**ARISE AND SHINE TRIAL 1 EXAMIANTION –AUGUST 2022**

KENYA CERTIFICATE OF SECONDARY EDUCATION

**CHEMISTRY PRACTICAL – PAPER 233/3**

**MARKING SCHEME**

1. Table 1……………………………………………………5mks

(i). Complete table ………………………………………..1mk

Conditions

* Complete table with 3 titrations done …..….1mk
* Incomplete table with only 2 titrations ½ mk
* Incomplete table with only 1 titration one ……...0mk
* For no titration done ….…..0mk

NOTE: where NO Titration done penalize FULLY for ALL the marking points for table

Penalties

Before awarding a mark for complete table

The examiner MUST ensure that none of the following mistakes is there in the table – otherwise penalize ½ k for EACH mistake to a maximum penalty of ½ mk i.e penalize ½ mk ONCE even if there are 2 or more mistakes

* Wrong arithmetic/subtraction
* Inverted table
* Burette readings beyond 50.0cm3, except where explained.
* Unrealistic titre values i.e. titres <1.0cm3 or>100cm3.

(ii). Use of decimals (tied to 2nd and 3rd rows ONLY) ……………….1mk

Conditions

Either 1 or 2 decimal places used consistently

If 2 decimal places are used then 2nd decimal place MUST be either 0 or 5

(iii). Accuracy (tied to correct titre values only……………………..1mk

Compare the candidate’s correct titre values with the school values i.e. Teacher’s Average tire

Conditions

* If at least one titre value is 0.1cm3 of school value award ……………1mk
* If NO titre value is within 0.1cm3  0.1cm3 of school value but at least one titre value is within 0.2cm3 of school value then award ………….1/2 mk
* If NONE of the titre values is within 0.2cm3 of the SV award …….0mk

(iv). Principles of averaging …….1mk

* If 3 consistent values average -------1mk
* If 3 titrations done,2 consistent values average d……..1mk
* If 2 titrations done , inconsistent and averaged ……0mk
* If 3 inconsistent titrations average …..0

(v) Final accuracy (tied to correct average titred………..1mk)

Compare the candidate correct average tire with the SV and award accordingly

* If within 0.1cm3 of S.V award …..1mk
* If NOT within 0.1cm3 of S.V but is within 0.2cm3 of S,V award ….. ½ mk
* If >0.2cm3 of S, V award …… ½ mk
* Complete table ….1mk
* Use of decimals ……1mk
* Accuracies ……1mk
* Principles of Averaging …....1mk
* Final Accuracy ….1mk

Total 5mks

(vi). Calculations

(i). Mols of Hcl is 50cm3 of solution G

= 1/2 = 0.05 moles 1/2 01

NB units may be given or NOT given but if given MUST be correct

(ii). Moles of NaOH in 25cm3 of solution H

= 1/2 = 0.025 moles 1/2 01

01

(iii). Mole of HCl in average volume of

Solution Q used.

= mole ratio

NaOH : Hcl =1:11/2

= correct newer 1/2 01

(iv). Moles of Hcl unreacted

= answer (iii) above x 250 = correct answer 1/2

Average tire

OR

= Answer in (i) – Answer in (iii) 1/2

= Correct answer 1/2

(v). Moles of HCl reacted with F

= Answer in (i) = Answer in (iv) 01

= Correct answer 1/2

(vi). Moles of metal F reacted

= ½ x Answer (v) above 1/2

= Correct answer 1/2

(vii) R.A.M for F

= 0.3 1/2= correct answer

Answer (vi)

Table 2………………………………………….6mks

Distribution.

(a). Complete table ………………3 mks

**Conditions/penalties**

* Award ½ mk for EACH experiment completely done
* Penalize ½ mk for EACH solubility value either wrongly worked out or NOT worked to maximum of 1mk.
* Penalize ½ mk if ALL temperature readings in the table are CONSTANT.

(b). Use of decimals tied to temperature readings)……………….1mk

* Accept ONLY if all readings recorded consistently either as whole Numbers or to one decimal places of -0 or -5 otherwise penalize FULLY.

(c). Accuracy …………………………1mk

* Compare candidate’s first temperature reading i.e. when 5cm3 of water is added with school value if within 2.0oc of S.V award 1mk otherwise award 0mk

(d). Trend ……………………..1mk

Award mark for Temperature readings showing a continuous Drop otherwise penalize Fully

Complete table 3mks

Use of decimals 1mk

Accuracy 1mk

Trend 1mk

06mks

Graph……………………………..3mks

Award 3 mks – distribution

1. Labelling of Axes …………….1/2 mk

Award ½ mk if both axes correctly Tabelled

Penalties

* Penalize FULLY for inversion on axes
* Penalize FULLY for wrong units given, ignore if units are NOT given
* Penalize FULLY if only one axis is labelled

1. Scale …………….1/2 mk

Conditions

* Area covered by the graph plots must be at least 8 big squares on both axes
* Scale interval must be consistent on each axis
* Scale chosen must accommodate all the plots

1. Plotting

Conditions

* If 6 or 5 points correctly plotted award …………..…1mk
* If only 4 or 3 points are correctly plotted award ……1/2 mk
* If less than 3 parts correctly plotted award …….0

1. Curve ………………………….1mk

Award 1mk for a smooth curve which is rising an joining at least three correctly plotted points

Graph- ….3mks

Labelling of Axes …..½ mk

Scale …..1/2 mk

Plotting …..1mk

Curve ……1mk

03mks

(H) Solubility of K at 25oC using the graph

= correct showing on graph ½

= correct answer ½ mk

Question 2

(a)

|  |  |
| --- | --- |
| observation | Inference |
| * Colourless filtrate * Blue precipitate ½ | Zn2+,Al3+,Pb2+present  Cu2+P Present 01 |

(b)

|  |  |
| --- | --- |
| observation | Inference |
| * No effervescence½ | ½ |

(b.i).

|  |  |
| --- | --- |
| observation | Inference |
| * No white precipitate ½ * Dissolves in excess ½ | Zn2+,Al3+,Pb2+present1  02 |

(b)(ii).

|  |  |
| --- | --- |
| observation | Inference |
| * white precipitate ½ * dissolves in excess ½ | Al3+,Pb2+ present 1  02 |

c)

|  |  |
| --- | --- |
| observation | Inference |
| * No white precipitate ½ * No effervescence | Al3+, present  Pb2+ absent 1/2  01 |

(d).

|  |  |
| --- | --- |
| observation | Inference |
| * white precipitate ½ | SO42- present 1  1 ½ |

e).

|  |  |
| --- | --- |
| Observation | Inference |
| * blue precipitat * dissolve to form deep blue solution 1 | Cu2+ in present 1  02 |

3.(a).

|  |  |
| --- | --- |
| Observation | Inference |
| burns with yellow sooty/smoky flame 1mk | C = C – C Any ½ present   * Unsaturated organelle compound |

(b).

|  |  |
| --- | --- |
| Observation | Inference |
| Dissolve to form colourless solution mk | Polar substance |

c).

|  |  |
| --- | --- |
| Observation | Inference |
| Purple potassium manganite (VII) decolorizedmk | C = C – C Any ½  R-OH ½ present |

(d).

|  |  |
| --- | --- |
| Observation | Inference |
| Effervescence occurs mk | R – COOH present 1 mk |