**4541/1**
**Chemistry**
**Paper 1**
**September 2007**
1¼ jam

**LOGO DAN NAMA SEKOLAH**

**SIJIL PELAJARAN MALAYSIA**

**PEPERIKSAAN PERCUBAAN 2007**

**CHEMISTRY**
**FORM 5**

Paper 1

1 hour 15 minutes

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

*1. Kertas soalan ini adalah dalam dwibahasa*

*2. Soalan di bahagian atas adalah dalam Bahasa Inggeris. Soalan di bawah dalam tulisan condong adalah dalam Bahasa Melayu yang sepadan.*

*3. Calon dikehendaki membaca maklumat di halaman 2 atau halaman 3.*

Kertas soalan ini mengandungi 24 halaman bercetak

**INFORMATION FOR CANDIDATES** **[Lihat sebelah**

1. This question paper consists of 50 questions.

2. Answer **all** questions.

3. Answer each question by blackening the correct space on the answer sheet.

4. Blacken only **one** space for each question.

5. If you wish to change your answer, erase the blackened mark that you have made. Then blacken the space for the new answer.

6. The diagrams in the questions provided are not drawn to scale unless stated.

7. You may use a non-programmable scientific calculator.

**MAKLUMAT UNTUK CALON**

1. *Kertas soalan ini mengandungi* 50 *soalan.*

2. *Jawab* **semua** *soalan.*

3. *Jawab dengan menghitamkan ruangan yang betul pada kertas jawapan.*

4. *Hitamkan* **satu** *ruangan sahaja bagi setiap soalan.*

5. *Sekiranya anda hendak menukar jawapan, padamkan tanda yang telah dibuat. Kemudian hitamkan jawapan yang baru.*

6. *Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.*

7. *Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram.*

1. Which of the following is a molecule?
*Yang manakah antara berikut adalah molekul?*

**A** Neon
*Neon.*
**B** Ammonia
*Ammonia.*
**C** Sodium chloride
*Natrium klorida.*
**D** *Potassium hexacyanoferate(III)*
*Kalium heksasianoferat(III)*

2. Which of following is the electron arrangement of a non-metal R?
*Yang manakah antara berikut merupakan susunan elektron bukan logam?*

**A** 2.1
**B** 2.2
**C** 2.8.3
**D** 2.8.7

3. What can be deduced from the symbol $^{27}_{13}$Al?
*Apakah yang dapat disimpulkan dari symbol $^{27}_{13}$Al?*

**I** The electron arrangement of aluminium atom is 2.8.3
*Susunan elektron bagi atom aluminium ialah 2.8.3.*
**II** Aluminium atom has 13 protons and 27 neutrons.
*Atom aluminium mempunyai 13 proton dan 27 neutron.*
**II** Aluminium atom has a proton number of 27 and 14 neutrons.
*Atom aluminium mempunyai nombor proton 27dan 14 neutron.*
**IV** The total number of proton and neutron of aluminium atom is 27.
*Jumlah bilangan proton dan neutron atom aluminium ialah 27.*

**A** I and III
**B** II and IV
**C** II and III
**D** I and IV

4. When 1.52 g of a metal oxide of Z is reduced, 1.04 g of the metal is obtained. Determine the empirical formula of the metal oxide. [RAM: O,16; Z,52].
*Apabila 1.52g oksida logam Z diturunkan, 1.04 g logam terhasil. Tentukan formula empirik bagi oksida logam tersebut. [JAR : O,16; Z,52]*

**A** $ZO_2$

**B** $Z_2O$
**C** $Z_2O_3$
**D** $Z_3O_2$

5. Which of the following chemical equation is balanced?
*Yang manakah antara berikut persamaan kimia seimbang?*

**A** $2NH_4Cl + Ca(OH)_2 \rightarrow CaCl_2 + 2NH_3 + H_2O$
**B** $2Cu(NO_3)_2 \xrightarrow{heat} 2CuO + 4NO_2 + O_2$
**C** $KI + Pb(NO_3)_2 \rightarrow PbI_2 + KNO_3$
**D** $CuCO_3 + HNO_3 \rightarrow Cu(NO_3)_2 + CO_2 + H_2O$

6. In a chemical reaction of calcium carbonate with hydrochloric acid, $36cm^3$ of carbon dioxide gas is collected at room temperature. What is number of mole of carbon dioxide collected?
[1 mole of gas occupies a volume of 24 $dm^3$ at room temperature and pressure]
*Dalam suatu tindak balas antara kalsium carbonate dengan asid hidroklorik acid, 36 $cm^3$ gas carbon dioksida terkumpul. Apakah bilangan mol karbon dioksida yang terkumpul ?*
*[1 mole gas menempati isipadu 24 $dm^3$ pada suhu bilik dan tekanan atmosfera]*

**A** 0.0015 mol
**B** 0.067 mol
**C** 1.50 mol
**D** 1.61 mol

7. Which noble gases given below is used to fill airships and weather balloons ?
*Manakah antara gas adi berikut digunakan untuk mengisi kapal udara dan belon kaji cuaca?*

**A** Helium
**B** Neon
**C** Argon
**D** Xenon

8. Table 1 shows the proton number of three elements P, Q and R. Which of the following statements is **true**?
*Jadual 1 menunjukkan nombor proton bagi tiga unsur iaitu P,Q dan R. Manakah antara pernyataan berikut yang **benar** ?*

| Element<br>*Unsur* | P | Q | R |
|---|---|---|---|
| Proton Number<br>*Nombor proton* | 11 | 13 | 17 |

Table 1
*Jadual 1*

**A** The electronegativity decreases in the order P, Q, R
*Keelektronegatifan berkurang mengikut susunan P,Q, R*
**B** P, Q and R are all conductors of electricity.
*P,Q dan R adalah pengalir elektrik yang baik.*
**C** All the elements exist as diatomic molecules.
*Semua unsur tersebut wujud dalam dwiatom.*
**D** The atomic radius decreases in the order P, Q, R.
*Jejari atom berkurang mengikut susunan P,Q, R.*

9. During the reaction between calcium and bromine to form a compound,
*Semasa tindak balas antara kalsium dan bromin untuk membentuk sebatian,*

**A** A calcium atom shares a pair of electron with two bromine atoms.
*Atom kalsium berkongsi sepasang elektron dengan dua atom bromin.*
**B** A calcium atom shares two pairs of electron with two bromine atoms.
*Atom kalsium berkongsi dua pasang elektron dengan dua atom bromin.*
**C** A calcium atom donates two electrons to two bromine atoms.
*Atom kalsium menderma dua elektron kepada dua atom bromin.*
**D** A bromine atom donates two electrons to a calcium atom.
*Atom bromin menderma dua elektron kepada satu atom kalsium.*

10. Table 2 shows the electron arrangement of four elements K, L, M and N.
*Jadual 2 menunjukkan susunan electron empat unsur K, L, M dan N.*

| Element<br>*Unsur* | Electronic arrangement<br>*Susunan elektron* |
|---|---|
| K | 2.4 |
| M | 2.8.6 |

Table 2
*Jadual 2*

What is the formula of the compound and the bond formed between elements K and M?
*Apakah formula dan jenis ikatan bagi sebatian yang terbentuk antara K dan M?*

| | Formula of compound<br>*Formula sebatian* | Bond<br>*Ikatan* |
|---|---|---|
| **A** | $KM_2$ | Covalent<br>*Kovalen* |
| **B** | $K_2M$ | Ionic<br>*Ion* |
| **C** | $KM_2$ | Ionic<br>*Ion* |
| **D** | $K_2M$ | Covalent<br>*Kovalen* |

11. The symbols of two elements are $^{19}_{9}Q$ and $^{40}_{20}R$. If P and Q combine to form a compound, what is the relative formula mass of this compound?
*Simbol bagi dua unsur adalah $^{19}_{9}Q$ dan $^{40}_{20}R$. Jika P berpadu dengan Q untuk membentuk sebatian, apakah formula relatif bagi sebatian ini?*

**A** 59
**B** 78
**C** 97
**D** 99

12. Which of the substances in the table 3 is a covalent compound?
*Di antara sebatian dalam jadual di bawah, yang manakah adalah sebatian kovalen?*

| Substance<br>*Bahan* | Melting point/ $^{o}$C<br>*Takat lebur/$^{o}$C* | Boiling point/ $^{o}$C<br>*Takat didih/$^{o}$C* | Electrical conductivity<br>*Konduktor elektrik* |
|---|---|---|---|
| **A** | -38 | 360 | Conductor<br>*Konduktor* |
| **B** | -21 | 104 | Non-conductor<br>*Bukan konduktor* |
| **C** | 780 | 1650 | Non-conductor |

| | | | |
|---|---|---|---|
| | | | *Bukan konduktor* |
| **D** | 801 | 1413 | Non-conductor<br>*Bukan konduktor* |

Table 3
*Jadual 3*

13. The ions present in aqueous copper(II) chloride solution are
*Ion-ion yang hadir dalam larutan akueus kuprum (II) klorida ialah*

**A** $Cu^{2+}$ and $Cl^-$
**B** $Cu^{2+}$, $Cl^-$, $H^+$ and $O^{2-}$
**C** $Cu^{2+}$, $Cl^-$, $H^+$ and $OH^-$
**D** $Cu^{2+}$, $Cl^-$, $H_3O^+$ and $O^{2-}$

14. Table 4 shows the voltage reading of three simple chemical cells formed by immersing a pair of metal electrodes into an electrolyte. What is the voltage produced by using Z and W electrodes?
*Jadual 4 menunjukkan bacaan voltan bagi tiga sel kimia ringkas yang terbentuk apabila pasangan elektrod logam dicelup ke dalam elektrolit. Apakah bacaan voltan yang terhasil apabila menggunakan elektrod Z dan W?*

| Electrodes<br>*Elektrod* | Voltage / Volt<br>*Voltan/Volt* | Negative terminal<br>*Terminal negatif* |
|---|---|---|
| W/X | 2.7 | W |
| X/Y | 2.0 | Y |
| Y/Z | 0.5 | Y |

Table 4
*Jadual 4*

**A** 1.5 Volt
**B** 1.2 Volt
**C** 0.8 Volt
**D** 0.6 Volt

15. Table 5 shows the electrolysis of two solutions using carbon electrodes.
*Jadual 5 menunjukkan elektrolisis bagi dua larutan menggunakan elektrod karbon.*

| Electrolyte<br>*Elektrolit* | Product formed at<br>*Hasil di* | |
|---|---|---|
| | Anode<br>*Anod* | Cathode<br>*Katod* |
| Sodium chloride solution 1.0 mol $dm^{-3}$<br>*Larutan natrium klorida* 1.0 mol $dm^{-3}$ | P | Hydrogen |
| Silver nitrate solution 1.0 mol $dm^{-3}$ | Oxygen | Q |

| | | |
|---|---|---|
| *Larutan argentum nitrat* 1.0 mol $dm^{-3}$ | | |

Table 5
*Jadual 5*

What are the products P and Q?
*Apakah hasil yang terbentuk di P dan Q?*

| | P | Q |
|---|---|---|
| **A** | Chlorine gas<br>*Gas klorin* | Silver<br>*Argentum* |
| **B** | Chlorine gas<br>*Gas klorin* | Oxygen gas<br>*Gas oksigen* |
| **C** | Oxygen gas<br>*Gas oksigen* | Hydrogen gas<br>*Gas hidrogen* |
| **D** | Oxygen gas<br>*Gas oksigen* | Silver<br>*Argentum* |

16. Which of the following statements is true about an acid?
*Antara pernyataan berikut yang manakah benar tentang asid?*

**I** An acid turns blue litmus paper red.
*Asid menukar kertas litmus biru ke merah*
**II** An acid contains hydrogen ion in aqueous solution
*Asid mengandungi ion hidrogen dalam larutan akueus*
**III** An acid has a pH more than 7
*Asid mempunyai nilai pH lebih daripada 7*
**IV** An acid reacts with metal to give off hydrogen gas.
*Asid bertindak balas dengan logam dan membebaskan gas hidrogen*

**A** I and II
**B** III and IV
**C** I, II and IV
**D** II, III and IV

17. The pH value of 0.1 mol $dm^{-3}$ sodium hydroxide solution is higher than the pH value of 0.1 mol $dm^{-3}$ ammonia solution. This is because
*Nilai pH bagi 0.1 mol $dm^{-3}$ larutan natrium hidroksida lebih tinggi daripada nilai pH bagi 0.1 mol $dm^{-3}$ larutan ammonia. Ini adalah kerana*

**A** sodium hydroxide is more soluble in water than ammonia.
*natrium hidroksida lebih larut dalam air daripada ammonia*

**B** the concentration of hydrogen ion in sodium hydroxide solution is higher than the concentration of hydrogen ion in ammonia solution.
*kepekatan ion hidrogen dalam larutan natrium hidroksida adalah lebih tinggi daripada kepekatan ion hidrogen dalam larutan ammonia*

**C** sodium hydroxide ionises partially in water whereas ammonia ionizes completely in water.
*natrium hidroksida mengion separa dalam air manakala ammonia mengion lengkap dalam air*

**D** the concentration of hydroxide ion in sodium hydroxide solution is higher than the concentration of hydroxide ion in ammonia solution.
*kepekatan ion hidroksida dalam larutan natrium hidroksida adalah lebih tinggi daripada kepekatan ion hidroksida dalam larutan ammonia*

18. Calculate the mass of sodium hydroxide present in 100 $cm^3$ sodium hydroxide 0.5 mol $dm^{-3}$ solution. [H,1; O,16; Na,23]
*Hitungkan jisim natrium hidroksida di dalam 100 $cm^3$ larutan natrium hidroksida 5 mol $dm^{-3}$. [H,1; O,16; Na,23]*

**A** 0.4 g
**B** 0.5 g
**C** 1.0 g
**D** 2.0 g

19. Calculate the volume of sodium hydroxide of concentration 0.5 mol $dm^{-3}$ needed to neutralise 25.0 $cm^3$ sulphuric acid of concentration 0.20 mol $dm^{-3}$.
*Hitungkan isipadu larutan natrium hidroksida berkepekatan 0.5 mol $dm^{-3}$ yang diperlukan untuk meneutralkan 25.0 $cm^3$ asid sulfurik 0.20 mol $dm^{-3}$.*

**A** 10 $cm^3$
**B** 20 $cm^3$
**C** 25 $cm^3$
**D** 50 $cm^3$

20. Substance X + Sulphuric acid $\rightarrow$ Salt Y + Water + Carbon dioxide
*Bahan X + asid sulfurik $\rightarrow$ Garam Y + air + karbon dioksida*

Based on the the equation above, what could substance X be?
*Merujuk kepada persamaan di atas , apakah bahan X yang mungkin?*

**A** Copper(II) oxide
*Kuprum (II) oksida*

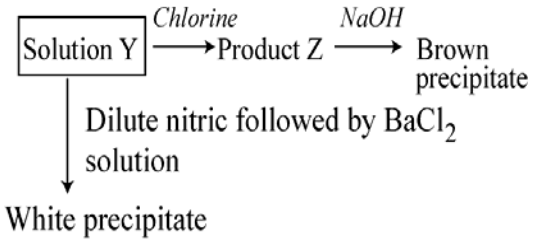
**B** Magnesium metal
*Logam magnesium*
**C** Zinc carbonate
*Zink karbonat*
**D** Sodium hydroxide
*Natrium hidroksida*

21. Examples of salt which can be prepared by double decomposition are
*Contoh-contoh garam yang dapat disediakan dengan kaedah penguraian ganda dua adalah*

**I** Silver chloride
*Argentum klorida*
**II** Magnesium nitrate
*Magnesium nitrat*
**III** Barium sulphate
*Barium sulfat*
**IV** zinc carbonate
*zink karbonat*

**A** I and III
**B** II and IV
**C** I, II and III
**D** I, III and IV

22. A series of test is carried out on solution Y and the results are shown in Diagram 1. Identify the substance present in solution Y.
*Satu siri ujian telah dijalankan ke atas larutan Y dan keputusan nya d itunjukkan dalam Rajah 1*




/ Mendakan perang

Mendakan putih

Diagram 1
*Rajah 1*

**A** Iron(II) sulphate
*Ferum(II) sulfat*
**B** Lead(II) sulphate
*plumbum(II) sulfat*
**C** Iron(III) nitrate
*Ferum(III) nitrat*
**D** Zinc carbonate
*Zink karbonat*

23. Which of the following reactions does not produce a salt?
*Antara tindak balas di bawah, yang manakah tidak menghasilkan garam?*

**A** Calcium carbonate and hydrochloric acid
*Kalsium karbonat dan asid hidroklorik*
**B** Copper(II) oxide and nitric acid.
*Kuprum (II) oksida dan asid nitrik*
**C** Zinc and hydrochloric acid
*Zink dan asid hidroklorik*
**D** Iron(II) nitrate and sulphuric acid
*Ferum (II) nitrat dan asid sulfurik*

24. Photochromic glass darkens on exposure to sunlight. The salt used to make photochromic glass is
*Kaca fotokromik menjadi gelap apabila didedahkan kepada cahaya matahari. Garam yang digunakan untuk membuat kaca fotokromik ialah*

**A** Lead(II) nitrate
*plumbum(II) nitrat*
**B** Silver chloride
*Argentum klorida*

**C** Copper(II) sulphate
*Kuprum(II) sulfat*
**D** Iron(II) sulphate
*Ferum (II) sulfat*

25. Which of the following sulphate salt given below is soluble in water?
*Di antara garam sulfat di bawah yang manakah larut dalam air?*

**A** Barium sulphate
*Barium sulfat*
**B** Magnesium sulphate
*Magnesium sulfat*
**C** Lead(II) sulphate
*plumbum(II) sulfat*
**D** Calcium sulphate
*Kalsium sulfat*

26. An alloy is harder than its pure metal because the foreign atoms in the alloy
*Aloi adalah lebih keras daripada logam tulen kerana logam asing di dalam aloi*

**A** increases the bond strength between the atoms.
*menambah kekuatan ikatan di antara atom.*
**B** increases the empty spaces between the atoms.
*Menambah ruang kosong antara atom-atom*
**C** react with the pure metal atoms to form a compound.
*Bertindak balas dengan atom-atom logam tulin untuk membentuk sebatian*
**D** reduces the ability of the atoms to slide across each other.
*Mengurangkan kebolehan atom-atom untuk menggelongsor antara satu sama lain*

27. Choose the conditions applied in the Contact Process to get optimum yield.
*Pilih keadaan-keadaan yang sesuai bagi Proses Sentuh supaya memperolehi hasil yang maksimum*

| | Temperature<br>*Suhu* | Pressure<br>*Tekanan* | Catalyst<br>*Mangkin* |
|---|---|---|---|
| **A** | 450$^{o}$C | 1 atmosphere | Vanadium (V) oxide |
| **B** | 500$^{o}$C | 200 | Vanadium |

| | | | |
|---|---|---|---|
| | | atmosphere | (V) oxide |
| **C** | 450°C | 1 atmosphere | Fine iron powder |
| **D** | 500°C | 200 atmosphere | Fine iron powder |

28. The main element present in glass is
*Unsur utama yang hadir dalam kaca adalah*

**A** Lead
P*lumbum*
**B** Sodium
*Natrium*
**C** Silicon
*Silicon*
**D** Boron
*Boron*

29. Ceramic is made from
*Seramik di buat dari*

**A** Silica, $SiO_2$
*Silika oksida, $SiO_2$*
**B** Cement
*Simen*
**C** Marble
*Marmar*
**D** Aluminosilicate hydrate
*Aluminosilikat terhidrat*

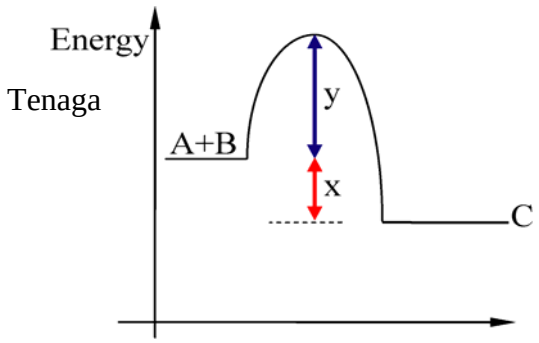



Diagram 2
*Rajah 2*

30. Diagram 2 shows the energy level for the reaction A + B ⟶ C. The activation energy for the reaction is
*Rajah 2 menunjukkan aras tenaga bagi tindak balas A + B ⟶ C. Tenaga pengaktifan bagi tindak balas tersebut adalah*

**A** x
**B** y
**C** (x + y)
**D** (y – x)

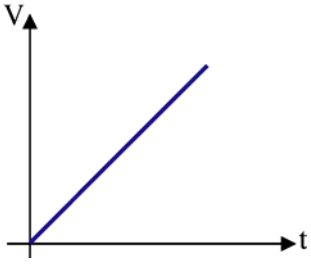
31. Zinc reacts with hydrochloric acid according to the equation below:

*Zink bertindak balas dengan asid hidroklorik seperti persamaan di bawah :*

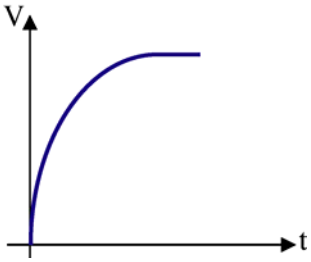
$$Zn(s) + 2HCl(aq) \longrightarrow ZnCl_2(aq) + H_2(g)$$

Which of the following graphs between volume (V) of hydrogen against time (t) is correct?
*Antara graf isipadu(V) hidrogen melawan masa(t) berikut berikut yang mana adalah betul ?*

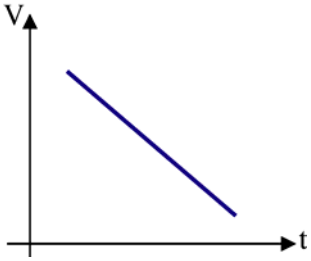
**A**



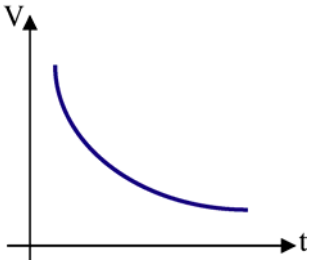
**B**




**C**




**D**

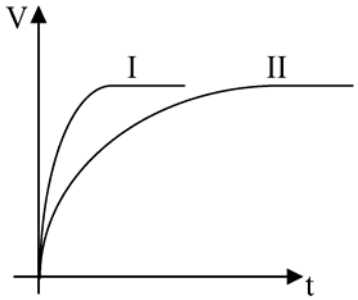



32 Two experiments are carried out as follows:
*Dua eksperimen telah dijalankan seperti berikut*:

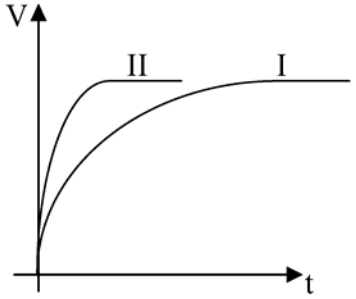
Experiment I : 100 $cm^3$ of 1.0 M HCl is added to 10g of marble chips at 30°C.
*Eksperimen I* *100$cm^3$ HCl 1.0M telah ditambah dengan 10g cip marmar pada suhu 30° C*
Experiment II : 50 $cm^3$ of 1.0 M HCl 1.0 M is added to 10g of marble chips at 50°C.
*Eksperimen II* *50$cm^3$ HCl telah 1.0 M ditambah ke 10g cip marmar pada 50° C.*

Which of the following graphs shows the volume of carbon dioxide (V) collected against time (t) in both the experiments?
*Antara graf-graf berikut, yang manakah menunjukkan isipadu karbon dioksida (V) yang dikumpul melawan masa (t) bagi kedua-dua eksperimen*

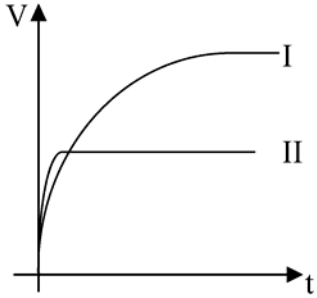
**A**



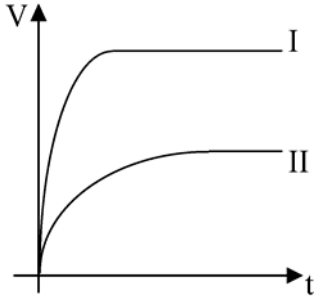

**B**




**C**




**D**




33. Excess zinc metal is added to 50 $cm^3$ of 0.2 mol $dm^{-3}$ of hydrochloric acid. The hydrogen gas evolved is collected at 20 second intervals. The results are tabulated in Table 6:
*Zink berlebihan telah ditambah ke 50 $cm^3$ of 0.2 mol $dm^{-3}$ asid hidroklorik . Hidrogen gas yang dibebaskan telah dikutip pada setiap 20 saat . Keputusan yang diperolehi direkodkan dalam Jadual 6*

| Time /seconds | 0 | 20 | 40 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|
| Total volume of $H_2/cm^3$ | 0 | 30 | 55 | 75 | 90 | 90 |

Table 6
*Jadual 6*

What information can you obtain from the result of the experiment?
*Apakah maklumat yang boleh diperolehi dari keputudan tersebut?*

**I** No hydrogen gas is given off at time 100 seconds.
*Tiada gas hydrogen dibebaskan pada masa 100 saat.*
**II** The average rate of reaction is 0.9 $cm^3$ $s^{-1}$.
*Kadar purata tindak balas ialah 0.9 $cm^3$ $s^{-1}$.*
**III** The total volume of hydrogen gas collected is 340 $cm^3$.
*Jumlah isipadu gas hydrogen terkumpul ialah 340 $cm^3$.*
**IV** The rate of release of hydrogen gas decreases with time.
*Kadar pembebasan gas hidrogen berkurang dengan masa.*

**A** IV only
**B** I and IV
**C** I, II and IV
**D** I, III and IV

34. The general formula of an organic substance that can decolourise the purple colour of acidified potassium permanganate(VII) solution is
*Formula am bagi satu bahan organik yang boleh menyahwarnakan larutan ungu kalium manganat(VII) berasid adalah*

**A** $C_nH_{2n+1}OH$
**B** $C_nH_{2n+1}COOH$
**C** $C_nH_{2n}$
**D** $C_nH_{2n+2}$

35. Which of the following pairs of substances are ***not*** isomers ?
*Antara pasangan berikut yang manakan **bukan** isomer?*

**A** Hexane and 2,3-dimethyl pentane
*Heksana dan 2,3 dimetilpentana*
**B** 1-butene and 2-methylpropene
*1-butena dan 2-metilpropena*
**C** Pentane and 2,2-dimethylpropane
*Pentana dan 2,2-dimetilpropana*
**D** 2-chloropentane and 3-chloropentane
*2-kloropentana dan 3-chloropentana*

36. Pentyl propanoate is a food flavouring with apricot taste. This substance can be obtained from the reaction between
*Pentil propanoat adalah perasa makanan dengan rasa aprikot. Bahan ini boleh didapati dari tindak balas antara*

**A** $C_3H_7OH$ and $C_4H_9COOH$
**B** $C_4H_9OH$ and $C_2H_5COOH$

**C** $C_5H_{11}OH$ and $C_2H_5COOH$
**D** $C_5H_{11}OH$ and $CH_3COOH$

37.

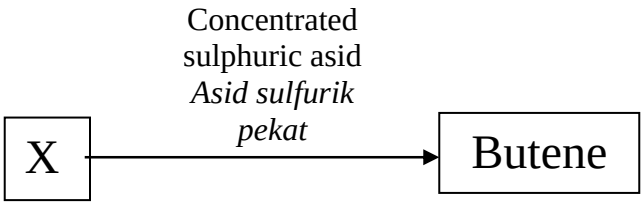



Diagram 3
*Rajah 3*

Consider the conversion in Diagram 3 and identify the substance X.
*Pertimbangkan pertukaran dalam Rajah 3 dan kenal pasti bahan X.*

**A** 1-butanol
*1-butanol*
**B** 2-methylpropanol
*2-metilpropanol*
**C** Butanoic acid
*Asid butanoik*
**D** 2-methyl-2-butanol
*2-metil-2-butanol*

38. W, X, Y and Z are four metals. Consider the reactions below involving these metals:
*W,X, Y dan Z terdiri dari empat logam. Pertimbangkan tindak balas yang melibatkan logam-logam tersebut di dibawah* :

Z sulphate + X ⟶ Z + X sulphate
Z sulphate + W ⟶ No reaction
Y sulphate + W ⟶ Y + W sulphate

Arrange the metals W, X, Y and Z in decreasing order of reactivity.
*Susun kereaktifan logam-logam W,X, Y dan Z mengikut tertib menurun.*

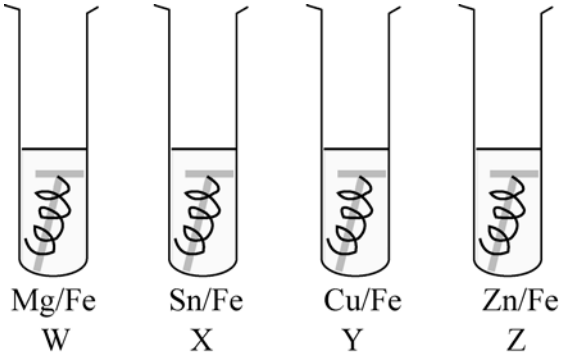
**A** X, W, Z, Y
**B** Y, W, Z, X
**C** X, Z, W, Y
**D** Y, Z, W, X

39. In which of the following compounds is the oxidation number of nitrogen the highest?
*Antara sebatian-sebatian berikut ,yang manakah mempunyai nombor pengoksidaan yang tertinggi bagi nitrogen ?*

**A** $KNO_2$

**B** $NH_4Cl$
**C** $N_2O$
**D** $HNO_3$

40.




Magnesium ribbon, tin foil, copper foil and zinc foil are coiled around four different iron nails. The metal pairs are then placed in a test tube containing aqueous sodium chloride solution. Which of the test tubes will contain the highest concentration of iron(II) irons after 2 days?
*Pita magnesium, lingkaran stanum, lingkaran ferum dan lingkaran zink diikat pada paku besi. Pasangan logam itu kemudian diletakkan di dalam tabung uji yang mengandungi larutan natrium klorida. Antara tabung uji berikut yang manakah mengandungi kepekatan ion ferum(II) yang paling tinggi selepas 2 hari.*

**A** W
**B** X
**C** Y
**D** Z

41. When a mixture of carbon and copper(II) oxide is heated strongly
*Apabila satu campuran karbon dengan kuprum(II) oksida di panaskan dengan kuat*

**I** the oxide ion loses two electrons.
*Ion oxida melepaskan dua elektron.*
**II** the oxidation number of carbon increases from 0 to +4
*nombor pengoxidaan karbon bertambah dari 0 kepada +4.*
**III** the copper(II) oxide acts as the reducing agent.
*Kuprum(II) oksida bertindak sebagai agen penurunan.*
**IV** the copper(II) ion accepts two electrons
*Ion kuprum(II) terima dua elektron.*

**A** I and III
**B** II and IV
**C** II, III and IV
**D** I, II, III and IV

42. When 25 $cm^3$ of 0.25 mol $dm^{-3}$ silver nitrate solution is added into 25 $cm^3$ of 0.25 mol $dm^{-3}$ sodium chloride solution, the temperature of the mixture rises by 3°C. What is the quantity of heat released in this experiment?

*Apabila 25 $cm^3$ of 0.25 mol $dm^{-3}$ larutan argentum nitrat ditambah ke 25 $cm^3$ of 0.25 mol $dm^{-3}$ larutan natrium klorida, suhu campuran tersebut meningkat sebanyak 3°C. Apakah kuantiti haba yang dibebaskan di dalam eksperimen ini.*

(Specific heat capacity of water = 4.2 J $g^{-1}$ $^oC^{-1}$)
*(Muatan haba tentu air = 4.2J $g^{-1}$ $^oC^{-1}$)*

**A** 25 x 4.2 x 3.0 J
**B** 25 x 4.2 x 0.25 x 3.0 J
**C** 50 x 4.2 x 3.0 J
**D** 50 x 4.2 x 0.25 x 3.0 J

43. The heat of neutralisation between *hydrochloric acid* and *sodium hydroxide solution* is higher than the heat of neutralisation between ethanoic acid and sodium hydroxide solution because
*Haba peneutralan antara asid hidroklorik dan larutan natrium hidroksida adalah lebih tinggi berbanding haba peneutralan antara asid etanoik dan larutan natrium hidroksida kerana*

**A** energy is needed to ionise the ethanoic acid.
*tenaga diperlukan untuk mengionkan asid etanoik*

**B** the reaction between ethanoic acid and sodium hydroxide solution is incomplete.
*tindak balas antara asid ethanoik dan larutan natrium hidroxida adalah tidak lengkap*

**C** hydrochloric acid is a mineral acid whereas ethanoic acid is an organic acid.
*asid hidroklorik adalah asid mineral manakala asid etanoik adalah asid organic*

**D** hydrochloric acid and ethanoic acid have different pH values.
*asid hidroklorik dan asid etanoik mempunyai nilai pH yang berbeza.*

44. In an experiment to determine the heat of combustion of propane, when 2.4 g propanol is completely burnt, the temperature of 500 $cm^3$ of water increases by 38.5 $^oC$. What is the heat of combustion of propanol?

*Dalam suatu eksperimen untuk menentukan haba pembakaran propane, apabila 2.4 g propanol terbakar dengan lengkap suhu 500 $cm^3$ air meningkatkan sebanyak 38.5$^oC$. Tentukan haba pembakaran propanol.*

(Relative molecular mass of propanol=60, Specific heat capacity of water = 4.2 J/g $^oC$)
*(Jisim molekul relatif propanol=60, Muatan haba tentu air = 4.2 J / g $^o$ C )*

**A** - $\frac{500 \times 4.2 \times 38.5}{2.4 \times 60 \times 1000}$ kJ/mol

**B** - $\frac{60 \times 4.2 \times 38.5}{2.4 \times 1000 \times 500}$ kJ/mol

**C** - $\frac{2.4 \times 60 \times 500}{4.2 \times 38.5}$ kJ/mol

**D** - $\frac{60 \times 500 \times 4.2 \times 38.5}{2.4 \times 1000}$ kJ/mol

45. The reaction between zinc and silver nitrate solution is represented by the equation:
*Tindak balas antara zink dengan argentum nitrat diwakili dengan tindak balas berikut :*

$$Zn(s) + 2AgNO_3(aq) \longrightarrow 2Ag(s) + Zn(NO_3)_2(aq) \quad \Delta H = -310 \text{ kJ mol}^{-1}$$

Which of the statements is true concerning the reaction above?
*Antara pernyataan berikut yang manakah yang benar mengenai tindak balas di atas*

[relative atomic mass of Ag = 108, Zn = 65]
[Jisim atom relatif Ag = 108, Zn = 65]

**I** The zinc metal is oxidised.
*Logam zink di oksidakan*

**II** The temperature of the mixture increases during reaction.
*Suhu camppuran meningkat semasa tindak balas*

**III** When 10.8 g of silver is displaced, 31 kJ of heat is released.
*Bila 10.8 g argentum disesarkan , 31 kJ haba dibebaskan*

**IV** When 6.5 g of zinc is reacted, 31 kJ of heat is released.
*Bila 6.5 g zink ditindak balaskan , 31 kJ haba di bebaskan*

**A** I and II
**B** III and IV
**C** I, II and IV
**D** II, III and IV

46. In which category of medicine is emphetamine grouped into?
*Dalam kategori ubat yang manakah emfetamin dikelaskan?*

**A** Antibiotic
**B** Analgesic
**C** Hormone
**D** Psychotherapeutic

47.

Picture 1
*Gambar 1*

Picture 1 shows some oil palm fruits. Saponification of oil palm produces
*Gambar 1 menunjukkan buah kelapa sawit. Saponifikasi minyak kelapa sawit menghasilkan*

**A** one glycerol molecule and one soap molecule.
*Satu molekul gliserol dan satu molekul sabun.*
**B** one glycerol molecule and two soap molecules.
*Satu molekul gliserol dan dua molekul sabun.*
**C** one glycerol molecule and three soap molecules.
*Satu molekul gliserol dan tiga molekul sabun.*
**D** soap and water molecules.
*Sabun dan molekul air.*

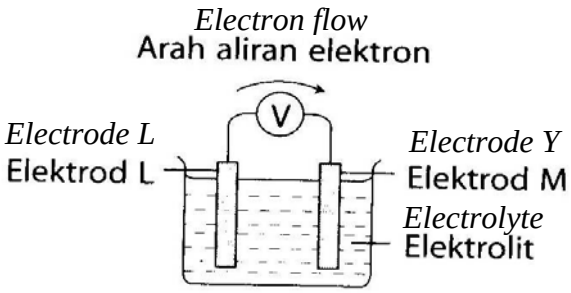
48. Which of the following food additive is correctly categorised?
*Antara bahan tambah makanan berikut , yang manakah di kategorikan dengan betul?*

| | Food additive | Category |
|---|---|---|
| **I** | Ascorbic acid | Antioxidant |

| | | |
|---|---|---|
| **II** | Carmoisine | Colouring |
| **III** | Starch powder | Thickening agent |
| **IV** | Sodium phosphate | Food additive |

**A** I and III
**B** I, II and IV
**C** II, III and IV
**D** I ,II ,III and IV

49 The diagram shows the set up of the apparatus of a simple chemical cell.
*Gambarajah menujukkan susunan alat-radas untuk sebuah sel ringkas.*




What are metals X and Y that produce the highest voltage of the cell?
*Apakah logam X dan Y yang boleh menghasilkan voltan sel yang tertinggi?*

| | Metal X<br>*Logam X* | Metal Y<br>*Logam Y* |
|---|---|---|
| A | Aluminium<br>*Aluminium* | Iron<br>*Besi* |
| B | Silver<br>*Argentum* | Magnesium<br>*Magnesium* |
| C | Magnesium<br>*Magnesium* | Copper<br>*Kuprum* |
| D | Zinc<br>*Zink* | Lead<br>*Plumbum* |

50 The diagram represents the molecular formula of a carbon compound.
*Gambarajah mewakili formula molekul suatu sebatian karbon.*

**$CH_3$-$CH_2$ -$COOCH_2CH_2CH_2CH_3$**

What is the IUPAC name for the above carbon compound?
*Apakah nama IUPAC untuk sebatian karbon di atas?*

A Ethyl propanoate
*Etil propanoat*
B Propyl propanoate
*Propil propanoate*
C Propyl butanoate
*Propil butanoat*
D Butyl propanoate
*Butil propanoat*

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