



JABATAN PELAJARAN KELANTAN  
DENGAN KERJASAMA  
PERSIDANGAN KEBANGSAAN PENGETUA-PENGETUA  
SEKOLAH MENENGAH MALAYSIA  
CAWANGAN KELANTAN

PEPERIKSAAN PERCUBAAN SPM  
TINGKATAN 5 (2010)

CHEMISTRY

UNTUK KEGUNAAN PEMERIKSA SAHAJA

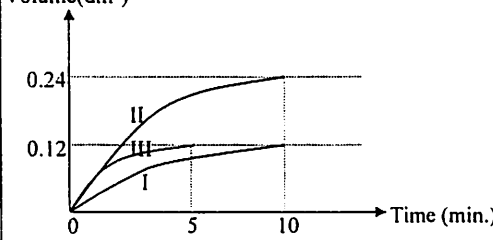
SKEMA  
PEMARIKAHAN

MARKING SCHEME  
PAPER 1

QUESTION NO	ANSWER	QUESTION NO	ANSWER
1	A	26	A
2	B	27	C
3	C	28	B
4	D	29	B
5	C	30	C
6	D	31	C
7	A	32	C
8	B	33	B
9	B	34	C
10	D	35	B
11	B	36	C
12	B	37	B
13	B	38	B
14	D	39	B
15	B	40	B
16	B	41	D
17	D	42	B
18	A	43	B
19	B	44	C
20	A	45	D
21	B	46	B
22	D	47	C
23	A	48	B
24	B	49	C
25	B	45	C



	(ii)	Float on the water.	1	
6	(a)	Redox reaction is a reaction in which oxidation and reduction occur at the same time.	1	11
	(b)	Oxygen and water	1	
	(c)	$\text{Fe (s)} \rightarrow \text{Fe}^{2+} \text{(aq)} + 2\text{e}^-$	1	
	(d)	Label of water droplet, oxygen and iron Label of negative pole and positive pole Draw arrow from negative to positive pole iron	1 1 1	
	(e)	Electron transfer from negative pole to positive pole through iron Electron gains by oxygen in water Hydroxide ion is form	1 1 1	
	(f)	Using sacrificial metal By alloying the ion By tin plating By galvanizing * any two	1 1	

QUESTION NO	Marking Criteria	MARK		
		SUB	TOTAL	
8	(a)	<ul style="list-style-type: none"> <li>- Industries emit (acidic gases)/(sulphur dioxide).</li> <li>- These gases dissolve in rainwater forming acid rain.</li> <li>- The rain water has a higher concentration of acid.</li> <li>- more collisions between (reacting particles)/(metal and acid) to occur.</li> </ul>	1 1 1 1	4
	(b) (i)	$\text{Zn} + 2\text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2$ $\text{HCl} : \text{H}_2 = 2 : 1$ Mole of $\text{H}_2 = \frac{1}{2} \times 0.4 \times 50/1000 // 0.01$ Volume of $\text{H}_2 = 0.01 \times 24 // 0.24 \text{ dm}^3$	1 1 1 1	4
	(ii)	Volume( $\text{dm}^3$ )  <ul style="list-style-type: none"> <li>- Axes are labels with units</li> <li>- Curves I, II and curve III are leveling started at 10 and 5 minutes respectively.</li> <li>- The gradient of curves II and III are more steep than curve I</li> <li>- Volume of graph level off in Exp. II is 0.24 <math>\text{dm}^3</math> and 0.12 <math>\text{dm}^3</math> in Exp. I and III.</li> </ul>	1 1 1 1	
	(iii)	I: rate = $0.12 \times 1000/10 \times 60 // 0.2$ II: rate = $0.24 \times 1000/10 \times 60 // 0.4$ III: rate = $0.12 \times 1000/5 \times 60 // 0.4$	1 1 1	3
	(iv)	Experiment I and Experiment II: <ul style="list-style-type: none"> <li>- The initial rate of reaction in experiment II is higher.</li> <li>- The concentration of hydrochloric acid in experiment II is higher.</li> <li>- The frequency of collision between zinc atoms and hydrogen ions is higher.</li> <li>- The frequency of effective collision also increases.</li> </ul> Experiment I and Experiment III: <ul style="list-style-type: none"> <li>- The initial rate of reaction in experiment III is</li> </ul>	1 1 1 1 1	



PAPER 3

Question	Explanation	Maximum score
1(a)(i)	<i>[Able to state the observations correctly]</i> Sample answer : Thermometer reading rises // Temperature increases	3
	<i>[Able to state observation]</i> Sample answer: Temperature rises	2
	<i>[Able to give an idea of observation]</i> Sample answer: Thermometer reading change // Temperature change	1
	<i>[No response given or wrong response]</i>	0

Question	Explanation	Maximum score
1 (a)(ii)	<i>[Able to state the inference correctly ]</i> Sample answer: Water absorbed heat energy // Mercury expand	3
	<i>[Able to state the inference ]</i> Sample answer: Exothermic reaction	2
	<i>[Able to state an idea of inference]</i> Sample answer: Water temperature increases	1
	<i>[No response given or wrong response]</i>	0

Question	Explanation	Maximum score
1 (b)	<i>[Able to state all variables correctly]</i> Sample answer: Manipulated variable: Types of alcohols Responding variable: Heat of combustion of alcohol Fixed variable: Volume of water	3
	<i>[Able to state any 2 variables correctly]</i>	2
	<i>[Able to state any 1 variable correctly]</i>	1
	<i>[No response given or wrong response]</i>	0

Question	Explanation	Maximum score
1 (c)	<i>[Able to state the relationship between the manipulated variable and the responding variable with direction correctly]</i> Sample answer: The higher the number of carbon atoms per alcohol molecule, the higher the heat of combustion. Note : RV → MV score 2	3
	<i>[Able to state the relationship between the manipulated variable and the responding variable]</i> Sample answer: The higher the number of carbon atoms, the higher the heat of combustion.	2
	<i>[Able to state an idea of hypothesis]</i> Sample answer: Different alcohols different heat of combustion.	1
	<i>[No response given or wrong response]</i>	0

Question	Explanation	Maximum score
1 (d)	<i>[Able to state all the mass of alcohols and round off into two decimal places correctly]</i> Sample answer: Methanol = 1.54 Ethanol = 1.20 Propanol = 1.10 Butanol = 1.61	3
	<i>[Able to state any three the mass of alcohols and round off into two decimal places correctly]</i>	2
	<i>[Able to state any two the mass of alcohols and round off into two decimal places correctly]</i>	1
	<i>[No response given or wrong response]</i>	0

Question	Explanation	Maximum score
1(e)	<i>Able to calculate the heat of combustion of methanol by fulfill the following criteria :</i> (i) Heat absorbed by water (ii) Number of mole (iii) Heat of combustion  Sample answer: Heat absorbed by water = 25200 J Number of mole = 0.048125 mol Heat of combustion = 523636.36 J mol <sup>-1</sup> // 523.64 kJ mol <sup>-1</sup>	3
	<i>Able to calculate the heat of combustion of methanol by fulfill any two criteria.</i> Note : ecf criteria (i) or (ii)	2
	<i>Able to calculate the heat of combustion of methanol by fulfill any one criteria.</i> Note : ecf criteria (i) and (ii)	1

	<i>[No response given or wrong response]</i>	0
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Question	Explanation	Maximum score
1 (f)	<i>Able to plot a graph by fulfill the following criteria:</i> (i) Axes are labelled with unit correctly (ii) Uniform scale so the size of graph at least 50% (iii) All point transferred correctly (iv) Best fit straight line	3
	<i>Able to plot a graph by fulfill the following criteria:</i> (i) Axes are labeled/ unit correctly (ii) At least three point are transferred correctly (iii) straight line	2
	<i>Able to plot a graph by fulfill the following criteria:</i> (i) At least two point are transferred correctly (ii) straight line	1
	<i>[No response given or wrong response]</i>	0

Question	Explanation	Maximum score
1(g)	<i>Able to predict the heat of combustion of pentanol with consist of the following criteria:</i>  1. Horizontal line is drawn towards Y axis from n=5. 2. value = 2400	3
	<i>Able to predict the heat of combustion of pentanol.</i> Sample answer: $2375 \leq x < 2400$ // $2400 < x \leq 2425$ <i>Able to give an idea to predict the heat of combustion.</i>	2
	Sample answer More than 1860	1
	<i>[No response given or wrong response]</i>	0

Question	Explanation	Maximum score
1(h)	<i>Able to state the operational definition for heat of combustion correctly</i> Sample answer: The heat energy released/produced when 1 mole of alcohol is burnt completely.	3
	<i>Able to state the operational definition for heat of combustion</i> Sample answer: Heat released/produced when alcohol is burnt completely.	2
	<i>Able to state an idea of operational definition for heat of combustion</i> Sample answer: Energy change when alcohol burns.	1
	<i>[No response given or wrong response]</i>	0

Question	Explanation	Maximum score
1(i)	<i>Able to give three reasons correctly</i> Sample answer: 1. incomplete combustion 2. loss of heat to the surrounding 3. container absorbed some heat	3
	<i>Able to give any two reasons correctly</i>	2
	<i>Able to give any one reason correctly</i>	1
	<i>[No response given or wrong response]</i>	0

Question	Explanation	Maximum score			
1(j)	<i>Able to classify all the substances correctly</i> Sample answer:	3			
	<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Hydrocarbon</th> <th>Non hydrocarbon</th> </tr> </thead> <tbody> <tr> <td>Propane Butene</td> <td>Methanoic acid Ethanol</td> </tr> </tbody> </table>		Hydrocarbon	Non hydrocarbon	Propane Butene
	Hydrocarbon	Non hydrocarbon			
	Propane Butene	Methanoic acid Ethanol			
	<i>[Able to classify any three substances correctly]</i>	2			
<i>[Able to classify any two substances correctly]</i>	1				
<i>[No response given or wrong response]</i>	0				

Question number	Rubric	Score
2 (a)	Able to give the statement of problem correctly. <u>Sample answer:</u>  Does the type of electrode/anode affect the choice of ions to be discharged?	3
	Able to give the statement of problem less correctly. <u>Sample answer:</u>  The type of electrode/anode affect the choice of ions to be discharged.	2
	Able to give an idea about the statement of problem/ aim. <u>Sample answer:</u>  Electrode affect the product formed.	1
	No response or wrong response	0

Question number	Rubric	Score
2 (b)	Able to state all variables correctly. <u>Sample answer:</u>  <u>Manipulated variable</u> Type of electrode/ anode  <u>Responding variable</u> Product formed at anode  <u>Controlled variable</u> Electrolyte	3
	Able to state any two variables above correctly.	2
	Able to state any one variable above correctly.	1
	No response or wrong response	0

Question number	Rubric	Score
2(c)	Able to give the hypothesis accurately <u>Sample answer:</u>  Type of electrode/anode will influence the choice of ion to be discharged// type of electrode/anode will produce different product.	3
	Able to give the statement of problem correctly. <u>Sample answer:</u>  Different anode will influence the choice of ion to be discharged// Different anode will produce different product.	2
	Able to give an idea of the hypothesis <u>Sample answer:</u>  Different electrode will produce different product	1
	No response or wrong response	0

Question number	Rubric	Score
2(d)	Able to list completely the materials and apparatus. <u>Sample answer:</u> Materials: 1. copper(II) sulphate solution, (0.5 – 2.0) mol dm <sup>-3</sup> //any suitable solution that match with metal plate used. 2. carbon rod 3. copper plate// any metal plate that match with a solution used. 4. wooden splinter// any suitable material used for testing a gas or any product at anode. Apparatus: 1. electrolytic cell 2. battery 3. connecting wire 4. test tube	3



	<p><b>Able to list incompletely materials and apparatus.</b>  <b>Sample answer:</b>  <b>Materials:</b></p> <ol style="list-style-type: none"> <li>1. Copper(II) sulphate solution //any suitable solution that match with metal plate used.</li> <li>2. carbon rod</li> <li>3. copper plate// any metal plate that match with a solution used.</li> </ol> <p><b>Apparatus:</b></p> <ol style="list-style-type: none"> <li>1. beaker/any suitable container .</li> <li>2. battery</li> <li>3. connecting wire</li> </ol>	2
	<p><b>Able to give an idea of materials and apparatus.</b>  <b>Sample answer:</b>  <b>Materials:</b></p> <ol style="list-style-type: none"> <li>1. any solution</li> <li>2 carbon rod / any metal plate</li> </ol> <p><b>Apparatus:</b></p> <ol style="list-style-type: none"> <li>1. any container</li> <li>2. battery</li> </ol>	1
	No response or wrong respons	0

Question number	Rubric	Score
2(e)	<p><b>Able to state all procedures completely and correctly.</b>  <b>Sample answer:</b></p> <ol style="list-style-type: none"> <li>1. Fill the electrolytic cell (beaker) with half full of copper(II) sulphate solution (any suitable electrolyte that match with metal plate used).</li> <li>2. A test tube filled with copper(II) solution is inverted on the anode carbon electrode.</li> <li>3. Complete the circuit.</li> <li>4. Electricity is flowed.</li> <li>5. Record observation at anode..</li> <li>6. Step 1-5 is repeated using copper plate</li> </ol>	3

	<p><b>Able to state procedures incompletely.</b>  <b>Sample answer:</b></p> <ol style="list-style-type: none"> <li>1. Copper(II) sulphate solution (any suitable electrolyte that match with metal plate used) is poured into a beaker/any suitable container.</li> <li>2. Complete the circuit.</li> <li>3. Record observation at anode .</li> <li>4. Step 1-3 is repeated using copper plate.</li> </ol>	2
	<p><b>Able to give an idea of the procedure.</b>  <b>Sample answer:</b></p> <ol style="list-style-type: none"> <li>1. Copper(II) sulphate solution is poured into a any container.</li> <li>2. Complete the circuit //</li> </ol>	1
	No response or wrong respons	0

Question number	Rubric	Score						
2(f)	<p><b>Able to exhibit the tabulation of data correctly.</b>  <b>Sample answer:</b></p> <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Type of electrode</th> <th>Observation</th> </tr> </thead> <tbody> <tr> <td>Carbon</td> <td></td> </tr> <tr> <td>Copper/any metal</td> <td></td> </tr> </tbody> </table>	Type of electrode	Observation	Carbon		Copper/any metal		2
Type of electrode	Observation							
Carbon								
Copper/any metal								

<p>Able to exhibit the tabulation of data less accurately.  <u>Sample answer:</u></p> <table border="1" data-bbox="1268 212 1324 694"> <tr> <td data-bbox="1268 212 1292 436">Type of electrode</td> <td data-bbox="1268 436 1292 694">Observation</td> </tr> <tr> <td> </td> <td> </td> </tr> </table>	Type of electrode	Observation			1
Type of electrode	Observation				
No response or wrong response	0				

END OF MARKING SCHEME