



BAHAGIAN PENGURUSAN SEKOLAH BERASRAMA PENUH  
DAN SEKOLAH KECEMERLANGAN

PENTAKSIRAN DIAGNOSTIK AKADEMIK SBP 2015  
PERCUBAAN SIJIL PELAJARAN MALAYSIA

CHEMISTRY

Kertas 1

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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 setiap soalan, pilih satu jawapan sahaja. Hitamkan jawapan anda pada kertas jawapan objektif yang disediakan.*
4. *Jika anda hendak menukar jawapan, padamkan tanda yang telah dibuat, kemudian hitamkan jawapan yang baru.*
5. *Rajah yang mengiringi soalan tidak dilukiskan mengikut skala kecuali dinyatakan*
6. *Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogramkan.*

Kertas soalan ini mengandungi 29 halaman bercetak.

- 1 Diagram 1 shows an atomic model proposed by a scientist.  
*Rajah 1 menunjukkan satu model atom yang dicadangkan oleh seorang saintis.*

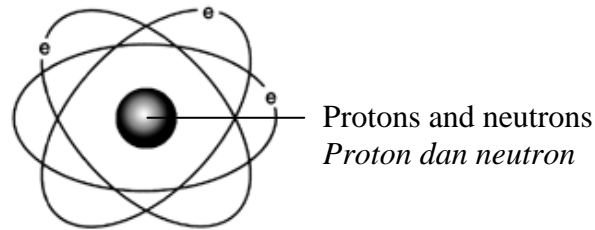


Diagram 1  
*Rajah 1*

- Who was the scientist?  
*Siapakah saintis itu?*
- A** Neils Bohr  
**B** J.J Thomson  
**C** James Chadwick  
**D** Ernest Rutherford
- 2 The average mass of magnesium atom is 24 times greater than  $\frac{1}{12}$  of the mass of carbon-12 atom.  
What is the relative atomic mass of magnesium?  
*Purata jisim satu atom magnesium ialah 24 kali lebih besar daripada  $\frac{1}{12}$  jisim satu atom karbon-12.*  
*Apakah jisim atom relatif bagi magnesium?*
- A** 2  
**B** 24  
**C** 36  
**D** 288
- 3 Atoms of the elements that involved in the formation of ionic compound will  
*Atom-atom bagi unsur yang terlibat dalam pembentukan sebatian ion akan*
- A** share electrons  
*kongsi elektron*  
**B** accept electrons  
*terima elektron*  
**C** donate electrons  
*derma elektron*  
**D** transfer electrons  
*pindah elektron*

- 4 Diagram 2 shows the uses of elements X and Y in our daily life. These elements are located in Period 3 of The Periodic Table of Elements.

*Rajah 2 menunjukkan kegunaan unsur-unsur X dan Y dalam kehidupan seharian kita. Unsur-unsur ini terletak dalam Kala 3 Jadual Berkala Unsur.*

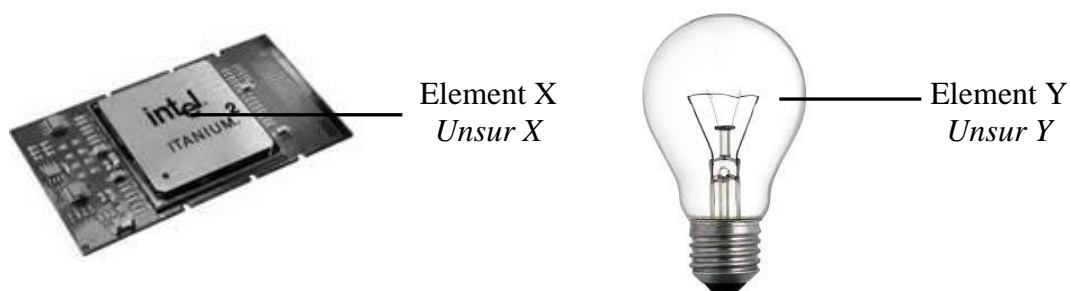


Diagram 2  
*Rajah 2*

In which group do elements X and Y located?

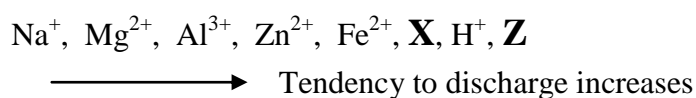
*Dalam kumpulan manakah unsur-unsur X dan Y terletak?*

	X	Y
A	Group 14 <i>Kumpulan 14</i>	Group 18 <i>Kumpulan 18</i>
B	Group 16 <i>Kumpulan 16</i>	Group 18 <i>Kumpulan 18</i>
C	Group 14 <i>Kumpulan 14</i>	Group 16 <i>Kumpulan 16</i>
D	Group 16 <i>Kumpulan 16</i>	Group 14 <i>Kumpulan 14</i>

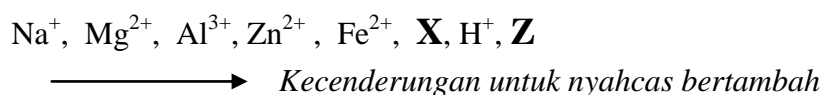
- 5 Which substance is acidic?  
*Bahan yang manakah bersifat asid?*

- A Lithium oxide  
*Litium oksida*
- B Sulphur dioxide  
*Sulfur dioksida*
- C Sodium hydroxide  
*Natrium hidroksida*
- D Magnesium oxide  
*Magnesium oksida*

- 6 The following information shows the arrangement of some cations in the electrochemical series.



*Maklumat berikut menunjukkan susunan beberapa kation dalam siri elektrokimia.*



What are X and Z?

*Apakah X dan Z?*

	<b>X</b>	<b>Z</b>
<b>A</b>	$\text{Ca}^{2+}$	$\text{Ag}^+$
<b>B</b>	$\text{Pb}^{2+}$	$\text{Cu}^{2+}$
<b>C</b>	$\text{Cu}^{2+}$	$\text{Pb}^{2+}$
<b>D</b>	$\text{Ag}^+$	$\text{Ca}^{2+}$

- 7 Which salt is soluble in water?  
*Garam yang manakah larut dalam air?*

- A** Barium sulphate  
*Barium sulfat*
- B** Zinc carbonate  
*Zink karbonat*
- C** Calcium sulphate  
*Kalsium sulfat*
- D** Potassium carbonate  
*Kalium karbonat*

- 8 Which statement explains the effective collision?  
*Pernyataan yang manakah menerangkan perlanggaran berkesan?*

- A** The collision that causes a reaction  
*Perlanggaran yang menyebabkan tindak balas berlaku*
- B** The collision which takes place after a reaction  
*Perlanggaran yang berlaku selepas tindak balas*
- C** The collision which takes place before a reaction  
*Perlanggaran yang berlaku sebelum tindak balas*
- D** The collision produces less energy than the activation energy  
*Pelanggaran menghasilkan tenaga kurang daripada tenaga pengaktifan*

- 9 Diagram 3 shows two glasses which are made from material M.  
*Rajah 3 menunjukkan dua gelas yang diperbuat daripada bahan M.*



Diagram 3  
*Rajah 3*

The glasses only suitable to fill cold drinks such as juices and wine.  
What is material M?  
*Gelas ini hanya sesuai mengisi minuman sejuk seperti jus dan wain.  
Apakah bahan M?*

- A Soda lime glass  
*Kaca soda kapur*
  - B Fused silica glass  
*Kaca silika terlakur*
  - C Borosilicate glass  
*Kaca borosilikat*
  - D Lead crystal glass  
*Kaca kristal plumbum*
- 10 Which substance is a natural polymer?  
*Bahan manakah adalah polimer semula jadi?*
- A Polyethene  
*Polietena*
  - B Polystyrene  
*Polistirena*
  - C Polyisoprene  
*Poliisoprena*
  - D Polyvinyl chloride  
*Polivinil klorida*

- 11 Diagram 4 shows the apparatus set-up to study the reactivity of a metal with oxygen.  
*Rajah 4 menunjukkan susunan radas untuk mengkaji kereaktifan satu logam dengan oksigen.*

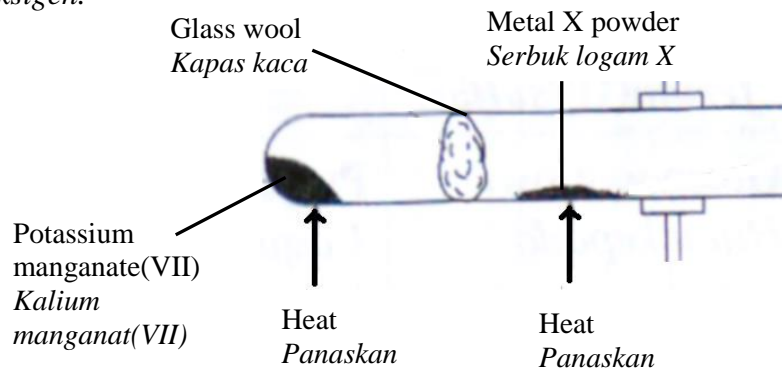


Diagram 4  
*Rajah 4*

Metal X is heated strongly to produce white residue.

What is X?

*Logam X dipanaskan dengan kuat menghasilkan baki berwarna putih.*

Apakah X?

- A Iron  
*Ferum*
- B Lead  
*Plumbum*
- C Copper  
*Kuprum*
- D Magnesium  
*Magnesium*
- 12 Streptomycin and penicillin are two examples of medicine Y.  
What is the type of medicine Y?  
*Streptomisin dan penisilin adalah dua contoh ubat Y.*  
Apakah jenis ubat Y?
- A Hormone  
*Hormon*
- B Antibiotic  
*Antibiotik*
- C Analgesic  
*Analgesik*
- D Psychotherapeutic  
*Psikoterapeutik*

- 13 Photo 1 shows a student who suffering from cramps during the race run on school sports day. The teacher uses a packet containing material Z to relieve her pain. What is material Z?

*Foto 1 menunjukkan seorang pelajar mengalami kekejangan otot semasa berlumba lari pada hari sukan sekolah. Gurunya menggunakan satu bungkus yang berisi bahan Z untuk melegakan kesakitannya.*

*Apakah bahan Z?*

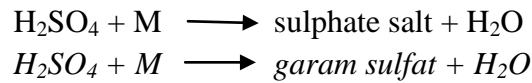


Material Z  
*Bahan Z*

Photo 1  
*Foto 1*

- A Ammonium nitrate powder and water  
*Serbuk ammonium nitrat dan air*
- B Magnesium powder and zinc sulphate solution  
*Serbuk magnesium dan larutan zink sulfat*
- C Sulphuric acid and potassium hydroxide solution  
*Asid sulfurik dan larutan kalium hidroksida*
- D Barium nitrate solution and sodium sulphate solution  
*Larutan barium nitrat dan larutan natrium sulfat*

- 14 The equation represents a reaction to prepare a soluble sulphate salt.  
*Persamaan mewakili satu tindak balas untuk menyediakan garam sulfat terlarutkan.*



What is substance M?

*Apakah bahan M?*

- A Copper(II) oxide  
*Kuprum(II) oksida*
  - B Lead(II) oxide  
*Plumbum(II) oksida*
  - C Barium hydroxide  
*Barium hidroksida*
  - D Calcium hydroxide  
*Kalsium hidroksida*
- 15 Photo 2 shows a child who is suffering from a swollen gland at his neck.  
He lost weight drastically and body temperature often gets hot and then suddenly become cold.  
*Foto 2 menunjukkan seorang kanak-kanak yang mengalami pembengkakan kelenjar pada lehernya. Dia mengalami penurunan berat badan secara drastik dan suhu badannya sering menjadi panas kemudian tiba-tiba menjadi dingin.*



Photo 2

*Foto 2*

Which substance can be used to overcome the child's problem?  
*Bahan yang manakah boleh digunakan untuk mengatasi masalah kanak-kanak ini?*

- A Streptomycin  
*Streptomisin*
- B Tranquiliser  
*Trankuilizer*
- C Cobalt-60  
*Kobalt-60*
- D Iodine-131  
*Iodin-131*



- 16 Diagram 5 shows the apparatus set-up to determine the empirical formula of copper(II) oxide.

*Rajah 5 menunjukkan susunan radas untuk menentukan formula empirik bagi kuprum(II) oksida.*

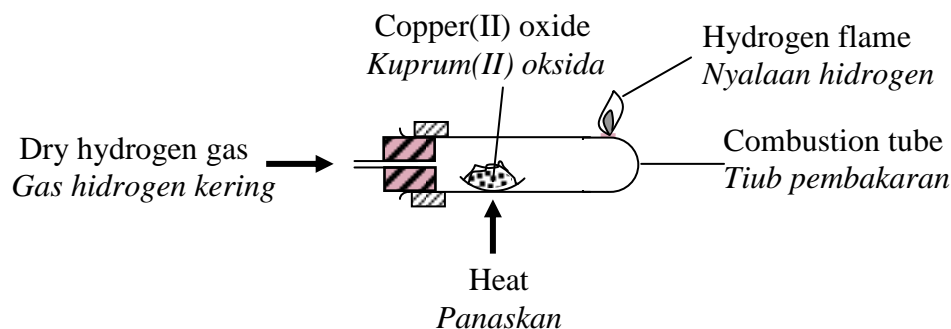


Diagram 5  
*Rajah 5*

The flow of dry hydrogen gas must be continued during the cooling process. What is the reason for this action?

*Aliran gas hidrogen kering mesti dialirkan semasa proses penyejukan. Apakah sebab tindakan ini diambil?*

- A** To remove the air from the combustion tube  
*Untuk menyingkirkan udara daripada tiub pembakaran*
- B** To avoid the oxidation of copper to copper(II) oxide  
*Untuk mengelakkan pengoksidaan kuprum kepada kuprum(II) oksida*
- C** To ensure the complete conversion of copper to copper(II) oxide  
*Untuk memastikan pertukaran lengkap kuprum kepada kuprum(II) oksida*
- D** To increase the mass of copper formed in the combustion tube  
*Untuk meningkatkan jisim kuprum yang terbentuk dalam tiub pembakaran*
- 17 The element astatine located in the same group as chlorine in the Periodic Table of Elements. Which of the following is the property of astatine?  
*Unsur astatin terletak dalam kumpulan yang sama dengan klorin dalam Jadual Berkala Unsur. Antara berikut yang manakah sifat astatin?*
- A** Forms a basic oxide  
*Membentuk satu oksida berbes*
- B** Exist as gas at room temperature  
*Wujud sebagai gas pada suhu bilik*
- C** Reacts with iron to form brown solid  
*Bertindak balas dengan ferum untuk menghasilkan pepejal perang*
- D** Forms a ionic compound when reacts with oxygen gas  
*Membentuk satu sebatian ion apabila bertindak balas dengan gas oksigen*

- 18 Diagram 6 shows the electron arrangement of atoms of elements X and Y.  
Both elements react to form a compound.  
*Gambarajah 6 menunjukkan susunan elektron bagi atom-atom unsur X dan Y.  
Kedua-dua unsur bertindak balas untuk membentuk satu sebatian.*

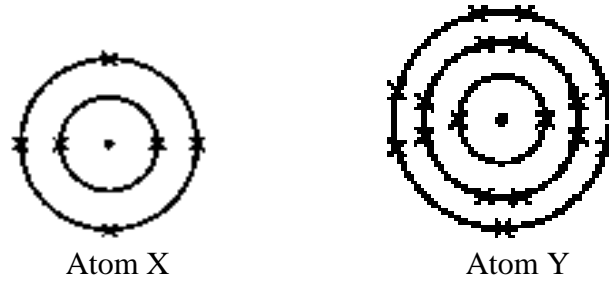


Diagram 6  
*Rajah 6*

Which statement is correct about the physical property of the compound formed?  
*Pernyataan yang manakah betul tentang sifat fizik sebatian yang terbentuk itu?*

- A** Conducts electricity in molten and aqueous state  
*Mengkonduksikan elektrik dalam keadaan leburan dan larutan akueus*
- B** Solid at room temperature  
*Pepejal pada suhu bilik*
- C** Low melting point  
*Takat lebur rendah*
- D** Soluble in water  
*Larut dalam air*

- 19 Diagram 7 shows a voltaic cell prepared by a group of students. They dipping two electrodes in a lemon and connected the electrodes to the voltmeter.  
*Rajah 7 menunjukkan satu sel volta yang disediakan oleh sekumpulan pelajar. Mereka mencucuk dua elektrod ke dalam buah limau dan menyambungkan elektrod-elektrod kepada voltmeter.*

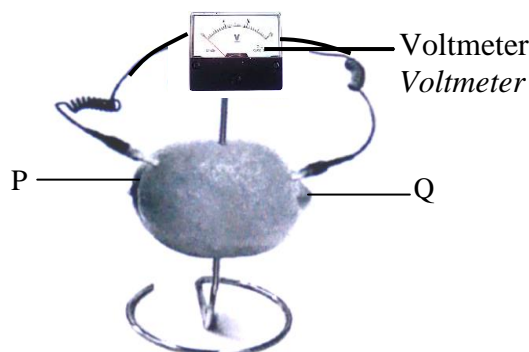
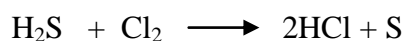


Diagram 7  
*Rajah 7*

Which pair of electrodes, P and Q will make the needle of voltmeter deflect?  
*Manakah pasangan elektrod, P dan Q yang akan menyebabkan jarum voltmeter terpesong?*

	P	Q
A	Carbon <i>Karbon</i>	Sulphur <i>Sulfur</i>
B	Sulphur <i>Sulfur</i>	Zinc <i>Zink</i>
C	Copper <i>Kuprum</i>	Copper <i>Kuprum</i>
D	Copper <i>Kuprum</i>	Zinc <i>Zink</i>

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



Which statement is correct?  
*Pernyataan yang manakah betul?*

- A Chlorine acts as a reducing agent  
*Klorin bertindak sebagai agen penurunan*
- B Hydrogen sulphide undergoes oxidation  
*Hidrogen sulfida mengalami pengoksidaan*
- C The oxidation number of hydrogen increases  
*Nombor pengoksidaan hidrogen meningkat*
- D The oxidation number of sulphur changes from 0 to -2  
*Nombor pengoksidaan sulfur berubah dari 0 kepada -2*

21



Photo 3

Foto 3

Photo 3 shows the car's engine block which made of ceramic.

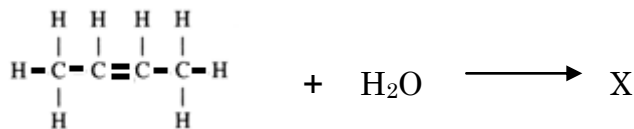
What property of ceramic makes it suitable to be used for making engine block?

*Foto 3 menunjukkan blok enjin kereta yang diperbuat daripada seramik.*

*Apakah sifat seramik yang menyebabkannya sesuai digunakan dalam pembuatan blok enjin ini?*

- A** It is very hard  
*Ia sangat keras*
- B** It is strong  
*Ia adalah kuat*
- C** Resistant to chemical corrosion  
*Tahan kepada kakisan kimia*
- D** Withstand high temperature  
*Tahan kepada suhu tinggi*

- 22** The following equation represents a reaction of a compound.  
*Persamaan berikut mewakili tindak balas bagi satu sebatian.*



What is X?

*Apakah X?*

- A** Butan-2-ol  
*Butan-2-ol*
- B** Butan-3-ol  
*Butan-3-ol*
- C** 1-methylpropan-1-ol  
*1-metilpropan-1-ol*
- D** 1-methylpropan-2-ol  
*1-metilpropan-2-ol*

- 23 Diagram 8 shows the set-up of apparatus to investigate a chemical property of nitric acid.

*Rajah 8 menunjukkan susunan radas untuk mengkaji satu sifat kimia asid nitrik.*

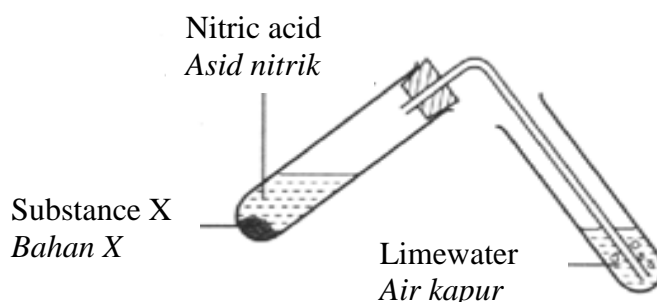


Diagram 8

*Rajah 8*

Which statement is correct about the property?

*Pernyataan yang manakah betul tentang sifat tersebut?*

- A** Nitric acid reacts with substance X to produce salt and water  
*Asid nitrik bertindak balas dengan bahan X menghasilkan garam dan air*
- B** Nitric acid reacts with substance X to produce salt and hydrogen gas  
*Asid nitrik bertindak balas dengan bahan X menghasilkan garam dan gas hidrogen.*
- C** Nitric acid reacts with substance X to produce salt, water and hydrogen gas.  
*Asid nitrik bertindak balas dengan bahan X menghasilkan garam, air dan gas hidrogen.*
- D** Nitric acid reacts with substance X to produce salt, water and carbon dioxide.  
*Asid nitrik bertindak balas dengan bahan X menghasilkan garam, air dan gas karbon dioksida*
- 24 Atom X has 18 protons and 22 neutrons in its nucleus.  
What is the number of electrons in atom X?  
*Atom X mempunyai 18 proton dan 22 neutron dalam nukleusnya.  
Berapakah bilangan elektron dalam satu atom X?*
- A** Equal with the number of protons  
*Sama dengan bilangan proton*
- B** Equal with the number of neutrons  
*Sama dengan bilangan neutron*
- C** Equal with the number of valence electron  
*Sama dengan bilangan elektron valens*
- D** Equal with the total number of protons and neutron  
*Sama dengan jumlah bilangan proton dan neutron*

- 25 The following information shows the effect of a particular factor on the rate of reaction.

*Maklumat berikut menunjukkan kesan satu faktor yang mempengaruhi kadar tindak balas.*

- The kinetic energy of particles increase  
*Tenaga kinetik zarah meningkat*
- Frequency of collision between particles increases  
*Frekuensi perlanggaran antara zarah meningkat*
- Frequency of effective collision increases  
*Frekuensi perlanggaran berkesan meningkat*

Which of the following cause the above effect?

*Manakah antara berikut memberikan kesan di atas?*

- A Adding a catalyst.  
*Menambah mangkin*
  - B Increasing the temperature of reactants  
*Menaikkan suhu bahan tindak balas*
  - C Increasing the concentration of reactants.  
*Menambah kepekatan bahan tindak balas*
  - D Using larger total surface area of reactants  
*Menggunakan jumlah luas permukaan bahan tindak balas yang lebih besar*
- 26 Ahmad is a mechanic. He faces the same problem every day. His shirt is always stained with grease.  
Which additive will remove the grease stain on Ahmad's shirt effectively?  
*Ahmad ialah seorang mekanik. Dia menghadapi masalah yang sama setiap hari. Bajunya sentiasa mempunyai kesan gris. Bahan tambah manakah akan menghilangkan kesan kotoran gris pada baju Ahmad dengan berkesan?*
- A Fragrance agent  
*Agen pewangi*
  - B Stabilising agent  
*Agen penstabil*
  - C Suspension agent  
*Agent antienapan*
  - D Biological enzyme  
*Enzim biologi*

- 27 Table 1 shows the heat of neutralisation for the reaction between hydrochloric acid with sodium hydroxide solution and ammonia solution.

*Jadual 1 menunjukkan haba peneutralan bagi tindak balas antara asid hidroklorik dengan larutan natrium hidroksida dan larutan ammonia.*

<b>Reactants</b> <i>Bahan tindak balas</i>	<b>Heat of neutralisation</b> <i>Haba peneutralan</i> <i>(kJ mol<sup>-1</sup>)</i>
Hydrochloric acid and ammonia solution <i>Asid hidroklorik dan larutan ammonia</i>	- 54.0
Hydrochloric acid and sodium hydroxide solution <i>Asid hidroklorik dan larutan natrium hidroksida</i>	-57.0

Table 1  
*Jadual 1*

Which statement is the best to explain the data?

*Pernyataan yang manakah paling baik untuk menerangkan data itu?*

- A** Ammonia solution ionises partially in water  
*Larutan ammonia mengion separa dalam air*
- B** Ammonia is weak alkali and sodium hydroxide is strong alkali  
*Ammonia ialah alkali lemah dan natrium hidroksida ialah alkali kuat*
- C** Reaction between ammonia solution and hydrochloric acid is an exothermic reaction  
*Tindak balas antara larutan ammonia dan asid hidroklorik adalah tindak balas eksotermik*
- D** Ammonia solution absorbs some of the heat energy released to complete its ionisation in water  
*Larutan ammonia menyerap sebahagian daripada tenaga yang dibebaskan untuk melengkapkan pengionannya dalam air*
- 28 Element P is located above element Q in a Periodic Table of Elements. Both elements dissolve in water to produce hydroxide ions. Which of the following is correct about P and Q?  
*Unsur P terletak di atas unsur Q dalam Jadual Berkala Unsur. Kedua-dua unsur melarut dalam air untuk menghasilkan ion hidroksida. Antara berikut yang manakah betul tentang P dan Q?*
- A** Atom P has bigger atomic radius than atom Q.  
*Atom P mempunyai jejari atom yang lebih besar daripada atom Q.*
- B** Element P has a lower melting point than element Q.  
*Unsur P mempunyai takat lebur lebih rendah daripada unsur Q.*
- C** Element P burns more vigorously than element Q in oxygen gas.  
*Unsur P terbakar dengan lebih marak daripada unsur Q dalam gas oksigen.*
- D** Atom P has a lower tendency to release its valence electron than atom Q.  
*Atom P mempunyai kecenderungan lebih rendah untuk melepaskan elektron valensinya daripada atom Q.*

- 29 Table 2 shows the group number for elements R and T.  
*Jadual 2 menunjukkan nombor kumpulan bagi unsur-unsur R dan T.*

Element <i>Unsur</i>	Group <i>Kumpulan</i>
R	14
T	16

Table 2  
*Jadual 2*

What is the chemical formula and the type of bond of the compound formed when element R reacts with element T?  
*Apakah formula kimia dan jenis ikatan bagi sebatian yang terbentuk apabila unsur R bertindak balas dengan unsur T?*

	Chemical formula <i>Formula kimia</i>	Type of bond <i>Jenis ikatan</i>
A	$RT_2$	Ionic <i>Ion</i>
B	$RT_2$	Covalent <i>Kovalen</i>
C	$R_2T$	Ionic <i>Ion</i>
D	$R_2T$	Covalent <i>Kovalen</i>

- 30 Pn. Farizah holds a wedding ceremony for her daughter. She used 7 trays made of bronze. She found one of the tray falls but not dented.  
 Which statement explains the situation above?  
*Pn. Farizah mengadakan satu majlis perkahwinan untuk anaknya. Dia menggunakan 7 dulang yang diperbuat daripada gangsa. Dia mendapati salah sebuah dulang terjatuh tetapi tidak kemek.*  
*Pernyataan yang manakah menerangkan keadaan di atas?*

- A Foreign atom makes strong bonds between the pure copper atom  
*Atom asing membina ikatan yang kuat dengan atom-atom kuprum tulen*
- B Foreign atom fill in all the empty spaces between pure copper atom  
*Atom asing mengisi semua ruangan kosong antara atom-atom logam tulen*
- C Foreign atom compresses the arrangement of atom in pure copper.  
*Atom asing memampatkan susunan atom dalam kuprum tulen*
- D Foreign atom reduced the layer of pure copper atoms from sliding.  
*Atom asing mengurangkan lapisan atom kuprum tulen daripada menggelongsor*



- 31 Diagram 9 shows the set-up of apparatus in an experiment to investigate the electrolysis process of two different substances.

*Rajah 9 menunjukkan susunan radas dalam satu eksperimen untuk menyasat proses elektrolisis bagi dua bahan berbeza.*

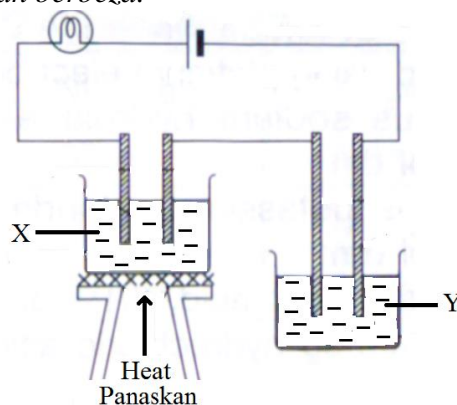


Diagram 9

*Rajah 9*

What are substances X and Y that will light up the bulb?

*Apakah bahan X dan Y yang akan menyalakan mentol?*

	X	Y
A	Molten lead(II) bromide <i>Leburan plumbum (II) bromida</i>	Ethanoic acid <i>Asid etanoik</i>
B	Molten sodium chloride <i>Leburan natrium klorida</i>	Glucose solution <i>Larutan glukosa</i>
C	Molten sulphur <i>Leburan sulfur</i>	Hydrochloric acid <i>Asid hidroklorik</i>
D	Molten naphthalene <i>Leburan naftalena</i>	Sodium chloride solution <i>Larutan natrium klorida</i>

- 32 One day, Mak Minah having dinner with her family at a restaurant. Suddenly power failure. The restaurant owner lights up candles.

What are the products formed when candle is burnt in excess air?

*Pada satu hari, Mak Minah makan malam bersama keluarganya di sebuah restoran. Tiba-tiba bekalan elektrik terputus. Pengusaha restoran menyalakan lilin.*

*Apakah bahan yang terhasil apabila lilin di bakar dalam udara berlebihan?*

- A Carbon  
*Karbon*
- B Carbon dioxide  
*Karbon dioksida*
- C Carbon dioxide and water  
*Karbon dioksida dan air*
- D Carbon monoxide and water  
*Karbon monoksida dan air*

- 33 Diagram 10 shows a golf stick which its head make from material P.  
*Rajah 10 menunjukkan satu batang kayu golf di mana bahagian kepalanya diperbuat daripada bahan P.*



Diagram 10  
*Rajah 10*

Material P has the following properties:  
*Bahan P mempunyai sifat berikut:*

- Strong  
*Kuat*
- Light  
*Ringan*
- Can withstand corrosion  
*Tahan kakisan*

What is material P?  
*Apakah bahan P?*

- A** Polymer  
*Polimer*
- B** Ceramic  
*Seramik*
- C** Composite  
*Komposit*
- D** Glass  
*Kaca*

- 34 The following are the information of two solutions.  
*Berikut adalah maklumat tentang dua larutan.*

0.2 mol dm <sup>-3</sup> sodium hydroxide solution 0.2 mol dm <sup>-3</sup> <i>larutan natrium hidroksida</i>	pH = 13
0.2 mol dm <sup>-3</sup> ammonia solution 0.2 mol dm <sup>-3</sup> <i>larutan ammonia</i>	pH = 9

Which of the following statements are true about the two solutions?  
*Penyataan yang manakah betul tentang kedua-dua larutan itu?*

- I** The solubility of sodium hydroxide in water is higher than ammonia  
*Keterlarutan natrium hidroksida dalam air lebih tinggi daripada ammonia*
- II** The concentration of OH<sup>-</sup> ion in sodium hydroxide solution is higher than in ammonia solution  
*Kepekatan ion OH dalam larutan natrium hidroksida lebih tinggi daripada larutan ammonia*
- III** The degree of dissociation of sodium hydroxide solution in water is lower than the degree of dissociation of ammonia solution  
*Darjah penceraian larutan natrium hidroksida dalam air adalah lebih rendah daripada darjah penceraian larutan ammonia*
- IV** Ammonia solution is a weak alkali while sodium hydroxide solution is a strong alkali.  
*Larutan ammonia adalah alkali lemah manakala larutan natrium hidroksida adalah alkali kuat.*
- A** I and II  
*I dan II*
- B** I and III  
*I dan III*
- C** II dan IV  
*II dan IV*
- D** III and IV  
*III dan IV*

- 35 Diagram 11 shows a series of tests conducted on mixture Q containing two types of salts.

*Rajah 11 menunjukkan satu siri ujian yang dijalankan ke atas campuran Q yang mengandungi dua jenis garam.*

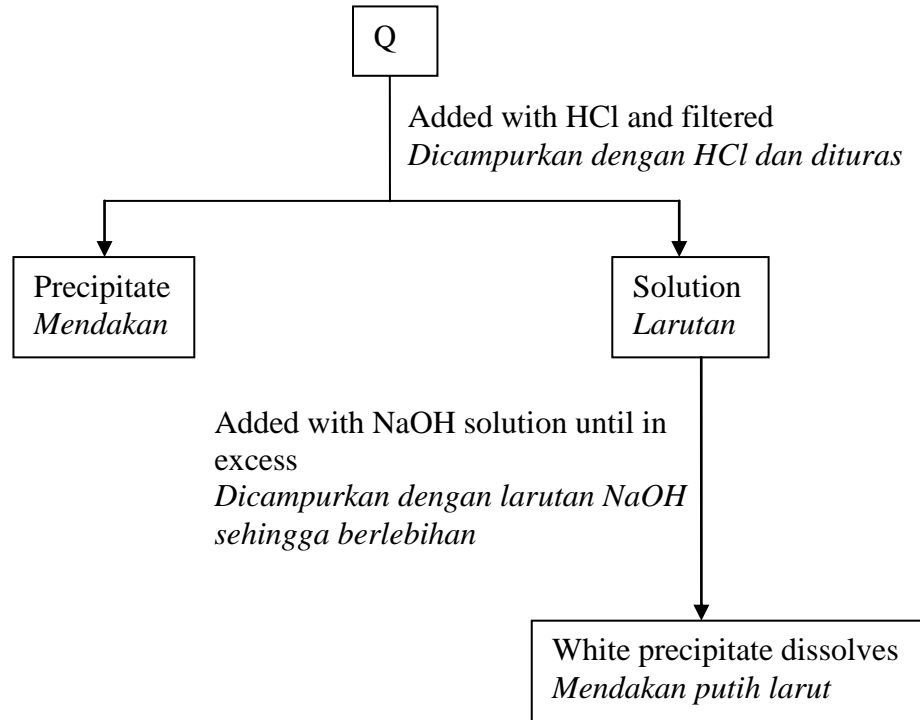


Diagram 11  
*Rajah 11*

Which of the following are possible salts found in mixture Q?

*Antara berikut, garam yang manakah mungkin terdapat dalam campuran Q?*

- A Barium nitrate and copper(II) nitrate  
*Barium nitrat dan kuprum(II) nitrat*
- B Barium nitrate and magnesium nitrate  
*Barium nitrat dan magnesium nitrat*
- C Lead(II) nitrate and zinc nitrate  
*Plumbum(II) nitrat dan zink nitrat*
- D Lead(II) nitrate and calcium nitrate  
*Plumbum(II) nitrat dan kalsium nitrat*

- 36 Diagram 12 shows a graph of two experiments conducted to investigate the rate of reaction between calcium carbonate powder and hydrochloric acid.

*Rajah 12 menunjukkan graf bagi dua eksperimen yang dijalankan untuk mengkaji kadar tindak balas antara serbuk kalsium karbonat dan asid hidroklorik.*

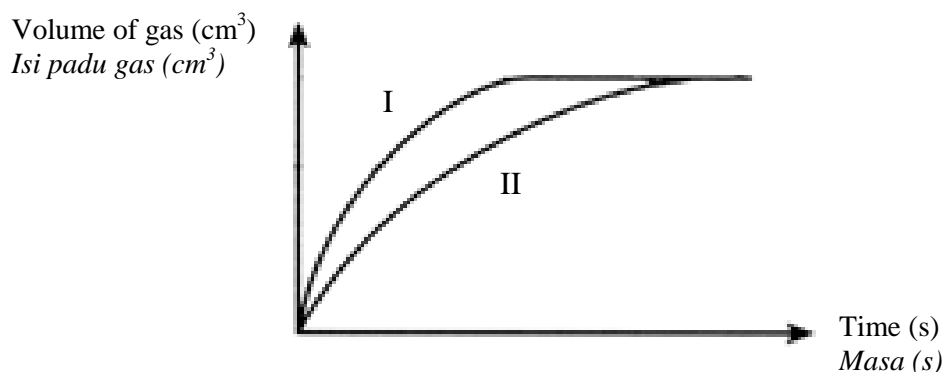


Diagram 12  
*Rajah 12*

Experiment I was conducted by using  $25 \text{ cm}^3$  of  $1.0 \text{ mol dm}^{-3}$  of hydrochloric acid.

What is the concentration and volume of hydrochloric acid to obtain curve II?

*Eksperimen I dijalankan dengan menggunakan  $25 \text{ cm}^3$  asid hidroklorik  $1.0 \text{ mol dm}^{-3}$ .*

*Apakah kepekatan dan isipadu asid hidroklorik mendapatkan lengkung II?*

	Concentration of HCl ( $\text{mol dm}^{-3}$ ) <i>Kepekatan HCl (<math>\text{mol dm}^{-3}</math>)</i>	Volume of HCl ( $\text{cm}^3$ ) <i>Isi padu HCl (<math>\text{cm}^3</math>)</i>
A	0.5	50
B	1.0	50
C	2.0	25
D	0.5	25

- 37 Displacement of silver occurs when copper is added into silver nitrate solution. Which of the following is correct about the reaction?

*Penyesaran argentum berlaku apabila kuprum ditambah ke dalam larutan argentum nitrat.*

*Antara berikut yang manakah betul tentang tindak balas tersebut?*

- A Silver ion is oxidised  
*Ion argentum dioksidakan*
- B Copper is an oxidising agent  
*Kuprum adalah agen pengoksidaan*
- C Colourless solution becomes blue at the end of experiment  
*Larutan tak berwarna menjadi biru pada akhir eksperimen*
- D Mass of silver produce increases when copper powder is used compared to copper granule  
*Jisim argentum terhasil bertambah apabila serbuk kuprum digunakan berbanding ketulan kuprum*

- 38 Diagram 13 shows an energy profile for a reaction.  
*Rajah 13 menunjukkan profil tenaga bagi satu tindak balas.*

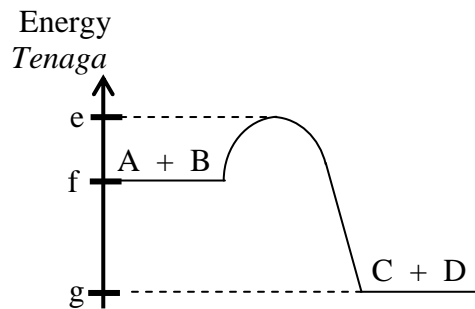


Diagram 13  
*Rajah 13*

- What is the heat change in the reaction?  
*Apakah perubahan tenaga dalam tindak balas itu?*
- A** e kJ  
**B** g kJ  
**C** (e – g) kJ  
**D** (f – g) kJ
- 39 A doctor advised a patient to complete the whole course of an antibiotic prescribed to him even if he feels better.  
 Which statement is correct about the usage of the medicine?  
*Seorang doktor menasihati pesakitnya untuk menghabiskan antibiotik yang diberikan kepadanya walaupun dia telah sihat.*  
*Pernyataan yang manakah betul tentang penggunaan ubat tersebut?*
- A** To relieve the pain  
*Untuk mengurangkan kesakitan*  
**B** To reduce anxiety  
*Untuk mengurangkan kebimbangan*  
**C** To make sure all the bacteria are kill  
*Untuk memastikan semua bakteria telah mati*  
**D** To stimulate the production of more hormones in body  
*Untuk merangsang penghasilan lebih banyak hormon dalam badan*

- 40 Table 3 shows the information of an atom of element X.  
*Jadual 3 menunjukkan maklumat bagi satu atom unsur X.*

Nucleon number <i>Nombor nukleon</i>	7
Number of neutrons <i>Bilangan neutron</i>	4

Table 3  
*Jadual 3*

Atom X releases electron to form an ion  $X^+$ .  
 What is the number of protons and electrons in ion  $X^+$ .  
*Atom X menderma elektron untuk membentuk satu ion  $X^+$ .*  
*Apakah bilangan proton dan elektron dalam ion  $X^+$ .*

	Proton <i>Proton</i>	Electron <i>Elektron</i>
A	3	2
B	3	3
C	4	3
D	4	7

- 41 Ions  $S^+$ ,  $T^{2+}$  and  $U^{3+}$  have the same number of electrons which is 10.  
 Which of the following is correct?  
*Ion-ion  $S^+$ ,  $T^{2+}$  dan  $U^{3+}$  mempunyai bilangan elektron yang sama iaitu 10.*  
*Antara berikut yang manakah betul?*
- A The strength of the nucleus to attract electrons in increasing order is U, T, S  
*Kekuatan nukleus untuk menarik elektron tertib menaik adalah U, T, S*
- B The atomic size in increasing order is U, T, S  
*Saiz atom tertib menaik adalah U, T, S*
- C The number of proton in an atom in decreasing order is S, T, U  
*Bilangan proton dalam atom tertib menaik adalah S, T, U*
- D The tendency of atom to release valence electrons in increasing order is S, T, U  
*Kecenderungan atom melepaskan electron valens tertib menaik adalah S, T, U*

- 42 Table 4 shows the relative molecular masses of two gases.  
*Jadual 4 menunjukkan jisim molekul relatif bagi dua gas.*

Gas <i>Gas</i>	Oxygen, O <sub>2</sub> <i>Oksigen</i>	Carbon dioxide, CO <sub>2</sub> <i>Karbon dioksida</i>
Relative molecular mass <i>Jisim molekul relatif</i>	32	44

Table 4  
*Jadual 4*

Which of the following are correct?

[Molar volume of gas at room temperature = 24 mol dm<sup>-3</sup>;

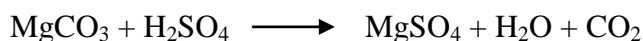
Relative atomic mass: C = 12, O = 16]

*Antara berikut, yang manakah betul?*

[*Isi padu molar bagi gas pada suhu bilik = 24 mol dm<sup>-3</sup> ;*

*Jisim atom relatif : C=12, O=16]*

- A** 1 mole of oxygen has the same mass as 1 mole of carbon dioxide  
*1 mol oksigen mempunyai jisim yang sama dengan 1 mol karbon dioksida*
- B** 1 mole of oxygen has the same volume as 1 mole of carbon dioxide  
*1 mol oksigen mempunyai isipadu yang sama dengan 1 mol karbon dioksida*
- C** 3 moles of oxygen has the same number of atom as 3 moles of carbon dioxide  
*3 mol oksigen mempunyai bilangan atom yang sama dengan 3 mol karbon dioksida*
- D** 0.5 mole of oxygen has the same number of molecules as 1 mole of carbon dioxide  
*0.5 mol oksigen mempunyai bilangan molekul yang sama dengan 1 mol karbon dioksida*
- 43 The equation represents the reaction between magnesium carbonate and sulphuric acid.  
*Persamaan mewakili tindak balas antara magnesium karbonat dan asid sulfurik.*



12.6 g of magnesium carbonate reacts with 200 cm<sup>3</sup> of 0.3 mol dm<sup>-3</sup> sulphuric acid.

What is the mass of magnesium carbonate which is not reacted?

[Relative atomic mass : H = 1, C = 12, O = 16, Mg = 24, S = 32]

*Jika 12.6 g magnesium karbonat bertindak balas dengan 200 cm<sup>3</sup> asid sulfurik 0.3 mol dm<sup>-3</sup>, berapakah jisim magnesium karbonat yang tidak bertindak balas?*

*[Jisim atom relatif : H = 1, C = 12, O = 16, Mg = 24, S = 32]*

- A** 2.52 g
- B** 5.04 g
- C** 6.25 g
- D** 7.56 g



- 44 Diagram 14 shows the electron arrangement of a compound.  
*Rajah 14 menunjukkan susunan elektron satu sebatian.*

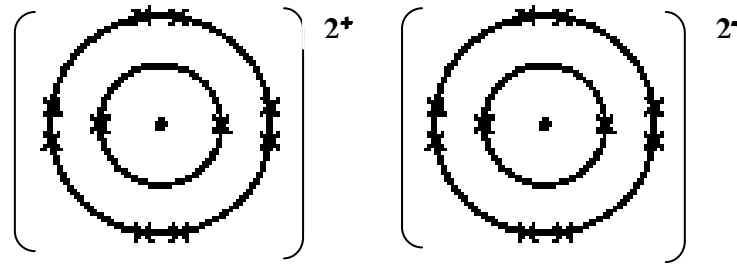


Diagram 14  
*Rajah 14*

Which compounds have the same physical properties as the compound in Diagram 14?  
*Sebatian manakah yang mempunyai sifat fizik yang sama seperti sebatian dalam Rajah 14?*

- I Limestone  
*Batu kapur*
- II Bauxite  
*Bauksit*
- III Glucose  
*Glukosa*
- IV Glycerol  
*Gliserol*
- 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*

- 45 Diagram 15 shows a simple voltaic cell.  
Rajah 15 menunjukkan satu sel volta ringkas.

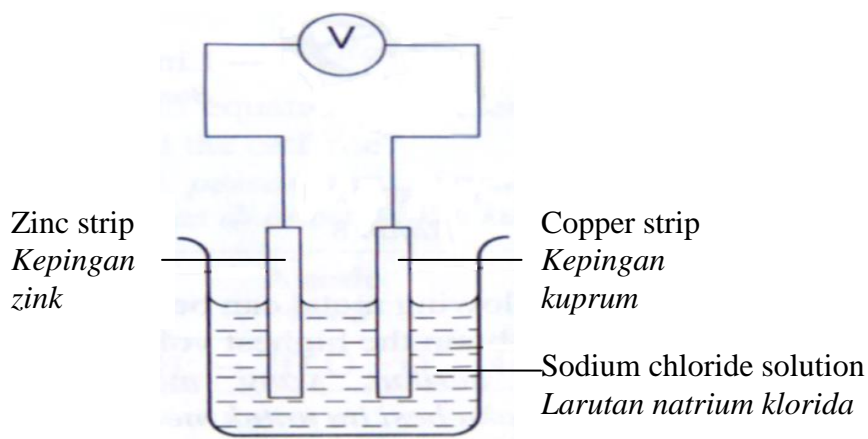


Diagram 15  
Rajah 15

Which half-equations represent the reactions at the positive terminal and the negative terminal of the cell?

Setengah persamaan yang manakah mewakili tindak balas di terminal positif dan terminal negatif bagi sel itu?

	Positive terminal <i>Terminal positif</i>	Negative terminal <i>Negatif terminal</i>
A	$2\text{H}^+ + 2\text{e} \longrightarrow \text{H}_2$	$\text{Cu} \longrightarrow \text{Cu}^{2+} + 2\text{e}$
B	$\text{Cu}^{2+} + 2\text{e} \longrightarrow \text{Cu}$	$\text{Zn} \longrightarrow \text{Zn}^{2+} + 2\text{e}$
C	$2\text{H}^+ + 2\text{e} \longrightarrow \text{H}_2$	$\text{Zn} \longrightarrow \text{Zn}^{2+} + 2\text{e}$
D	$\text{Na}^+ + \text{e} \longrightarrow \text{Na}$	$4\text{OH}^- \longrightarrow \text{O}_2 + 2\text{H}_2\text{O} + 4\text{e}$

- 46 Ant bite contains acid.  
Which substance is the most suitable to be applied on ant bite?  
Gigitan semut mengandungi asid.  
Bahan manakah yang paling sesuai diletakkan pada gigitan semut?

- A Tootpaste  
*Ubat gigi*
- B Detergent  
*Detergen*
- C Vinegar  
*Cuka*
- D Sugar  
*Gula*

- 47 Table 5 shows the volume of carbon dioxide gas released at half minutes intervals when hydrochloric acid reacts with marble chips.  
*Jadual 5 menunjukkan isi padu gas karbon dioksida terbebas bagi setiap setengah minit apabila asid hidroklorik bertindak balas dengan marmar.*

Time (min) <i>Masa (min)</i>	0.0	0.5	1.0	1.5	2.0	2.5	3.0
Volume of CO <sub>2</sub> (cm <sup>3</sup> ) <i>Isi padu gas CO<sub>2</sub> (cm<sup>3</sup>)</i>	0	170	260	305	340	350	350

Table 5  
*Jadual 5*

What is the average rate of reaction in the second minute?  
*Apakah kadar tindak balas purata dalam minit kedua?*

- A 80.0 cm<sup>3</sup> min<sup>-1</sup>  
 B 170.0 cm<sup>3</sup> min<sup>-1</sup>  
 C 220.0 cm<sup>3</sup> min<sup>-1</sup>  
 D 340.0 cm<sup>3</sup> min<sup>-1</sup>
- 48 Diagram 16 shows the structural formula of a compound.  
*Rajah 16 menunjukkan formula struktur bagi satu sebatian.*

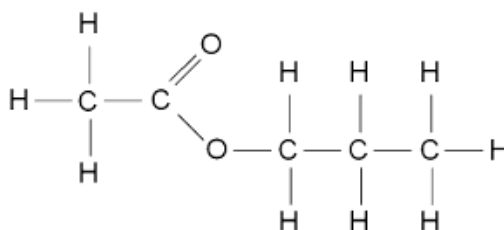


Diagram 16  
*Rajah 16*

What is the name of the compound?  
*Apakah nama sebatian itu?*

- A Methyl ethanoate  
*Metil etanoat*  
 B Ethyl propanoate  
*Etil propanoat*  
 C Methyl butanoate  
*Metil butanoat*  
 D Propyl ethanoate  
*Propil etanoat*

- 49 Diagram 17 shows the apparatus set-up to determine the position of carbon and other metals in the reactivity series of metal.

*Rajah 17 menunjukkan susunan radas untuk menentukan kedudukan karbon dan logam-logam lain siri kereaktifan logam.*

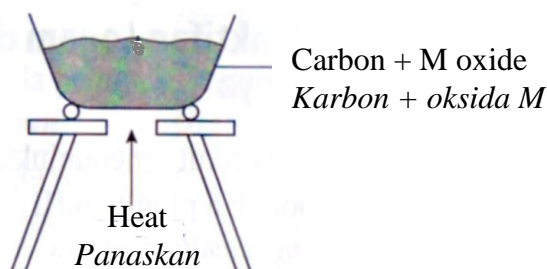


Diagram 17  
*Rajah 17*

The experiment is repeated by replacing oxide of metal M with oxide of metal N and oxide of metal R. Table 6 shows the results obtained.

*Eksperimen itu diulangi dengan menggantikan oksida M dengan oksida N dan oksida R. Jadual 6 menunjukkan keputusan yang didapati.*

<b>Mixture</b> <i>Campuran</i>	<b>Observation</b> <i>Pemerhatian</i>
Carbon + M oxide <i>Karbon + oksida M</i>	Glows dimly, grey solid formed <i>Membara malap, pepejal kelabu terbentuk</i>
Carbon + N oxide <i>Karbon + oksida N</i>	No changes <i>Tiada perubahan</i>
Carbon + R oxide <i>Karbon + oksida R</i>	Burns brightly, grey solid formed <i>Menyala terang, pepejal kelabu terbentuk</i>

Table 6  
*Jadual 6*

Which of the following is the correct arrangement in descending order of carbon, M, N and R in the reactivity series of metal?

*Antara berikut, yang manakah susunan tertib menurun yang betul bagi karbon, M, N dan R dalam siri kereaktifan logam?*

- A** Carbon, M, R, N  
*N, karbon, R, M*
- B** M, N, carbon, R  
*M, N, karbon, R*
- C** N, carbon, M, R  
*N, karbon, M, R*
- D** R, M, carbon, N  
*R, M, karbon, N*

- 50 The following information shows the results of an experiment to study the heat of combustion of butanol,  $C_4H_9OH$ .

*Maklumat berikut menunjukkan keputusan bagi satu eksperimen untuk mempelajari haba pembakaran butanol,  $C_4H_9OH$ .*

- Volume of water in the metal container =  $250 \text{ cm}^3$   
*Isipadu air dalam bekas logam =  $250 \text{ cm}^3$*
  
- Initial temperature of water =  $25.0^\circ\text{C}$   
*Suhu awal air =  $25.0^\circ\text{C}$*
  
- Highest temperature of water =  $T^\circ\text{C}$   
*Suhu tertinggi air =  $T^\circ\text{C}$*

What is the highest temperature,  $T^\circ\text{C}$  obtained in this experiment if 1.11 g of butanol is completely burnt?

[Specific heat capacity of water =  $4.2 \text{ Jg}^{-1} \text{ }^\circ\text{C}^{-1}$  ;

Relative molecular mass of butanol=74,

Heat of combustion of butanol =  $- 2\,450 \text{ kJ mol}^{-1}$ ]

*Apakah suhu tertinggi,  $T^\circ\text{C}$  yang dicapai dalam eksperimen ini, jika 1.11 g butanol dibakar lengkap?*

*[Muatan haba tentu air =  $4.2 \text{ Jg}^{-1} \text{ }^\circ\text{C}^{-1}$ , Jisim molekul relatif butanol=74*

*Haba pembakaran butanol =  $- 2\,450 \text{ kJ mol}^{-1}$  ]*

- A  $60.0^\circ\text{C}$
- B  $42.0^\circ\text{C}$
- C  $35.0^\circ\text{C}$
- D  $30.0^\circ\text{C}$

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