18
Period Kala	1																		
	2	J															K		
	3																L	M	
	4																		

Diagram 4

*Rajah 4*

Which of the following is correct about elements J, K, L and M?

*Antara yang berikut, yang manakah betul tentang unsur-unsur J, K, L dan M?*

- I Proton number increases in the order of J, K, L, M.  
*Nombor proton bertambah dalam tertib J, K, L, M.*
- II Electronegativity decreases in the order of K, L, J.  
*Keelektronegatifan berkurang dalam tertib K, L, J.*
- III J and K combine to form a compound with the formula of JK<sub>2</sub>.  
*J dan K berpadu membentuk sebatian berformula JK<sub>2</sub>.*
- IV Charge of J ion and K ion is +2 while L ion and M ion is +3.  
*Cas bagi ion J dan ion K ialah +2 manakala ion L dan ion M ialah +3.*
- 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*

- 21 Which statement is correct about hexane and hexene?  
*Pernyataan yang manakah betul tentang heksana dan heksena?*
- A Hexane dissolved in water but hexene does not  
*Heksana terlarut dalam air tetapi heksena tidak terlarut dalam air*
- B Hexane reacts with bromine water but hexene does not  
*Heksana bertindak balas dengan air bromin tetapi heksena tidak bertindak balas dengan air bromin*
- C Hexane produces more soot when it burns but hexene does not  
*Heksana menghasilkan banyak jelaga apabila dibakar tetapi heksena tidak menghasilkan banyak jelaga apabila dibakar*
- D Hexene decolourised the purple colour of acidified potassium manganate(VII) solution but hexane does not  
*Heksena menyahwarnakan warna ungu larutan kalium manganat(VII) berasid tetapi heksana tidak menyahwarnakan warna ungu larutan kalium manganat(VII) berasid*
- 22 Table 2 shows the number of protons, neutrons and electrons for particles R and S.  
*Jadual 2 menunjukkan bilangan proton, neutron dan elektron bagi zarah R dan S*

Particle <i>Zarah</i>	Number of protons <i>Bilangan proton</i>	Number of neutrons <i>Bilangan neutron</i>	Number of electrons <i>Bilangan elektron</i>
R	12	12	12
S	19	20	18

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Table 2  
*Jadual 2*

Which of the following is correct about particles R and S ?  
*Antara berikut yang manakah adalah betul mengenai zarah R dan S ?*

- A The mass of one atom of S is 37  
*Jisim satu atom S ialah 37*
- B The nucleon number of atom R is 24  
*Nombor nukleon atom R ialah 24*
- C The valence electrons of atom R is 2 and the valence electron of atom S is 8  
*Elektron valens atom R ialah 2 manakala elektron valens atom S ialah 8*
- D The electron arrangement of atom R is 2.8.2 and atom S is 2.8.8  
*Susunan elektron atom R ialah 2.8.2 manakala atom S ialah 2.8.8*

- 23 The following thermochemical equation shows a reaction between copper(II) oxide and hydrogen gas.

*Persamaan termokimia berikut menunjukkan satu tindak balas antara kuprum(II) oksida dan gas hidrogen.*



Based on the equation, which statement is correct?

*Berdasarkan persamaan itu, pernyataan yang manakah betul?*

- A The reaction is endothermic  
*Tindak balas adalah endotermik*
- B The activation energy is  $130.5 \text{ kJ mol}^{-1}$   
*Tenaga pengaktifan ialah  $130.5 \text{ kJ mol}^{-1}$*
- C The temperature of the mixture increase  
*Suhu campuran meningkat*
- D The total energy of the reactants is higher than the products  
*Jumlah tenaga bahan tindak balas adalah lebih tinggi daripada hasil tindak balas.*
- 24 When the temperature of a reacting mixture increase, the rate of reaction increases. Which statement explains why the rate of reaction increases?  
*Apabila suhu campuran bahan tindak balas meningkat, kadar tindak balas meningkat. Pernyataan yang manakah menerangkan mengapa kadar tindak balas meningkat?*
- A The number of effective collisions increases.  
*Bilangan perlanggaran berkesan meningkat.*
- B The total surface area of the reactant particles increases.  
*Jumlah luas permukaan zarah-zarah bahan tindak balas bertambah.*
- C The total number of reactant particles per unit volume increases.  
*Jumlah bilangan zarah-zarah bahan tindak balas per unit isi padu bertambah*
- D The reactant particles which collide more often are able to overcome the lower activation energy.  
*Zarah-zarah bahan tindak balas yang berlanggar lebih kerap boleh mengatasi tenaga pengaktifan yang lebih rendah.*

- 25 Diagram 5 shows the structural formula of a substance.  
*Rajah 5 menunjukkan formula struktur bagi suatu bahan.*

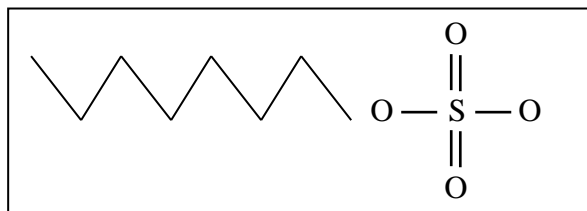


Diagram 5  
*Rajah 5*

What is the substance?  
*Apakah bahan itu?*

- A** Soap  
*Sabun*
- B** Detergent  
*Detergen*
- C** Sulphuric acid  
*Asid sulfurik*
- D** Ammonium sulphate  
*Ammonium sulfat*
- 26 Diagram 6 shows the electron arrangement of atom Q and atom R.  
*Rajah 6 menunjukkan susunan elektron bagi atom Q dan atom R.*

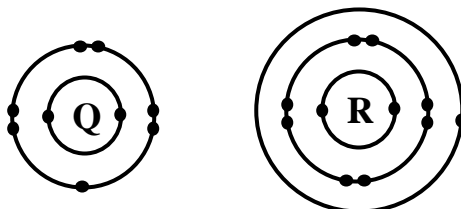
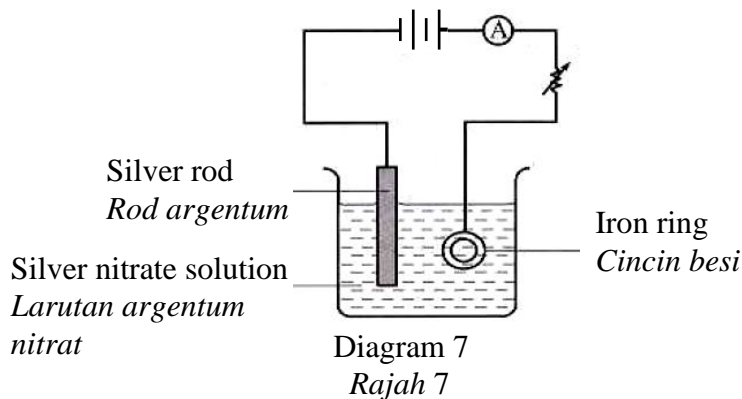


Diagram 6  
*Rajah 6*

Which of the following is same between ion Q and ion R?  
*Antara berikut, yang manakah sama antara ion Q dan ion R?*

- A** Nucleon number  
*Nombor nukleon*
- B** Number of proton  
*Bilangan proton*
- C** Number of electron  
*Bilangan elektron*
- D** Number of neutron  
*Bilangan neutron*

- 27 Diagram 7 shows the set up of apparatus to plate an iron ring with silver.  
*Rajah 7 menunjukkan susunan radas untuk menyadur cincin besi dengan argentum.*



After 30 minutes it was found that no plating took place on the iron ring.  
 What should be done?

*Selepas 30 minit didapati tiada penyaduran berlaku pada cincin besi.  
 Apakah yang perlu dilakukan?*

- A** Use a bigger silver rod  
*Menggunakan rod argentum yang lebih besar*
- B** Rub the iron ring with sand paper  
*Menggosok cincin besi dengan kertas pasir*
- C** Interchange the terminals in the cell  
*Saling tukar terminal pada sel*
- D** Increase the concentration of the silver nitrate solution  
*Tambah kepekatan larutan argentum nitrat*
- 28 Manufacture of sulfuric acid involves several series of chemical reactions.  
 Which of the following chemical reaction using a catalyst?  
*Pembuatan asid sulfurik melibatkan beberapa siri tindak balas kimia.  
 Antara tindak balas kimia berikut, yang manakah menggunakan mangkin?*
- A**  $S + O_2 \rightarrow SO_2$
- B**  $2SO_2 + O_2 \rightarrow 2SO_3$
- C**  $SO_3 + H_2SO_4 \rightarrow H_2S_2O_7$
- D**  $H_2S_2O_7 + H_2O \rightarrow 2H_2SO_4$

- 29 Table 3 shows the proton numbers for elements Q, R, T, X and Z. Q, R, T, X and Z are not the actual symbols of the elements.

*Jadual 3 menunjukkan nombor proton bagi unsur Q, R, T, X dan Z. Q, R, T, X dan Z bukan simbol sebenar unsur.*

Element <i>Unsur</i>	Q	R	T	X	Z
Proton number <i>Nombor proton</i>	11	13	15	16	18

Table 3

*Jadual 3*

Which statement is correct about these elements?

*Pernyataan yang manakah betul mengenai unsur-unsur ini?*

- A Element T forms a basic oxide.  
*Unsur T membentuk oksida bes.*
- B Element Z is a good electrical conductor.  
*Unsur Z adalah konduktor elektrik yang baik.*
- C Atomic size increases in the order of Q, R, T, X, Z.  
*Saiz atom yang semakin bertambah mengikut tertib Q, R, T, X, Z.*
- D Element R combines with element X to form an ionic compound.  
*Unsur R berpadu dengan unsur X untuk membentuk sebatian ion.*
- 30 Table 4 shows information about three chemical cells.  
*Jadual 4 menunjukkan maklumat tentang tiga sel kimia.*

Chemical cell <i>Sel kimia</i>	Pair of electrodes <i>Pasangan elektrod</i>	Voltage (V) <i>Voltan (V)</i>	Positive terminal <i>Terminal positif</i>
I	D and E <i>D and E</i>	0.7	E
II	D and F <i>D dan F</i>	1.3	F
III	E and G <i>E dan G</i>	1.5	G

Table 4

*Jadual 4*

What is the potential difference of a chemical cell which uses F and G as electrodes?

*Berapakah beza keupayaan sel kimia yang menggunakan F dan G sebagai elektrod?*

- A 0.2 V
- B 0.9 V
- C 2.0 V
- D 2.2 V

- 31 Diagram 8 shows a simple chemical cell built using a lime. Two different metals are used as electrodes.

*Rajah 8 menunjukkan sel kimia ringkas yang dibina menggunakan buah limau. Dua logam berlainan digunakan sebagai elektrod.*

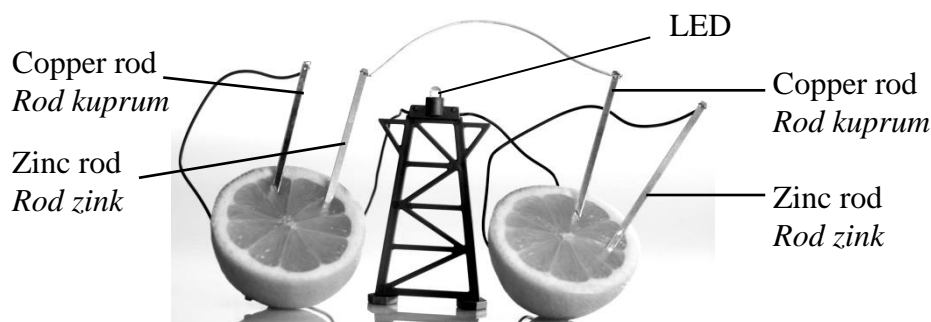
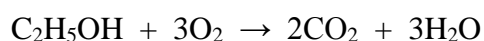


Diagram 8  
*Rajah 8*

Which metal can be used to replace the zinc rod to get the LED flame lighter?

*Logam yang manakah boleh menggantikan rod zink untuk mendapatkan nyalaan LED yang lebih terang?*

- A Iron  
*Besi*
  - B Tin  
*Stanium*
  - C Magnesium  
*Magnesium*
  - D Aluminium  
*Aluminium*
- 32 The following equation shows the complete combustion of ethanol in excess oxygen.



What is the volume of oxygen gas needed for 0.5 mol of ethanol to burn completely?

*Berapakah isi padu gas oksigen yang diperlukan bagi 0.5 mol etanol terbakar dengan lengkap?*

[Molar volume :  $24 \text{ dm}^3 \text{ mol}^{-1}$  at room conditions]

[*Isi padu molar :  $24 \text{ dm}^3 \text{ mol}^{-1}$  pada keadaan bilik* ]

- A  $18 \text{ dm}^3$
- B  $24 \text{ dm}^3$
- C  $36 \text{ dm}^3$
- D  $72 \text{ dm}^3$



- 33 Diagram 9 shows the standard representation for atom T.  
Rajah 9 menunjukkan perwakilan piawai bagi atom T.

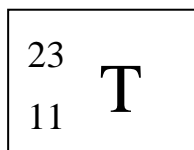


Diagram 9  
Rajah 9

Which of the following is correct?  
Antara berikut, yang manakah betul?

	<b>Proton number</b> <i>Nombor proton</i>	<b>Nucleon number</b> <i>Nombor nukleon</i>	<b>Number of electrons</b> <i>Bilangan elektron</i>
<b>A</b>	11	23	11
<b>B</b>	11	12	11
<b>C</b>	12	23	12
<b>D</b>	23	11	23

- 34 Which characteristic of ammonia enables to show alkaline properties in water?  
Ciri ammonia yang manakah membolehkannya menunjukkan sifat kealkaliannya dalam air?
- A** Ionises partially in water to produce hydroxide ions.  
*Mengion separa dalam air menghasilkan ion hidroksida.*
- B** Contains hydrogen in its molecule.  
*Mengandungi hidrogen dalam molekulnya*
- C** Exist as gas at room temperature.  
*Wujud dalam keadaan gas pada suhu bilik.*
- D** Dissolves partially in water.  
*Larut separa dalam air.*

- 35 An ionic compound has a formula of  $E_2T_3$ .  
What is the number of ion T in 10.2 g of the compound?  
[Relative atomic mass: E = 27; T = 16. Avogadro's constant =  $6 \times 10^{23} \text{ mol}^{-1}$ ]  
*Satu sebatian ion mempunyai formula  $E_2T_3$ .  
Berapakah bilangan ion T yang terdapat dalam 10.2 g sebatian itu?  
[Jisim atom relatif: E = 27; T = 16. Pemalar Avogadro =  $6 \times 10^{23} \text{ mol}^{-1}$ ]*

- A**  $0.1 \times \frac{3}{5} \times 6 \times 10^{23}$
- B**  $0.1 \times 1 \times 6 \times 10^{23}$
- C**  $0.1 \times \frac{3}{2} \times 6 \times 10^{23}$
- D**  $0.1 \times 3 \times 6 \times 10^{23}$

- 36 Which of the following acts as an oxidizing agent?  
*Antara berikut, yang manakah merupakan agen pengoksidaan?*
- I Zinc metal  
*Logam zink*
  - II Bromine water  
*Air bromin*
  - III Hydrogen peroxide  
*Hidrogen peroksida*
  - IV Hydrogen sulphide gas  
*Gas hidrogen sulfida*
- A I and II  
*I dan II*
  - B II and III  
*II dan III*
  - C I and IV  
*I dan IV*
  - D III and IV  
*III dan IV*
- 37 Which of the following is a property of potassium fluoride?  
*Antara yang berikut, yang manakah sifat bagi kalium florida?*
- A Volatile  
*Mudah meruap*
  - B Insoluble in water  
*Tidak larut dalam air*
  - C Has a low melting point  
*Mempunyai takat lebur rendah*
  - D Conducts electricity in the molten state  
*Mengalirkan arus elektrik dalam keadaan lebur*
- 38 10 g magnesium carbonate,  $\text{MgCO}_3$  powder is reacted with  $100 \text{ cm}^3$  of  $1 \text{ mol dm}^{-3}$  sulphuric acid,  $\text{H}_2\text{SO}_4$ .  
What is the mass of magnesium carbonate that is not reacted?  
[Relative atomic mass: C = 12; O = 16; Mg = 24]  
10 g *serbuk magnesium karbonat*,  $\text{MgCO}_3$  ditindakbalaskan dengan  $100 \text{ cm}^3$  *asid sulfurik*,  $\text{H}_2\text{SO}_4$   $1 \text{ mol dm}^{-3}$ .  
*Berapakah jisim magnesium karbonat yang tidak bertindak balas?*  
[*Jisim atom relatif*: C = 12; O = 16; Mg = 24]
- A 0.84 g
  - B 1.60 g
  - C 8.40 g
  - D 9.16 g

- 39** Which of the following has the same number of atoms as one mol of chlorine gas?  
*Antara yang berikut, yang manakah mempunyai bilangan atom yang sama dengan satu mol gas klorin?*
- A** 1 mol of argon gas  
*1 mol gas argon*
  - B** 1 mol of magnesium  
*1 mol magnesium*
  - C** 1 mol of sulphur dioxide gas  
*1 mol gas sulfur dioksida*
  - D** 1 mol of carbon monoxide gas  
*1 mol gas karbon monoksida*
- 40** The joint of a student's leg is swollen and painful.  
What medicine is suitable to be given to the student?  
*Sendi kaki seorang murid bengkak dan berasa sakit.*  
*Apakah ubat yang sesuai diberikan kepada murid itu?*
- A** Codein  
*Kodeina*
  - B** Penicilin  
*penisillin*
  - C** Paracetamol  
*Parasetamol*
  - D** Barbiturate  
*Barbiturat*
- 41** 0.25 mol of T combine with 12 g of oxygen to form T oxide.  
What is the empirical formula of T oxide?  
[Relative atomic mass: O = 16]  
*0.25 mol T berpadu dengan 12 g oksigen membentuk oksida T.*  
*Apakah formula empirik bagi oksida T itu?*  
[Jisim atom relatif: O = 16]
- A**  $\text{TO}_3$
  - B**  $\text{T}_2\text{O}_3$
  - C**  $\text{T}_3\text{O}$
  - D**  $\text{T}_3\text{O}_2$

- 42 Diagram 10 shows a syringe with  $m$  g of carbon dioxide gas at room conditions.  
*Rajah 10 menunjukkan satu picagari yang mengandungi  $m$  g gas karbon dioksida pada keadaan bilik.*

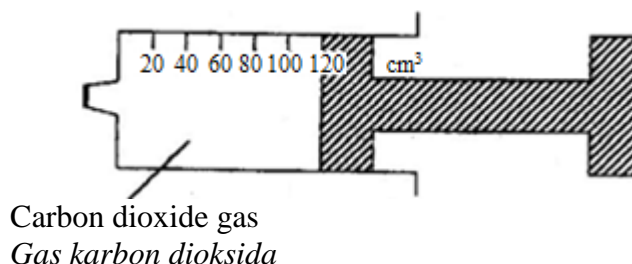


Diagram 10  
*Rajah 10*

What is the value of  $m$ ?

[Relative atomic mass: C = 12; O = 16. Molar volume of gas =  $24 \text{ dm}^3 \text{ mol}^{-1}$  at room conditions]

*Berapakah nilai  $m$ ?*

[*Jisim atom relatif: C = 12; O = 16. Isi padu molar gas =  $24 \text{ dm}^3 \text{ mol}^{-1}$  pada keadaan bilik*]

- A 0.14  
 B 0.22  
 C 0.30  
 D 0.44
- 43 Table 5 shows the pH values of four alkaline solutions which have the same concentration.  
*Jadual 5 menunjukkan nilai pH bagi empat larutan alkali yang mempunyai kepekatan yang sama.*

Solution <i>Larutan</i>	pH value <i>Nilai pH</i>
K	10.0
L	11.0
M	12.0
N	13.0

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Table 5  
*Jadual 5*

Which alkaline solution has the highest degree of dissociation?

*Larutan alkali manakah mempunyai darjah penceraian yang paling tinggi?*

- A K  
 B L  
 C M  
 D N

- 44 Diagram 11 shows the process of producing compound M.  
Rajah 11 menunjukkan proses penghasilan sebatian M.

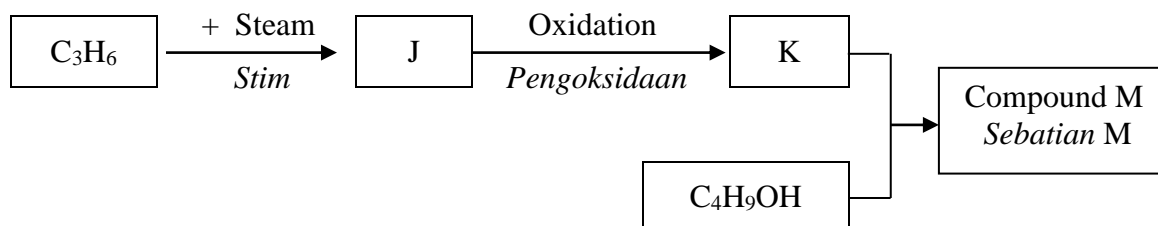


Diagram 11  
Rajah 11

Which of the following is the structural formula for compound M?  
Antara berikut, yang manakah formula struktur bagi sebatian M?

- A  $\text{CH}_3 - \overset{\text{O}}{\parallel}{\text{C}} - \text{O} - \text{CH}_2 - \text{CH}_2 - \text{CH}_2 - \text{CH}_3$
- B  $\text{CH}_3 - \text{CH}_2 - \overset{\text{O}}{\parallel}{\text{C}} - \text{O} - \text{CH}_2 - \text{CH}_2 - \text{CH}_3$
- C  $\text{CH}_3 - \text{CH}_2 - \overset{\text{O}}{\parallel}{\text{C}} - \text{O} - \text{CH}_2 - \text{CH}_2 - \text{CH}_2 - \text{CH}_3$
- D  $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \overset{\text{O}}{\parallel}{\text{C}} - \text{O} - \text{CH}_2 - \text{CH}_2 - \text{CH}_2 - \text{CH}_3$

- 45 0.2 mol of zinc powder react with excess dilute nitric 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 nitrik cair. Selepas 30 saat, 0.05 mol zink tertinggal sebagai baki.

Berapakah kadar tindak balas 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  $8.3 \times 10^{-3} \text{ mol s}^{-1}$

- 46 Diagram 12 shows a chemical cell.  
Rajah 12 menunjukkan satu sel kimia.

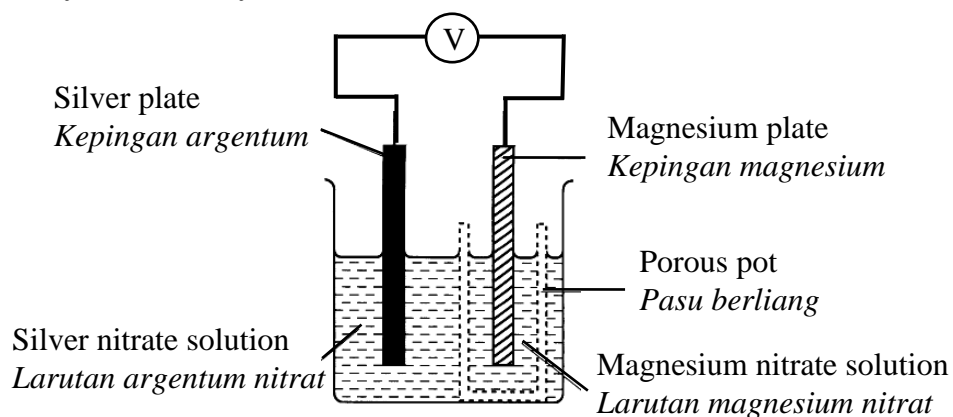
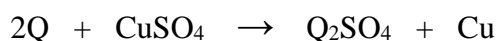


Diagram 12  
Rajah 12

Which half equation represents the reaction at the negative terminal of the chemical cell?

Setengah persamaan manakah mewakili tindak balas di terminal negatif sel kimia itu?

- A  $\text{Ag}^+ + \text{e}^- \rightarrow \text{Ag}$   
 B  $2\text{H}^+ + 2\text{e}^- \rightarrow \text{H}_2$   
 C  $\text{Mg} \rightarrow \text{Mg}^{2+} + 2\text{e}^-$   
 D  $4\text{OH}^- \rightarrow \text{O}_2 + 2\text{H}_2\text{O} + 4\text{e}^-$
- 47 The following equation represents a reaction between metal Q and copper(II) sulphate solution.  
Persamaan berikut mewakili satu tindak balas antara logam Q dan larutan kuprum(II) sulfat.



What is the volume of  $1 \text{ mol dm}^{-3}$  copper(II) sulphate solution needed to react with 0.92 g metal Q?

[Relative atomic mass: Q = 23]

Berapakah isi padu larutan kuprum(II) sulfat  $1 \text{ mol dm}^{-3}$  yang diperlukan untuk bertindak balas dengan 0.92 g logam Q?

[Jisim atom relatif: Q = 23]

- A  $10 \text{ cm}^3$   
 B  $20 \text{ cm}^3$   
 C  $40 \text{ cm}^3$   
 D  $80 \text{ cm}^3$

- 48 Diagram 13 shows the apparatus set-up for the electrolysis of  $1.0 \text{ mol dm}^{-3}$  sodium chloride solution.

*Rajah 13 menunjukkan susunan radas untuk menjalankan elektrolisis bagi larutan natrium klorida  $1.0 \text{ mol dm}^{-3}$ .*

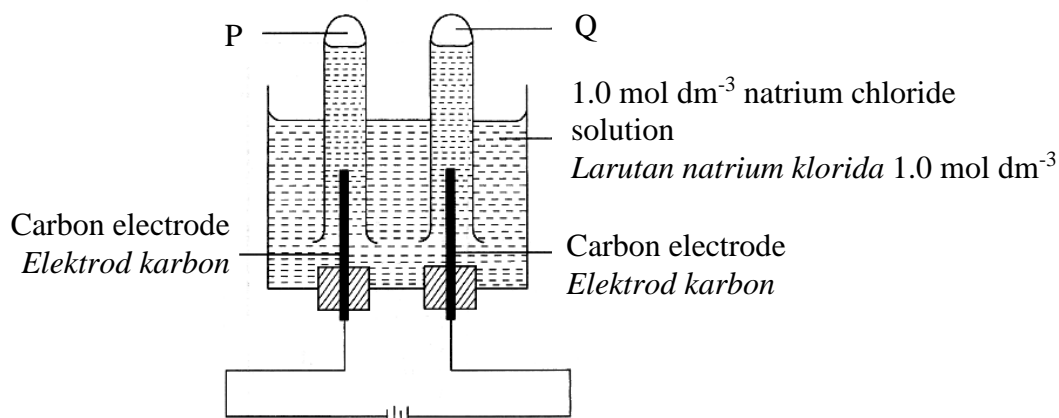


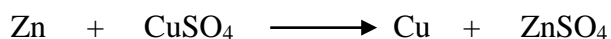
Diagram 13  
*Rajah 13*

What are the products at P and Q?

*Apakah hasil tindak balas pada P dan Q?*

	P	Q
<b>A</b>	Oxygen gas <i>Gas oksigen</i>	Hydrogen gas <i>Gas hidrogen</i>
<b>B</b>	Chlorine gas <i>Gas klorin</i>	Hydrogen gas <i>Gas hidrogen</i>
<b>C</b>	Hydrogen gas <i>Gas hidrogen</i>	Oxygen gas <i>Gas oksigen</i>
<b>D</b>	Hydrogen gas <i>Gas hidrogen</i>	Chlorine gas <i>Gas klorin</i>

- 49 The following equation represents a redox reaction.  
*Persamaan berikut mewakili satu tindak balas redoks.*



Which of the following change in oxidation number is correct for Cu?

*Antara berikut, perubahan nombor pengoksidaan yang manakah betul bagi Cu?*

- A**  $0 \longrightarrow +1$   
**B**  $0 \longrightarrow +2$   
**C**  $+1 \longrightarrow 0$   
**D**  $+2 \longrightarrow 0$

- 50 Diagram 14 shows the structural formula of an organic compound.  
*Rajah 14 menunjukkan formula struktur suatu sebatian organik.*

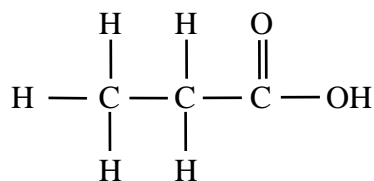


Diagram 14

*Rajah 14*

Which of the following is correct about the organic compound?

*Antara berikut, yang manakah betul tentang sebatian organik itu?*

- A React with steam to produce alcohol  
*Bertindak balas dengan stim untuk membentuk alkohol*
- B Decolourise the brown colour of bromine water  
*Menyahwarnakan warna perang air bromin*
- C React with sodium carbonate solution to produce carbon dioxide  
*Bertindak balas dengan larutan natrium karbonat untuk menghasilkan karbon dioksida*
- D Decolourise the purple coloured acidified potassium manganat(VII) solution.  
*Menyahwarnakan larutan ungu kalium manganat (VII) berasid*

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