**GATUNDU SOUTH CHEMISTRY PAPER 3,2023**

**MARKING SCHEME**

1. a) **TABLE**

Complete table…………………………….(1mark)

Complete table 3 or 2 titrations ……………(1mark)

Incomplete table ……………………………(0mark)

Penalties

Inverted table

Unrealistic values

Wrong units in the table

Wrong arithmetic

Penalize ( mark) to max of…………………(1 mark)

Decimal…………………………… ………..(1 mark)

(Tied to 1st and 2nd row)

1 dp or 2 dp used consistently.

Accuracy…………………………………….(1mark)

Compare the candidates value with the school value.

If any one of the candidates value is within 0.1 s.v ………… (1 mark)

If within 0.2 of the s.v …………………………………………….(mark)

If none is within award ………………………………………………(0 mark)

***NOTE***: If there is wrong arithmetic work out for the candidate and award accordingly.

Put a tick on the correct value.

Principles of averaging ………………………………..(1 mark)

Values to be averaged MUST be within 0.2 of each other.

Working MUST be shown.

Titre value must be given to at least 2 dp unless it works out exactly.

If units are included MUST be correct.

If 3 values are within average all for ………………….. (1 mark)

If 2 values are within average the 2 for ………………... (1 mark)

If the candidate have averaged the wrong values, pick and average for the candidate and award accordingly.

Final accuracy…………………………………………………….(1 mark)

Compare average titre with s.v 0.2 …………………(1 mark)

**Calculations**.

1. (ii) √ 1

Correct Ans√

1. (i) Moles of Iron (II) salt solution A

1:5

Ans b (ii) x 5 √ 1

Correct Ans√

(ii) Concentration of solution A in moles/litres

√ 1

Correct Ans√

(iii) Concentration of solution A in grams per litre

8.5 x 4 √

Correct Ans √ 1

(iv) 1

Correct Ans

(v) 284 + 18n = Ans (c iv) √ 1

Correct Ans √

1. **b)** TABLE

Complete table 2 marks

Decimal 1

Accuracy

Trend 1

5

**Complete table**

Award mark for every filled value of time and correct .

is given to at least 3 dp unless it works out to less than 3 dp.

should be given in decimal not as fraction.

**Decimal**

Award 1 mark if time readings are either whole numbers, to 1 dp or 2 dp used

Consistently, otherwise penalize fully.

**Accuracy**

Award mark. Compare school value with the first reading 2 seconds.

**Trend**

Award 1 mark if the time is increasing as temperature decreases.

**I. GRAPH**

**Labeling…………………….mark.**

Both axes Must be correctly labeled, units May or May not be included if included MUST be correct units

**Scale………………………….mark**

* Plotted points Must cover of the grid provided.
* Scale Must be consistent for both axes and accommodate all the points.
* Scale Must start from the origin.

**Plots……………………….1 mark**

4 – 5 points correctly plotted 1 mark.

2 – 3 points correctly plotted mark.

**Shape………………………1 mark.**

Straight line graph passing through the origin.

II (a) Reading from a correct graph √

Showing √ 2

Application √ 1

b) Reading from a correct graph√

Showing √ 1

c) Rate of reaction increases with an increase in temperature (OWTTE) √ 1

2. You are provided with solid Q. Carry out the following tests and record your observations and

inferences in the spaces provided.

1. Add about 15cm3 of distilled water to solid Q and shake. Filter and retain both the filtrate and the residue.

i) To about 2cm3 of the filtrate add ammonia solution dropwise until in excess.

Observations √ 1 Inferences√ 1

**No white precipitate Ca2+ Present**

*Credit for Zn2+ Mg2+ Al2+ Pb2+ absent if all 2*

*are mentioned.*

ii) To about 2cm3 of filtrate add a few of dilute hydrochloric acid.

Observations Inferences

**Effervescence√ 1**  **CO32- √ 1 SO32- Present.**  2

**// Bubbles of colourless gas 2-mentioned 1 mark**

**1- mentioned mark**

1. i) Put the residue in a test tube add about 10cm3 of dilute Nitric (v) acid and wait for five minutes,To 2cm3 of the solution add 2-3 drops of Barium nitrate

Observations Inferences

**No white precipitate√ 1 SO42- absent √ 1 2**

*Ignore SO32- CO32- inferred as present*

ii) To 2cm3 of the solution add ammonia solution drop wise unfill in excess.

Observations Inferences

**White precipitate √ Insoluble in excess √ Pb2+ Al3+  Mg2+ present**

*3- Mentioned 1 mark*

*2- Mentioned mark* 2

*1-Mentioned 0 mark*

iii) To 2cm3 add 2-3 drops of Potassium iodide solution.

Observations Inferences

**Yellow precipitate √ 1 Pb2+present √ 1 2**

*Must be correctly inferred in b. ii) above to earn a credit*.

3. You are provided with organic solid **M**, carry out the tests below. Write your observations and inferences in the spaces provided.

a. Place half of solid M in a clean metallic spatula and ignite using a non-luminous flame.

Observations Inferences

**Burns with yellow sooty flame √ -C=C- -C C- √ Present**  1

b. Place the remaining portion of solid **M** in a boiling tube add 10cm3 of distilled water, filter,

divide the filtrate into four portions.

i) To the first portion add 2-3 drops of acidified potassium manganite (vii).

Observation Inferences

**Purple solution changes to colourless √ 1 -C=C- -C C √ present 2**

**ROH present √**

ii) To the second portion, add 2 -3 drops of bromine water.

Observations Inferences

**Yellow solution changes to colourless √ 1 -C=C-, -C C- Present √ 1 2**

iii) To the third portion add 2-3 drops of acidifies potassium dichromate (vi).

Observations Inferences

**Orange solution changes to green √ 1 ROH Present √ 1 2**

*NB: Solution changes but not turns. If turns is used penalize fully for observations and inferences.*