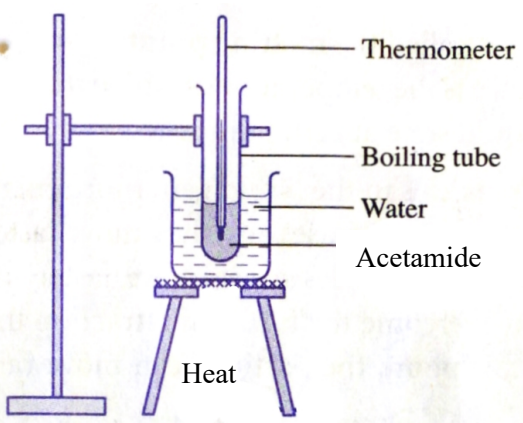


**PERATURAN PEMARKAHAN
PEPERIKSAAN PERCUBAAN SPM 2018
KERTAS 2**

No			Mark Scheme	Sub Mark	Total marks
1	(a)	(i)	A: Salt B: Sugar	1 1	2
		(ii)	Prevent or slow down the growth of bacteria	1	1
		(iii)	1. Diabetes 2. Aspartame	1 1	2
	(b)	(i)	1. Can cause internal bleeding of stomach 2. Paracetamol	1 1	2
		(ii)	1. Finish the medicine 2. Bacteria killed completely	1 1	2
					TOTAL
2	(a)	Blue	1	1	
	(b)	(i)	The change in the volume of gas collected per unit time	1	
		(ii)	1. Concentration of hydrochloric acid / hydrogen ions 2. Presence of catalyst	1 1	3
	(c)	(i)	1. Correct curve of experiment I and III 2. Label Exp I and III correctly	1 1	2
<div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p style="text-align: center;">Volume of H₂ / cm³</p> <p style="text-align: center;">Time / s</p> </div>					
	(ii)	Rate of reaction I: = $\frac{600 \text{ cm}^3}{40 \text{ s}}$ Rate of reaction II: = $\frac{600 \text{ cm}^3}{20 \text{ s}}$ Rate of reaction III: = $\frac{600 \text{ cm}^3}{15 \text{ s}}$ (Answers with correct unit)	1 1	2	
	(iii)	Adding catalyst (alum/ Aluminium oxide/ Al ₂ O ₃)	1	1	
				TOTAL	9
3	(a)	Sodium ion / Na ⁺ , Chloride ion / Cl ⁻ , hydrogen ion / H ⁺ , hydroxide ion / OH ⁻	1	1	
	(b)	(i)	Electrode where the oxidation occur / electron is released	1	1
		(ii)	Anode becomes thinner	1	1
		(iii)	Mg → Mg ²⁺ + 2e ⁻ Correct formulae of reactant & product	1	

			Balanced equation with electron	1	2
	(c)		1. Decreases. 2. The distance between Pb and Cu is nearer compare to the distance between Mg and Cu in Electrochemical Series	1 1	2
	(d)	(i)	Al ₂ O ₃	1	1
		(ii)	Aluminium	1	1
		(iv)	To low the melting point of aluminium oxide	1	1
				TOTAL	10
4	(a)	(i)	2.4	1	1
		(ii)	Z	1	1
	(b)	(i)	Covalent	1	1
		(ii)			
			<i>[Number of atom combined: 1 W/ Carbon and 2 Y/ Oxygen]</i>	1	
			<i>[Electron arrangement with 2 double covalent bonds]</i>	1	2
	(c)	(i)	2Z + Y ₂ → 2XY <i>[Correct formulae of reactants and product]</i> <i>[Balanced equation]</i>	1 1	2
		(ii)	1. Number of mole of Z = $\frac{2.4}{24}$ // 0.1 2. Mole Ratio: 2 mol Z reacts with 1 mol Y ₂ // 1.1 mol Z reacts with 0.05 mol Y ₂ 3. Mass Y ₂ = 0.05 x 32 g // 1.6 g (mass with correct unit)	1 1 1	3
				TOTAL	11
5	(a)	(i)	W	1	1
		(ii)	2.1	1	1
		(iii)	Nuclei attraction on the valence electron of atom Q is stronger than M	1	1
	(b)	(i)	2Fe + 3R ₂ ----> 2FeR ₃ 1. Correct formulae reactant and product 2. Balanced chemical equation	1 1	2
		(ii)	2 mole of Fe produced 2 mole of FeCl ₃ // 0.2 mole of Fe produced 0.2 mole of FeCl ₃ Mass of FeCl ₃ = mole X molar mass = 0.2 X 162.5 g //	1	

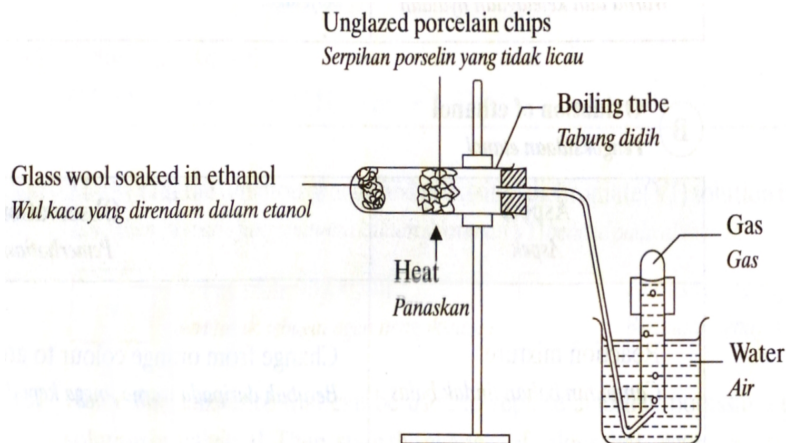
			= 32.5 g (mass with correct unit)	1	2
	(c)	(i)	1. Oxide of M: Basic Oxide 2. Oxide of V: Acidic Oxide	1 1	2
		(ii)	1. Dissolve in NaOH to form colourless solution 2. Dissolve in HNO ₃ to form colourless solution	1 1	2
				TOTAL	11
6	(a)	(i)	1. Diffusion 2. Perfume particles move randomly from higher concentration region to lower concentration region.	1 1	2
		(ii)	The particles move faster	1	1
	(b)	(i)	Molecule	1	1
		(ii)	<u>Arrangement of particle</u> : Particles are arranged slightly loose then become far apart <u>Movement of particles</u> : Particles move faster / freely	1 1	2
		(iii)	1. Number of mole of steam = $\frac{12}{24}$ // 0.5 2. Mass of steam = 0.5 x 18 g // 6 g (correct answer with unit)	1 1	2
	(c)		1. Functional diagram 2. Label (thermometer, boiling tube, water, acetamide, heat)	1 1	2
					
				TOTAL	11

SECTION B

No		Mark Scheme	Sub Mark	Total marks
7	(a)	<ol style="list-style-type: none">1. Lead (II) nitrate 2. Correct axis with unit3. Correct and Smooth line4. Correct scale	1	
			1	
			1	

				1	4
	(b)	(i)	1. Potassium nitrate 2. Volume of $\text{Pb}(\text{NO}_3)_2 = 5 \text{ cm}^3$ 3. No of mole Lead(II) ion $= \frac{1 \times 5}{1000} // 0.005$ 4. No of mole Chromate(VI) ion $= \frac{1 \times 5}{1000} // 0.005$	1 1 1 1	
		(ii)	$\text{Pb}^{2+} + \text{CrO}_4^{2-} \rightarrow \text{PbCrO}_4$ 1. Correct formulae of reactants and product 2. Balanced chemical equation	1 1	2
	(c)	(i)	1. Salt P = Copper(II) carbonate / CuCO_3 2. Gas Q = Carbon dioxide 3. R precipitate = Calcium sulphate	1 1 1	3
		(ii)	$\text{CuSO}_4 + \text{Ca}(\text{NO}_3)_2 \rightarrow \text{CaSO}_4 + \text{Cu}(\text{NO}_3)_2$ 1. Correct formulae of reactants and products 2. Balanced chemical equation	1 1	2
		(iii)	<u>Confirmatory test for cation:</u> 1. Add ammonia// sodium hydroxide solution until excess 2. Blue precipitate formed dissolves in excess ammonia to produce dark blue solution // blue precipitate does not dissolve in excess NaOH indicates the presence of Cu^{2+} ion. <u>Confirmatory test for anion:</u> 3. Add hydrochloric acid. 4. Add barium chloride solution. 5. White precipitate formed indicate the presence of SO_4^{2-} ion	1 1 1 1 1	5
				TOTAL	20
8	(a)		1. Change in oxidation number of iron is +2 to +3 2. Change in oxidation number of bromine 0 to -1 3. Bromine water as oxidizing agent 4. Green solution turns brown solution	1 1 1 1	4
	(b)		1. When food can dent, the tin plate is crack and form small hole and the ion is exposed. 2. Iron atom will donates/releases 2 electrons to form iron(II) ions 3. $\text{Fe} \rightarrow \text{Fe}^{2+} + 2\text{e}$ 4. In food can also have water and some oxygen gas. The water and oxygen gas gain electron to formed hydroxide ion 5. Iron(II) ion will combine with hydroxide ion to form iron(II) hydroxide. 6. $\text{Fe}^{2+} + 2\text{OH}^- \rightarrow \text{Fe}(\text{OH})_2$ 7. $\text{Fe}(\text{OH})_3$ are oxidized by oxygen to form brown solid which is iron(III) oxide /rust.	1 1 1 1 1 1 1	6

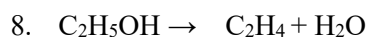
		(max: 6)		
	(c)	1. Metal X is Mg/ Zn / Al <u>Set I</u> 2. Metal X more electropositive than copper 3. X is oxidized // X <u>atom</u> loses electron to form X^{2+} $X \rightarrow X^{2+} + 2e$ 4. Cu^{2+} is reduced / receives electrons to form copper atom $Cu^{2+} + 2e \rightarrow Cu$ 5. Brown precipitate formed is copper <u>Set II</u> 6. Metal X more electropositive than iron 7. Rusting does not occur 8. X is oxidized / X <u>atom</u> loses electron to form X^{2+} $X \rightarrow X^{2+} + 2e$ 9. Oxygen and water is reduced /receive electron to form OH^- $O_2 + 2H_2O + 4e \rightarrow 4OH^-$ 10. Pink colour shows the presence of OH^- .	1 1 1 1 1 1 1 1 1 1	10
			TOTAL	20
9	(a)	1. Substance: Vinegar 2. Vinegar is acidic thus can neutralise the alkaline sting. 3. Vinegar is a weak acid that will not burn the skin. 4. Vinegar is also easily available.	1 1 1 1	4
	(b)	1. Example of P: Ethanoic acid 2. Example of Q: Sulphuric acid 3. P is a weak acid while Q is strong acid 4. Q ionised completely in water and produced high concentration of H^+ ions 5. P ionised partially in water and produced low concentration of H^+ ions 6. The higher the concentration of H^+ ions the lower pH value	1 1 1 1 1 1	6
	(c)	1. Suggestion solid X: zinc oxide//zinc carbonate//zinc 2. Acid Y: Sulphuric acid Preparation of zinc sulphate 3. Pour (50-100cm ³) of (0.1-1.0mol dm ⁻³) sulphuric acid into a beaker and heat slowly. 4. Add zinc oxide//zinc carbonate//zinc powder into the acid and stir 5. Stop adding zinc oxide//zinc carbonate//zinc powder when solid cannot dissolve/ in excess.	1 1 1 1 1	



Procedure

3. Some glass wool is placed in a boiling tube 1
4. Using a dropper, some ethanol is added into the boiling tube to wet the glass wool 1
5. The boiling tube is clamped horizontally and unglazed porcelain chip are placed in the mid-section of boiling tube. 1
6. The boiling tube is closed with a stopper fitted with a delivery tube and the other hand of delivery tube is placed under an inverted test tube filled with water. 1
7. The unglazed porcelain chips are heated strongly. When the porcelain chips are hot, the flame is shifted to gently heat the glass wool to vaporize the ethanol. 1

Chemical equation



Chemical test to proof the product

9. Flow the gas produced in a test tube contain bromine water // acidified potassium manganate(VII) solution. 1
10. If ethene produced then brown bromine water /purple acidified potassium manganate(VII) solution turns colourless 1

					10
	(b)		1. Q = Ethanoic acid 2. Acidified potassium manganate(VII) solution// potassium dicromate(VI) solution.//Ethanol $\text{C}_2\text{H}_5\text{OH} + 2[\text{O}] \rightarrow \text{CH}_3\text{COOH} + \text{H}_2\text{O}$ 3. Correct formulae of reactant and product 4. Balanced chemical equation	1 1 1 1	4
				TOTAL	20