**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 $\pm $0.1cm3 of school value award ……………1mk
* If NO titre value is within $\pm $0.1cm3  $\pm $0.1cm3 of school value but at least one titre value is within $\pm $0.2cm3 of school value then award ………….1/2 mk
* If NONE of the titre values is within $\pm $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 $\pm $0.1cm3 of S.V award …..1mk
* If NOT within $\pm $0.1cm3 of S.V but is within $\pm $0.2cm3 of S,V award ….. ½ mk
* If >$\pm $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

= $\frac{50 x 1}{1000}$ $√$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

= $\frac{50 x 0.1}{1000}$ $√$1/2 = 0.025 moles $√$1/2 01

 01

(iii). Mole of HCl in average volume of

Solution Q used.

 = mole ratio

NaOH : Hcl =1:1$√$1/2

 = 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 $\pm $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+presentCu2+P Present 01 |

(b)

|  |  |
| --- | --- |
| observation | Inference |
| * No effervescence$√$½
 |  ½  |

(b.i).

|  |  |
| --- | --- |
| observation | Inference |
| * No white precipitate $√$½
* Dissolves in excess ½
 | Zn2+,Al3+,Pb2+present$√$1 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+, presentPb2+ 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 $≡ C$ Any ½ present * Unsaturated organelle compound
 |

(b).

|  |  |
| --- | --- |
| Observation | Inference |
| Dissolve to form colourless solution $√$mk | Polar substance $√1$  |

c).

|  |  |
| --- | --- |
| Observation | Inference |
| Purple potassium manganite (VII) decolorized$√$mk |  C = C – C $≡ C$ Any ½  R-OH $√$½ present |

(d).

|  |  |
| --- | --- |
| Observation | Inference |
| Effervescence occurs $√1/2 $mk | R – COOH present $√$1 mk |