

PEPERIKSAAN PERCUBAAN SPM PERLIS TAHUN 2020

SKEMA KIMIA KERTAS 3 (4541/3)

Question number	Rubric	Score
1 (a)	[Able to record all readings accurately with unit.] Sample answer : Set I : 0.7 V Set II : 1.6 V Set III : 2.4 V	3
	[Able to record all readings accurately without unit, or able to record any two readings correctly with unit, or able to record all readings accurately in two decimal places without unit.] Sample answer : Set I : 0.7 / 0.70 Set II : 1.6 / 1.60 Set III : 2.4 / 2.40	2
	[Able to record at least one reading correctly.]	1
	No response or wrong response	0

Question number	Rubric	Score
1 (b)	[Able to state the three variables correctly.] Sample answer : Manipulated variable : Pairs of metals//Tin, zinc, magnesium Responding variable : Potential difference//Voltmeter reading Fixed variable : Type of electrolyte//Metal X	3
	[Able to state any two variables correctly.]	2
	[Able to state any one variable correctly.]	1
	No response or wrong response	0

Question number	Rubric	Score
1 (c)	[Able to state the relationship between the manipulated variable and the responding variable and state the direction correctly.] Sample answer : The further the distance between two metals in electrochemical series, the voltmeter reading becomes higher.	3
	[Able to state the relationship between the manipulated variable and the responding variable without stating the direction.] Sample answer : The distance between two metals in electrochemical series influences changes the voltmeter reading.	2
	[Able to give an idea of hypothesis.] Sample answer : Different metal has a different voltage.	1
	No response or wrong response	0

Question number	Rubric	Score
1 (d)	[Able to give the operational definition for the construction of electrochemical series correctly with the following aspects : (I) What should be done (II) What should be observed Sample answer : When two different metals are dipped into an electrolyte, the voltmeter gives a higher reading shows that the further the distance between two metals.	3
	[Able to give the operational definition for the construction of electrochemical series incompletely with any (one) aspects either (I) or (II)] Sample answer : Two different metals are dipped into an electrolyte// the voltmeter gives a higher reading shows that the further the distance between two metals.	2
	[Able to give an idea of operational definition for the construction of electrochemical series.] Sample answer : The voltmeter gives a reading.	1
	No response or wrong response	0

Question number	Rubric	Score
1 (e)	[Able to arrange the four metals correctly.] (accept symbol) Sample answer : X, tin, zinc, magnesium.	3
	[Able to arrange any three metals in sequence correctly.] (accept symbol) Sample answer : X, tin, zinc//Tin, zinc, magnesium	2
	[Able to arrange any two metals in sequence correctly.] (accept symbol) Sample answer : X, tin // tin, zinc // zinc, magnesium.	1
	No response or wrong response	0

Question number	Rubric	Score
1 (f)(i)	[Able to state the size change of metal X correctly.] Sample answer : The size of metal X increases//thicker.	3
	[Able to state the size change of metal X less correctly.] Sample answer : The size of metal X changes.	2
	[Able to give an idea of any observation.] Sample answer : Magnesium electrode become thinner.	1
	No response or wrong response	0

Question number	Rubric	Score
1 (f)(ii)	[Able to make inference correctly.] Sample answer : Copper(II) ion receive electron/discharge to form copper atom.	3
	[Able to make inference less correctly.] Sample answer : Copper(II) ion discharge//copper atom formed.	2
	[Able to give an idea of inference based on observation given in f(i).] Sample answer : Magnesium dissolved.	1
	No response or wrong response	0

Question number	Rubric	Score
1 (f)(iii)	[Able to state the relationship between the change in the size of X electrode with time correctly.] Sample answer : The size of X electrode increases with time.	3
	[Able to state the relationship between the change in the size of X electrode with time less correctly.] Sample answer : The size of X electrode directly proportional with time.	2
	[Able to give an idea of size of X electrode.] Sample answer : The size of X electrode changes.	1
	No response or wrong response	0

Question number	Rubric	Score
1 (g)	[Able to predict the voltage produced accurately.] Answer : 2.0 V//2.0	3
	[Able to predict the voltage produced less accurately.] Sample answer : 1.8 [Any value between 1.6 and 2.4]	2
	[Able to give an idea of the voltmeter reading.] Answer : Less than 2.4	1
	No response or wrong response	0

Question number	Rubric	Score
1 (h)	[Able to achieve all the following aspects correctly : (i) Balance the half equation at zinc electrode. (ii) Balance the half equation at metal X electrode. (iii) Write the overall ionic equation.] Answer : At zinc electrode : $\text{Zn} \rightarrow \text{Zn}^{2+} + 2\text{e}$ At metal X electrode : $\text{X}^{2+} + 2\text{e} \rightarrow \text{X}$ Overall ionic equation : $\text{Zn} + \text{X}^{2+} \rightarrow \text{Zn}^{2+} + \text{X}$	3
	[Able to achieve any two aspects correctly.]	2
	[Able to achieve any one aspect correctly.]	1
	No response or wrong response	0

Question number	Rubric	Score				
1 (i)	<p>[Able to classify all the four metals correctly.]</p> <p>Answer :</p> <table border="1" data-bbox="289 300 1177 436"> <tr> <td data-bbox="289 300 740 367">Metal which are more electropositive than copper</td> <td data-bbox="740 300 1177 367">Metal which are less electropositive than copper</td> </tr> <tr> <td data-bbox="289 367 740 436">Iron Tin</td> <td data-bbox="740 367 1177 436">Silver Gold</td> </tr> </table>	Metal which are more electropositive than copper	Metal which are less electropositive than copper	Iron Tin	Silver Gold	3
	Metal which are more electropositive than copper	Metal which are less electropositive than copper				
	Iron Tin	Silver Gold				
	[Able to classify any three metals correctly.]	2				
[Able to classify any two metals correctly.]//Classify inversely	1					
No response or wrong response	0					

Question number	Rubric	Score
2 (a)	[Able to give the problem statement correctly.] Sample answer : How does when iron in contact with magnesium, rusting of iron inhibit? // How does when iron in contact with copper, rusting of iron increase? // What is the effect of other metal on the rusting of iron?	3
	[Able to give the problem statement less correctly.] Sample answer : To investigate the effect of rusting of iron when in contact with more electropositive metal. // To investigate the effect of rusting of iron when in contact with less electropositive metal.	2
	[Able to give an idea of the problem statement.] Sample answer : Does rusting occurs when iron in contact with other metal?	1
	No response or wrong response	0

Question number	Rubric	Score
2 (b)	[Able to state all the variables correctly.] Sample answer : Manipulated variable : Magnesium and copper // Type of metals in contact with iron. Responding variable : Rusting of iron // formation of blue spot/colouration. Fixed variable : Iron nails // jelly/agar-agar solution // electrolyte // temperature // potassium hexacyanoferrate(III) solution.	3
	[Able to state any two variables correctly.]	2
	[Able to state any one variable correctly.]	1
	No response or wrong response	0

Question number	Rubric	Score
2 (c)	[Able to state the relationship between the manipulated variable and the responding variable correctly and with direction.] Sample answer : When iron in contact with magnesium, rusting of iron inhibit // When iron in contact with copper, rusting of iron increase	3
	[Able to state the relationship between the manipulated variable and the responding variable correctly and without direction.] Sample answer : When iron in contact with metal, iron does not rust. // When iron in contact with metal, rusting occurs.	2
	[Able to give an idea of the hypothesis.] Sample answer : The presence of metal effect rusting.	1
	No response or wrong response	0

Question number	Rubric	Score
2 (d)	[Able to list all the materials and apparatus correctly.] Sample answer : Materials : Iron nail, magnesium ribbon, copper strip, jelly//agar-agar solution, potassium hexacyanoferrate(III) and phenolphthalein indicator, sand paper. Apparatus : Test-tubes//boiling tubes, test tube rack.	3
	[Able to give a list the following materials and apparatus.] Sample answer : Materials : Iron nail, magnesium, copper, jelly solution, potassium hexacyanoferrate (III). Apparatus : Test-tubes//boiling tubes, test tube rack.	2
	[Able to give an idea of materials and apparatus.] Sample answer : Materials : Iron nail, magnesium/copper. Apparatus : Boiling tube / beaker / any suitable container.	1
	No response or wrong response	0

Question number	Rubric	Score
2 (e)	[Able to state all steps in the procedure correctly.] Sample answer : 1. Iron nails, magnesium ribbon and copper strip are cleaned with sand paper. 2. Both iron nails is coiled with different metal. 3. The iron nails are put into two different test tubes. 4. The mixture of jelly solutions, potassium hexacyanoferrate (III) and phenolphthalein indicator is poured into the test tubes. 5. The test tube left aside for one day. 6. Any observation are recorded.	3
	[Able to state the steps 2, 3, 4 and 6]	2
	[Able to state steps 2 and 4]	1
	No response or wrong response	0

Question number	Rubric	Score						
2 (f)	[Able to tabulate the data with the following aspects :] 1. Correct titles 2. Complete list of metals Sample answer : <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Pairs of metal</th> <th>Observation</th> </tr> </thead> <tbody> <tr> <td>Iron + magnesium</td> <td></td> </tr> <tr> <td>Iron + copper</td> <td></td> </tr> </tbody> </table>	Pairs of metal	Observation	Iron + magnesium		Iron + copper		2
	Pairs of metal	Observation						
	Iron + magnesium							
Iron + copper								
[Able to tabulate the data but incomplete.] Sample answer : <table border="1" style="margin-left: auto; margin-right: auto;"> <tbody> <tr> <td></td> <td></td> </tr> <tr> <td>Iron + magnesium</td> <td></td> </tr> <tr> <td>Iron + copper</td> <td></td> </tr> </tbody> </table>			Iron + magnesium		Iron + copper		1	
Iron + magnesium								
Iron + copper								
No response or wrong response	0							