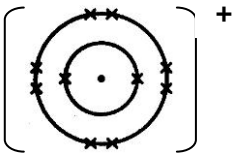
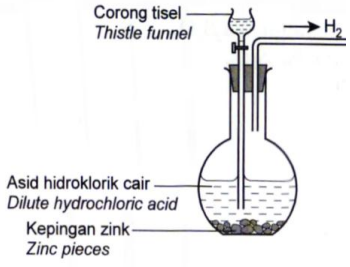
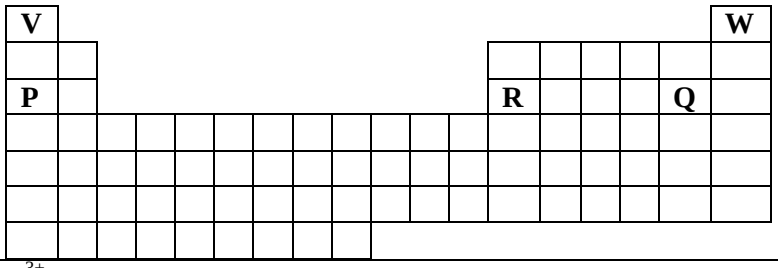
MARKING SCHEME CHEMISTRY PAPER 2
PPT PPD TUMPAT TAHUN 2016

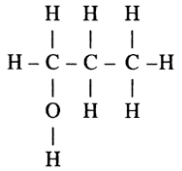
Question	Answer	Submark	∑ Mark
1(a) (i)	Nucleon number	1	1
(ii)		1	1
(iii)	17	1	1
(b) (i)	Carbon-12	1	1
(ii)	Number of moles of RO_2 = $\frac{0.672}{22.4}$ = 0.03 mol Mass of RO_2 = 0.03 x 44 = 1.32 g	1 1	2
(iii)	Number of molecules = 0.03 x 6.02 x 10^{23} = 1.806 x 10^{22}	1	1
© (i)	Ammonium chloride	1	1
(ii)	1. Ammonia 2. Ammonia moves faster because the molecular mass of ammonia is lighter	1 1	2
TOTAL		10	

Question 2	Answer	Submark	∑ Mark
2(a)	Formula kimia yang menunjukkan nisbah teringkas bagi setiap unsur dalam sebatian	1+1	2
(b)		1 1 1	3
(c) (i) (ii) (iii) (iv)	6.4g 1.6g 1:1 CuO	1 1 1 1	4
(b)(i)	Tidak boleh	1	1
TOTAL		10	

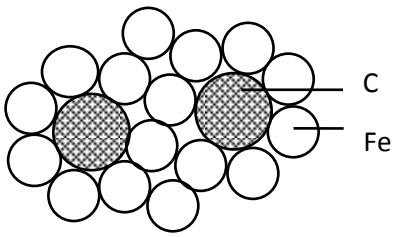
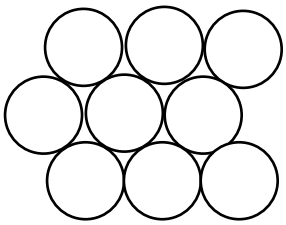
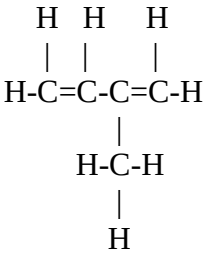
Question 3	Answer	Submark	∑ Mark
(a)	The increament of proton number /*Pertambahan nombor proton*	1	1
(b)	Group: The number of electrovalens / *Bilangan elektrovalens* Period: Number of shells that occupied by electrons/ *Bilangan petala yang berisi elektron.*	1 1	2
(c)		1 + 1	2
(d)(i) (ii)	R^{3+} Atom R release 3 electron to form R^{3+} ion */ Atom R membebaskan 3 elektron untuk membentuk ion R^{3+}.*	1 1	2
(e)(i)	Helium gas is light and inert./ *Gas helium ringan dan lengai.*	1	1
(ii)	Cannot. Hydrogen gas is flameable and it will explode with the presence of oxygen gas at high temperature. *Tidak boleh.Kerana gas hidrogen mudah terbakar dan meletup dengan kehadiran gas oksigen pada suhu yang tinggi.*	1 1	2
Total		**10**	

Question		Answer	Sub mark	∑ marks
4(a)	(i)	Negative charged ion	1	3
	(ii)	Cl^- and OH^-	1	
	(iii)	Chlorine	1	
(b)	(i)	Y	1	3
	(ii)	$2H^+ + 2e \rightarrow H_2$ 1.correct formula of reactant and product 2.correct balancing	 1 1	
©		2.4 dm^3 //0.1 x 24 dm^3	1	1
(d)	(i)	Hydroxide ion	1	2
	(ii)	Concentration of KCl is very low//no of hyroxide ion is higher//the solution is dilute	1	
(e)		-vinegar/lime juice/lemon juice/salts solution *(*any suitable electrolyte that can be found at the kitchen)* - contain free moving ions	1 1	2

TOTAL			11	
Question		Answer	Sub mark	∑ marks
5(a)	(i)	Acid : bleach solution, apple juice Alkali: liqui	1 + 1	2
	(ii)	-Liquid detergent -concentration of OH^- is higher than magnesia milk	1 + 1	2
	(iii)	Acid which ionised partially in water to produce low concentration of H^+ ions.	1	1
(b)	(i)	1. Number of mol 100(0.1) / 1000 // 0.01 2. Mass with correct unit 0.01 x 56 g // 0.56 g	1 1	2
	(ii)	Correct volume with unit 200(0.02) cm^3 // 40 cm^3	1	1
(c)		- Gastric relief/medicine is alkaline - Neutralised acid produce in stomach Able to suggest the alternative medication -sodium bicarbonate solution// * any suitable alkaline substances	1 1 1	3
TOTAL			**11**	

Question	Answer	Submark	∑ Mark
6 (a)	Alkene / *Alkena*	1	1
(b)	Temperature/*suhu* : 300^OC Catalyst/*mangkin* : Phosphoric acid, H_3PO_4 Pressure /*tekanan* : 60 atm	1	1
(c)		1	1
(d) (i)	$C_3H_6 + H_2 \rightarrow C_3H_8$	1	1
(ii)	1. Pour 2 cm^3 of propane and propene into 2 test tubes, add bromine water and shake the test tubes. *Tuangkan 2 cm3 propana dan propena kedalam 2 buah tabung uji, tambah air bromine dan goncangkan tabung uji*	1	2

	2. Propane – brown colour remain unchanges *Propana – warna perang air bromine tidak berubah* Propene – brown colour turns colourless Propena – *Warna perang air bromine menjadi tidak berwarna*	1	
(e) (i)	$C_2H_5COOC_3H_7$	1	1
(ii)	1. In soluble in water / *tidak larut dalam air* 2. Volatile / *meruap* 3. Low boiling point / *takat didih rendah* 4. Soluble in organic solvent / *larut dalam pelarut organik* 5. Less dense than water / *kurang tumpat dari air*	1 (any 1)	1
(f)	1. Percentage of C in C_4H_{10} = 82.75% *Peratus C dalam C_4H_{10}* Percentage of C in $C_{12}H_{26}$ = 84.71% *Peratus C dalam $C_{12}H_{26}$* 2. Number of carbonatom in C_{12} H_{26} is more than C_4H_{10} *Bilangan atom karbon di dalam C_{12} H_{26} lebih banyak daripada C_4H_{10}* 3. C_4H_{10} is more suitable to be used as a cooking fuel *C_4H_{10} lebih sesuai digunakan sebagai bahan api memasak*	1 1 1	3
		TOTAL	**11**

Question		Answer	Submark	∑ Mark
7	(a)(i)	*Able to state types of metal for both bridges correctly* Answer : - Silver Bridge : iron & Silver Memorial Bridge : steel	1	
	(ii)	*Able to state two advantages for the types of metal used in the construction of Silver Memorial Bridge correctly* Sample answer : - Steel is more resistant to corrosion - Steel is harder than iron/its pure metal	1 1	
	(iii)	*Able to explain why steel is better than iron* - Presence of carbon atom/foreign atom distrupt the orderly arrangement of iron atom - Atom in steel difficult to slide each other easily.	1 1	7
	(iv)	Steel  iron 	1+1	
	(b) (i)	Polymer is a long chain molecule that consist of repeated sub unit that is called monomer	1	1
	(b)(ii)	Isoprene / 2-methylbut-1,3-diene	1	1
	(b)(iii)		1	1
	(b)(iv)	-Non-biodegration/ cannot be decomposed by bacteria -when throw in the drain causes drain clogged/rubbish -Mosquito breeding -When it is burnt produces poisonous gas/ carbon monoxide *Able to state the way to overcome* -Recycle / artificial 'tukun'/Combustion in absence of oxygen / pyrolysis/ combustion in incenerator	1 1 1 1 1	5
	(c)(i)	ceramics	1	5

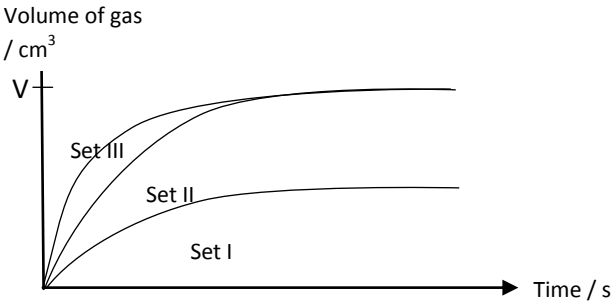
	(c)(ii)	To make water storage tanks/boat/helmets **any suitable example*	1	
	(c)(iii)	Borosilicate glass **correct spelling*	1	
	(c)(iv)	*Able to state two advantages of fibre glass compare to glass R* -High tensile strength -low density -easy molded in thin layer -light -strong/hard ** any two*	1+1	
		TOTAL	20	
8	(a)	✓ The electron arrangement of P atom is 2.4 ✓ and Q atom is 2.6. ✓ Q atom is in group 16 because it ✓ has 6 valence electron and ✓ it is in period 2 because ✓ it has 2 shells occupied with electron.	1 1 1 1 1 1	6
	(b)	✓ X atom has 7 valance electron and Y atom has 2 valance electron. ✓ These two atoms are unstable. ✓ To achieve a stable electron arrangement, Y atom donate 2 electron and form Y^{2+} ions ✓ X atom receive 1 electron and form X^{-} ions. ✓ One Y^{2+} ion and two X- ions are attract each other by an electrostatic force and form an ionic compound with formulae YX_2 ✓ The covalent bond formed between W atom and X atom. ✓ W atom has 4 valance electron and X atom has 7 valance atom. ✓ These two atoms are unstable ✓ To achieve a stable electron arrangement, one W atom share 4 electron with 4 atom X. ✓ W atom contribute 4 electron to be shared and X atom contribute 1 electron to be shared and formed a compound with a formula WX_4	1 1 1 1 1 1 1 1 1 1 1 1	10

	©	Ionic compound	Covalent compound	2+2	4
		1. soluble in water	Insoluble in water		
		2. insoluble in organic solvent	Soluble in organic solvent		
		3. conduct electricity in molten and aqueous state	Cannot conduct electricity in any state		
		4. high melting and boiling point	Low melting and boiling point		
TOTAL				**20**	

Question	Answer	Submark	∑ Mark
9 (a) (i)	Method I : $NaNO_3$/NaCl/Na_2SO_4/KNO_3/KCl/K_2SO_4 Kaedah I Method II: MgSO4 / $CuCl_2$ / $Zn(NO_3)_2$ Kaedah II	1 1	2
(ii)	Similarities of method I and method II *Persamaan kaedah I dan kaedah II* 1. Both are soluble salt *Kedua-duanya adalah garam terlarut* 2. Filtered to obtain the salt *Penurasan perlu untuk mendapatkan garam* Differences of method I and method II *Perbezaan kaedah I dan kaedah II* 1. Method I used reaction between acid and alkali whereas method II used reaction between oxide metal or carbonate metal and acid *Kaedah I menggunakan tindak balas acid dan alkali manakala kaedah II menggunakan tindak balas antara oksida logam atau karbonat logam dengan asid* 2. Method I involve only one filtration whereas method II involve two filtration *Kaedah II melibatkan penurasan sekali sahaja manakala kaedah II melibatkan penurasan dua kali.*	1 1 1 1	4
(b) (i)	Salt X : Zinc nitrate / $Zn(NO_3)_2$ *Garam X: Zink nitrat / $Zn(NO_3)_2$* Gas Y : Karbon dioxide / CO_2 *Gas Y :Karbon dioksida / CO_2*	1 1	3

Question	Answer	Submark	∑ Mark
	Substance Z : Zinc oxide / ZnO *Bahan Z : Zink oksida / ZnO*	1	
(ii)	Chemical test for cation (Zn) *Ujian kimia bagi kation (Zn)* i. Add NaOH solution into a test tube contain cation in excess, white precipitate formed soluble in excess NaOH. *Tambahkan larutan NaOH ke dalam tabung uji yang mengandungi kation dengan berlebihan, pepejal putih terbentuk dan larut dalam NaOH berlebihan* ii. Add Ammonia solution into a test tube contain cation in excess, white precipitate formed soluble in excess ammonia solution. *Tambahkan larutan ammonia ke dalam tabung uji yang mengandungi kation dengan berlebihan, pepejal putih terbentuk dan larut dalam ammonia berlebihan* Chemical test for anion $NO3^-$ *Ujian kimia bagi anion $NO3^-$* i. Add diluted sulphuric acid and iron(II) sulfate into 2 cm^3 solution X and shake. *Tambahkan asid sulfurik cair dan larutan ferum(II) sulfat ke dalam tabung uji yang mengandungi larutan X dan goncang.* ii. A few drop of concentrated sulphuric acid is added slowly down the side the slanting test tube, brown ring formed *Beberapa titis asid sulfurik ditambah perlahan-lahan melalui dinding tabung uji yang dicondongkan. Cincin perang terbentuk.*	1 1 1 1 1	4
(iii)	$ZnCO_3 + 2HNO_3 \rightarrow Zn(NO_3)_2 + CO_2 + H_2O$ i. Correct formulae of reactant and product *Formula bahan dan hasil yang betul* ii. Balanced equation *Persamaan seimbang* 1. No of mol HNO_3 = 1(100) / 1000 // 0.1 mol 2. 2 mol $HNO_3 \rightarrow$ 1 mol CO_2 0.1 mol $\rightarrow$ 0.05 mol CO_2 3. Volume of CO_2 = 0.05 x 24dm^3 // 1.2 dm^3 *Isipadu CO_2*	1 1 1 1 1	5
(c)	- Ammonium nitrate *Ammonium nitrate*	1	2

Question	Answer	Submark	∑ Mark
	- because the percentage of nitrogen atom per molecule in ammonium nitrate is higher than ammonium sulphate *sebab peratus nitrogen atom per molekul dalam ammonium nitrat lebih tinggi daripada ammonium sulfat*	1	
		TOTAL	**20**

Question	Answer	Submark	∑ Mark
10(a)	1. Correct initial rate of reaction for set I and III 2. Correct maximum volume of set I and III 	1 1	2
(b)	1. Rate of reaction in Set I is lower than Set II // Rate of reaction in Set I is the lowest 2. Concentration of HCl in Set I is lower than Set II 3. Maximum volume of gas collected in Set I is half compare to Set II 4. The number of moles of HCl used in Set I is half compare to Set II 5. Rate of reaction in Set III is higher than Set II // Rate of reaction in Set III is the highest. 6. Temperature in Set III is higher than Set II 7. Maximum volume of gas collected in Set III is same as in Set II 8. The number of moles of HCl used in Set III is the same as in Set II	1 1 1 1 1 1 1 1	8

(c)(i)	<u>Set I and Set II</u> 1. Rate of reaction in Set II is higher than Set I 2. The concentration of hydrochloric acid in Set II is higher than Set I 3. The number of HCl / H^+ ion perunit volume in Set II is higher than Set I 4. The frequency of collision between cockle shell / calcium carbonate and H^+ ion in Set II is higher than Set I 5. The frequency of effective collision in Set II is higher than Set I	1 1 1 1 1	5
(ii)	<u>Set I and Set II</u> 1. Rate of reaction in Set III is higher than Set II 2. The temperature in Set III is higher than Set II 3. The kinetic energy of particle in Set III is higher than Set II 4. The frequency of collision between cockle shell / calcium carbonate and H^+ ion in Set III is higher than Set II 5. The frequency of effective collision in Set III is higher than Set II	1 1 1 1 1	5
TOTAL		20	

TAMAT