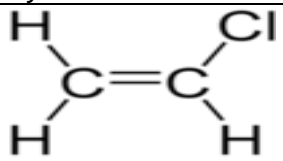
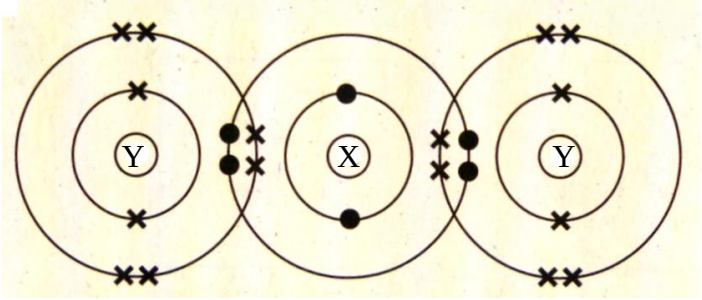
SKEMA PERMARKAHAN PENILAIAN PERCUBAAN SPM NEGERI PAHANG 2017
KIMIA KERTAS 2

No.		Answer	Marks
1	a	Na /Mg / Al	1
	b	Na : group 1, period 3 Mg : group 2, period 3 Al : group 13, period 3	1 + 1
	c	2.8.2	1
	d(i)	Atom Argon has archive stable octet electron arrangement // atom has eight valence electrons.	1
	d(ii)	Al	1
	d(iii)	Al_2O_3	1
	e	Size of Cl atom is smaller than size of Na atom. The force of attraction between nucleus and valence electron in Cl atom is stronger than Na atom.	1 1
		Total	9

No.		Answer	Marks
2	(a)(i)	A long chain of molecule made up from many monomers	1
	(a)(ii)	Vinyl chloride/chloroethene	1
	(a)(iii)		1
	(a)(iv)	Does not rust	1
	(b)(i)	A : Soap B : Detergent	1 1
	(b)(ii)	Cleansing B Cleansing A from scum in hard water Cleansing B not form scum in hard water	1 1 1
		Total	9

No.		Answer	Marks
3	a)(i)	Na : 2.8.1 Cl : 2.8.7	1 1
	a)(ii)	NaCl	1
	a)(iii)	Na : sodium atom donate one electron Cl : Atom chlorine accept one electron	1 1
	a(iv)	Electrostatic force	1
	b)(i)		2
	b)(ii)	Covalent bond	1
	b)(iii)	Cannot conduct electricity in // insoluble in water // low melting and boiling point	1
		Total	10

No.		Answer	Marks
4	a)(i)	Solvent X : tetrachloromethane/ethanol Solvent Y : water	1 1
	a)(ii)	H^+	1
	a)(iii)	Test tube I : HCl exist as molecule // No H^+ ion Test tube II : HCl <u>ionise to produces H^+ ion</u>	1 1
	b)(i)	HZ	1
	b)(ii)	HZ ionise partially in water produce low concentration of H^+ ion	1
	b)(iii)	H_2Y is diprotic acid // 1 mole of H_2Y ionise in water produce 2 mole of H^+ ion HX is monoprotic acid //1 mole of HX ionise in water produce 1 mole of H^+ ion	1 1
	b)(iv)	H_2SO_4 / sulphuric acid	1
		Total	10

No.			Answers	Marks
5	(a)	i	$CaSO_4$	1
		ii	Insoluble salt	1
	(b)	i	Double decomposition/ precipitation reaction	1
		ii	Sodium sulphate solution Calcium Chloride solution	1 1
		iii	$Ca^{2+} + SO_4^{2-}$ ---→ $CaSO_4$ Correct formulae of reactant Correct formulae of product	 1 1
	(c)	i	Pour the BaCl solution Add the HCl solution White precipitate form	1 1 1
		ii	White precipitate	1
			Total	11

No.		Answer	Marks
6	a)(i)	H^+, Na^+, OH^- and SO_4^{2-}	1
	a)(ii)	H^+, Na^+	1
	a)(iii)	Hydrogen	1
	a)(iv)	Hydrogen ion is selectively discharged at the cathode. Hydrogen ion located lower than sodium ion in the electrochemical series.	1 1
	a(v)	$2H^+ + 2e \rightarrow H_2$	1 + 1
	b)(i)	Cu, B, A	1
	b)(ii)	1.5 V	1
	b(iii)	Cannot because metal B is more electropositive than metal D	1 1
		Total	11

<table>
<tr><th colspan="2">Question Number</th><th>Answer</th><th>Mark</th></tr>
<tr><td>7</td><td>(a)</td><td>Able to compare substance A and substance B correctly

1. Type of reaction
2. Temperature change
3. Change in the total energy content of reactant and total energy content of product
4. Formation and breaking bond
5. Example of reaction

<table>
<tr><td>Substance A</td><td>I</td><td>II</td></tr>
<tr><td>Type of reaction</td><td>Exothermic</td><td>Endothermic</td></tr>
<tr><td>Temperature changes</td><td>Temperature increase</td><td>Temperature decrease</td></tr>
<tr><td>Change in total energy content</td><td>Total energy content of reactant is higher than total energy content of product</td><td>Total energy content of reactant is lower than total energy content of product</td></tr>
<tr><td>Bod formation and bond breaking</td><td>Heat released during bond formation is greater than heat absorb during bond breaking</td><td>Heat released during a bond breaking is greater than heat released during bond formation</td></tr>
<tr><td>Example or reaction</td><td>Neutralization/combustion/ displacement</td><td>Ammonium salt dissolve in water</td></tr>
</table></td><td>1
1
1
1
1</td></tr>
<tr><td></td><td>(b)</td><td>Able to calculate the temperature change correctly

1. Number of mole
2. Heat change
3. Temperature change

Answer

Number of mole : 100(0.5)/1000 = 0.05
Heat change : 0.05 X 105 = 5.25kJ/5250J
Temperature change : 5250 (100 X 4.2) //12.5˚C</td><td>1
1
1</td></tr>
<tr><td></td><td>(c)(i)</td><td>Able to suggest acid X and acid Y

<u>Sample answer</u>
Acid X : ethanoic acid \

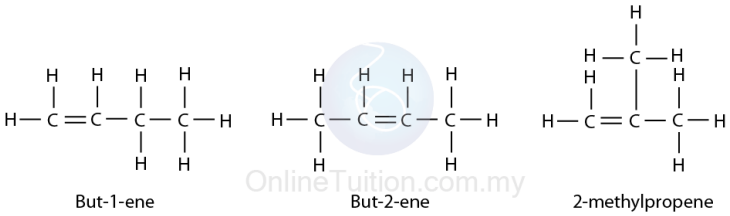
Acid Y : hydrochloric acid / nitric acid/ sulphuric acid</td><td>1
1</td></tr>
</table>

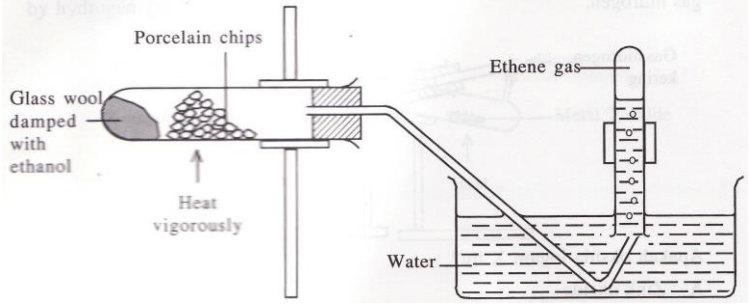
	(ii)	Able to describe an experiment to determine the heat of neutralization correctly <u>Sample answer</u> 1. Measure [20-200cm^3] of [0.1-2.0 $moldm^{-3}$]acid X/acid Y and measure [20-200cm^3] of [0.1-2.0 $moldm^{-3}$] NaOH 2. Pour acid X/J and NaOH into polystyrene/plastic cup 3. Record initial temperature both solution 4. Mix 2 solution to together 5. Stir mixture 6. Record highest temperature Calculation 7. Initial temperature acid X/Y : T_1 ˚C Initial temperature KOH : T_2 ˚C Highest temperature : T_3 ˚C Temperature change : θ ˚C // T_3 - (T_2-T_1) 8. Number of mole X / KOH = (1.0 x 100)÷1000 // 0.1 9. Q = [100+100] x C x θ 10. Heat of neutrazalition : $\Delta H = \frac{[\ 100+100\ ] \times C \times \theta}{0.01}$ // - z $kJmol^{-1}$	1 1 1 1 1 1 1 1 1 1
		Total	**20**

No	Answer			Mark
8	(a)	(i)	Rusting process	1
			1.zinc is more electropositive than iron	1
			2.zinc is oxidize first.	1
			3.zinc protect iron from rusting	
				Max=3
			1.Magnesium is more electropositive metal/ reactive	1
		(ii)	2. Magnesium easily oxidized to formed MgO	1
			3. MgO is not strong/brittle	1
				Max=3
	(b)		1. Reaction I is not a redox reaction	1
			2. reasons: no changes in oxidation number in any elements	1
			3. Reaction II is a redox reaction	1
			4. reason: oxidation number of Zn increases from 0 to +2 and Cu reduced from +2 to 0	1
				Max =4
	(c)		1. Chemical substance: iron (II) sulphate, bromine water , iron (III) sulphate, zinc powder	1
			[*Change iron (II) to iron (III)]*	
			2. $2cm^3$ iron (II) sulphate solution is poured into a test tube.	
			3. 2 drops Bromine water is added to the solution	1
			4. the test tube is warmed gently	1
			5. Overall equation : $2Fe^{2+} + Br_2 \rightarrow 2Fe^{3+} + 2Br^-$	1
				1
			6.Observation : The colour changes from green to brown	1
			[*Change iron (III) to iron (II)]*	
			7. 2 cm^3 iron (III) sulphate solution is poured into a test tube.	
			8. Half a spatula of zinc powder is added to the solution	
			9.Heat the mixture then, filtered	1
			10.Overall ionic equation : $2Fe^{2+} + Zn \rightarrow 2Fe^{3+} + Zn^{2+}$	1
			11.Observation : The colour changes from brown to green	1
				1
				Max:10
Total				20

No	Answer			Mark
9	(a)	(i)	Exp I = $\frac{40\ cm^3}{55s}$ $0.73 cm^3 s^{-1}$ Exp II = $\frac{55 cm^3}{40s}$ $1.38\ cm3s^{-1}$	1 1 Max= 2
		(ii)	<u>Exp I and II</u> 1. The concentration of vinegar in Exp II is higher than Exp I 2. The number of hydrogen ion /H^+ per unit volume in Exp II is higher than Exp I 3. Frequency of collision between ion H^+ and baking powder in Exp II is higher than Exp I 4. Frequency of effective collision between in Exp II is higher than Exp I 5. Thus, the rate of reaction for Exp II is higher than in Exp I <u>Exp I and III</u> 1.The temperature in Exp III is higher than Exp I 2.The kinetic energy of particles in Exp III is higher than Exp I 3.Frequency of collision between ion H^+ and baking powder in Exp III is higher than Exp I 4.Frequency of effective collision in Exp III is higher than Exp I 5.Thus, the rate of reaction for Exp III is higher than in Exp I	1 1 1 1 1 Max=4 1 1 1 1 1 Max =4
	(b)		[Apparatus] measuring cylinder, conical flask, white paper mark with a cross 'X' marked and stopwatch, [material] sodium thiosulphate, sulphuric acid dan distilled water Procedure 1. [20-100] of [0.2-1.0] $moldm^{-3}$ sodium thiosulphate, is measured using measuring cylinder. 2. The solution is poured into a conical flask 3. the conical flask is placed on a piece of paper marked 'X' 4. $5cm^3$ of dilute sulphuric acid is measured and quickly poured into sodium thiosulphate 5. The stopwatch is started immediately 6. The stopwatch is stopped as soon as cross disappears. 7. The observation is recorded 8. Steps 1-7 are repeated with the different concentration of sodium thiosulphate /different volume of sodium	1 1 1 1 1 1 1 1 1 1 1 1 1

			thiosulphate and distilled water	1 Max= 10
Total				20

Question Number		Answer	Mark
10	(a)(i)	Sample answer  But-1-ene But-2-ene 2-methylpropene OnlineTuition.com.my	1 + 1 1 + 1
	(ii)	Correct formula of reactant and product Balance chemical equation Sample answer: $C_4H_8 + 6O_2 \rightarrow 4CO_2 + 4H_2O$ 1. Number of mole 8.4/ [12(4) +1(8)] // 56 = 0.15 2. Compare ratio mol 1 mole C_4H_8 produces 4 mole CO_2 0.15 mole C_4H_8 produces 0.6 mole 3. Volume of gas 0.6 X 24 = 14.4dm^3	1 1 1 1 1
	(b)(i)	Process I : dehydration Process II : oxidation Compound Q : propanoic acid	1 1 1
	(ii)	*Functional diagram* *Label* [porcelain chip, glass wool soaked with A, water, heat]	 1 1

			
	(iii)	[able to describe how to compound C prepared] Sample Answer 1. Measure [2-50]cm^3 compound A/etanol 2. Pour compound A/ethanol into boiling tube / round bottom flask 3. Measure [2-50]cm^3 compound Q/propanoic acid 4. Add compound Q/propanoic acid to ethanol 5. Add concentrated sulphuric acid 6. Heat slowly/ reflux the mixture 7. $C_2H_5OH + C_2H_5COOH \rightarrow C_2H_5COOC_2H_5 + H_2O$	1 1 1 1 1 1 1 Max : 6
		Total	**20**