MARKING SCHEME PAPER 3 SET 1 CHEMISTRY JUJ PAHANG 2019

<table>
<tr><th>Question Number</th><th>Rubric</th><th>Score</th></tr>
<tr><td rowspan="4">1(a)</td><td>Able to state all the length of rubber strips into 1 decimal place and correct unit. Before the weight is hang and after weight is removed

Set I 10.0 cm 11.0 cm
Set II 10.0 cm 10.0 cm</td><td>3</td></tr>
<tr><td>Able to state all the length of rubber strip without unit accurately. // more than 1 decimal place // any 3 accurate reading</td><td>2</td></tr>
<tr><td>Able to record at least 2 reading</td><td>1</td></tr>
<tr><td>No respons or wrong respons</td><td>0</td></tr>
</table>

<table>
<tr><th>Question Number</th><th>Rubric</th><th>Score</th></tr>
<tr><td rowspan="4">1(b)</td><td>Able to construct a table to record the length that contain:
1. Correct titles with unit
2. Readings

<table>
<tr><th>Set</th><th>Before weight is hung (cm)</th><th>After the weight is removed (cm)</th><th>Extansion of the strip (cm)</th></tr>
<tr><td>Set I</td><td>10.0</td><td>11.0</td><td>1.0</td></tr>
<tr><td>Set II</td><td>10.0</td><td>10.0</td><td>0.0</td></tr>
</table></td><td>3</td></tr>
<tr><td>Able to construct a less accurate table that contains:
1. Titles without unit
2. Readings</td><td>2</td></tr>
<tr><td>Able to construct a table with at least one title / reading</td><td>1</td></tr>
<tr><td>No respons or wrong respons</td><td>0</td></tr>
</table>

Question Number	Rubric	Score

1(c)(i)	Able to state the observation correctly
	
	Sample answer:
	The natural rubber will extends / the length increase, **while** the length of vulcanized rubber does not change after weight is removed
	// The length of natural rubber strip is 1.0 cm, **while** vulcanized rubber is 0.0 cm
	// vulcanized rubber difficult to stretched but easily return to its original shape, while natural rubber easily stretched but difficult to return to its original shape
		3

	Able to state the observation less correctly
	
	Sample answer:
	The natural rubber will extends,
	// vulcanized rubber does not change
	// The length of natural rubber strip is 1.0 cm,
	// vulcanized rubber is 0.0 cm
		2

	Natural rubber is soft
	// vulcanized rubber is strong/hard
	// natural rubber is long
		1

	No respons or wrong respons	0

Question Number	Rubric	Score

1(c)(ii)	Able to state the related inference correctly
	
	Sample answer:
	Vulcanised rubber is stronger/tougher than natural rubber
	// vulcanized rubber is more elastic than natural rubber
	// natural rubber is less elastic than vulcanized rubber
		3

	Able to state the inference less correctly Sample answer Vulcanised rubber is stronger/tougher // Natural rubber is less elastic/stronger/tougher	2
	Able to give idea on inference Sample answer: change in size/length	1
	No respons or wrong respons	0

Question Number	Rubric	Score
1(d)	Able to state three variables correctly: Sample answer: Manipulated variable: Type of strips // Vulcanised rubber and natural rubber Responding variable: The elasticity of rubber strips // The stretching of rubber strip // Change in length of rubber strips Constant variable: The width and thickness of rubber strips // Mass of weight // Size/length of rubber strip	3
	Able to state two variables correctly	2
	Able to state one of the above variable	1
	No respons or wrong respons	0

Question Number	Rubric	Score
1(e)	Able to state the relationship between the manipulated variable and the responding variable with correct direction. Sample answer: Vulcanised rubber is more elastic than natural rubber // Natural rubber is less elastic than vulcanized rubber.	3
	Able to state the relationship between the manipulated variable and responding variable but less accurate in stating the direction. Sample answer: Vulcanised rubber is more elastic / Natural rubber is less elastic natural rubber is easily to stretch than Vulcanised rubber. //Vulcanised rubber is easily return to its original shape	2
	Able to give an idea of hypothesis Sample answer: Vulcanised rubber is strong/ tougher than natural rubber	1
	No respons or wrong respons	0

Question Number	Rubric	Score
1(f)	Able to give the operational definition of elasticity correctly Sample answer: WTD : When the weight is hung to the natural rubber strip WTO : the natural rubber will extends while vulcanized rubber does not change	3
	Able to state the operational definition less correctly Sample answer: Any one of WTD/WTO	2
	Able to state an idea for elasticity	1
	No respons or wrong respons	0

Question Number	Rubric	Score
1(g)	Able to predict the type of rubber strips that will break first and the reason accurately Answer: 1. Natural rubber 2. Because natural rubber is less elastic/softer than vulcanized Rubber // no cross- links between rubber polymer	3
	Able to predict the type of rubber strips that will break first without the reason or vise versa Answer: Natural rubber // Its less elastic/softer than vulcanized rubber	2
	Able to give an idea of prediction Sample answer: Vulcanised rubber /softer	1
	No respons or wrong respons	0

Question Number	Rubric	Score
1(h)	Able to state the relationship between the number of days and extansion of the rubber correctly Sample answer: When the days/time is increase/longer, extansion of the rubber strip increase.	3
	Able to state the relationship between the number of days and extansion of the rubber less correctly. Sample answer: Extansion of the rubber strip increase./**the length** of rubber strip increase // the number of days/time is directly propotional to the extansion of the rubber strip	2
	Able to state any idea of relationship	1
	No respons or wrong respons	0

Question Number	Rubric	Score
1(i)	Able to describe the reason correctly Sample answer: 1. Cross-link with the rubber molecules through strong covalent bonds. 2. This will lessen the ability of the rubber molecule chains from slipping on top of one another and from becoming loose.	3
	Able to explain the reason less correctly/able to give any one of the reason Sample answer: Cross-link with the rubber molecules through strong covalent bonds. // Rubber molecule chains difficult to glide on one another and from becoming loose.	2
	Able to give an idea Sample answer: difficult to glide / cross-link	1
	No respons or wrong respons	0

<table>
<tr><th>Question Number</th><th>Rubric</th><th>Score</th></tr>
<tr><td rowspan="4">1(j)</td><td>Able to classify all product correctly

<table><tr><th>Substance that can coagulate latex</th><th>Substance does not coagulate latex</th></tr><tr><td>CH_3COOH/ethanoic acid
$HCOOH/CH_2O_2$/ formic acid
HCl / Hydrochloric acid</td><td>NaOH / Sodium hydroxide
NH_3 / Ammonia
KOH/ Potassium hydroxide</td></tr></table></td><td>3</td></tr>
<tr><td>Able to give at least 4 products correctly</td><td>2</td></tr>
<tr><td>Able to give at least 2 product correctly
// {reverse order]</td><td>1</td></tr>
<tr><td>No respons or wrong respons</td><td>0</td></tr>
</table>

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<tr><th>Question Number</th><th>Rubric</th><th>Score</th></tr>
<tr><td rowspan="4">2(a)</td><td>Able to state the problem statement correctly.
Sample answer:

Does asid X/HCl/HNO_3/H_2SO_4 and asid Y/CH_3COOH affect the value of heat of neutralization when react with sodium hydroxide solution?

// Does the value of heat of neutralization between acid X/HCl/HNO_3/H_2SO_4 with sodium hydroxide solution is higher than heat of neutralization between acid Y/ CH_3COOH with sodium hydroxide solution?
.</td><td>3</td></tr>
<tr><td>Able to state the problem statement less correctly

Sampel answer:
Does type of acids affect the heat of neutralization when react with alkali/sodium hydroxide/NaOH
// Does the value of heat of neutralization of weak acid and sodium hydroxide is low?
// Does the value of heat of neutralization strong acid and sodium hydroxide solution is high.?</td><td>2</td></tr>
<tr><td>Able to state an idea of problem statement

Sample answer :
Does the value of heat of neutralization between acid and alkali different?</td><td>1</td></tr>
<tr><td>No respons or wrong respons</td><td>0</td></tr>
</table>

Question Number	Rubric	Score

2(b)	Able to list all variable correctly
	
	Sample answer :
	
	Manpulated variable: Acid X and acid Y
	// hydrochloric acid / nitric acid / sulphuric acid **and** ethanoic acid
	// type of acids,
	//strong acid and weak asid
	a : (formula accept)
	
	Responding variable : Heat of neutralization
	//temperature change// temperature rise
	Constant variable : Sodium hydroxide
	//volume and concentration of NaOH
	//volume and concentration of acid X / $HCl/HNO_3/H_2SO_4$
	// volume and concentration of acid Y / CH_3COOH
	// polistirene/plastic cup
		3

	Able to list 2 variable correctly **or** 1 correct + 2 idea	2
	Able to list 1 variable correctly **or** 3 idea	1
	No respons or wrong respons	0

Question Number	Rubric	Score
2(c)	Able to state hypothesis correctly **-Maniplated variable** Ethanoic acid/(acid Y) and hydrochloric acid / nitric acid / sulphuric acid /acid X //Type of acid //strong acid and weak acid (formula accept) **-kesan yang berhubung dengan pembolehubah** Heat of neutralization // temperature change / temperature rise -**Arah kesan** Higher /lower Sample answer : 1. Hydrochloric acid / nitric acid / sulphuric acid /acid X /strong acid **produced higher / lower** heat of neutralization / (temperature change/temperature rise) than ethanoic acid /weak acid / acid X when react with sodium hydroxide solution // revearse. 2. difference type of acids react with sodium hydroxide solution produced difference (heat of neutralization / temperature change/ temperature rise)	3
	Able to state hypothesis less correctly ## No comparison Sample answer: 1. . Hydrochloric acid / nitric acid / sulphuric acid /acid X /strong acid produced higher heat of neutralization when react with sodium hydroxide solution 2. Type of acids **affect** heat of neutralization / temperature change/ temperature rise 3. temperature rise/ heat of neutralization / temperature change of Hydrochloric acid / nitric acid / sulphuric acid/acid X /strong acid is higher 4. The stronger the acid react with sodium hydroxide solution the stronger the heat of neutralization. 5. Hydrochloric acid / nitric acid / sulphuric acid/acid X /strong acid produced difference heat of neutralization compare to ethanoic acid. (tiada aras kesan)	2

	Able to state an idea of hypothesis. Sample answer : 1. Heat of neutralization is affected by type of acids 2. Acid / concentration of H^+ ion produced heat of neutralization. 3. The higher the concentration of acid the higher the heat of neutralization . 4. Temperature rise of acid is higher. 5. Temperature affect the heat of neutralization.	1
	No respons or wrong respons	0

Question Number	Rubric	Score
2(d)	Able to give complete list of substances and apparatus Materials: 1. Hydrochloric acid / nitric acid / sulphuric acid 2. Ethanoic acid, 3. Sodium hydroxide Apperatus: 1. Thermometer 2. Polystrine / plastic cup 3. measuring cylinder	3
	Able to give at least two substances and at least two apparatus 1. Acid X // acid Y 2. Sodium hydroxide Apperatus: 1. Thermometer 2. Any suitable container	2
	Able to give an idea 1. Acid X // acid Y//strong acid 2. thermometer 3. any container	1
	No respons or wrong respons	0

Question Number	Rubric	Score
2(e)	Able to list all the steps correctly Prosedur 1 . [50 - 100 cm^3] hydrochloric acid [0.5 - 2.0] $moldm^3$ hydochloric acid/ nitric acid / sulphuric acid / acid X is measured using measuring cylinder and poured into a polystrine cup. The initial temperature of the solution is measured after a few minutes. 2. [50 - 100 cm^3] sodium hydroxide solution [0.5 - 2.0] $moldm^3$ is measured using measuring cylinder and poured into a poystrine cup. The initial temperature of the solution is measured after a few minutes. 3. The hyrochloric acid is then poured quickly and carefully into the sodium hydroxide solution. 4. The mixture is stirred using thermometer and the highest temperature reached is recorded. 5. Step 1 to 4 is repeated using ethanoic acid and sodium hydroxide solution.	3
	Able to list steps 1, 2, 3 and 4	2
	Able to list steps 3 and 4 Any idea of mix between acid and alkali	1
	No respons or wrong respons	0

<table>
<tr><th>Question Number</th><th>Rubric</th><th>Score</th></tr>
<tr><td rowspan="3">2(f)</td><td>Able to tabulate the data with the following aspects

1. correct titles and correct unit
2. complete list of reacting mixture

<table>
<tr><td>Reacting mixture</td><td>Sodium hydroxide and hydochloric acid/ nitric acid / sulphuric acid / acid X</td><td>Sodium hydroxide solution and Ethanoic acid /acid Y</td></tr>
<tr><td>Initial temperature/^{o}C of acid</td><td></td><td></td></tr>
<tr><td>Initial temperature/^{o}C of NaOH</td><td></td><td></td></tr>
<tr><td>Avarage temperature of asid and NaOH /^{o}C</td><td></td><td></td></tr>
<tr><td>Highest temperature of mixture/^{o}C</td><td></td><td></td></tr>
<tr><td>Increase in temperature/ ^{o}C</td><td></td><td></td></tr>
</table></td><td>2</td></tr>
<tr><td>Able to construct a table with at least
1. one title
2. incomplete list of elements

Sample answer:
<table>
<tr><td>Reacting mixture</td><td>Sodium hydroxide and hydochloric acid/ nitric acid / sulphuric acid / acid X</td><td>Sodium hydroxide solution and Ethanoic acid /acid Y</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
</table></td><td>1</td></tr>
<tr><td>No respons or wrong respons</td><td>0</td></tr>
</table>