

PAPER 3: CHEMISTRY 2014

Ques. 1	Details		Score									
(a).(i)	<p>Able to state any three observations and any three inferences correctly.</p> <p><u>Sample answer :</u></p> <table border="1"> <thead> <tr> <th>Set</th> <th>Observation</th> <th>Inference</th> </tr> </thead> <tbody> <tr> <td>I</td> <td> 1. Temperature increases. // 2. Blue solution turns colourless // 3. Brown solid formed </td> <td> 1. Exothermic reaction // Heat is released. 2. Concentration of copper ion decreases. 3. Copper formed // Copper ion becomes Cu // Cu^{2+} / (copper ion) discharge </td> </tr> <tr> <td>II</td> <td> 1. Temperature decreases // 2. Solid ammonium chloride dissolved in water. </td> <td> 1. Endothermic reaction // Heat is absorbed. 2. Ammonium chloride is a soluble salt. </td> </tr> </tbody> </table>		Set	Observation	Inference	I	1. Temperature increases. // 2. Blue solution turns colourless // 3. Brown solid formed	1. Exothermic reaction // Heat is released. 2. Concentration of copper ion decreases. 3. Copper formed // Copper ion becomes Cu // Cu^{2+} / (copper ion) discharge	II	1. Temperature decreases // 2. Solid ammonium chloride dissolved in water.	1. Endothermic reaction // Heat is absorbed. 2. Ammonium chloride is a soluble salt.	3+3
Set	Observation	Inference										
I	1. Temperature increases. // 2. Blue solution turns colourless // 3. Brown solid formed	1. Exothermic reaction // Heat is released. 2. Concentration of copper ion decreases. 3. Copper formed // Copper ion becomes Cu // Cu^{2+} / (copper ion) discharge										
II	1. Temperature decreases // 2. Solid ammonium chloride dissolved in water.	1. Endothermic reaction // Heat is absorbed. 2. Ammonium chloride is a soluble salt.										
	Able to state any two observations and any two inferences correctly.		2+2									
	Able to state any one observation and any one inference correctly.		1+1									
	No response or wrong response		0									

Ques. 1	Details	Score												
(ii)	<p>Able to construct a table to record the initial temperature , highest/ final temperature and increase/decrease in temperature for Set I and Set II that contain:</p> <ol style="list-style-type: none"> 1. Correct titles 2. Readings and units <p><u>Sample answer:</u></p> <table border="1"> <thead> <tr> <th>Set</th> <th>I</th> <th>II</th> </tr> </thead> <tbody> <tr> <td>Initial temperature / °C</td> <td>28.0</td> <td>29.0</td> </tr> <tr> <td>Highest/final temperature / °C</td> <td>36.0</td> <td>27.0</td> </tr> <tr> <td>Increase/ Decrease/ change in temperature / °C</td> <td>8.0</td> <td>2.0</td> </tr> </tbody> </table>	Set	I	II	Initial temperature / °C	28.0	29.0	Highest/final temperature / °C	36.0	27.0	Increase/ Decrease/ change in temperature / °C	8.0	2.0	3
Set	I	II												
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Increase/ Decrease/ change in temperature / °C	8.0	2.0												
	<p>Able to construct a less accurate table that contains the following:</p> <ol style="list-style-type: none"> 1. Titles 2. Readings <p><u>Sample answer:</u></p> <table border="1"> <thead> <tr> <th></th> <th>I</th> <th>II</th> </tr> </thead> <tbody> <tr> <td>Initial temperature</td> <td>28 °C</td> <td>29</td> </tr> <tr> <td>Highest temperature</td> <td>36 °C</td> <td>27</td> </tr> <tr> <td>Increase in temperature</td> <td>8 °C</td> <td>2</td> </tr> </tbody> </table>		I	II	Initial temperature	28 °C	29	Highest temperature	36 °C	27	Increase in temperature	8 °C	2	2
	I	II												
Initial temperature	28 °C	29												
Highest temperature	36 °C	27												
Increase in temperature	8 °C	2												
	<p>Able to construct a table with at least one title / reading</p> <p><u>Sample answer:</u></p> <table border="1"> <thead> <tr> <th></th> <th>I</th> <th>II</th> </tr> </thead> <tbody> <tr> <td>Increase in temperature</td> <td></td> <td></td> </tr> </tbody> </table>		I	II	Increase in temperature			1						
	I	II												
Increase in temperature														
	No response or wrong response	0												



Ques. 1	Details	Score

Ques. 1	Details	Score
(b).	Able to state three precautions correctly <u>Sample answer:</u> 1. Stir the solution 2. Take the highest temperature 3. Zinc powder must be added quickly 4. Use plastic / polystyrene cup	3
	Able to state two precautions correctly.	2
	Able to state one precaution correctly.	1
	No response or wrong response	0
(c) (i)	Able to predict the thermometer reading for Set I correctly Reading and unit <u>Sample answer:</u> 38.0 - 48.0 °C	3
	Able to predict the thermometer reading for Set I less correctly Reading <u>Sample answer:</u> 38 - 48	2



Ques. 1	Details	Score
	Able to predict the thermometer reading for Set I Reading <u>Sample answer:</u> 37 // Reading is higher // Increase in reading // Reading is lower // Reading decrease // change in reading	1
	No response or wrong response	0
Ques. 1	Details	Score
	Able to explain correctly for (c) (i) <u>Sample answer:</u> Distance between zinc and silver is bigger than zinc and copper in the electrochemical series // vise versa	3
(c) (ii)	Able to explain less correctly for (c) (i) <u>Sample answer:</u> Distance between zinc and silver is bigger in the electrochemical series // vises versa	2
	Has idea to explain for (c) (i) <u>Sample answer:</u> Silver is below copper / zinc in the electrochemical series // Silver is less reactive	1
(d)	No response or wrong response	0



Ques. 1	Details	Score
	Able to state the operational definition correctly based on the following aspects <ol style="list-style-type: none"> 1. what have been done 2. what is observed <u>Sample answer:</u> 1. solid ammonium chloride is added to water, reading of thermometer reduce 2. solid ammonium chloride is added to water, decrease in thermometer reading	3
	Able to state the operational definition less correctly <u>Sample answer:</u> 1. solid ammonium chloride is added to water, heat is absorbed 2. solid ammonium chloride is added to water, temperature reduced	2
	Has idea to state the operational definition <u>Sample answer:</u> 1. reading of thermometer reduce 2. decrease in thermometer reading 3. temperature reduced 4. heat is absorbed	1
	No response or wrong response	0

Ques. 2	Details	Score			
(a).	Able to state three variables correctly Answer: <table border="1" style="margin-left: 20px;"> <tr> <td> (i) Manipulated variable: Type of alkali metals // Lithium, Potassium </td> </tr> <tr> <td> (ii) Responding variable: Reactivity of alkali metals // Activity of burning </td> </tr> <tr> <td> (iii) Fixed variable: Oxygen gas // size of alkali metals </td> </tr> </table>	(i) Manipulated variable: Type of alkali metals // Lithium, Potassium	(ii) Responding variable: Reactivity of alkali metals // Activity of burning	(iii) Fixed variable: Oxygen gas // size of alkali metals	3
(i) Manipulated variable: Type of alkali metals // Lithium, Potassium					
(ii) Responding variable: Reactivity of alkali metals // Activity of burning					
(iii) Fixed variable: Oxygen gas // size of alkali metals					
	Able to state two variables correctly.	2			
	Able to state one variable correctly.	1			



Ques. 2	Details	Score
	No response or wrong response	0

Ques.	Details	Score
2(b)	Able to state the relationship correctly with direction <u>Sample answer:</u> 1.The lower the position of Group1 elements, the higher the reactivity towards oxygen 2. Going down the position of Group 1 elements, the reactivity towards oxygen increase	3
	Able to state the relationship less accurately. <u>Sample answer:</u> 1. Different type of Group 1 elements, different reactivity towards oxygen. 2. Different position of Group 1 elements, different reactivity towards oxygen.	2
	Able to give an idea of relationship <u>Sample answer:</u> Position of Group 1 element affected the reactivity.	1
	No response given / wrong response	0

Ques.	Rubric	Score
2(c)	Able to state the hypothesis correctly with direction <u>Sample answer:</u>	3

	As going down group I, reactivity towards oxygen increases	
	Able to state the hypothesis correctly <u>Sample answer:</u> As going down group I, reactivity increases	2
	Able to state an idea of the hypothesis <u>Sample answer:</u> Potassium, so reactivity increase	1
	No response given / wrong response	0

2(d)	Able to classify all the substances correctly <u>Sample answer:</u>		3
	Acidic substances	Alkaline substances	
	Vinegar	Baking powder	
	Soft drinks	toothpaste-	
	Sample answer 3 corrects		2
	2 / 1 correct		1
	No response given / wrong response		0
3	(a)	Able to give the aim of experiment correctly. <u>Sample answer:</u> To investigate the effect of acid/ ethanoic acid and alkali/ ammonia solution on the coagulation of latex	3

		<p>Able to give the problem statement less accurately</p> <p><u>Sample answer:</u> How does an acid / ethanoic acid and alkali / ammonia solution affect the coagulation of latex? //</p> <p>Does acid coagulate the latex. // Does alkali prevent the coagulation of latex.</p>	2
		<p>Able to give an idea of problem statement.</p> <p><u>Sample answer:</u> Acid / alkali affect / influence coagulation of latex.</p>	1
		<i>No response or wrong response</i>	0
	(b)	<p>Able to state the three variables correctly.</p> <p><u>Sample answer:</u> Manipulated variable: Acid / Ethanoic acid and Alkali / Ammonia solution</p> <p>Responding variable : Coagulate / Does not coagulate</p> <p>Constant variable : Volume of latex / acid / (ammonia solution) / alkali // latex // temperature</p>	3
		Able to state any two variables correctly	2
		Able to state any one variables correctly	1
		<i>No response or wrong response</i>	0

(c)	<p>Able to state the relationship between the manipulated variable and the responding variable correctly with direction.</p> <p><u>Sample answer:</u></p> <p>Acid / Ethanoic acid coagulate the latex while alkali / ammonia solution does not coagulate the latex.</p>	3
	<p>Able to state the relationship between the manipulated variable and the responding variable.</p> <p><u>Sample answer:</u></p> <p>Latex coagulate when acid / ethanoic acid is added but does not coagulate when alkali / ammonia solution is added.</p>	2
	<p>Able to state the idea of hypothesis.</p> <p><u>Sample answer:</u></p> <p>Acid / Ethanoic acid can coagulate latex //</p> <p>Alkali / ammonia solution does not coagulate latex.</p>	1
	<p><i>No response or wrong response</i></p>	0

(d)	<p>Able to give complete list of substances and apparatus.</p> <p><u>Sample answer:</u></p> <p>Apparatus</p> <ol style="list-style-type: none"> 1. [100 – 250] cm³ beaker 2. Measuring cylinder 3. Glass rod 4. Dropper <p>Substances</p> <ol style="list-style-type: none"> 1. Latex 2. [0.1 – 2.0] mol dm⁻³ ethanoic acid 3. Ammonia solution 	3
	<p>Able to list basic substances and apparatus.</p> <p><u>Sample answer:</u></p> <p>Apparatus</p> <ol style="list-style-type: none"> 1. Beaker 2. Measuring cylinder 3. Glass rod <p>Substances</p> <ol style="list-style-type: none"> 1. Latex 2. Ethanoic acid / any acid 3. Ammonia / any alkali 	2
	<p>Able to give an idea of substances and apparatus.</p> <p><u>Sample answer:</u></p> <p>Apparatus Any container</p> <p>Substances Latex and acid / alkali</p>	1
	<i>No response or wrong response</i>	0

(e)	<p>Able to state the steps correctly:</p> <p><u>Sample answer:</u></p> <ol style="list-style-type: none"> 1 [10-50] cm³ of latex is added into a beaker. 2 Ethanoic acid is added into the beaker using a dropper and the mixture is stirred with a glass rod. 3 The beaker is left aside. 4 Steps 1 to 3 / experiment are repeated using ammonia solution to replace ethanoic acid. 5 The observations are recorded. 	3						
	<p>Steps 1, 2, and 4 # Ignore the value in step 1</p>	2						
	<p>Add acid / alkali into the latex.</p>	1						
	<p><i>No response or wrong response</i></p>	0						
(f)	<p>Able to tabulate the data with the following information :</p> <ol style="list-style-type: none"> 1. Correct titles 2. Complete list of mixture <p><u>Sample answer :</u></p> <table border="1"> <thead> <tr> <th>Mixture / Substances</th> <th>Observation</th> </tr> </thead> <tbody> <tr> <td>Latex + acid / ethanoic acid</td> <td></td> </tr> <tr> <td>Latex + alkali / ammonia solution</td> <td></td> </tr> </tbody> </table>	Mixture / Substances	Observation	Latex + acid / ethanoic acid		Latex + alkali / ammonia solution		2
Mixture / Substances	Observation							
Latex + acid / ethanoic acid								
Latex + alkali / ammonia solution								



	<p>Able to construct a table with:</p> <ol style="list-style-type: none">1. At least one title2. Incomplete list of mixture. <p>Sample answer :</p> <table border="1"><thead><tr><th></th><th>Observation</th></tr></thead><tbody><tr><td>Latex + acid / alkali</td><td></td></tr></tbody></table>		Observation	Latex + acid / alkali		1
	Observation					
Latex + acid / alkali						
	<p><i>No response or wrong response</i></p>	0				

END OF MARK SCHEME