JABATAN PELAJARAN NEGERI JOHOR

PEPERIKSAAN PERCUBAAN SETARA NEGERI JOHOR 2011

SKEMA PEMARKAHAN

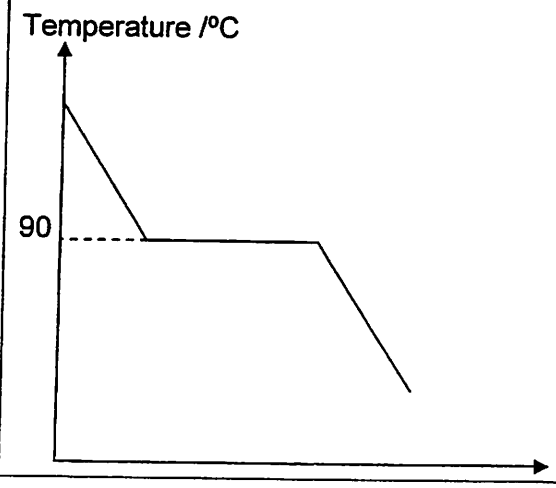
CHEMISTRY

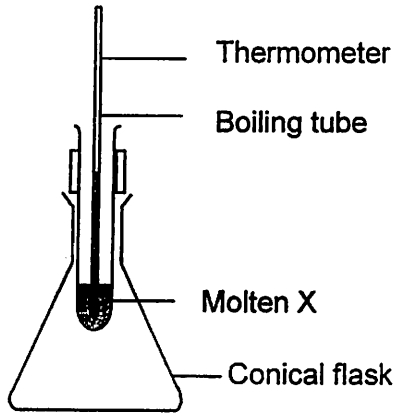
PAPER 1

PAPER 2

PAPER 3

No.		Mark scheme	Sub mark	Total mark
2 (a)	(i)	Z	1	3
	(ii)	U	1	
	(iii)	W	1	
(b)	(i)	2.8.1	1	2
	(ii)	X^+	1	
(c)	(i)	They have same number of shells filled/occupied with electrons	1	2
	(ii)	X, Y , Z // X > Y > Z	1	
(d)	(i)	$4X + O_2 \rightarrow 2X_2O$ // $2X + \frac{1}{2} O_2 \rightarrow X_2O$ Correct reactants and products – 1 Correctly balance - 1	1 + 1	3
	(ii)	$Z_2 + H_2O \rightarrow \underline{HZ} + HOZ$	1	
			Total Mark	**10**

No.	Mark scheme	Sub mark	Total mark
3 (a)	Melting	1	1
3 (b)(i)			

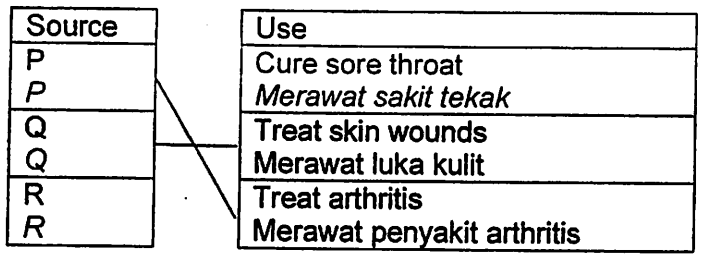
	Correct axis with units Correct graph and 90°C is stated	1 1	
3(b)(ii)	The molten X is stirred continuously throughout the experiment	1	
(iii)	 Labelled diagram Correct and functional apparatus	 1 1	5
3(c)	Because an atom consists of an equal number of electrons and protons.	1	1
3(d)	80 Br 35	1	1
3(e)(i)	Atoms of the same element with the same number of protons / proton number but different number of neutrons/ nucleon number	1	2
3(e)(ii)	Use in phosphate fertilizers // to study the metabolism of phosphorus in plants	1	
		Total mark	**10**

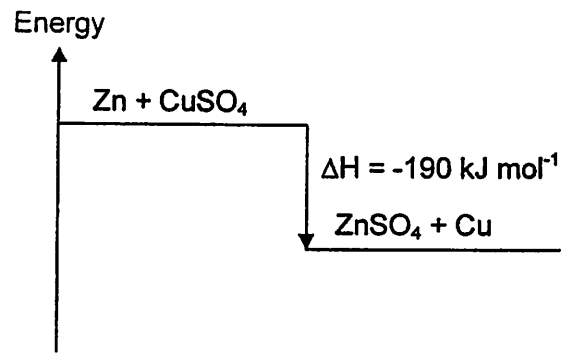
JULANG JOHOR 2011
CHEMISTRY
PAPER 1
ANSWER

QUESTION	ANSWER
1	A
2	C
3	A
4	B
5	B
6	B
7	A
8	D
9	A
10	D
11	D
12	A
13	C
14	D
15	C
16	D
17	C
18	D
19	C
20	A
21	B
22	C
23	A
24	C
25	B

QUESTION	ANSWER
26	A
27	B
28	C
29	B
30	C
31	C
32	B
33	D
34	A
35	A
36	A
37	C
38	B
39	D
40	C
41	B
42	D
43	B
44	C
45	D
46	B
47	D
48	B
49	A
50	D

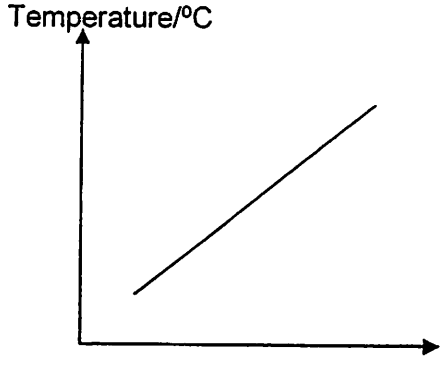
Section A

No.	Mark scheme	Sub mark	Total mark
1 (a) (i)	Haber	1	
(ii)	Nitrogen and Hydrogen	1	
(iii)	To get a better yield	1	
(iv)	1. To make fertilisers 2. To produce nitric acid	1+1	5
(b)		1	1
(c) (i)	Paracetamol √	1	
(ii)	Codeine / 3-methylmorphine	1	
	Addiction / depression / nausea / vomiting / itching / drowsiness / dry mouth / orthostatic hypotension / urinary retention / miosis / constipation	1	
(iii)	Activate level of alertness // Reduce normal fatigue // Elevate mood // Stimulate activity of brain / central nervous system.	1	4
		Total mark	10

No.	Mark Scheme	Sub Mark	Total Mark
4 (a)	Heat released when 1 mole of metal is displaced from its salt solution by a more electropositive metal. a: heat change	1	1
(b)	exothermic	1	1
(c)	1. Brown solid deposited. 2. The colour of solution change from blue to light blue / colourless. 3. Container becomes hot. 4. Mass of zinc decreased 5. Size of zinc becomes thinner [Any two]	2	2
(d)	 • Correct two energy levels and axis labeled energy. • Correct reactants, products and value of ΔH.	1 1	2
(e)	No. of mole $CuSO_4$ = $\frac{(0.2)(25)}{1000}$ // 0.005 mol Heat energy released = 0.005 mol x 190 kJ mol^{-1} // = 0.95 kJ / 950 J	1 1	2
(f)	1. Value of ΔH more / higher than -190kJ. 2. Magnesium is more electropositive compare zinc in electrochemical series // Distance between magnesium and copper is further than the distance between zinc and copper in electrochemical series.	1 1	2
		Total mark	10

No.	Mark Scheme	Sub Mark	Total Mark
5 (a)(i)	Copper(II) oxide	1	1
(ii)	Neutralisation	1	1
(iii)	Correct reactants and products Balance the equation $2HCl + CuO \rightarrow CuCl_2 + H_2O$	1 1	2
(iv)	To complete the reaction	1	1
5(b)(i)	Double Decomposition / Precipitation reaction	1	1
(ii)	$Ag^+ + Cl^- \rightarrow AgCl$	1	1
(iii)	Filtration	1	1
(c)	Cation : Cu^{2+} Anion : Cl^-	1 1	2
		Total mark	10

No.	Mark Scheme	Sub Mark	Total Mark
6 (a)	Yellow precipitate	1	1
(b)	$Na_2S_2O_3 + H_2SO_4 \rightarrow Na_2SO_4 + S + H_2O + SO_2$	1	1
(c)	1. Rate of reaction for Experiment 5 is higher than Experiment 1 (or vice versa).	1	1
(d)	1. Temperature in Experiment 5 is higher. 2. The kinetic energy of the particles is higher. 3. The frequency of collisions between H^+ ions and $S_2O_3^{2-}$ ions increases 4. The frequency of effective collisions increases.	1 1 1 1	4

(e)		1	1
(f)	1. The higher the temperature 2. the shorter the time taken for the egg to become hard-boiled // vice versa	1 1	2
		Total mark	**10**

Section B

No.		Mark Scheme	Sub mark	Total Mark
7(a)	(i)	Anode: Silver (rod/foil) Cathode: Iron key Electrolyte:Silver nitrate solution	1 1 1	3
	(ii)	Anode : $Ag \rightarrow Ag^+ + e$ Cathode : $Ag^+ + e \rightarrow Ag$	1 1	2
	(iii)	1. Use a small electrical current 2. Use low concentration of the silver nitrate solution. 3. Turn the iron key slowly during experiment. 4. Clean the iron key with sandpaper before carrying out experiment. **Any two**	2	2
7(b)	(i)	<u>Experiment I and II</u> Comparison: 1. Rate of reaction in experiment I is higher // The reaction in experiment I is faster Explanation: 2. Metal P is more electropositive compared with metal Q in the electrochemical series	1 + 1	

		3. Deposit of brown metal is more in experiment I compared with experiment II 4. Distance between metals P and Cu is further than metal Q and Cu in the electrochemical series	1 + 1	
		Experiment I and III Comparison: 5. There is a reaction in experiment I and no reaction in experiment III Explanation: 6. Metal P is more electropositive compared with copper metal in the electrochemical series	1 + 1	
		7. There is brown deposit in experiment I and no deposit in experiment III 8. Metal P is placed higher than copper in the electrochemical series // Copper metal is placed below metal R in the electrochemical series // metal P is more electropositive than Cu	1 + 1	8
	(ii)	Metal P : Aluminium, Al Metal Q : Zn / Fe / Sn r: Pb	1 1	2
	(iii)	Mol of $CuSO_4$ solution = $\frac{(0.1)(25)}{1000}$ // 0.0025 mol	1	
		Ratio : 1 mol of $CuSO_4$ produced 1 mol Cu 0.0025 mol of $CuSO_4$ produced 0.0025 mol Cu	1	
		Mass of copper = 0.0025 mol x 64 = 0.16 g	1	3
			Total mark	**20**

No.		Mark scheme	Sub mark	Total mark
8(a)		The number of molecules = $1.5 \times 6.02 \times 10^{23}$ $= 9.03 \times 10^{23}$	1 1	2
8(b)		Urea, $CO(NH_2)_2$ $\frac{2(14)}{12 + 16 + (14+2)2} \times 100\% = 46.67\%$	1	

<table>
<tr><td></td><td></td><td>Ammonium nitrate, NH_4NO_3

$\frac{2(14)}{14 + 4 + 14 + 3(16)}$ x 100% = 35.0%

Hydrazine, N_2H_4

$\frac{2(14)}{2(14) + 4(1)}$ x 100% = 87.5%

Hydrazine has the highest percentage mass of nitrogen</td><td>1

1

1</td><td>4</td></tr>
<tr><td>8(c)</td><td></td><td>1. Double bond
Formed when two pairs of electrons are shared between two non-metal atoms.

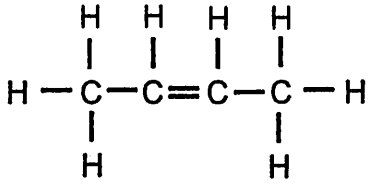
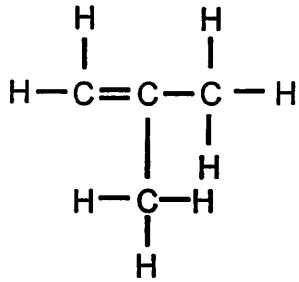
2. Triple bond
Formed when three pairs of electrons are shared between two non-metal atoms.</td><td>1
1
1
1</td><td>4</td></tr>
<tr><td>8(d)</td><td>(i)</td><td>
<table>
<tr><td></td><td>Compound</td><td>K_2O</td><td>SO_2</td></tr>
<tr><td>1</td><td>Physical state at room temperature</td><td>Solid</td><td>Gas</td></tr>
<tr><td>2</td><td>Melting point</td><td colspan="2">High Low
Accept : A melting point of K_2O is higher than SO_2</td></tr>
<tr><td>3</td><td>Electrical conductivity</td><td>Can conduct electricity in molten or aqueous state</td><td>Cannot conduct electricity in all physical state</td></tr>
<tr><td>4</td><td>Solubility in water</td><td>Soluble</td><td>Insoluble</td></tr>
</table>
Answers can be in sentence form to show comparison.

K_2O :
1. forces of attraction between ions in K_2O is stronger than SO_2
2. more heat is needed to overcome / break the attraction force
// vice versa for SO_2</td><td>1+1
1+1
1+1
1+1

1
1</td><td>8

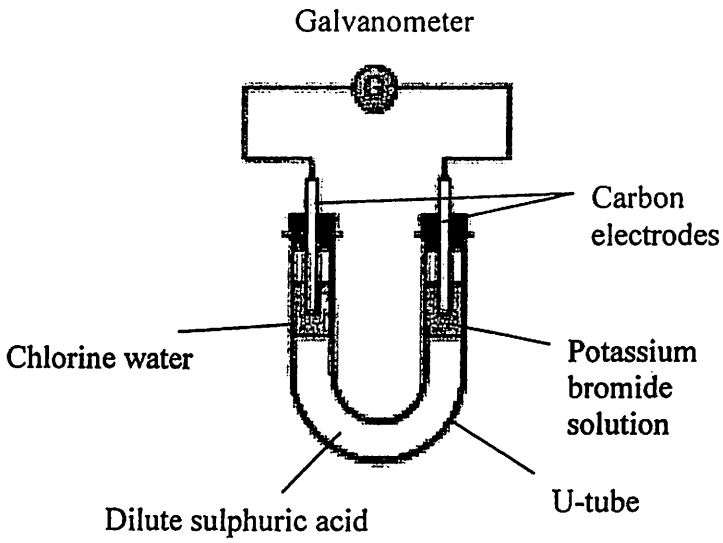
2</td></tr>
<tr><td colspan="3">Total mark</td><td>20</td></tr>
</table>

Section C

No.		Mark Scheme	Sub Mark	Total Mark
9(a)		 But-2-ene	1+1	
		 2-methylpropene // 2-methylprop-1-ene	1+1	4
(b)	(i)	Propanoic acid , Ethanol	1+1	2
	(ii)	[Accept if student name the reactants or the products] Chemical properties for propanoic acid: 1. React with reactive metal produce salt and hydrogen gas // 2. React with bases produce salt and water // 3. React with carbonates metal produce salt, carbon dioxide gas and water // 4. React with alcohol produce ester [Any two answers]	1 1	
		Chemical properties for ethanol: 1. Undergo combustion produce carbon dioxide and water // Burnt in oxygen to produce CO_2 and H_2O 2. Undergo oxidation produce carboxylic acid / ethanoic acid // React with acidified $K_2Cr_2O_7$ /$KMnO_4$ to produce carboxylic acid 3. Undergo dehydration produce alkene / ethene. [Any two answers]	1 1	4
(c)		<u>Reaction with bromine</u>		

		Procedure: 1. Pour about [2 -5 cm^3] of hexane into a test tube. 2. Add 4-5 drops of bromine water and shake. 3. Observe any changes and repeat with hexene. Observation: Hexane: brown colour remains unchanged. Hexene: Brown colours decolourise / turn colourless. <u>Reaction with acidified potassium manganate(VII) solution</u> Procedure: 1. Pour about [2-5 cm^3] of hexane into a test tube. 2. Add 4-5 drops of potassium manganate(VII) solution and shake. 3. Observe any changes and repeat with hexene. Observation: Hexane: Purple colour remain unchanged Hexene: Purple colours decolourise. [Any two tests]	1 1 1 1 1 1 1 1 1 1	5 5
			Total mark	**20**

No	Mark scheme	Sub mark	Total mark
10 (a)(i)	Sample answer : Metal A : Magnesium / Mg $Mg \rightarrow Mg^{2+} + 2e$ Reactant and product correct Balance the equation correctly	1 1 1	 3
(ii)	Oxidation	1	1
(b)	Solution X : Ferum (II) sulphate /$FeSO_4$ Solution Y : Ferum (III) sulphate / $Fe_2(SO_4)_3$ Reducing agent : Fe^{2+} / Ferum (II) sulphate / $FeSO_4$ / Iron(II) ion Reason : oxidation number increase from +2 to +3 Oxidising agent : Fe^{3+} / Ferum (III) sulphate / $Fe_2(SO_4)_3$ / Iron(III) ion Reason : Oxidation number decrease from +3 to +2	1 1 1 1 1 1	 6

(c)			
	Correct and functional apparatus Correctly labelled	1 1	
	1. Suitable chemical : potassium bromide solution //any suitable chemical solution	1	
	2. Dilute sulphuric acid is poured into a U-tube	1	
	3. A dropper is used to fill one arm of the U-tube with chlorine water	1	
	4. Potassium bromide solution is added carefully to another arm of the U-tube	1	
	5. Both arm of the U-tube is fitted with carbon electrode	1	
	6. Reducing agent : potassium bromide solution	1	
	7. At negative electrode, bromide ions are oxidized to bromine	1 1	
	8. $2Br^- \rightarrow Br_2 + 2e$	1	Max= 10
	9. At positive electrode, chlorine are reduced to chloride ions	1	
	10. $Cl_2 + 2e \rightarrow 2Cl^-$		
		Total mark	**20**