

Chemistry Paper 3

Question	Rubric	Score
1(a)	[Able to give the hypothesis accurately] Sample answer : Acid speeds up the coagulations of latex while alkali does not coagulate latex.	3
	[Able to give the hypothesis almost accurately] Acid can coagulate the latex.	2
	[Able to state an idea of hypothesis] Set I coagulates the latex but Set III does not coagulates the latex	1
	No response or wrong response	0
1(b)	[Able to record the the time taken accurately with unit] Sample answer: Set I : 5 minutes Set II : 360 minutes	3
	[Able to record the time taken correctly without unit] Sample answer: Set I : 5 Set II : 360	2
	[Able to give an idea to record the time taken] Sample answer: 5 and 360	1
	No response or wrong response	0

1(c)	[Able to construct a table accurately with title and unit] Sample answer: <table border="1"> <thead> <tr> <th>Set / Experiment</th> <th>Time taken/Minute</th> </tr> </thead> <tbody> <tr> <td>I</td> <td>5</td> </tr> <tr> <td>II</td> <td>360</td> </tr> </tbody> </table>	Set / Experiment	Time taken/Minute	I	5	II	360	3		
Set / Experiment	Time taken/Minute									
I	5									
II	360									
	[Able to construct a table almost accurately without title and unit] Sample answer: <table border="1"> <thead> <tr> <th>Set / Experiment</th> <th>Time taken</th> </tr> </thead> <tbody> <tr> <td>I</td> <td>5</td> </tr> <tr> <td>II</td> <td>360</td> </tr> </tbody> </table>	Set / Experiment	Time taken	I	5	II	360	2		
Set / Experiment	Time taken									
I	5									
II	360									
	[Able to give an idea to construct a table] Sample answer: <table border="1"> <tbody> <tr> <td>I</td> <td>5</td> </tr> <tr> <td>II</td> <td>360</td> </tr> </tbody> </table>	I	5	II	360	1				
I	5									
II	360									
	No response or wrong response	0								
1(d)	[Able to state one observation from each set of experiment accurately] Sample answer: <table border="1"> <thead> <tr> <th>Set</th> <th>Observations</th> </tr> </thead> <tbody> <tr> <td>I</td> <td>Latex coagulate very quickly</td> </tr> <tr> <td>II</td> <td>Latex coagulate very slowly</td> </tr> <tr> <td>III</td> <td>Latex does not coagulate</td> </tr> </tbody> </table>	Set	Observations	I	Latex coagulate very quickly	II	Latex coagulate very slowly	III	Latex does not coagulate	3
Set	Observations									
I	Latex coagulate very quickly									
II	Latex coagulate very slowly									
III	Latex does not coagulate									
	[Able to state one observation from 2 set of experiment correctly]	2								
	[Able to state one observation from 1 set of experiment correctly]	1								
	No response or wrong response	0								
1(e)	[Able to state one inference accurately] Sample answer: Latex coagulated very quickly because acid can coagulated latex	3								
	[Able to state one inference almost accurately] Sample answer: Because Acid can coagulated latex	2								
	[Able to give an idea about inference] Sample answer: Because acid added	1								
	No response or wrong response	0								

1(f)	[Able to state Operational Definition for coagulation of latex accurately] Sample answer: Latex becomes solid when acid is added or when exposed to air.	3
	[Able to state Operational Definition for coagulation of latex almost accurately] Sample answer: Latex becomes solid when acid is added.	2
	[Able to give an idea about operational definition] Sample answer: Latex becomes solid.	1
	No response or wrong response	0
1(g)	[Able to state all variable correctly] Sample answer: Manipulated variable: Ethanoic acid and ammonia solutions Responding variable :Coagulation of latex/time taken for coagulation of latex. Constant variable : Volume of latex	3
	[Able to state two variable correctly]	2
	[Able to state one variable correctly]	1
	No response or wrong response	0
1(h)(i)	[Able to state the observation when nitric acid is added into the latex accurately] Sample answer: Latex coagulates after excess nitric acid is added.// Latex becomes solid after excess nitric acid is added.	3
	[Able to state the observation when nitric acid is added into the latex almost accurately] Sample answer: Latex coagulates after excess acid is added.// Latex becomes solid after acid is added.	2
	[Able to give an idea about observation when nitric acid is added into the latex.] Sample answer: Latex coagulates.	1
	No response or wrong response	0
1(h)(ii)	[Able to give explanation about coagulation of latex accurately] Sample answer: 1. When acid is added, H ⁺ ions from the acid neutralized the ammonia and negative membrane in the latex. 2. The protein membrane then break during collision 3. and rubber molecule combine and become entangled causing latex to coagulate.	3
	[Able to give 2 point on explanation about coagulation of latex almost accurately]	2
	[Able to give 1 point on explanation about coagulation of latex accurately]	1
	No response or wrong response	0

1(i)	[Able to explain coagulation of latex without acid accurately] Sample answer: 1. This is because the bacteria from the air enter and attack the protein membrane of latex. 2. The protein is converted to lactic acid 3. That causes the coagulation of latex.				
	[Able to explain 2 points the coagulation of latex without acid]				
	[Able to explain 1 points the coagulation of latex without acid]				
	No response or wrong response	0			
1(j)(i)	[Able to give reason why latex in set II coagulate slower than set II accurately] Sample answer: The quantity/concentration of H^+ ion/acid in set I is higher than set II.	3			
	[Able to give reason why latex in set II coagulate slower than set II almost accurately] Sample answer: The quantity/concentration of H^+ ion/acid in set I is higher.	2			
	[Able to give reason why latex in set II coagulate slower than set II accurately] Sample answer: The H^+ ion/acid in set I is higher.	1			
	No response or wrong response	0			
1(j)(ii)	[Able to classify all the four substances correctly] Sample answer:	3			
	<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Can coagulate latex</th> <th>Cannot coagulate latex</th> </tr> </thead> <tbody> <tr> <td>Hydrochloric acid Propanoic acid</td> <td>Sodium hydroxide Potassium hydroxide</td> </tr> </tbody> </table>		Can coagulate latex	Cannot coagulate latex	Hydrochloric acid Propanoic acid
	Can coagulate latex	Cannot coagulate latex			
	Hydrochloric acid Propanoic acid	Sodium hydroxide Potassium hydroxide			
	[Able to classify any three substances correctly]	2			
[Able to classify any two substances correctly]	1				
[No response or wrong response]	0				
2(a)	[Able to state the statement of the problem correctly] Sample answer: How the effect on rusting when iron is in contact with another metal?	3			
	[Able to state the statement of the problem less accurately] Sample answer: To investigate the effect of other metals on the rusting of iron.	2			
	[Able to give an idea of the statement of the problem] Sample answer: To study the rusting of iron	1			
	No response or wrong response	0			

2(b)	[Able to state all variable correctly] Sample answer: Manipulated variable: Different types of metals/Different metals Responding variable :Rate of rusting/ Rusting of iron Constant variable: Iron nails // temperature	3
	[Able to state any two variable correctly]	2
	[Able to state any one correctly]	1
	[No response or wrong response]	0
2(c)	[Able to state the relationship between manipulated variable and responding variable correctly] Sample answer: When a more electropositive metal is in contact with iron, the metal inhibits rusting // When a less electropositive metal is in contact with iron, the metal speed up rusting // Iron rusts faster when in contact with metal less electropositive	3
	[Able to state the relationship between manipulated variable and responding variable but in the opposite direction] Sample answer: The metal inhibits rusting when a more electropositive metal is in contact with iron, // The metal speed up rusting when a less electropositive metal is in contact with iron, // Iron rusts faster when in contact with metal less electropositive	2
	[Able to state an idea of hypothesis] Sample answer: When a less electropositive metal is in contact with iron, the metal inhibits rusting	1
	No response or wrong response	0
	2(d)	[Able to give the list of the apparatus and substances correctly and completely] Sample answer: <i>Apparatus</i> : Five test tubes, test tube rack <i>Materials</i> : sand paper, five iron nails, magnesium strip, zinc strip, tin strip, copper strip, hot agar-agar/jelly solution mixed with potassium hexacyanoferrate(III) solution and phenolphthalein indicator
	(Able to give the list of the apparatus and substances correctly and but not completely) Sample answer: List of apparatus and materials Test tube, iron nail, magnesium,zinc, tin,copper,water, potassium hexacyanoferrate(III) / phenolphthalein indicator	2
	[Able to give an idea about the list of the apparatus and materials correctly] : Any one apparatus and two materials	1
	[No response or wrong response]	0

2(e)	[Able to state all procedures correctly] Sample answer: 1. Clean all the metal strips with sand paper 2. Coil the metal strip around the iron nails and then put in the each test tube 3. Pour the same volume of hot agar-agar/jelly solution has been mixed with potassium hexacyanoferrate(III) and phenolphthalein indicator 4. Leave the test tubes aside for one day 5. Compare the intensity of the blue and pink colour in each test tube and recorded	3																		
	[Able to state 3 steps of procedures correctly) Example : Steps 2,3,5	2																		
	[Able to state 2 steps of procedures correctly] Steps 2,3	1																		
	[No response or wrong response]	0																		
2(f)	[Able to exhibit the tabulation of data correctly] Sample answer: <table border="1"> <thead> <tr> <th>Test tube</th> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>E</th> </tr> </thead> <tbody> <tr> <td>Intensity of blue colour</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Intensity of pink colour</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Test tube	A	B	C	D	E	Intensity of blue colour						Intensity of pink colour						2
	Test tube	A	B	C	D	E														
	Intensity of blue colour																			
Intensity of pink colour																				
[Able to exhibit the tabulation of data less accurately] Sample answer: <table border="1"> <thead> <tr> <th>Test tube</th> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>E</th> </tr> </thead> <tbody> <tr> <td>Observation</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Test tube	A	B	C	D	E	Observation						1							
Test tube	A	B	C	D	E															
Observation																				
[No response or wrong response]	0																			

END OF MARKING SCHEME