

4541/1  
Percubaan  
SPM  
Chemistry  
2009  
Paper 1  
1¼ hours

PEPERIKSAAN PERCUBAAN  
SIJIL PELAJARAN MALAYSIA  
NEGERI PERAK  
2009

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CHEMISTRY

PAPER 1

One hour and fifteen minutes  
*Satu jam lima belas minit*

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DO NOT OPEN THE QUESTION PAPER UNTIL YOU ARE TOLD TO DO SO  
*JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU*

1. Kertas soalan ini adalah dalam dwibahasa
2. Soalan dalam bahasa Inggeris mendahului soalan yang sepadan dalam Bahasa Melayu.
3. Calon dikehendaki membaca maklumat di halaman belakang kertas soalan ini.

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Kertas soalan ini mengandungi 20 halaman bercetak.

- 1 What is the use of phosphorus-32?  
*Apakah kegunaan fosforus-32?*
- A Treatment of cancer  
*Rawatan cancer*
- B Destroy bacteria in food  
*Memusnahkan bakteria dalam makanan*
- C Estimate the age of fossils  
*Menganggarkan umur fosil*
- D Study the metabolism of fertilisers in plant  
*Mengkaji metabolisma baja dalam tumbuhan*

- 2 Diagram 1 shows the structure of fluorine atom.  
*Rajah 1 menunjukkan struktur bagi atom fluorin*

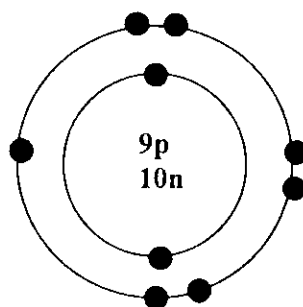


Diagram 1  
*Rajah 1*

- Which of the following is **true** about fluorine atom?  
*Antara berikut, yang manakah benar tentang atom fluorin?*

	Number of electrons <i>Bilangan elektron</i>	Nucleon number <i>Nombor nukleon</i>
A	9	10
B	9	19
C	10	19
D	19	28

- 3 Which of the following substance and its chemical formula is true?  
*Antara bahan dan formula kimia berikut yang manakah benar?*

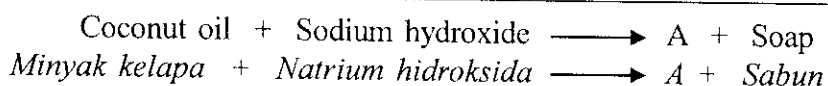
	Substance <i>Bahan</i>	Chemical formula <i>Formula kimia</i>
A	Sodium sulphate <i>Natrium sulfat</i>	$\text{Na}_2\text{SO}_4$
B	Magnesium nitrate <i>Magnesium nitrat</i>	$\text{MgNO}_3$
C	Zinc chloride <i>Zink klorida</i>	$\text{ZnCl}$
D	Aluminium carbonate <i>Aluminium karbonat</i>	$\text{Al}(\text{CO}_3)_3$

- 4 Which of the following scientists was the first to classify elements into different groups?  
*Antara ahli sains berikut yang manakah mula-mula mengelaskan unsur-unsur dalam kumpulan yang berlainan?*
- A Antoine Lavoisier
  - B John Newlands
  - C H.J.G Moseley
  - D Dmitri Mendeleev
- 5 Which of the following statements show the changes in the chemical properties of Group 17 elements when going down the group?  
*Antara pernyataan berikut, yang manakah menunjukkan perubahan sifat kimia unsur Kumpulan 17 apabila menuruni kumpulan?*
- I Number of shell increases  
*Bilangan petala bertambah*
  - II Reactivity of the elements increases  
*Kereaktifan unsur bertambah*
  - III The tendency to gain electron decreases  
*Kecenderungan untuk menerima electron berkurang*
  - IV The oxidation number decreases  
*Nombor pengoksidaan berkurang*
- A I and III only
  - B II and IV only
  - C I, II and III only
  - D I, II, III and IV
- 6 Two or more atoms are bonded chemically by sharing electrons.  
What type of bond formed?  
*Dua atau lebih atom membentuk ikatan kimia melalui perkongsian elektron. Apakah jenis ikatan yang terbentuk?*
- A Ionic bond.  
*Ikatan ionik.*
  - B Covalent bond.  
*Ikatan kovalen.*
  - C Metallic bond.  
*Ikatan logam.*
  - D Van der Waals force.  
*Daya Van der Waals.*
- 7 Which of the following substances is an ionic compound?  
*Antara bahan berikut yang manakah merupakan sebatian ion?*
- A Sugar  
*Gula*
  - B Sodium chloride  
*Natrium klorida*
  - C Carbon dioxide  
*Karbon dioksida*
  - D Oxygen gas  
*Gas oksigen*

- 8 What is an electrolyte?  
*Apakah elektrolit?*
- A Substances that conduct electricity in molten state and aqueous solution.  
*Bahan yang mengalirkan elektrik dalam keadaan leburan dan larutan akues.*
- B Ionic compound that conduct electricity in all physical states.  
*Sebatian ionik mengalirkan elektrik dalam semua keadaan fizik.*
- C Substances that cannot conduct electricity.  
*Bahan yang tidak boleh mengalirkan elektrik.*
- D Non metal that can conduct electricity.  
*Bukan logam yang boleh mengalirkan elektrik.*
- 9 Which of the following chemical equations represent neutralization?  
*Antara persamaan kimia berikut yang manakah mewakili peneutralan?*
- A  $\text{Zn} + \text{H}_2\text{SO}_4 \rightarrow \text{ZnSO}_4 + \text{H}_2$
- B  $\text{AgNO}_3 + \text{HCl} \rightarrow \text{AgCl} + \text{HNO}_3$
- C  $2\text{NaOH} + \text{H}_2\text{SO}_4 \rightarrow \text{Na}_2\text{SO}_4 + 2\text{H}_2\text{O}$
- D  $\text{CaCO}_3 + \text{H}_2\text{SO}_4 \rightarrow \text{CaSO}_4 + \text{H}_2\text{O} + \text{CO}_2$
- 10 Substance X + Sulphuric acid  $\rightarrow$  Salt Y + Water + Carbon dioxide  
What is substance X?  
*Bahan X + asid sulfurik  $\rightarrow$  Garam Y + air + karbon dioksida*  
*Apakah bahan X?*
- A Copper(II) oxide  
*Kuprum (II) oksida*
- B Magnesium metal  
*Logam magnesium*
- C Zinc carbonate  
*Zink karbonat*
- D Sodium hydroxide  
*Natrium hidroksida*
- 11 Which of the following salts are prepared by precipitation reaction?  
*Antara garam-garam berikut yang manakah disediakan melalui tindak balas pemendakan?*
- I Silver chloride  
*Argentum klorida*
- II Magnesium nitrate  
*Magnesium nitrat*
- III Barium sulphate  
*Barium sulfat*
- IV Zinc carbonate  
*Zink karbonat*
- A I and III only
- B II and IV only
- C I, II and III only
- D I, III and IV only

- 12 What is the product of Haber Process?  
*Apakah hasil daripada Proses Haber?*
- A Fertilizers  
*Baja*
  - B Ammonia  
*Ammonia*
  - C Nitric acid  
*Asid nitrik*
  - D Sulphuric acid  
*Asid sulfurik*
- 13 How does temperature increase the rate of reaction?  
*Bagaimanakah suhu dapat meningkatkan kadar tindak balas?*
- A Increase the activation energy of the reaction  
*Meningkatkan tenaga pengaktifan tindak balas*
  - B Increase the energy of particles involved in the reaction.  
*Meningkatkan tenaga zarah-zarah yang terlibat dalam tindak balas*
  - C Decrease the effective collision of particles involved  
*Mengurangkan perlanggaran berkesan bagi zarah-zarah yang terlibat.*
  - D Decrease the rate of collision among the particles involved  
*Mengurangkan kadar perlanggaran antara zarah-zarah yang terlibat*
- 14 What is the meaning of the effective collision?  
*Apakah maksud perlanggaran berkesan?*
- A The collision which takes place before reaction  
*Perlanggaran yang berlaku sebelum tindak balas*
  - B The collision that has the highest energy  
*Perlanggaran yang mempunyai tenaga yang paling tinggi*
  - C The collision that can causes reaction.  
*Perlanggaran yang akan menyebabkan tindak balas*
  - D The collision where its energy is less than the activation energy.  
*Perlanggaran di mana tenaganya adalah kurang daripada tenaga pengaktifan.*

15



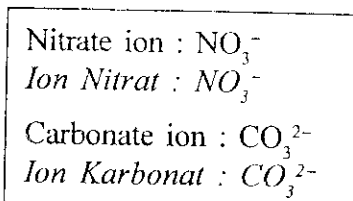
What is A?

*Apakah A?*

- A Ethane  
*Etana*
- B Ethanol  
*Etanol*
- C Glycerol  
*Gliserol*
- D Sodium ethanoate  
*Natrium etanoat*

Dapatkan skema Jawapan di Laman

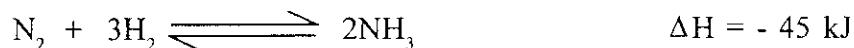
- 16 Which of the following statements is true?  
*Antara pernyataan berikut yang manakah benar?*
- A The density of heptane is higher than that of decane.  
*Ketumpatan heptana adalah lebih tinggi daripada dekana.*
- B The boiling point of hexane is higher than that of octane.  
*Takat didih heksana adalah lebih tinggi daripada oktana.*
- C The viscosity of nonane is higher than that of pentane.  
*Kelikatan nonana adalah lebih tinggi daripada pentana.*
- D Both butane and octane are liquids at room temperature.  
*Kedua-dua butana dan oktana adalah cecair pada suhu bilik.*
- 17 Which of the following metals act as the sacrificial metal to protect iron from rusting?  
*Antara logam berikut, yang manakah bertindak sebagai logam korban untuk melindungi besi daripada berkarat?*
- A Aluminium  
*Aluminium*
- B Silver  
*Argentum*
- C Tin  
*Stannum*
- D Copper  
*Kuprum*
- 18 Which of the following chemical reactions is an endothermic reaction?  
*Antara tindak balas kimia berikut, manakah tindak balas endotermik?*
- A Combustion of fuel  
*Pembakaran bahan api*
- B Burning of metal  
*Pembakaran logam*
- C Neutralisation  
*Peneutralan*
- D Photosynthesis  
*Fotosintesis*
- 19 The formulae of nitrate ion and carbonate ion is shown below  
*Formula bagi ion nitrat dan ion karbonat ditunjukkan di bawah.*



If the formula of nitrate of M is  $\text{M}(\text{NO}_3)_3$ . What is the formula of carbonate of M?  
*Jika formula M nitrat ialah  $\text{M}(\text{NO}_3)_3$ . Apakah formula M karbonat?*

- A  $\text{MCO}_3$   
 B  $\text{M}(\text{CO}_3)_2$   
 C  $\text{M}_2\text{CO}_3$   
 D  $\text{M}_2(\text{CO}_3)_3$

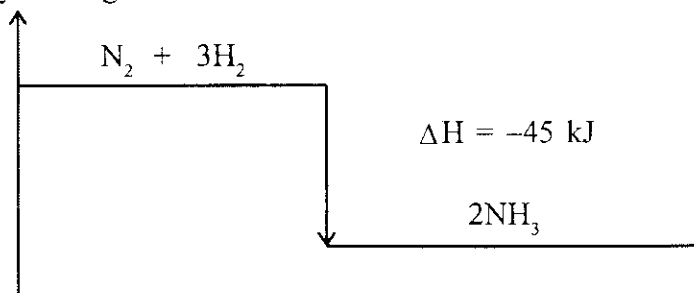
- 20 The following thermochemical equation represents the formation of ammonia gas.  
*Persamaan termokimia berikut mewakili pembentukan gas ammonia.*



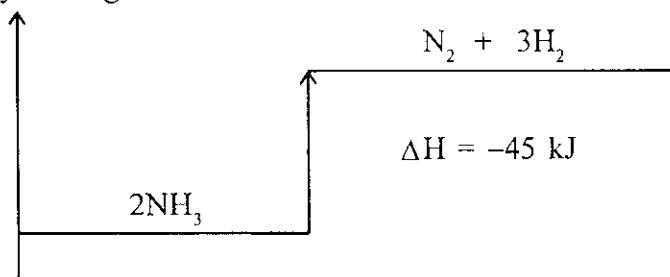
Which of the following diagrams shows the correct energy level diagram for the thermochemical equation?

*Antara rajah berikut, yang manakah menunjukkan gambar rajah aras tenaga yang betul bagi persamaan termokimia itu?*

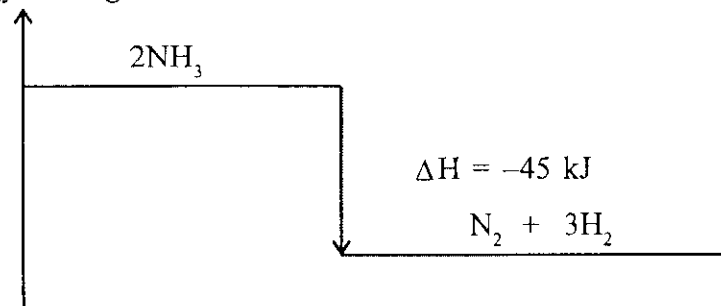
A Energy / Tenaga



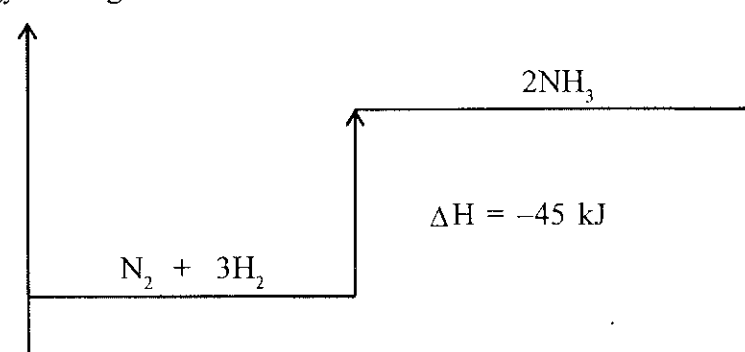
B Energy / Tenaga



C Energy / Tenaga



D Energy / Tenaga



Dapatkan skema Jawapan di Laman

21 What is the usage of penicillin?

*Apakah kegunaan penicillin?*

- A Reducing pain  
*Mengurangkan kesakitan*
- B Reducing anxiety  
*Mengurangkan kemurungan*
- C Controlling the level of glucose in blood  
*Mengawal aras gula dalam darah*
- D Destroying or preventing the growth of bacteria  
*Memusnahkan atau menghalang pertumbuhan bakteria*

22 Diagram 2 shows the heating curve of solid X.

*Rajah 2 menunjukkan lengkung pemanasan pepejal X*

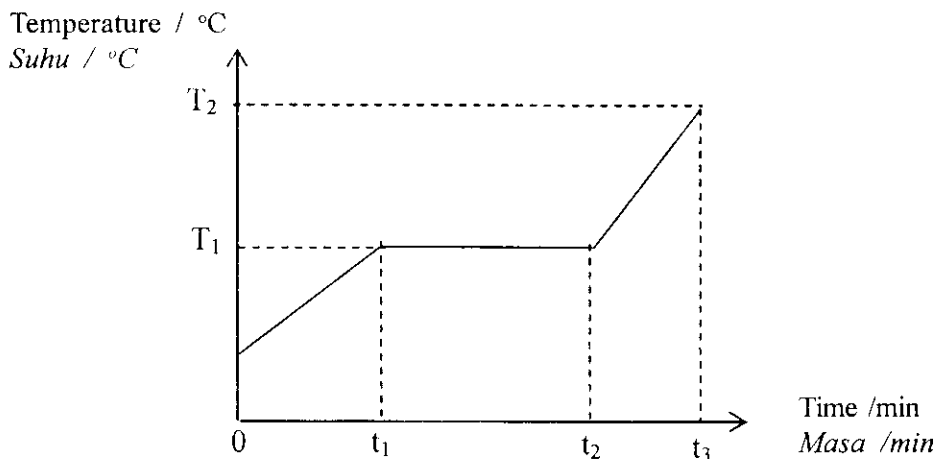


Diagram 2

*Rajah 2*

Which of the following statements can be deduced from Diagram 2?

*Antara pernyataan berikut, yang manakah boleh disimpulkan daripada Rajah 2?*

- A The melting point of X is  $T_2$   
*Takat lebur X ialah  $T_2$*
- B Substance X is a liquid at  $t_1$  to  $t_2$   
*Bahan X adalah cecair pada  $t_1$  hingga  $t_2$*
- C Heat energy is absorbed from 0 to  $t_3$   
*Tenaga haba diserap daripada 0 ke  $t_3$*
- D Kinetic energy of particles decreases from  $t_2$  to  $t_3$   
*Tenaga kinetik zarah berkurang daripada  $t_2$  ke  $t_3$*



- 23 Atom of element X consists of 19 protons, 20 neutrons and 19 electrons.  
Which of the following statements shows the chemical properties of element X?  
*Atom bagi unsur X mempunyai 19 proton, 20 neutron dan 19 elektron.*  
*Antara pernyataan berikut, yang manakah menunjukkan sifat kimia bagi unsur X?*
- A X reacts with water to form alkali solution.  
*X bertindak balas dengan air untuk menghasilkan larutan alkali*
- B Atom X form ion  $X^{2+}$   
*Atom X membentuk ion  $X^{2+}$*
- C X is chemically inert.  
*X lengai secara kimia*
- D X react with oxygen to form covalent compound  
*X bertindakbalas dengan oksigen membentuk sebatian kovalen*
- 24 Table 1 shows the electron arrangement of atom of elements K and L.  
*Jadual 1 menunjukkan susunan elektron bagi atom K dan L.*

Atom of element <i>Atom bagi unsur</i>	Electron Arrangement <i>Susunan Elektron</i>
K	2.8.2
L	2.8.7

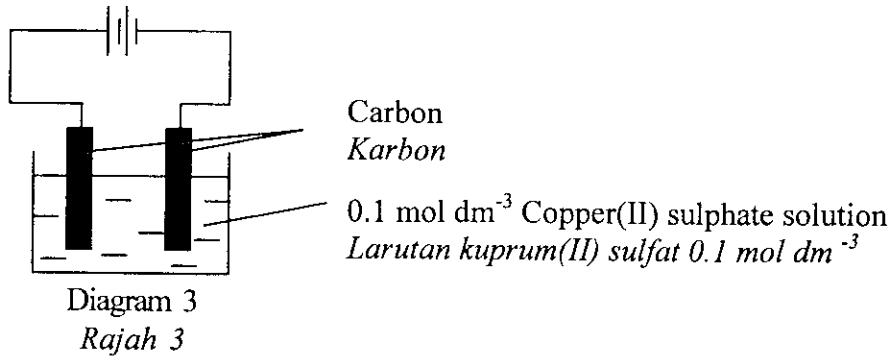
Table 1  
*Jadual 1*

Which of the following chemical formulae and types of bonding formed when element K reacts with element L?  
*Antara formula kimia dan jenis ikatan berikut, yang manakah terbentuk apabila unsur K bertindak balas dengan unsur L?*

- |   | Chemical formula<br><i>Formula kimia</i> | Type of bonding<br><i>Jenis Ikatan</i> |
|---|--|--|
| A | $KL_2$                                   | Ionic<br><i>Ion</i>                    |
| B | $K_2L$                                   | Ionic<br><i>Ion</i>                    |
| C | $KL_2$                                   | Covalent<br><i>Kovalen</i>             |
| D | $K_2L_5$                                 | Covalent<br><i>Kovalen</i>             |

Dapatkan skema Jawapan di Laman

- 25 Diagram 3 shows the set up of apparatus of an electrolysis process.  
*Rajah 3 menunjukkan susunan radas bagi suatu proses elektrolisis.*



Which ion that will be discharged at the anode?  
*Ion manakah yang akan dinyahcaskan di anod?*

- A Copper (II) ion.  
*Ion kuprum (II).*
- B Sulphate ion.  
*Ion sulfat*
- C Hydroxide ion.  
*Ion hidroksida.*
- D Hydrogen ion.  
*Ion hidrogen.*
- 26 Which of the following acids has the lowest pH value?  
*Antara asid-asid berikut yang manakah mempunyai nilai pH paling rendah?*
- A 50 cm<sup>3</sup> of 0.1 mol dm<sup>-3</sup> hydrochloric acid.  
*50 cm<sup>3</sup> asid hidroklorik 0.1 mol dm<sup>-3</sup>.*
- B 50 cm<sup>3</sup> of 0.1 mol dm<sup>-3</sup> ethanoic acid.  
*50 cm<sup>3</sup> asid etanoik 0.1 mol dm<sup>-3</sup>.*
- C 50 cm<sup>3</sup> of 0.1 mol dm<sup>-3</sup> sulphuric acid.  
*50 cm<sup>3</sup> asid sulfurik 0.1 mol dm<sup>-3</sup>.*
- D 50 cm<sup>3</sup> of 0.1 mol dm<sup>-3</sup> nitric acid  
*50 cm<sup>3</sup> asid nitrik 0.1 mol dm<sup>-3</sup>.*
- 27 A student poured 25.0 cm<sup>3</sup> of 2.0 mol dm<sup>-3</sup> of sodium hydroxide solution into a conical flask. Then 25.0 cm<sup>3</sup> of distilled water was added into the same conical flask. What is the final concentration of the sodium hydroxide solution in the conical flask?  
*Seorang pelajar telah memasukkan 25.0 cm<sup>3</sup> larutan natrium hidroksida berkepekatan 2.0 mol dm<sup>-3</sup> ke dalam sebuah kelalang kon. Selepas itu 25.0 cm<sup>3</sup> air suling ditambahkan ke dalam kelalang kon yang sama. Apakah kepekatan akhir larutan natrium hidroksida dalam kelalang kon itu?*
- A 0.5 mol dm<sup>-3</sup>
- B 1.0 mol dm<sup>-3</sup>
- C 2.5 mol dm<sup>-3</sup>
- D 4.0 mol dm<sup>-3</sup>

28 The followings are the properties of a glass:-

- No resistance to heat
- Malleable

Berikut ialah sifat-sifat bagi kaca:-

- Tidak tahan haba
- Boleh ditempa

Which of the following glass has the above characteristics?

Antara jenis kaca berikut yang manakah mempunyai ciri-ciri seperti di atas?

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

29 Diagram 4 shows the results of a series of test which is carried out on solution Y.

Rajah 4 menunjukkan keputusan bagi satu siri ujian yang dijalankan ke atas larutan Y.

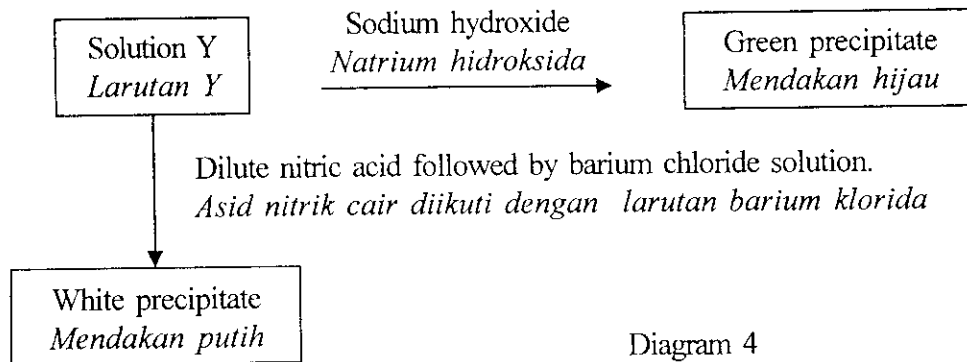


Diagram 4  
Rajah 4

Identify the solution Y

Kenal pasti larutan Y.

- A Iron(II) sulphate  
*Ferum(II) sulfat*
- B Lead(II) sulphate  
*Plumbum(II) sulfat*
- C Iron(III) nitrate  
*Ferum(III) nitrat*
- D Zinc nitrate  
*Zink nitrat*

30 Which of the following half equations represents an oxidation reaction?

Antara persamaan setengah berikut, yang manakah mewakili tindak balas pengoksidaan?

- A  $\text{Cr}_2\text{O}_7^{2-} + 14\text{H}^+ + 6\text{e}^- \rightarrow 2\text{Cr}^{3+} + 7\text{H}_2\text{O}$
- B  $\text{Sn}^{2+} \rightarrow \text{Sn}^{4+} + 2\text{e}^-$
- C  $\text{MnO}_4^- + 8\text{H}^+ + 5\text{e}^- \rightarrow \text{Mn}^{2+} + 4\text{H}_2\text{O}$
- D  $\text{Cl}_2 + 2\text{e}^- \rightarrow 2\text{Cl}^-$

- 31 Diagram 5 shows curve T obtained from the decomposition of  $50 \text{ cm}^3$  of  $1.0 \text{ mol dm}^{-3}$  hydrogen peroxide solution by using  $5 \text{ g}$  of manganese(IV) oxide powder as a catalyst at  $30^\circ\text{C}$ .

*Rajah 5 menunjukkan lengkung T yang diperolehi daripada penguraian  $50 \text{ cm}^3$  larutan hidrogen peroksida  $1.0 \text{ mol dm}^{-3}$  menggunakan  $5 \text{ g}$  serbuk mangan (IV) oksida sebagai mangkin pada suhu  $30^\circ\text{C}$*

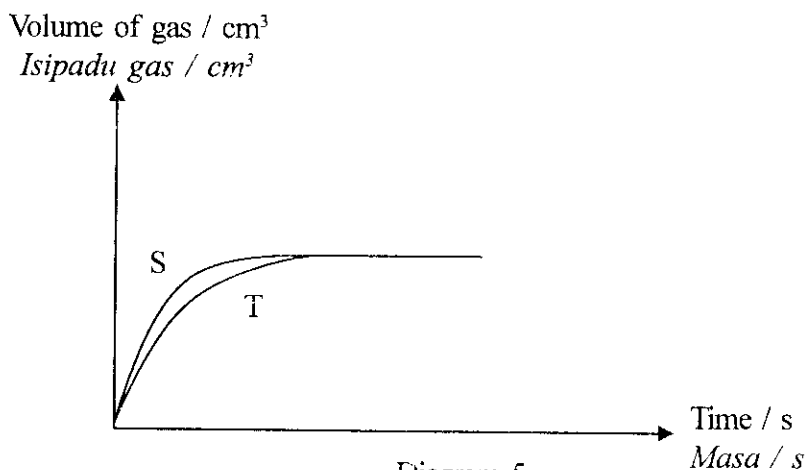


Diagram 5  
Rajah 5

Which of the following changes of reacting conditions must be done to obtain curve S?

*Antara perubahan keadaan tindak balas berikut yang manakah mesti dilakukan untuk menghasilkan lengkung S ?*

- A Increase the temperature up to  $60^\circ\text{C}$   
*Tingkatkan suhu kepada  $60^\circ\text{C}$*
- B Use  $3 \text{ g}$  manganese(IV) oxide powder  
*Gunakan  $3 \text{ g}$  serbuk mangan(IV) oksida*
- C Use  $100 \text{ cm}^3$  of  $1.0 \text{ mol dm}^{-3}$  hydrogen peroxide solution.  
*Gunakan  $100 \text{ cm}^3$  larutan hidrogen peroksida  $1.0 \text{ mol dm}^{-3}$*
- D Add  $50 \text{ cm}^3$  of distilled water into the solution  
*Tambahkan  $50 \text{ cm}^3$  air suling ke dalam larutan*
- 32 The following statements refer to the properties of compound J.  
*Pernyataan berikut merujuk kepada sifat sebatian J*
- \* reacts with magnesium  
*bertindak balas dengan magnesium*
  - \* can be prepared from ethanol  
*boleh disediakan daripada etanol*

What is the name of compound J?

*Apakah nama sebatian J?*

- A Methanoic acid  
*Asid metanoik*
- B Ethanoic acid  
*Asid etanoik*
- C Propanoic acid  
*Asid propanoik*
- D Methyl ethanoate  
*Metil etanoat*

- 33 A student found that an iron nail left in a beaker of gelatin, rusts after a few days. How the rate of rusting can be reduced?

*Seorang pelajar mendapati paku besi berkarat, selepas dibiarkan di dalam bikar yang mengandungi gelatin selama beberapa hari. Bagaimanakah kadar pengurangan dapat dikurangkan?*

- A A few drops of phenolphthalein is added  
*Beberapa titis fenolphtalein dimasukkan*
- B The beaker is kept away from the sunlight  
*Bikar diletakkan jauh daripada cahaya matahari*
- C The beaker of gelatin is covered with a petri dish  
*Bikar yang mengandungi gelatin ditutup dengan piring petri.*
- D Zinc powder is added to the gelatin before the experiment.  
*Serbuk ferum dimasukkan kepada gelatin sebelum eksperimen..*
- 34 What is the name of the process to prepare soap?  
*Apakah nama proses bagi penyediaan sabun?*
- A Ostwald  
*Ostwald*
- B Neutralisation  
*Peneutralan*
- C Esterification  
*Pengesteran*
- D Saponification  
*Saponifikasi*
- 35 What is the common traditional medicine used to treat malaria?  
*Apakah ubat tradisional yang digunakan untuk merawat malaria.*
- A Aloe vera  
*Aloe vera*
- B Ginger  
*Halia*
- C Quinine  
*Kuinin*
- D Bamboo  
*Buluh*
- 36 The following information is about atom W  
*Maklumat berikut adalah tentang atom W*

- |  |
|--|
| <ul style="list-style-type: none"> <li>The number of neutrons is 20<br/><i>Bilangan neutron ialah 20</i></li> <li>The number of electrons is 19<br/><i>Bilangan elektron ialah 19</i></li> </ul> |
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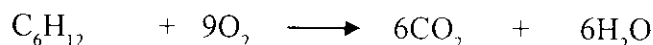
Which of the following symbols represent an atom W ?  
*Antara simbol berikut, yang manakah mewakili atom W ?*

- |   |                      |   |                      |
|---|----------------------|---|----------------------|
| A | $^{19}_{20}\text{W}$ | C | $^{39}_{20}\text{W}$ |
| B | $^{20}_{19}\text{W}$ | D | $^{39}_{19}\text{W}$ |

Dapatkan skema Jawapan di Laman

- 37 What is the percentage composition by mass of nitrogen in ammonium nitrate,  $\text{NH}_4\text{NO}_3$ ?  
 [ Relative atomic mass : H, 1 ; N, 14 ; O, 16 ]  
*Berapakah peratus komposisi mengikut jisim bagi nitrogen dalam ammonium nitrat  $\text{NH}_4\text{NO}_3$ ?*  
 [ Jisim atom relatif : H, 1 ; N, 14 ; O, 16 ]
- A 17.5 %  
 B 22.5 %  
 C 35.0 %  
 D 60.0 %

- 38 The chemical equation below represents the combustion reaction of hexene,  $\text{C}_6\text{H}_{12}$ .  
*Persamaan kimia di bawah mewakili tindak balas pembakaran heksena,  $\text{C}_6\text{H}_{12}$*



What is the volume of carbon dioxide formed when 8.4 g of hexene burnt in excess oxygen?  
*Berapakah isipadu gas karbon dioksida terbentuk apabila 8.4 g heksena terbakar dalam oksigen berlebihan?*

[Relative atomic mass : H, 1 ; C, 12 ; O, 16 ; and 1 mol of gas occupies the volume of 24 dm<sup>3</sup> at room conditions]

[ Jisim atom relatif : H, 1 ; C, 12 ; O, 16 ; dan 1 mol gas menempati isipadu sebanyak 24 dm<sup>3</sup> pada keadaan bilik ]

- A 10.80 dm<sup>3</sup>  
 B 14.40 dm<sup>3</sup>  
 C 26.40 dm<sup>3</sup>  
 D 28.88 dm<sup>3</sup>
- 39 X, Y and Z are elements in the same period in the Periodic Table of Elements.  
 The properties of their oxide compound is shown below.

- \* the oxide of X is amphoteric,
- \* the oxide of Y is acidic
- \* the oxide of Z is basic.

*Unsur-unsur X, Y dan Z terletak pada kala yang sama dalam Jadual Berkala Unsur. Sifat-sifat bagi oksida sebatian itu adalah seperti di bawah.*

- \* oksida bagi X bersifat amfoterik.
- \* oksida bagi Y bersifat asid.
- \* oksida bagi Z bersifat bes.

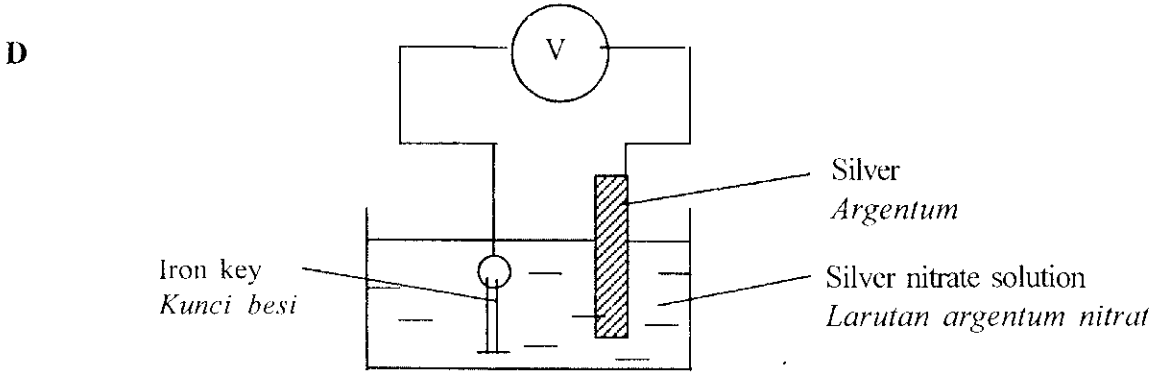
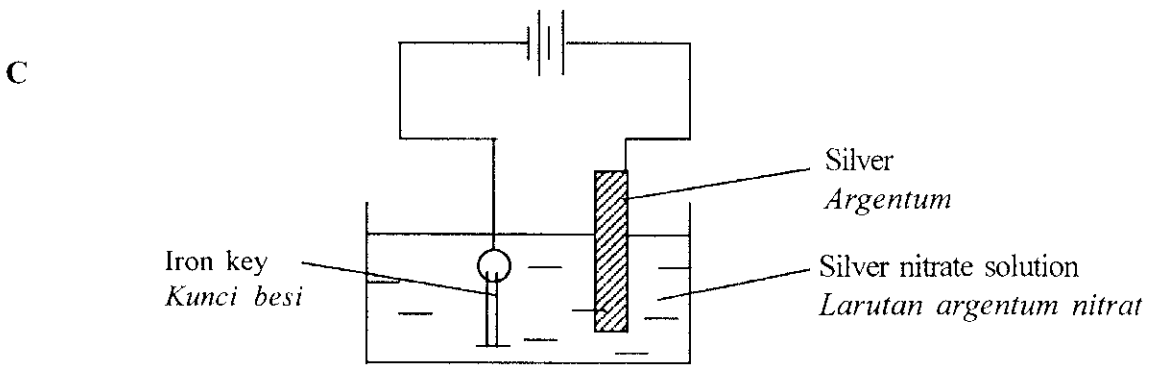
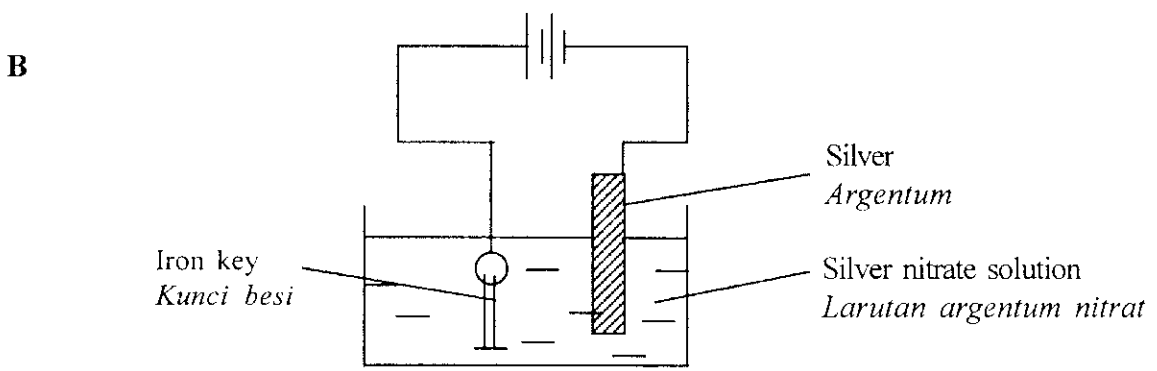
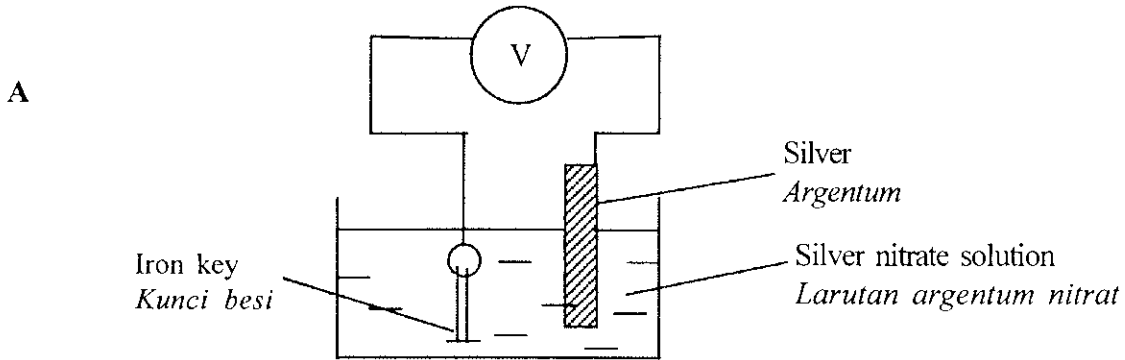
Arrange the elements X, Y and Z in the order of increasing proton number.

*Susunkan unsur-unsur X, Y dan Z berdasarkan susunan nombor proton menaik.*

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

41 Which of the following diagrams shows the correct set-up of apparatus to electroplate an iron key with silver?

*Yang manakah antara rajah berikut menunjukkan susunan radas yang betul untuk menyadurkan paku besi dengan argentum?*



Dapatkan skema Jawapan di Laman

- 42 Table 2 shows the pair of electrodes in chemical cell, cell voltages and the negative terminals of three different chemical cells.

*Jadual 2 menunjukkan pasangan elektrod dalam sel kimia, voltan sel dan terminal negatif bagi tiga sel kimia berlainan.*

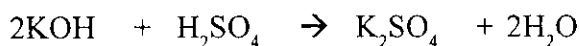
Pair of Electrodes <i>Pasangan elektrod</i>	Voltage (V) <i>Voltan (V)</i>	Negative terminal <i>Terminal negatif</i>
W and Y W dan Y	3.0	W
X and Y X dan Y	1.1	X
Y and Z Y dan Z	0.5	Y

Table 2  
*Jadual 2*

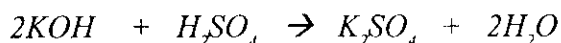
What is the cell voltage if X and Z are used as the electrodes in the chemical cell?

*Berapakah voltan sel sekiranya X dan Z digunakan sebagai elektrod dalam sel kimia itu?*

- A 0.6 V  
B 1.6 V  
C 3.5 V  
D 4.6 V
- 43 The chemical equation for the reaction between sulphuric acid and potassium hydroxide solution is shown below:



*Persamaan kimia bagi tindak balas antara asid sulfurik dan larutan kalium hidroksida ditunjukkan seperti di bawah:*



What is the volume of  $0.1 \text{ mol dm}^{-3}$  of sulphuric acid needed to neutralize  $25.0 \text{ cm}^3$  of  $0.5 \text{ mol dm}^{-3}$  of potassium hydroxide solution.

*Apakah isipadu asid sulfurik berkepekatan  $0.1 \text{ mol dm}^{-3}$  yang diperlukan untuk meneutralkan  $25.0 \text{ cm}^3$  larutan kalium hidroksida  $0.5 \text{ mol dm}^{-3}$ .*

- A  $15.5 \text{ cm}^3$   
B  $25.0 \text{ cm}^3$   
C  $50.0 \text{ cm}^3$   
D  $62.5 \text{ cm}^3$
- 44 What is the oxidation number for nitrogen in nitrate ion,  $\text{NO}_3^-$ ?
- Apakah nombor pengoksidaan bagi nitrogen dalam ion nitrat,  $\text{NO}_3^-$ ?*
- A - 1  
B - 3  
C + 5  
D + 7



- 45 What is the mass of zinc sulphate that can be prepared by adding excess zinc with  $50 \text{ cm}^3$  of  $1.0 \text{ mol dm}^{-3}$  sulphuric acid  
*Apakah jisim zink sulfat yang boleh disediakan apabila zink berlebihan ditambahkan kepada  $50 \text{ cm}^3$  asid sulfurik,  $1.0 \text{ mol dm}^{-3}$*
- [Relative atomic mass : O, 16 ; S, 32 ; Zn, 65]  
 [Jisim atom relatif : O, 16 ; S, 32 ; Zn, 65]
- A 6.50 g  
 B 8.05 g  
 C 11.45 g  
 D 16.10 g
- 46 Which of the following are the uses of photochromic glass?  
*Antara berikut kegunaan kaca fotokromik?*
- I Optical lenses.  
*Kanta cermin mata*  
 II Windows glass  
*Kaca tingkap pejabat*  
 III Car windshields  
*Cermin penghadang angin kereta*  
 IV Volumetric flask  
*Kelalang volumetrik*
- A I and II only  
 B III and IV only  
 C I, II and III only  
 D II, III and IV only
- 47 Table 3 shows the volume of hydrogen gas liberated when excess magnesium powder reacts with  $25 \text{ cm}^3$  of  $0.1 \text{ mol dm}^{-3}$  of hydrochloric acid  
*Jadual 3 menunjukkan isipadu gas hidrogen yang dibebaskan apabila serbuk magnesium berlebihan bertindak balas dengan  $25 \text{ cm}^3$  asid hidroklorik  $0.1 \text{ mol dm}^{-3}$ .*

Time / min <i>Masa / min</i>	0	1	2	3	4	5
Volume of hydrogen gas / $\text{cm}^3$ <i>Isipadu gas hidrogen/ <math>\text{cm}^3</math></i>	0.0	15.0	25.0	30.0	33.0	33.0

Table 3  
*Jadual 3*

What is the average rate of reaction in the third minute?  
*Berapakah kadar tindak balas purata dalam minit ketiga?*

- A  $0.067 \text{ cm}^3 \text{ s}^{-1}$   
 B  $0.083 \text{ cm}^3 \text{ s}^{-1}$   
 C  $0.110 \text{ cm}^3 \text{ s}^{-1}$   
 D  $0.167 \text{ cm}^3 \text{ s}^{-1}$

48

Propanol reacts with ethanoic acid in the presence of concentrated sulphuric acid to form compound Z.

*Propanol bertindak balas dengan asid etanoik dalam kehadiran asid sulfurik pekat bagi menghasilkan sebatian Z.*

What is the name of compound Z.

*Apakah nama sebatian Z*

- A Ethanoic acid  
*Asid etanoik*
- B Potassium propanoate  
*Kalium propanoat*
- C Propyl propanoate  
*Propil propanoat*
- D Propyl ethanoate  
*Propil etanoat*
- 49 2.8 g of iron reacts completely with copper (II) sulphate solution to displace copper. 7.5 kJ of energy is given out.  
*2.8 g ferum bertindak balas lengkap dengan larutan kuprum (II) sulfat bagi menyesarkan kuprum. 7.5 kJ tenaga dibebaskan.*

What is the value of heat of displacement of copper?

*Berapakah nilai haba penyesaran bagi kuprum?*

[ Relative atomic mass; Fe, 56; Cu, 64 ]

[ *Jisim atom relatif; Fe, 56; Cu, 64* ]

- A + 150.0 kJ mol<sup>-1</sup>
- B + 171.4 kJ mol<sup>-1</sup>
- C - 150.0 kJ mol<sup>-1</sup>
- D - 171.4 kJ mol<sup>-1</sup>
- 50 The heat of combustion of ethanol is -1376 kJ mol<sup>-1</sup>.  
*Haba pembakaran etanol ialah -1376 kJ mol<sup>-1</sup>.*
- What is the mass of ethanol used to heat 150 cm<sup>3</sup> of water, by increasing the temperature of 30.0 °C.  
*Berapakah jisim etanol yang digunakan untuk memanaskan 150 cm<sup>3</sup> air dengan kenaikan suhu sebanyak 30.0 °C.*

[ Relative molecular mass ; ethanol ; 46, specific heat capacity of water = 4.2 Jg<sup>-1</sup>°C<sup>-1</sup> ]

[ *Jisim molekul relatif ; etanol; 46 , muatan haba tentu bagi air = 4.2 Jg<sup>-1</sup>°C<sup>-1</sup> ]*

- A 0.318 g
- B 0.632 g
- C 6.920 g
- D 10.615 g

END OF QUESTION PAPER

*KERTAS SOALAN TAMAT*

Dapatkan skema Jawapan di Laman

**INFORMATION FOR CANDIDATES**  
**MAKLUMAT UNTUK CALON**

1. This question paper consists of 50 questions.  
*Kertas soalan ini mengandungi 50 soalan.*
2. Answer **all** questions.  
*Jawab **semua** soalan.*
3. Answer each question by blackening the correct space on the answer sheet.  
*Jawab dengan menghitamkan ruangan yang betul pada kertas jawapan.*
4. Blacken only **one** space for each question.  
*Hitamkan **satu** ruangan sahaja bagi setiap soalan.*
5. If you wish to change your answer, erase the blackened mark that you have made. Then blacken the space for the new answer.  
*Sekiranya anda hendak menukarkan jawapan, padamkan tanda yang telah dibuat. Kemudian hitamkan jawapan yang baru.*
6. The diagrams in the questions provided are not drawn to scale unless stated.  
*Rajah yang mengiringi soalan tidak dilukiskan mengikut skala kecuali dinyatakan.*
7. You may use a non-programmable scientific calculator.  
*Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram.*