



**JABATAN PELAJARAN NEGERI TERENGGANU**

**Peperiksaan Percubaan**

**4541/1**

**SIJIL PELAJARAN MALAYSIA 2012**

**CHEMISTRY**

**Kertas 1**

**Ogos/ Sept**

**1 ¼ jam**

**Satu jam lima belas minit**

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**JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU**

- Kertas ini adalah dalam dwibahasa.*
- Soalan dalam bahasa Inggeris mendahului soalan dalam bahasa Melayu.*
- Calon dikehendaki membaca maklumat di halaman belakang kertas soalan ini.*

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Dibiayai oleh:  
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**TERENGGANU NEGERI ANJUNG ILMU**

*Dicetak Oleh:*

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Kertas soalan ini mengandungi 32 halaman bercetak

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- 1 Which of the following substances exists as molecules?  
*Antara bahan berikut, yang manakah wujud sebagai molekul?*

- A Carbon  
*Karbon*
- B Helium  
*Helium*
- C Sulphur dioxide  
*Sulfur dioksida*
- D Silver chloride  
*Argentum klorida*

- 2 Which of the following statements is true for one mole of a substance?  
*Antara pernyataan berikut, yang manakah benar bagi satu mol bahan?*

- A 1 mol of magnesium contains  $6.02 \times 10^{23}$  molecules  
*1 mol magnesium mengandungi  $6.02 \times 10^{23}$  molekul*
- B 1 mol of hydrogen gas contains  $6.02 \times 10^{23}$  atoms  
*1 mol gas hidrogen mengandungi  $6.02 \times 10^{23}$  atom*
- C 1 mol of water contains the same number of atoms as in 12 g of carbon-12  
*1 mol air mengandungi bilangan atom yang sama dengan 12 g karbon-12*
- D 1 mol of carbon dioxide contains the same number of molecules as the number of atom in 12 g of carbon-12  
*1 mol karbon dioksida mengandungi bilangan molekul yang sama dengan bilangan atom dalam 12 g karbon-12*

- 3 Diagram 1 shows the Periodic Table of Elements.  
*Rajah 1 menunjukkan Jadual Berkala Unsur.*

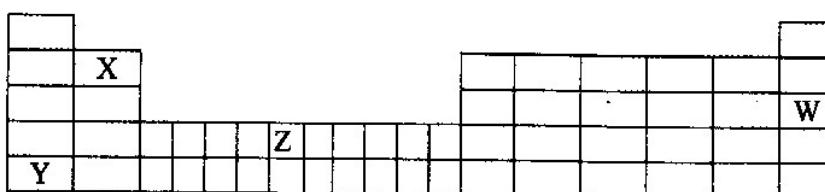


Diagram 1  
*Rajah 1*

Which of the following element has different oxidation numbers in its compounds?  
*Antara yang berikut, manakah unsur yang mempunyai nombor pengoksidaan yang berbeza dalam sebatian-sebatiananya?*

- A W  
B X  
C Y  
D Z
- 4 Propane and water have low melting and boiling points. Propane and water are  
*Propana dan air mempunyai takat lebur dan takat didih yang rendah. Propana dan air adalah*
- A ionic compound  
*sebatian ion*  
B organic compound  
*sebatian organik*  
C covalent compound  
*sebatian kovalen*  
D hydrocarbon compound  
*sebatian hidrokarbon*

- 5 Which of the following substances is an electrolyte?  
*Antara bahan berikut, yang manakah elektrolit?*

- A Copper metal  
*Logam kuprum*
- B Glucose solution  
*Larutan glukosa*
- C Molten naphthalene  
*Leburan naftalena*
- D Sodium chloride solution  
*Larutan natrium klorida*

- 6 Ascorbic acid is a weak acid because it  
*Asid askorbik adalah asid lemah kerana asid ini*

- A has a high melting point.  
*mempunyai takat lebur yang tinggi*
- B is only partially ionized in water  
*hanya mengion separa dalam air*
- C contains few hydrogen atoms  
*mengandungi sedikit atom-atom hidrogen*
- D is only slightly soluble in water  
*larut sedikit dalam air*

- 7 Which of the following compounds is a soluble salt?  
*Antara sebatian berikut, yang manakah adalah garam terlarutkan?*

- A Lead(II) iodide  
*Plumbum(II) iodida*
- B Barium sulphate  
*Barium sulfat*
- C Calcium chloride  
*Kalsium klorida*
- D Magnesium carbonate  
*Magnesium karbonat*

8 Which of the following food additives is an antioxidant?

*Antara bahan tambah makanan berikut, yang manakah adalah pengantioksida?*

- A Benzoic acid  
*Asid benzoik*
- B Ascorbic acid  
*Asid askorbik*
- C Sodium nitrate  
*Natrium nitrat*
- D Ethyl ethanoate  
*Etil etanoat*

9 Which of the following is not a characteristic of a catalyst?

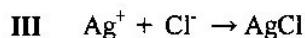
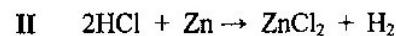
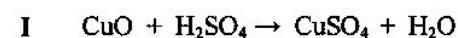
*Antara yang berikut, manakah bukan ciri mangkin?*

- A A catalyst is specific in its reaction  
*Mangkin adalah khusus dalam tindak balasnya*
- B A catalyst does not change the quantity of product  
*Mangkin tidak mempengaruhi kuantiti hasil tindak balas*
- C A catalyst can increase the activation energy reaction  
*Mangkin meninggikan tenaga pengaktifan tindak balas*
- D Only a little amount of a catalyst is needed to change the rate of reaction  
*Hanya sedikit mangkin diperlukan untuk mempengaruhi kadar tindak balas*

10 Hexene is classified as an unsaturated hydrocarbon because  
*Heksena dikelaskan sebagai hidrokarbon tidak tepu kerana*

- A it contains only carbon and hydrogen  
*ia mengandungi karbon dan hidrogen sahaja.*
- B it is a liquid at room temperature.  
*ia adalah cecair pada suhu bilik.*
- C it is less dense than water.  
*ia kurang tumpat daripada air*
- D it has a double bond between carbon atom  
*ia mempunyai ikatan ganda di antara atom karbon*

11 Which of the following equations represent a redox reaction?  
*Antara persamaan berikut, yang manakah mewakili tindak balas redok?*



A I and II  
*I dan II*

B II and IV  
*II dan IV*

C I and III  
*I dan III*

D III and IV  
*III dan IV*

- 12 Which of the following is true of an exothermic reaction?

*Antara yang berikut, 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 The heat energy is converted to kinetic energy.  
*Tenaga haba di tukar kepada tenaga kinetik.*
- D Heat energy is absorbed from the surroundings.  
*Tenaga haba diserap dari persekitaran.*

- 13 Diagram 2 shows the symbol of sodium atom. The nucleus of this atom contains  
*Rajah 2 menunjukkan simbol bagi atom natrium. Nukleus atom ini mengandungi*

23	Na
11	

Diagram 2  
*Rajah 2*

- A 11 proton and 12 neutron  
*11 proton dan 12 neutron*
- B 11 proton and 23 neutron  
*11 proton dan 23 neutron*
- C 11 neutron and 11 electron  
*11 neutron dan 11 elektron*
- D 12 neutron and 11 electron  
*12 neutron dan 11 elektron*

- 14 Diagram 3 shows the apparatus set-up to determine the empirical formula of magnesium oxide.

Rajah 3 menunjukkan radas untuk menentukan formula empirik bagi magnesium oksida.

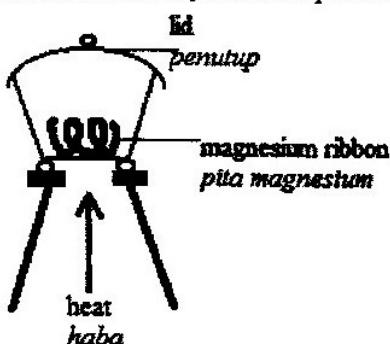


Diagram 3

Rajah 3

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

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

- A To avoid the oxygen gas entering the crucible dish  
*Untuk mengelak gas oksigen daripada memasuki mangkuk pijar*
- B To avoid the magnesium ribbon from burning  
*Untuk mengelak pita magnesium daripada terbakar*
- C To avoid the white fumes from escaping  
*Untuk mengelak wasap putih daripada terbebas keluar*
- D To avoid water vapour from entering the crucible dish  
*Untuk mengelak wap air daripada memasuki mangkuk pijar*

- 15 Elements are arranged in the Modern Periodic Table based on their  
*Unsur-unsur di susun dalam Jadual Berkala Moden berdasarkan*

- A atomic mass  
*jisim atom*
- B atomic radius  
*jejari atom*
- C proton number  
*nombor proton*
- D number of neutron  
*bilangan neutron*

- 16 Solid lead(II) bromide does not conduct electricity because

*Pepejal plumbum(II) bromida tidak mengkonduksi elektrik kerana*

- A It does not contain ion.

*Ia tidak mengandungi ion-ion*

- B It consists of molecules.

*Ia terdiri daripada molekul-molekul*

- C Lead(II) ions and bromide ions are bonded by strong covalent bonds.

*Ion plumbum(II) dan ion bromida terikat oleh ikatan kovalen yang kuat*

- D It contains lead(II) ions and bromide ions that are not free to move.

*Ia terdiri daripada ion plumbum(II) dan ion bromida yang tidak bebas bergerak.*

- 17 Diagram 4 shows the apparatus set-up of an electrolytic cell.

*Rajah 4 menunjukkan susunan radas bagi satu sel elektrolisis.*

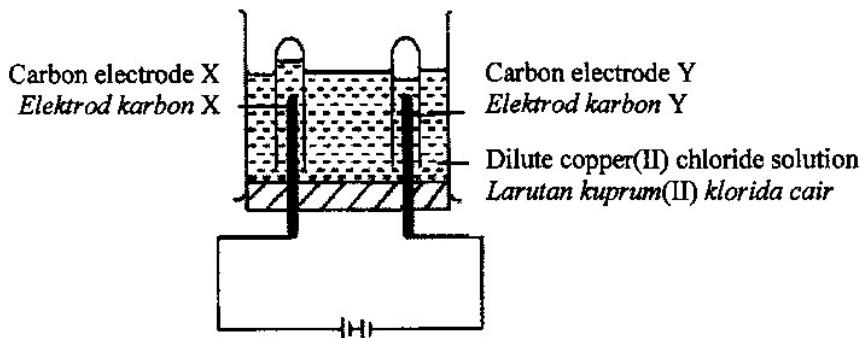
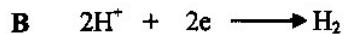
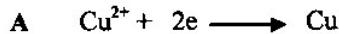


Diagram 4

*Rajah 4*

Which of the following half equations represents the reaction that occurred at electrode Y?

*Antara persamaan setengah berikut, yang manakah mewakili tindak balas yang berlaku di elektrod Y?*



18 Which of the following is correct about strong alkaline solution?

*Antara yang berikut, yang manakah betul tentang larutan alkali kuat?*

- A Have pH value of 14  
*Mempunyai nilai pH 14*
- B Partially ionize in water  
*Mengion separa dalam air*
- C Low concentration of hydroxide ion  
*Kepakatan ion hidroksida rendah*
- D Solution does not react with acid  
*Larutan tidak bertindak balas dengan asid*

19 The following information shows the properties of salt X when heated

*Maklumat berikut menunjukkan sifat-sifat garam X bila dipanaskan*

- Releases brown gas and a gas which lights up glowing splinter when heated strongly  
*Membebaskan gas perang dan gas yang menyalaakan kayu uji berbara apabila dipanaskan dengan kuat*
- Leaving a brown residue when hot and yellow when cold  
*Menghasilkan baki yang berwarna perang semasa panas dan kuning semasa sejuk*

What is salt X?

*Apakah garam X?*

- A Zinc nitrate  
*Zink nitrat*
- B Zink carbonate  
*Zinc karbonat*
- C Lead(II) nitrate  
*Plumbum(II) nitrat*
- D Lead(II) carbonate  
*Plumbum(II) karbonat*

- 20 Diagram 5 shows the two examples of medicine P.  
*Rajah 5 menunjukkan dua contoh ubat P.*

- Penicillin  
*Penisilin*
- Streptomycin  
*Streptomisin*

Diagram 5  
*Rajah 5*

What is medicine P?  
*Apakah jenis ubat P?*

- A Hormone  
*Hormon*
- B Analgesic  
*Analgesik*
- C Antibiotic  
*Antibiotik*
- D Psychotherapeutic  
*Psikoterapeutik*
- 21 Diagram 6 shows the electron arrangement of atom X.  
*Rajah 6 menunjukkan susunan elektron bagi atom X.*

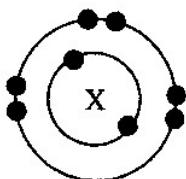


Diagram 6  
*Rajah 6*

How many protons are there in the nucleus of atom X?  
*Berapakah bilangan proton yang terdapat dalam nukleus atom X?*

- A 2
- B 4
- C 6
- D 8

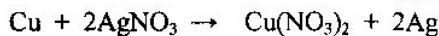
- 22 The following chemical equation shows a reaction for ethanol.  
*Persamaan kimia berikut menunjukkan satu tindak balas bagi etanol.*



What is the name of the reaction?  
*Apakah nama bagi tindak balas itu?*

- A Oxidation  
*Pengoksidaan*
- B Reduction  
*Penurunan*
- C Dehydration  
*Pendehidratan*
- D Fermentation  
*Penapaian*

- 23 The following equation shows the redox reaction between copper and silver nitrate solution.  
*Persamaan berikut menunjukkan tindak balas redok antara kuprum dengan larutan argentum nitrat.*



Which of the following statements is true about this reaction?  
*Antara pernyataan berikut, yang manakah benar mengenai tindak balas ini?*

- A Silver ion is oxidized  
*Ion argentum dioksidakan*
- B Copper is the oxidizing agent  
*Kuprum adalah agen pengoksidaan*
- C The oxidation number of copper increases  
*Nombor pengoksidaan kuprum bertambah*
- D The oxidation number of nitrogen decreases  
*Nombor pengoksidaan nitrogen berkurang*

- 24** Diagram 7 shows the setup of apparatus for the determination of heat of reaction.  
*Rajah 7 menunjukkan susunan radas untuk menentukan haba tindak balas.*

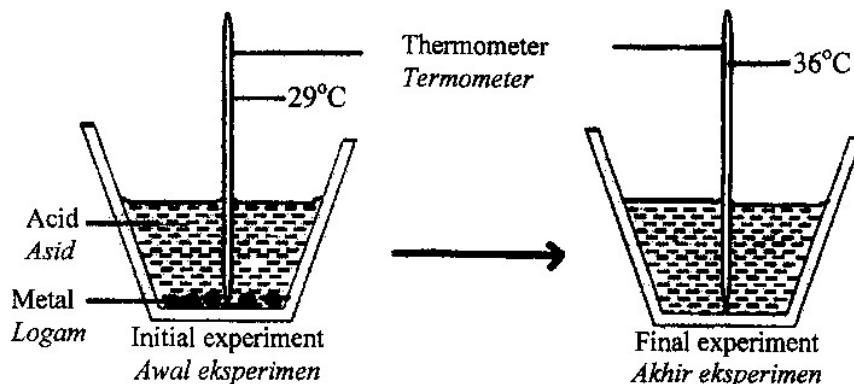


Diagram 7  
*Rajah 7*

Which of the following statement is true?  
*Antara pernyataan yang berikut, manakah benar?*

- I** Process of bond formation occurs.  
*Proses pembentukan ikatan berlaku*
  - II** The temperature increases during the reaction.  
*Suhu meningkat semasa tindak balas berlaku*
  - III** The value of  $\Delta H$  for the reaction is positive.  
*Nilai  $\Delta H$  dalam tindak balas ini adalah positif*
  - IV** The energy content of the products is lower than the energy content of the reactants.  
*Kandungan tenaga hasil tindak balas lebih rendah daripada kandungan tenaga bahan tindak balas*
- A** I and II  
*I dan II*
  - B** III and IV  
*III dan IV*
  - C** I, II and IV  
*I, II dan IV*
  - D** I, II, III and IV  
*I, II, III dan IV*

- 25** Table 1 shows the number of electrons, protons and neutrons for particle X and Y.

*Jadual 1 menunjukkan bilangan elektron, proton dan neutron bagi zarah X dan Y.*

Particle <i>Zarah</i>	Number of electron <i>Bilangan elektron</i>	Number of proton <i>Bilangan proton</i>	Number of neutron <i>Bilangan neutron</i>
X	10	10	11
Y	10	10	14

Table 1  
*Jadual 1*

Which of the following statements is true for X and Y?

*Antara yang berikut, manakah pernyataan yang benar bagi X dan Y?*

- A** X is a positive ion  
*X ialah ion positif*
- B** X and Y are isotopes  
*X dan Y merupakan isotop*
- C** Both X and Y are charged particles  
*Kedua-dua X dan Y merupakan zarah berasa*
- D** Both X and Y have the same nucleon number  
*Kedua-dua X dan Y mempunyai nombor nukleon yang sama*

- 26 Table 2 shows two elements and their respective relative atomic mass.

*Jadual 2 menunjukkan dua unsur dan jisim atom relatif masing-masing.*

Element <i>Unsur</i>	Relative atomic mass <i>Jisim atom relatif</i>
	S
S	32
O	16

Table 2  
*Jadual 2*

Which of the following is true about the atom of elements S and O?

*Antara yang berikut, manakah benar tentang atom bagi unsur S dan unsur O?*

- A The mass of 1 mol of S is twice the mass of 1 mol of O  
*Jisim 1 mol S adalah dua kali jisim 1 mol O*
- B 1 mol of S has the same mass of 1 mol of O  
*1 mol S mempunyai jisim yang sama dengan 1 mol O*
- C The mass of an atom S is 32g and the mass of an atom O is 16g  
*Jisim 1 atom S ialah 32 g and jisim 1 atom O ialah 16g*
- D The number of mole in 16 g of atom O is equal to the number of mole 16g atom S  
*Bilangan mol dalam 16g atom O sama dengan bilangan mol dalam 16g atom S*

- 27 Diagram 8 shows the symbols for elements X and Y.  
*Rajah 8 menunjukkan simbol bagi unsur X dan Y.*

23 <b>X</b> 11	39 <b>Y</b> 19
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Diagram 8  
*Rajah 8*

Which of the following is true about elements X and Y?  
*Antara yang berikut, yang manakah adalah benar bagi unsur X dan Y?*

- A Element X is less reactive than element Y  
*Unsur X kurang reaktif daripada unsur Y*
- B Both elements X and Y are monoatomic gas  
*Kedua-dua unsur X dan Y adalah gas monoatom*
- C Both elements X and Y are non metal  
*Kedua-dua unsur X dan Y adalah bukan logam*
- D Element X react with element Y to form an ionic compound  
*Unsur X bertindakbalas dengan unsur Y untuk membentuk sebatian ion*

- 28 Which of the following is true about an alkali?  
*Antara peryataan berikut yang manakah benar tentang alkali?*

- A An alkali is not corrosive  
*Alkali tidak mengakas*
- B An alkali is a base that is soluble in water  
*Alkali adalah bas yang larut dalam air*
- C A strong alkali has a lower pH value  
*Alkali kuat mempunyai pH yang rendah*
- D A weak alkali has a high degree of ionization  
*Alkali lemah ialah alkali yang mempunyai kadar pengionan yang tinggi*

- 29 Diagram 9 shows the electron arrangement of a carbon dioxide molecule.  
*Rajah 9 menunjukkan susunan elektron bagi molekul karbon dioksida.*

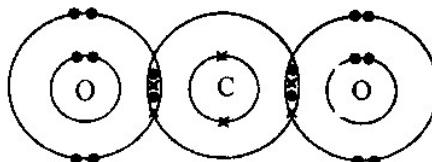


Diagram 9  
*Rajah 9*

Which of the following is true?

*Antara yang berikut, manakah benar?*

- A Each oxygen atom contributes one electron for sharing.  
*Setiap atom oksigen menyumbang satu elektron untuk dikongsi.*
- B Four double covalent bonds are formed in a carbon dioxide molecule.  
*Empat ikatan kovalen ganda dua terbentuk dalam molekul karbon dioksida.*
- C One carbon atom contributes four electrons to be shared by two oxygen atoms  
*Satu atom karbon menyumbang empat elektron untuk dikongsi dengan dua atom oksigen.*
- D One carbon atom requires two electrons to achieve the octet electron arrangement.  
*Satu atom karbon memerlukan dua elektron untuk mencapai susunan elektron oktet.*

- 30 Table 3 shows the information about three simple cells  
*Jadual 3 menunjukkan maklumat tentang tiga sel ringkas*

Pairs of metals <i>Pasangan logam</i>	Potential difference/ V <i>Beza keupayaan /V</i>	Negative Terminal <i>Terminal negatif</i>
X and iron <i>X dan ferum</i>	0.63	X
Y and iron <i>Y dan ferum</i>	1.58	Y
Z and iron <i>Z dan ferum</i>	0.82	Iron <i>Ferum</i>

Table 3  
*Jadual 3*

What is the potential difference of the cell which uses the pair of metals, Y and Z?  
*Apakah beza keupayaan sel yang menggunakan pasangan logam Y and Z?*

- A 0.95 V
- B 1.45 V
- C 2.40 V
- D 2.97 V

- 31 Which of the following substances can be used to differentiate between sodium sulphate solution and sodium chloride solution?

*Antara bahan berikut, yang manakah boleh digunakan untuk membezakan larutan natrium sulfat dan larutan natrium klorida?*

- A Dilute nitric acid  
*Asid nitrik cair*
- B Barium nitrate solution  
*Larutan barium nitrat*
- C Potassium iodide solution  
*Larutan kalium iodida*
- D Magnesium nitrate solution  
*Larutan magnesium nitrat*

- 32 Diagram 10 shows a racing car. The body of the car is made of substance Q.

Rajah 10 menunjukkan sebuah kereta lumba. Badan kereta tersebut diperbuat daripada bahan Q.

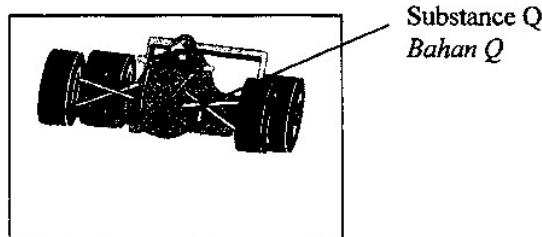


Diagram 10  
Rajah 10

Substance Q has the following properties  
Bahan Q mempunyai ciri-ciri berikut

- strong  
*kuat*
- light  
*ringan*
- durable  
*tahan lasak*
- withstand high temperature  
*tahan haba tinggi*

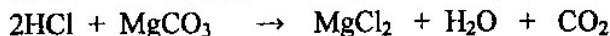
Which of the following is substance Q?

Antara yang berikut, manakah bahan Q?

- A Ceramic  
*Seramik*
- B Concrete  
*Konkrit*
- C Plastic  
*Plastik*
- D Composite material  
*Bahan komposit*

- 33 The following equation shows a reaction between hydrochloric acid and granulated marble to produce carbon dioxide gas.

*Persamaan berikut menunjukkan tindak balas antara asid hidroklorik dengan ketulan marmar untuk menghasilkan gas karbon dioksida.*



Which of the following will increase the rate of gas release?

*Antara yang berikut, manakah akan meningkatkan kadar pembebasan gas?*

- A Increase the time of reaction  
*Menambahkan masa tindak balas*
- B Increase the volume of acid  
*Menambahkan isipadu asid*
- C Use the marble powder  
*Gunakan serbuk marmar*
- D Decrease the temperature of the mixture  
*Merendahkan suhu campuran*

- 34 Diagram 11 shows the structural formula of a compound.

*Rajah 11 menunjukkan formula struktur bagi suatu sebatian..*

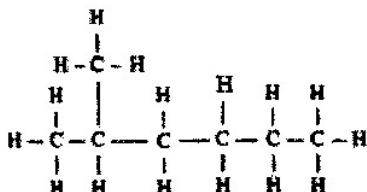


Diagram 11

*Rajah 11*

Which of the following is the name of the compound.

*Antara yang berikut, manakah nama sebatian itu.*

- A 2-methylhexane  
*2-metilheksana*
- B 1,2-dimethylpentane  
*1,2-dimetilpentana*
- C 5-methylhexane  
*5-metilheksana*
- D 3,5-dimethylpentane  
*3,5-dimetilpentana*

- 35** Element X is a reducing agent. Which of the following electron arrangements is for atom X ?  
*X adalah agen penurunan. Antara susunan elektron berikut adalah bagi atom unsur X?*

- A** 2.8.2
- B** 2.8.8
- C** 2.8.7
- D** 2.8.4

- 36** Diagram 12 shows the energy level diagram of the following chemical reaction.  
*Rajah 12 menunjukkan gambar rajah aras tenaga bagi tindak balas kimia berikut.*

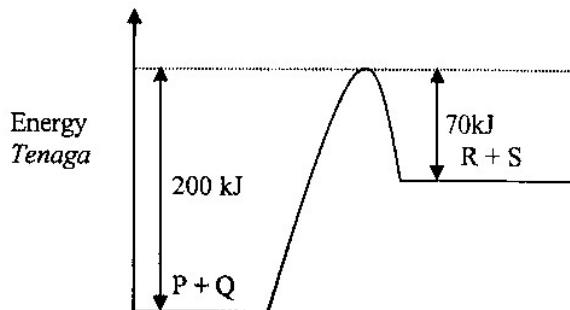


Diagram 12  
*Rajah 12*

Which of the following statements is true?  
*Antara pernyataan berikut, yang manakah benar?*

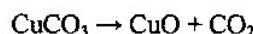
- A** The heat of reaction is 70 kJ.  
*Haba tindak balas bagi tindak balas ialah 70 kJ.*
- B** R and S are more stable than P and Q.  
*R dan S adalah lebih stabil daripada P dan Q.*
- C** The activation energy of reaction is 200 kJ.  
*Tenaga pengaktifan bagi tindak balas adalah 200 kJ.*
- D** Heat is released when P reacts with Q to produce R and S.  
*Haba terbebas apabila P bertindak balas dengan Q untuk menghasilkan R dan S.*

- 37 Electron arrangement of atom X is 2.8.2 and atom Y is 2.8.7.  
Which of the following statement is true about  $X^{2+}$  ion and  $Y^-$  ion?

*Susunan elektron bagi atom X ialah 2.8.2 dan atom Y ialah 2.8.7.  
Antara pernyataan berikut, manakah benar tentang ion  $X^{2+}$  dan ion  $Y^-$ ?*

- A Has same chemical properties  
*Mempunyai sifat yang kimia*
- B Has same number of proton  
*Mempunyai bilangan proton yang sama*
- C Has same number of electron  
*Mempunyai bilangan elektron yang sama*
- D Number of shell occupied with electron is different  
*Bilangan petala yang mengandungi elektron adalah berbeza*

- 38 Copper (II) carbonate dissociate when heated strongly according to the chemical equation.  
*Kuprum(II) karbonat terurai apabila di panaskan mengikut persamaan kimia berikut.*



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

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

*Berapakah jisim kuprum(II)oksida yang terbentuk apabila 12.4g kuprum(II) karbonat terurai selengkapnya?*

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

- A 8.0 g
- B 16.0 g
- C 24.8 g
- D 160 g

- 39 Table 4 shows the properties of oxide of elements in the Periodic Table of elements.  
*Jadual 4 menunjukkan sifat oksida bagi suatu unsur dalam Jadual Berkala Unsur*

Oxide Oksida	Observation <i>Pemerhatian</i>	
	With sodium hydroxide solution <i>Dengan larutan natrium hidroksida</i>	With dilute nitric acid <i>Dengan asid nitrik cair</i>
R <sub>x</sub> O <sub>z</sub>	The white powder dissolves to form colourless solution <i>Serbuk putih larut membentuk larutan tanpa warna.</i>	The white powder dissolves to form a colourless solution. <i>Serbuk putih larut membentuk larutan tanpa warna</i>

Table 4  
*Jadual 4*

What is the inference that can make from the observation?  
*Apakah inferen yang dapat dibuat berdasarkan pemerhatian tersebut?*

- A RxO<sub>z</sub> shows acidic properties only.  
*RxO<sub>z</sub> menunjukkan sifat-sifat asid sahaja.*
- B RxO<sub>z</sub> shows basic properties only.  
*RxO<sub>z</sub> menunjukkan sifat-sifat bes sahaja.*
- C RxO<sub>z</sub> shows acidic and basic properties.  
*RxO<sub>z</sub> menunjukkan sifat-sifat asid dan bes.*
- D RxO<sub>z</sub> shows acidic, basic and non-metallic properties.  
*RxO<sub>z</sub> menunjukkan sifat-sifat asid, bes dan bukan logam.*

- 40 Diagram 13 shows the electron arrangements of atoms X and Y  
Rajah 13 menunjukkan susunan elektron bagi atom X dan Y

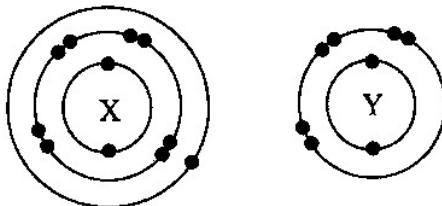


Diagram 13  
Rajah 13

Which of the following is true when X react with Y?  
Antara yang berikut, manakah benar apabila X bertindak balas dengan Y?

- A Atom X receives electrons  
*Atom X menerima elektron*
- B Atom Y receives electrons  
*Atom Y menerima elektron*
- C The compound formed has a formula of  $XY_2$   
*Sebatian terbentuk mempunyai formula  $XY_2$*
- D The compound formed is made up of molecules  
*Sebatian terbentuk terdiri daripada molekul*

- 41 Diagram 14 shows the setup of apparatus for a voltaic cell  
*Rajah 14 menunjukkan susunan radas sebuah sel voltan*

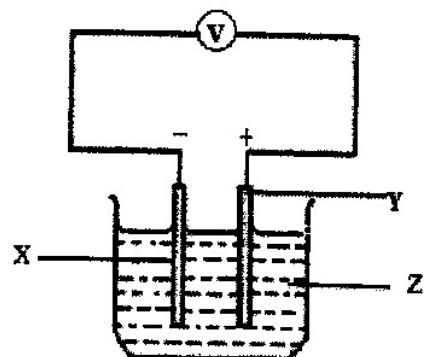


Diagram 14  
*Rajah 14*

Which of the following sets of material would cause the electric current to flow?  
*Antara yang berikut, manakah set bahan yang menyebabkan arus elektrik mengalir?*

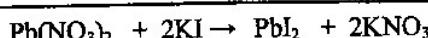
	X	Y	Z
A	Zinc <i>Zinc</i>	Copper <i>kumprum</i>	Copper(II) sulphate solution <i>Larutan kuprum(II) sulfat</i>
B	Zinc <i>Zinc</i>	Magnesium <i>Magnesium</i>	Dilute hydrochloric acid <i>Asid cair hidroklorik</i>
C	Iron <i>Besi</i>	Zinc <i>Zinc</i>	Zinc chloride solution <i>Larutan zink klorida</i>
D	Silver <i>Argentum</i>	Zinc <i>Zinc</i>	Silver nitrate solution <i>Larutan argentiums nitrat</i>

- 42 Both ethanoic acid and hydrochloric acid with concentration of  $1 \text{ mol dm}^{-3}$  have  
*Kedua-dua asid etanoik dan asid hidroklorik yang berkepekatan  $1 \text{ mol dm}^{-3}$  mempunyai*

- A the same concentration of hydrogen ions  
*kepekatan ion hidrogen yang sama*
- B different degree of ionisation in water  
*darjah pengionan dalam air yang berbeza*
- C same pH value  
*nilai pH yang sama*
- D the same concentration of hydroxide ions  
*kepekatan ion hidroksida yang sama*

- 43 The following chemical equation shows the reaction between potassium iodide solution and lead(II) nitrate solution:

*Persamaan kimia berikut menunjukkan tindak balas antara larutan kalium iodida dan larutan plumbum(II) nitrat:*



Calculate the maximum mass of precipitate,  $\text{PbI}_2$  formed when excess potassium iodide solution is added to  $50 \text{ cm}^3$  of  $0.2 \text{ mol dm}^{-3}$  lead(II) nitrate solution.

[Relative atomic mass: Pb = 207, I = 127, K = 39, N = 14, O = 16]

*Hitungkan jisim maksimum mendakan,  $\text{PbI}_2$  yang terbentuk apabila larutan kalium iodida berlebihan ditambah ke dalam  $50 \text{ cm}^3$  larutan plumbum(II) nitrat  $0.2 \text{ mol dm}^{-3}$ .*

*[Jisim atom relatif: Pb = 207, I = 127, K = 39, N = 14, O = 16]*

- A 1.01 g
- B 2.02 g
- C 4.61 g
- D 9.22 g

- 44** Which of the following reactions needs a catalyst for the production of sulphuric acid by Contact Process?

*Antara tindak balas berikut yang manakah memerlukan mangkin untuk penghasilan asid sulfurik melalui Proses Sentuh?*

- A  $S + O_2 \rightarrow SO_2$
- B  $2SO_2 + O_2 \rightarrow 2SO_3$
- C  $SO_3 + H_2S_2O_7 \rightarrow H_2S_2O_7$
- D  $H_2S_2O_7 + H_2O \rightarrow 2H_2SO_4$

- 45** The molecular formulae of two molecules P and Q are as follows.

*Formula molekul bagi molekul P dan Q adalah seperti berikut*

P:  $CH_3CH_2OH$

Q:  $CH_3CH_2CH_2OH$

Which of the following statements is true for both molecules P and Q?

*Antara pernyataan berikut, yang manakah benar bagi kedua-dua molekul P dan Q?*

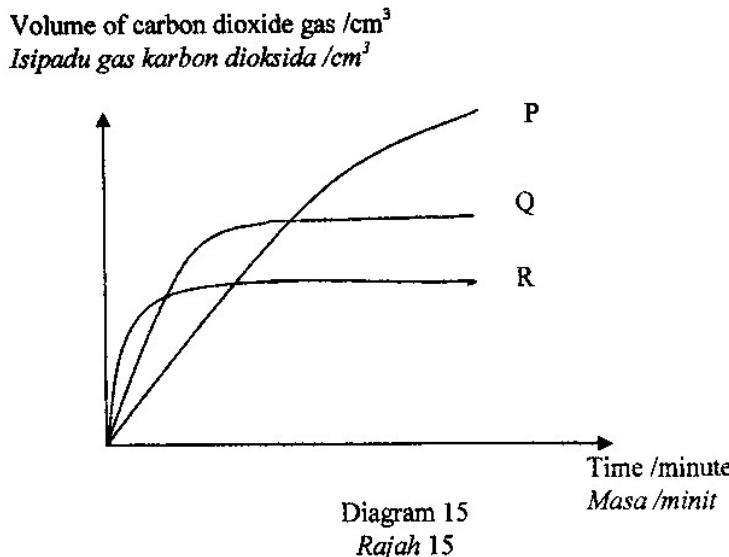
- A They have different functional groups  
*Kedua-duanya mempunyai kumpulan berfungsi yang berlainan*
- B All their physical properties are similar  
*Semua sifat fiziknya sama*
- C All their chemical properties are different  
*Semua sifat kimianya berbeza*
- D They can be represented by the same general formula  
*Kedua-duanya boleh diwakili oleh satu formula am yang sama*

- 46 Three experiments were conducted by a group of students to investigate the reaction between excess zinc and the acids as shown in the table below.

Tiga eksperimen telah dilakukan oleh sekumpulan pelajar untuk menyiasat tindakbalas di antara zink yang berlebihan dengan asid-asid seperti yang ditunjukkan dalam jadual.

Experiment Eksperimen	Hydrochloric acid Asid hidroklorik
I	25 cm <sup>3</sup> hydrochloric acid 2.0 mol dm <sup>-3</sup> 25 cm <sup>3</sup> asid hidroklorik 2.0 mol dm <sup>-3</sup>
II	50 cm <sup>3</sup> hydrochloric acid 1.5 mol dm <sup>-3</sup> 50 cm <sup>3</sup> asid hidroklorik 1.5 mol dm <sup>-3</sup>
III	15 cm <sup>3</sup> sulphuric acid 1.5 mol dm <sup>-3</sup> 15 cm <sup>3</sup> asid sulfatik 1.5 mol dm <sup>-3</sup>

Diagram 15 shows the graph of volume carbon dioxide gas against time for the above experiments.  
Rajah 15 menunjukkan graf isi padu gas karbon dioksida melawan masa bagi eksperimen di atas.

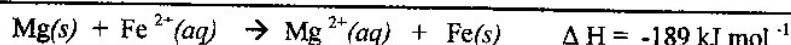


Which of the following represents the results of the experiments correctly?  
Manakah di antara berikut mewakili keputusan-keputusan eksperimen dengan betul?

	I	II	III
A	P	Q	R
B	Q	P	R
C	P	R	Q
D	R	Q	P

- 47 The thermochemical ionic equation below represents the reaction between magnesium powder and iron(II) sulphate solution.

*Persamaan ion termokimia berikut mewakili tindak balas antara serbuk magnesium dan larutan ferum(II) sulfat.*



What is the temperature increase when excess magnesium powder is added into  $80 \text{ cm}^3$  of  $0.4 \text{ mol dm}^{-3}$  iron(II) sulphate solution.

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

*Berapakah kenaikan suhu campuran apabila serbuk magnesium yang berlebihan ditambah kepada  $80 \text{ cm}^3 0.4 \text{ mol dm}^{-3}$  larutan ferum(II) sulfat.*

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

- A  $6.5 \text{ }^\circ\text{C}$
- B  $13.5 \text{ }^\circ\text{C}$
- C  $18.0 \text{ }^\circ\text{C}$
- D  $37.8 \text{ }^\circ\text{C}$

- 48 Diagram 16 shows the apparatus set up to investigate the effect of metals X, Y and Z on the rusting of iron nail.

Rajah 16 menunjukkan susunan radas untuk mengkaji kesan logam X, Y dan Z ke atas pengaratan paku besi.

	A	B	C
Experiment Eksperimen	Hot agar solution + potassium hexacyanoferrate(III) <i>Agar-agar panas + kalium heksasianoferrat(III)</i> 	Hot agar solution + potassium hexacyanoferrate(III) <i>Agar-agar panas + kalium heksasianoferrat(III)</i> 	Hot agar solution + potassium hexacyanoferrate(III) <i>Agar-agar panas + kalium heksasianoferrat(III)</i> 
Material Bahan	Iron nail and metal X <i>Paku besi dengan logam X</i>	Iron nail and metal Y <i>Paku besi dengan logam Y</i>	Iron nail and metal Z <i>Paku besi dengan logam Z</i>
Observation Pemerhatian	Small amount of blue spot <i>Sedikit tompok biru</i>	No change <i>Tiada perubahan</i>	A lot of blue spot <i>Banyak tompok biru</i>

Diagram 16  
Rajah 16

Which of the following arrangements of metals X, Y and Z is in descending order of their electropositivity?  
Antara yang berikut, manakah susunan logam X, Y dan Z mengikut tertib kelektropositifan menurun?

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

- 49** Table 6 shows the number of neutron and proton in atom X and Y  
*Jadual 6 menunjukkan nombor neutron dan proton bagi atom X dan Y.*

Atom <i>Atom</i>	Number of neutron <i>Bilangan neutron</i>	Number of proton <i>Bilangan proton</i>
X	6	6
Y	8	6

Table 6  
*Jadual 6*

Which of the following shows the characteristic of atom X and Y?  
*Antara yang berikut, manakah merupakan ciri-ciri bagi atom X dan Y?*

- A** The size of atom X is bigger than the size of atom Y  
*Saiz atom X lebih besar daripada saiz atom Y*
- B** Atom X and atom Y has the same melting point and boiling point  
*Atom X dan atom Y mempunyai takat lebur dan takat didih yang sama*
- C** X dan Y has the same nucleon number  
*X dan Y mempunyai nombor nukleon yang sama*
- D** X dan Y occupy the same position in the Periodic Table of Element  
*X dan Y berada pada kedudukan yang sama dalam Jadual Berkala Unsur*

- 50** 1.3 g of zinc reacts with excess sulphuric acid. What is the volume of hydrogen gas formed at stp  
 [Relative Atomic Mass: Zn= 65, 1 mole of gas occupies a volume of 22.4 dm<sup>3</sup> at s.t.p.]

*1.3g zink bertindakbalas dengan asid sulfurik berlebihan. Hitungkan isipadu gas hidrogen yang terbentuk pada s.t.p.*  
*[Jisim atom relatif: Zn= 65, 1 mol gas menempati 22.4 dm<sup>3</sup> pada s.t.p.]*

- A** 24 cm<sup>3</sup>
- B** 112 cm<sup>3</sup>
- C** 336 cm<sup>3</sup>
- D** 448 cm<sup>3</sup>



NAMA : .....

TINGKATAN : .....

**JABATAN PELAJARAN NEGERI TERENGGANU****Peperiksaan Percubaan**

4541/2

**SIJIL PELAJARAN MALAYSIA 2012****CHEMISTRY**

Kertas 2

Ogos/Sept

2 ½ jam

Dua jam tiga puluh minit

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1. Tulis nama dan tingkatan anda pada ruangan yang disediakan di atas.
2. Kertas soalan ini adalah dalam dwibahasa.
3. Soalan dalam Bahasa Inggeris mendahului soalan yang sepadan dalam Bahasa Melayu.
4. Calon dibenarkan menjawab keseluruhan atau sebahagian soalan sama ada dalam Bahasa Inggeris atau Bahasa Melayu.
5. Calon dikehendaki membaca maklumat di halaman belakang kertas soalan ini

Untuk Kegunaan Pemeriksa		
Bahagian	Soalan	Markah diperoleh
A	1	
	2	
	3	
	4	
	5	
	6	
B	7	
	8	
C	9	
	10	
<b>Jumlah</b>		

Disediakan oleh:  
Guru AKRAM Terengganu

Dengan kerjasama  
MPSM Negeri Terengganu

Dibiayai oleh:  
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**INFORMATION FOR CANDIDATES**  
**MAKLUMAT UNTUK CALON**

1. This question paper consists of three sections: **Section A**, **Section B** and **Section C**.  
*Kertas soalan ini mengandungi tiga bahagian: Bahagian A, Bahagian B dan Bahagian C.*
2. Answer all questions in Section A. Write your answers for **Section A** in the spaces provided in the question paper.  
*Jawab semua soalan dalam Bahagian A. Tuliskan jawapan bagi Bahagian A dalam ruang yang disediakan dalam kertas soalan*
3. Answer one question from Section B and one question from Section C.  
Write your answers for **Section B** and **Section C** on the 'answer sheet' provided by the invigilators. Answer questions in **Section B** and **Section C** in detail.  
You may use equations, diagrams, tables, graphs and other suitable methods to explain your answer.  
*Jawab satu soalan daripada Bahagian B dan satu soalan daripada Bahagian C. Tuliskan jawapan bagi Bahagian B dan Bahagian C pada kertas tulis yang dibekalkan oleh pengawas peperiksaan. Jawab Bahagian B dan Bahagian C dengan terperinci. Anda boleh menggunakan persamaan, gambar rajah, jadual, graf dan cara lain yang sesuai untuk menjelaskan jawapan anda.*
4. The diagrams in the questions are not drawn to scale unless stated.  
*Rajah yang mengiringi soalan tidak dilukiskan mengikut skala kecuali dinyatakan*
5. Marks allocated for each question or sub-part of the question are shown in brackets.  
*Markah yang diperuntukkan bagi setiap soalan atau ceraian soalan ditunjukkan dalam kurungan.*
6. Show your working. It may help you to get marks.  
*Tunjukkan kerja mengira. Ini membantu anda mendapatkan markah.*
7. If you wish to change your answer, neatly cross out the answer that you have done. Then write down the new answer.  
*Sekiranya anda hendak membatalkan sesuatu jawapan, buat garisan di atas jawapan itu.*
8. You may use a non-programmable scientific calculator.  
*Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogramkan.*
9. You are advised to spend 90 minutes to answer questions in **Section A**, 30 minutes for **Section B** and 30 minutes for **Section C**.  
*Anda dicadangkan mengambil masa 90 minit untuk menjawab soalan dalam Bahagian A, 30 minit untuk Bahagian B dan 30 minit untuk Bahagian C.*
10. Tie together your answer sheets at the end of the examination.  
*Ikat semua kertas jawapan anda di akhir peperiksaan.*

## **Section A**

[60 marks]

**Answer all questions in this section.**  
*Jawab semua soalan dalam bahagian ini.*

- 1 Diagram 1 shows part of the Periodic Table of Elements.  
*Rajah 1 menunjukkan sebahagian daripada Jadual Berkala Unsur.*

#### **Diagram / Rajah 1**

- (a) (i) State the name of the element represented by the symbol Cu in Diagram 1.  
*Nyatakan nama bagi unsur yang diwakili dengan simbol Cu dalam Rajah 1.*

[1 mark]

- (ii) Cu is a transition element.  
State **one** special characteristic of the transition elements.  
*Cu ialah satu unsur peralihan.*  
*Nyatakan satu sifat istimewa unsur peralihan itu.*

[1 mark]

- (b) Which element is very stable and not reactive? Explain your answer.  
*Unsur yang manakah sangat stabil dan tidak reaktif? Terangkan jawapan anda.*

[3 marks]

- (c) Na and K react with water to produce alkaline solution.

Which element more reactive when react with water? Explain your answer.

Na dan K bertindak balas dengan air menghasilkan larutan beralkali.

Unsur yang manakah lebih reaktif apabila bertindak balas dengan air.

.....  
.....  
.....

[3 marks]

- (d) Na and Cl in the same period. Which element is bigger atomic size?

Na dan Cl dalam kala yang sama. Unsur yang manakah lebih besar saiz atom?

.....

[1 mark]

- 2 Table 2 shows the diagram of electron arrangement of carbon atom, oxygen atom and sodium atom.

Jadual 2 menunjukkan gambar rajah susunan elektron bagi atom karbon, atom oksigen dan atom natrium.

Carbon atom Atom karbon	Oxygen atom Atom oksigen	Sodium atom Atom natrium

Table / Jadual 2

- (a) Write the electron arrangement for carbon atom.  
*Tuliskan susunan elektron bagi atom karbon.*

.....  
[1 mark]

- (b) Carbon combines with oxygen to form a compound.  
*Karbon bergabung dengan oksigen untuk membentuk suatu sebatian.*

- (i) What is the type of the compound formed?  
*Apakah jenis sebatian yang terbentuk?*

.....  
[1 mark]

- (ii) Draw the diagram of electron arrangement of this compound.  
*Lukiskan gambar rajah susunan elektron bagi sebatian tersebut.*

[2 marks]

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- (iii) State one physical property of the compound.  
*Nyatakan satu sifat fizik bagi sebatian tersebut.*

.....  
[1 mark]

- (c) Oxygen combines with sodium to form another compound.  
*Oksigen bergabung dengan natrium membentuk satu lagi sebatian.*

- (i) Write the chemical equation for the reaction between oxygen and sodium.  
*Tuliskan persamaan kimia bagi tindak balas antara oksigen dan natrium.*

.....  
[2 marks]

- (ii) The compound formed has a high melting point. Explain why.  
*Sebatian yang terbentuk mempunyai takat lebur yang tinggi. Terangkan mengapa.*

.....  
.....  
.....  
.....  
[2 marks]

- 3 Diagram 3 shows two types of cell.  
*Rajah 3 menunjukkan dua jenis sel.*

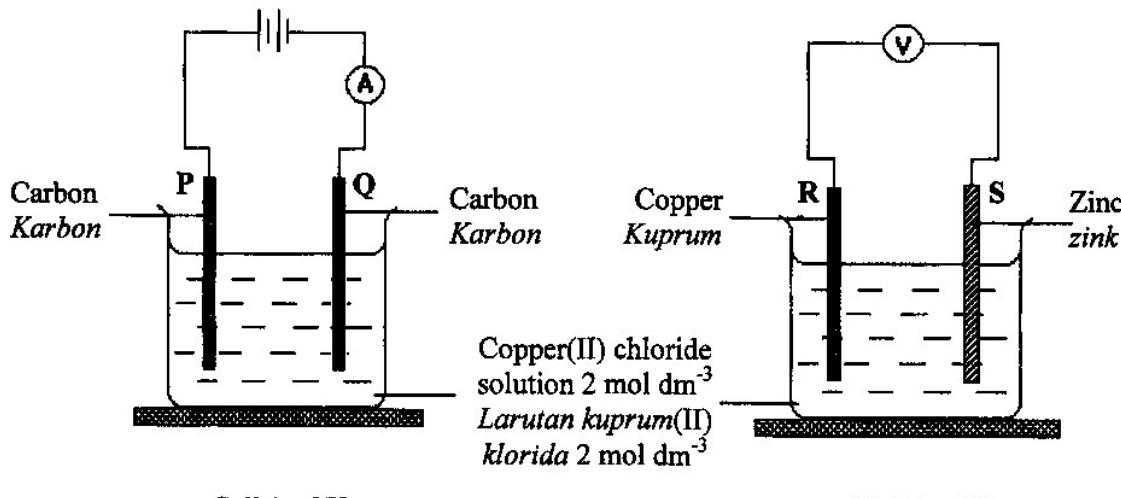


Diagram / Rajah 3

- (a) State the name of cell X and cell Y.  
*Namakan sel X dan sel Y.*

Cell X :  
*Sel X* : .....

Cell Y :  
*Sel Y* : .....

[1 mark]

- (b) Write the formulae of all anions present in copper(II) chloride solution.  
*Tuliskan formula bagi semua anion yang hadir dalam larutan kuprum(II) klorida.*

.....  
[1 mark]

- (c) Based on the cell X;  
*Berdasarkan sel X;*

- (i) State the observation at electrode carbon Q.  
*Nyatakan pemerhatian pada elektrod karbon Q.*

.....  
[1 mark]

- (ii) Write a half equation for the reaction that occurs at the electrode carbon Q.  
*Tulis setengah persamaan bagi tindak balas yang berlaku di elektrod karbon Q.*

.....  
[1 mark]

- (iii) If copper(II) chloride solution  $2 \text{ mol dm}^{-3}$  is replaced by copper(II) chloride solution  $0.001 \text{ mol dm}^{-3}$ . State the product formed at electrode carbon P.  
*Jika larutan kuprum(II) klorida  $2 \text{ mol dm}^{-3}$  diganti dengan larutan kuprum(II) klorida  $0.001 \text{ mol dm}^{-3}$ . Nyatakan bahan yang terhasil di elektrod karbon P.*

.....  
[1 mark]

- (d) Based on the cell Y;  
*Berdasarkan sel Y;*

- (i) Draw arrows ( $\rightarrow$ ) to show the direction of the electrons flow.  
*Lukiskan anak panah ( $\rightarrow$ ) untuk menunjukkan arah pengaliran elektron.*  
[1 mark]

- (ii) Which electrode act as negative terminals?  
*Elektrode manakah yang bertindak sebagai terminal negatif?*

.....  
[1 mark]

- (iii) If the zinc S is replaced by a magnesium strip, the voltmeter reading increases. State one reason.  
*Jika zink S digantikan dengan pita magnesium, bacaan voltmeter meningkat. Nyatakan satu sebab.*

.....  
[1 mark]

- (e) Compare the intensity of blue colour of copper(II) chloride solution after a few minutes in both cells. Explain your answer.  
*Bandingkan keamatan warna biru larutan kuprum(II) klorida selepas beberapa minit dalam kedua-dua sel. Terangkan jawapan anda.*

.....  
[2 marks]

- 4 (a) Table 4.1 shows the ionisation and the colour of phenolphthalein of the solution P, Q and R.

*Jadual 4.1 menunjukkan pengionan dan warna larutan fenolftalein bagi larutan P, Q dan R.*

Solution <i>Larutan</i>	Ionisation <i>Pengionan</i>	Colour of phenolphthalein in the <i>Warna fenolftalein dalam larutan itu</i>
P	Ionises completely <i>Mengion lengkap</i>	Colourless <i>Tanpa warna</i>
Q	Ionises partially <i>Mengion separa</i>	Colourless <i>Tanpa warna</i>
R	Ionises completely <i>Mengion lengkap</i>	Pink <i>Merah jambu</i>

Table / Jadual 4.1

- (i) Which solution has the lowest pH value?

*Larutan manakah yang mempunyai nilai pH paling rendah?*

..... [1 mark]

- (ii) Give a reason for your answer in (a) (i).

*Beri satu sebab bagi jawapan anda di (a) (i).*

..... [1 mark]

- (iii) Solution P, Q and R might be acid or alkali. Classify the solutions into acid or alkali.

*Larutan P, Q dan R mungkin asid atau alkali. Kelaskan larutan itu kepada asid atau alkali.*

Acid / asid : .....

Alkali / alkali : .....

[2 marks]

- (b) Diagram 4.2 shows the observations in test tube I and test tube II when hydrogen chloride in tetrachloromethane and hydrogen chloride in solvent X are reacted with zinc.

*Rajah 4.2 menunjukkan pemerhatian dalam tabung uji I dan tabung uji II apabila hidrogen klorida dalam tetraklorometana dan hidrogen klorida dalam pelarut X bertindak balas dengan zink.*

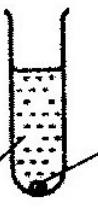
Test tube	I	II
Apparatus set-up <i>Susunan radas</i>		
	Hydrogen chloride in tetrachloromethane <i>Hidrogen klorida dalam tetraklorometana</i>	Hydrogen chloride in solvent X <i>Hidrogen klorida dalam pelarut X</i>
Observation	No change	Bubbles of gas are produced

Diagram / Rajah 4.2

- (i) State the name of solvent X.  
*Nyatakan nama pelarut X.*

.....  
[1 mark]

- (ii) Write the formula of ion that causes an acid shows its acidic properties.  
*Tuliskan formula ion yang menyebabkan asid menunjukkan sifat asid.*

.....  
[1 mark]

- (iii) Explain the differences in observation in test tube I and II.  
*Terangkan perbezaan pemerhatian dalam tabung uji I dan II.*

.....  
.....  
.....  
[2 marks]

- (c) Vinegar consists of an ethanoic acid. Describe briefly a chemical test to verify the acid without using an indicator.

*Cuka mengandungi asid etanoik. Huraikan secara ringkas satu ujian kimia untuk mengenal pasti asid tanpa menggunakan penunjuk.*

.....  
.....  
.....

[2 marks]

- 5 Soap is one of the chemical used widely by consumers. Diagram 5.1 shows the set-up of apparatus to prepare soap in the laboratory.

*Sabun merupakan salah satu bahan kimia yang digunakan secara meluas oleh pengguna. Rajah 5.1 menunjukkan susunan radas untuk menyediakan sabun dalam makmal.*

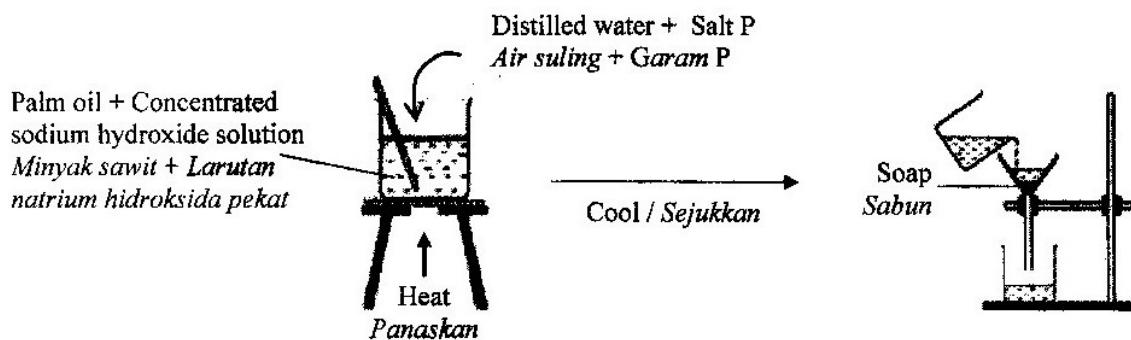


Diagram / Rajah 5.1

- (a) State the name of salt P.

*Nyatakan nama garam P.*

[1 mark]

- (b) State the purpose of adding salt P in the preparation of soap.

*Nyatakan tujuan menambahkan garam P dalam penyediaan sabun.*

[1 mark]

- (c) Diagram 5.2 shows part of the cleaning action of soap particles on a cloth stained with grease.

*Rajah 5.2 menunjukkan sebahagian daripada tindakan pencucian oleh zarah-zarah sabun ke atas kotoran bergris pada kain.*

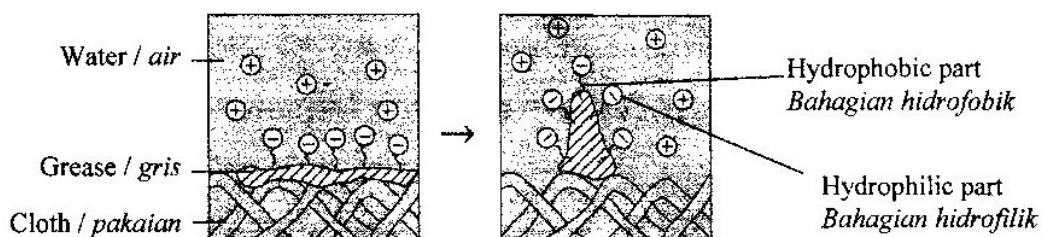


Diagram / Rajah 5.2

Based on Diagram 5.2;

- (i) Which part of soap particles is soluble in the water?

*Bahagian manakah daripada zarah sabun yang larut dalam air?*

.....

[1 mark]

- (ii) Explain how the anion of soap acts on grease.

*Terangkan bagaimana anion sabun bertindak ke atas gris.*

.....

.....

.....

[2 marks]

- (d) Soap is not effective in hard water.

State another cleaning agent that effective in hard water.

Explain your answer.

*Sabun tidak berkesan dalam air liat.*

*Nyatakan agen pencuci lain yang berkesan dalam air liat.*

*Terangkan jawapan anda.*

.....

.....

.....

[3 marks]

- (e) Food additive is another chemical for consumer. Diagram 5.3 shows the label at container of ice cream that shows some of food additive used.

*Bahan tambah makanan adalah bahan kimia untuk pengguna yang lain. Rajah 5.3 menunjukkan label pada bekas aiskrim yang menunjukkan beberapa bahan tambah makanan yang digunakan.*



Diagram / Rajah 5.3

Ingredient:  
Essence vanilla  
Evaporated milk  
Refined sugar  
Egg  
Food additive Q

Kandungan:

Esen vanila  
Susu cair  
Gula halus  
Telur  
Bahan tambah makanan Q

- (i) What is the function of essence vanilla in ice cream?  
*Apakah fungsi esen vanila dalam aiskrim?*

.....

[1 mark]

- (ii) Suggest one name of food additive Q that can make ice cream smoother and stay in texture. State the type of the food additive.

*Cadangkan satu nama bahan tambah makanan Q yang menjadikan aiskrim lebih lembut dan kekal teksturnya. Nyatakan jenis bahan tambah makanan itu.*

.....  
.....

[2 marks]

- 6 Diagram 6 shows the apparatus set up used in experiment to determine heat of displacement of copper by zinc.

Rajah 6 menunjukkan susunan radas yang digunakan dalam eksperimen untuk menentukan haba penyesaran kuprum oleh zink.

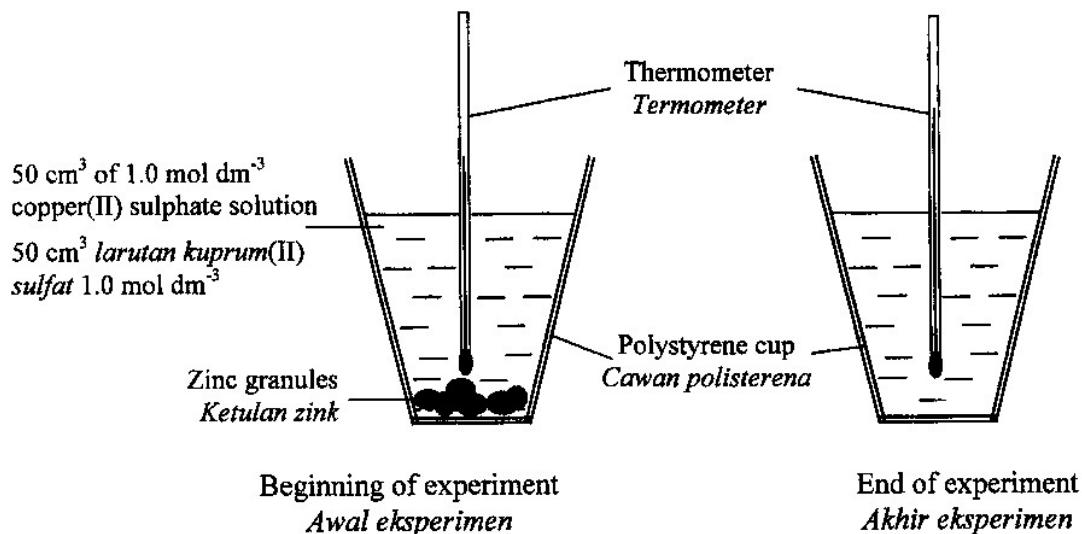


Diagram / Rajah 6

Table 6 shows the results of this experiment.

Jadual 6 menunjukkan keputusan eksperimen ini.

Description <i>Penerangan</i>	Temperature (°C) <i>Suhu (°C)</i>
Initial temperature of copper(II) sulphate solution <i>Suhu awal larutan kuprum(II) sulfat</i>	29.0
Highest temperature of mixture <i>Suhu tertinggi campuran</i>	35.0

Table / Jadual 6

- (a) What is the meaning of heat of displacement of copper by zinc?  
*Apakah yang dimaksudkan dengan haba penyesaran kuprum oleh zink?*

.....  
.....

[1 mark]

(b) Calculate

*Hitungkan*

(i) The heat released during the reaction.

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

*Haba yang dibebaskan semasa tindak balas*

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

[1 mark]

(ii) The number of moles of copper(II) sulphate solution.

*Bilangan mol larutan kuprum(II) sulfat.*

[1 mark]

(iii) The heat of displacement copper by zinc

*Haba penyesaran kuprum oleh zink*

[2 marks]

- (c) Draw an energy level diagram for this reaction.  
*Lukis gambar rajah aras tenaga bagi tindak balas ini.*

[3 marks]

- (d) State the colour changes of the copper(II) sulphate solution in the experiment.  
*Nyatakan perubahan warna larutan kuprum(II) sulfat dalam eksperimen itu.*

.....  
[1 mark]

- (e) The experiment is repeated using  $50 \text{ cm}^3$  of  $0.5 \text{ mol dm}^{-3}$  copper(II) sulphate solution. Predict the heat released during reaction. Explain your answer.  
*Eksperimen diulangi dengan menggunakan  $50 \text{ cm}^3$  larutan kuprum(II) sulfat  $0.5 \text{ mol dm}^{-3}$ . Ramalkan haba yang dikeluarkan semasa tindak balas. Terangkan jawapan anda.*

.....  
.....  
[2 marks]

**Section B**  
[20 marks]

Answer any one question from this section.  
*Jawab mana-mana satu soalan daripada bahagian ini.*

- 7 Diagram 7 shows a series of reaction starting from solid lead(II)nitrate , Pb(NO<sub>3</sub>)<sub>2</sub>.  
*Rajah 7 menunjukkan satu siri tindak balas bermula dengan pepejal plumbum(II) nitrat, Pb(NO<sub>3</sub>)<sub>2</sub>.*

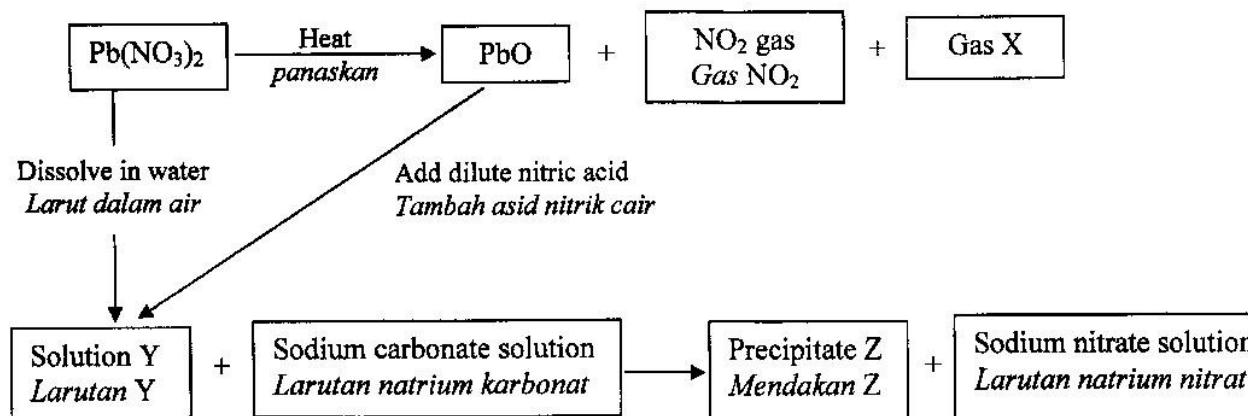


Diagram / Rajah 7

Based on Diagram 7:

Berdasarkan Rajah 7:

- (a) Identify gas X, solution Y and precipitate Z.  
*Kenalpasti gas X, larutan Y dan mendakan Z.*

[3 marks]

- (b) Write the chemical equation for the reaction between solution Y and sodium carbonate solution.  
*Tuliskan persamaan kimia bagi tindak balas antara larutan Y dan larutan natrium karbonat.*

*State the name of the reaction.*

*Tuliskan persamaan kimia bagi tindak balas antara larutan Y dan larutan natrium karbonat.*

*Nyatakan nama bagi tindak balas itu.*

[3 marks]

- (c) Identify an anion that is present in the solution Y and describe a chemical test to verify the anion.

*Kenalpasti anion yang hadir dalam larutan Y danuraikan satu ujian kimia untuk menentusahkan anion itu.*

[6 marks]

- (d) Compare and contrast the observation when solid  $\text{Pb}(\text{NO}_3)_2$  and precipitate Z are heated in terms of
- colour of residue when hot and when cold.
  - gas produced.

*Banding dan bezakan pemerhatian apabila pepejal  $\text{Pb}(\text{NO}_3)_2$  dan mendakan Z dipanaskan dari segi*

- warna baki apabila panas dan apabila sejuk.
- gas yang terhasil.

[4 marks]

- (e) 33.1g of  $\text{Pb}(\text{NO}_3)_2$  is heated strongly.

Given that 2 mol  $\text{Pb}(\text{NO}_3)_2$  decompose to produce 1 mol gas X , and relative atomic mass : Pb=207 ; N=14 ; O=16 ;

1mol of gas occupies the volume of  $24 \text{ dm}^3$  at room temperature and pressure.

Calculate the volume of gas X produced at room temperature and pressure.

*33.1g  $\text{Pb}(\text{NO}_3)_2$  dipanaskan dengan kuat.*

*Diberi bahawa 2 mol  $\text{Pb}(\text{NO}_3)_2$  terurai menghasilkan 1 mol gas X , dan jisim atom relatif : Pb=207 ; N=14 ; O=16 ;*

*1 mol gas menempati isipadu sebanyak  $24 \text{ dm}^3$  pada suhu dan tekanan bilik.*

*Hitungkan isipadu gas X yang terhasil pada suhu dan tekanan bilik.*

[4 marks]

- 8 (a) Table 8.1 show the equation of two reactions:

*Jadual 8.1 menunjukkan persamaan bagi dua tindak balas:*

Reaction <i>Tindak balas</i>	Chemical Equation <i>Persamaan Kimia</i>
<b>A</b>	$\text{NaOH} + \text{HCl} \rightarrow \text{NaCl} + \text{H}_2\text{O}$
<b>B</b>	$\text{Mg} + \text{Zn}(\text{NO}_3)_2 \rightarrow \text{Mg}(\text{NO}_3)_2 + \text{Zn}$

Table / Jadual 8.1

Determine whether each of the reactions is a redox reaction or not a redox reaction.  
Explain your answer in term of oxidation number.

*Tentukan sama ada setiap tindak balas tersebut merupakan tindak balas redoks atau bukan tindak balas redoks. Terangkan jawapan anda dari segi nombor pengoksidaan.*

[4 marks]

- (b) Table 8.2 shows the formulae for two oxides of copper compounds.

*Jadual 8.2 menunjukkan formula bagi dua sebatian oksida kuprum.*

Compound	Formula
<b>P</b>	$\text{CuO}$
<b>Q</b>	$\text{Cu}_2\text{O}$

Table / Jadual 8.2

- (i) State the oxidation number of copper in the both compounds.

*Nyatakan nombor pengoksidaan bagi kuprum dalam kedua-dua sebatian tersebut.*

[2 marks]

- (ii) Name both of the compounds based on the IUPAC nomenclature system.

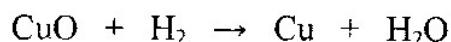
*Explain your answer.*

*Namakan kedua-dua sebatian tersebut berdasarkan sistem tatanama IUPAC.  
Terangkan jawapan anda.*

[4 marks]

(iv) Chemical equation below shows the reaction between CuO and hydrogen gas.

*Persamaan kimia di bawah menunjukkan tindak balas antara CuO dengan gas hidrogen.*



Based on the equation, determine:

*Berdasarkan persamaan, tentukan:*

- the substance that is oxidised  
*bahan yang dioksidakan*
- the substance that is reduced  
*bahan yang diturunkan*
- the oxidizing agent  
*agen pengoksidaan*
- the reducing agent  
*agen penurunan*

[4 marks]

(c) Diagram 8 shows the set up of apparatus to investigate the reactivity of metals towards oxygen.

*Rajah 8 menunjukkan susunan radas untuk mengkaji kereaktifan logam terhadap oksigen.*

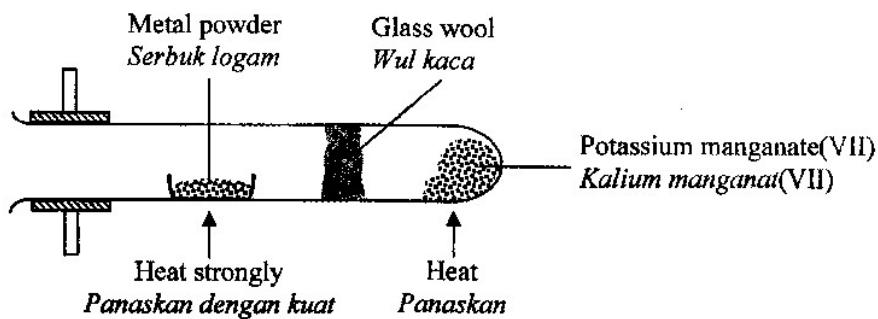


Diagram / Rajah 8

Table 8.3 show the observation when three metals; X, Y and Z are heated strongly as shown in Diagram 8.

Jadual 8.3 menunjukkan pemerhatian apabila tiga logam X, Y dan Z dipanaskan dengan kuat seperti yang ditunjukkan dalam Rajah 8.

Metal Logam	Observation Pemerhatian
X	Burns vigorously with a bright flame. A white residue is formed. <i>Terbakar dengan nyalaan yang terang. Baki berwarna putih terbentuk.</i>
Y	Glows faintly and slowly. A black residue is formed. <i>Membara dengan malap dan perlahan. Baki berwarna hitam terbentuk.</i>
Z	Burns slowly with a bright flame. A brown residue when hot and yellow when cold is formed. <i>Menyala dengan perlahan. Baki berwarna perang semasa panas dan kuning apabila sejuk terbentuk.</i>

Table / Jadual 8.3

- (i) Based on the observations in Table 8.3, arrange X, Y and Z in descending order of reactivity of metal towards oxygen.  
*Berdasarkan pemerhatian dalam Jadual 8.3, susunkan X, Y dan Z mengikut tertib menurun kereaktifan logam terhadap oksigen.* [1 mark]
- (ii) Based on the information in Table 8.3, state which of the metal is copper, lead and magnesium.  
*Berdasarkan maklumat dalam Jadual 8.3, nyatakan logam manakah yang merupakan kuprum, plumbum dan magnesium.* [3 marks]
- (iii) Write a chemical equation for the reaction between metal X and oxygen.  
*Tulis persamaan kimia bagi tindak balas antara logam X dengan oksigen.* [2 marks]

**Section C**  
[20 marks]

Answer any **one** question from this section.

*Jawab mana-mana satu soalan daripada bahagian ini.*

- 9 Diagram 9 shows how compound Y is formed from an alkene W. Then compound Y react with alcohol X to produce ester Z.

*Rajah 9 menunjukkan bagaimana sebatian Y terbentuk daripada alkena W. Kemudian sebatian Y bertindak balas dengan alkohol X menghasilkan ester Z.*

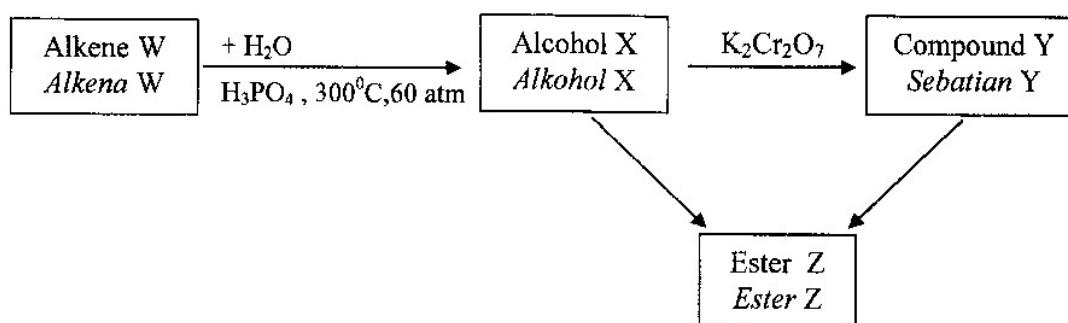


Diagram / Rajah 9

- (a) (i) Name **one** alkene that has less than five carbon atoms.

Write its molecular formula

*Namakan satu alkena yang mempunyai kurang daripada lima atom karbon.*

*Tulis formula molekulnya.*

[2 marks]

- (ii) Based on the answer in 9 (a) (i), state the name of alcohol X and compound Y.

*Berdasarkan jawapan di 9 (a) (i), nyatakan nama bagi alkohol X dan sebatian Y.*

[2 marks]

- (iii) Write the chemical equation and state the observation for the reaction between alcohol X and potassium dichromate, K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub> to produce compound Y that you named in (a) (ii).

*Tuliskan persamaan kimia dan nyatakan pemerhatian bagi tindak balas antara alkohol X dan kalium dikromat, K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub> untuk menghasilkan sebatian Y yang anda namakan di (a) (ii).*

[3 marks]

- (b) (i) By using alcohol X and compound Y that you named in (a) (ii), describe the preparation of ester Z in the laboratory.

In your description, include the chemical equation for the reaction.

Dengan menggunakan alkohol X dan sebatian Y yang anda namakan di (a) (ii),uraikan penyediaan ester Z di dalam makmal.

Dalamuraian anda, sertakan persamaan kimia bagi tindak balas itu.

[5 marks]

- (ii) Alkene W can be prepared from alcohol X.

Draw the set –up of apparatus for the preparation of the alkene W.

Alkena W boleh disediakan daripada alkohol X.

Lukiskan susunan radas bagi penyediaan alkena W itu.

[2 marks]

- (c) Table 9 shows the results of latex coagulation.

Jadual 9 menunjukkan keputusan pengumpalan getah.

Procedure <i>Prosedur</i>	Observations <i>Pemerhatian</i>
Compound Y is added to latex <i>Sebatian Y ditambah kepada susu getah</i>	The latex coagulates immediately <i>Susu getah menggumpal dengan serta merta.</i>
Compound T is added to latex <i>Sebatian T ditambah kepada suhu getah</i>	The latex does not coagulate within a longer period. <i>Susu getah tidak menggumpal dalam suatu tempoh yang lebih lama.</i>
Latex is left under natural conditions <i>Susu getah dibiarkan pada keadaan semula jadi</i>	The latex coagulates slowly. <i>Susu getah menggumpal dengan perlahan.</i>

Table / Jadual 9

Explain why there is a difference in these observations. Suggest the compound T.

Terangkan mengapa terdapat perbezaan pemerhatian itu. Cadangkan sebatian T itu.

[6 marks]

- 10 Diagram 10.1 shows the time taken for beef to cook using different size.  
*Rajah 10.1 menunjukkan masa yang diambil untuk memasak daging lembu menggunakan saiz yang berbeza.*

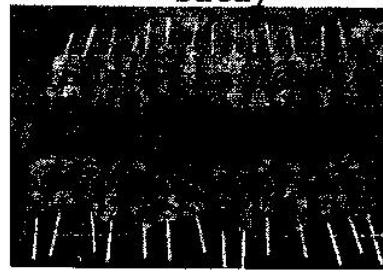
lembu panggang	satay
	
120 minutes 120 minit	20 minutes 20 minit

Diagram / Rajah 10.1

- (a) Explain why different size of beef takes different times to cook?  
*Terangkan mengapa saiz daging lembu yang berbeza mengambil masa yang berbeza untuk masak?*
- [2 marks]
- (b) Two experiments were carried out to study the effect size of magnesium on the rate of reaction between magnesium and an acid. Graph in Diagram 10.2 shows the results of Experiment I and Experiment II.  
*Dua eksperimen dijalankan untuk mengkaji kesan saiz magnesium ke atas kadar tindak balas antara magnesium dengan suatu asid. Graf dalam Rajah 10.2 menunjukkan keputusan Eksperimen I dan Eksperimen II.*

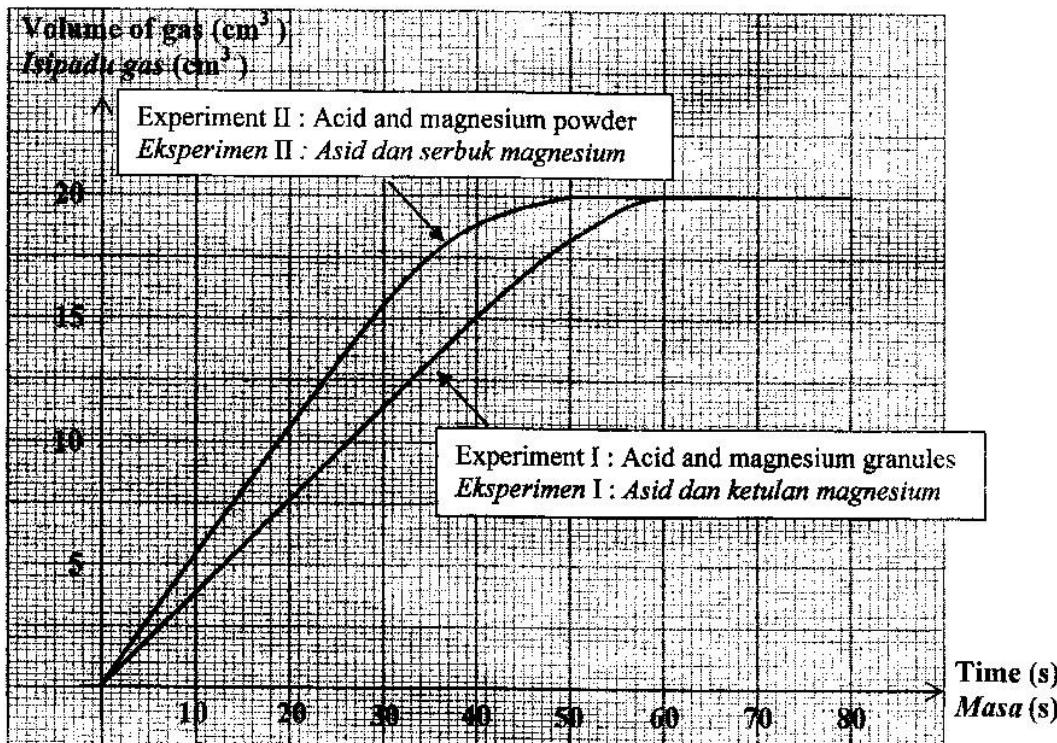


Diagram / Rajah 10.2

- (i) State a suitable example of the acid used and write the chemical equation for the reaction between this acid and magnesium.

*Nyatakan satu contoh asid yang sesuai digunakan dan tuliskan persamaan kimia bagi tindak balas antara asid ini dengan magnesium.*

[3 marks]

- (ii) Calculate the average rate of reaction for Experiment I and Experiment II and compare the rate of reaction for both experiments.

*Hitung kadar tindak balas purata untuk Eksperimen I dan Eksperimen II dan bandingkan kadar tindak balas bagi kedua-dua eksperimen.*

[3 marks]

- (iii) Describe how to carry out the experiment in the laboratory.

*Huraikan bagaimana untuk menjalankan eksperimen ini di dalam makmal.*

[12 marks]

**END OF QUESTION PAPER**

**KERTAS SOALAN TAMAT**

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## THE PERIODIC TABLE OF ELEMENTS

**H**  
Hydrogen

10  
Ne  
Neon  
— Proton number  
Symbol  
Name of element  
Relative atomic mass

10 Ne Neon	11 Na Sodium	12 Mg Magnesium	13 Al Aluminum	14 Si Silicon	15 P Phosphorus	16 S Sulfur	17 Cl Chlorine	18 Ar Argon
19 K Potassium	20 Ca Calcium	21 Sc Samarium	22 Ti Titanium	23 V Vanadium	24 Cr Chromium	25 Mn Manganese	26 Fe Iron	27 Co Cobalt
29 Rb Rubidium	30 Sr Strontium	31 Y Yttrium	32 Zr Zirconium	33 Nb Niobium	34 Mo Molybdenum	35 Tc Technetium	36 Ru Ruthenium	37 Rh Rhodium
37 Cs Cesium	38 Ba Barium	39 La Lanthanum	40 Ce Cerium	41 Pr Praseodymium	42 Nd Neodymium	43 Pm Promethium	44 Os Osmium	45 Ir Iridium
55 Cs Cesium	56 Ba Barium	57 La Lanthanum	58 Ce Cerium	59 Pr Praseodymium	60 Nd Neodymium	61 Pm Promethium	62 Hf Hafnium	63 Ta Tantalum
77 Fr Francium	78 Ra Radium	79 Ac Actinium	80 U Uranium	81 Th Thorium	82 Pa Protactinium	83 U Uranium	84 Nh Neptunium	85 Fm Fermium
89 Cs Cesium	90 Ba Barium	91 La Lanthanum	92 Ce Cerium	93 Pr Praseodymium	94 Nd Neodymium	95 Pm Promethium	96 Hf Hafnium	97 Ta Tantalum
103 Fr Francium	104 Ra Radium	105 Ac Actinium	106 U Uranium	107 Th Thorium	108 Pa Protactinium	109 Nh Neptunium	110 Fm Fermium	111 Bk Berkelium
140 Cs Cesium	141 Ba Barium	142 La Lanthanum	143 Ce Cerium	144 Pr Praseodymium	145 Nd Neodymium	146 Pm Promethium	147 Hf Hafnium	148 Ta Tantalum
159 Tb Terbium	160 Dy Dysprosium	161 Ho Holmium	162 Er Erbium	163 Tm Thulium	164 Yb Ytterbium	165 Dy Dysprosium	166 Ho Holmium	167 Er Erbium
232 Ra Radium	233 Fr Francium	234 Ac Actinium	235 U Uranium	236 Th Thorium	237 Pa Protactinium	238 Nh Neptunium	239 Fm Fermium	240 Bk Berkelium