CEKENAS END OF TERM I EXAM-2022

FORM FOUR EXAM

Kenya Certificate of Secondary Education (K.C.S.E)

MARKING SCHEME

CHEMISTRY PAPER 3

233/3

1. Table 1

Award three marks distributed as follows:

I. Complete table (1mk)

- Complete table with 8 readings (1mk)
- Incomplete table with 7/6 readings (½mk)
- Incomplete table with less than 6 readings (0mk)

II. Decimal place (½mk)

Award half mark for consistently used whole numbers or 1 decimal point for temperature readings otherwise penalise FULLY.

III. Accuracy (½mk)

Award half mark for temperature readings at time 0 if it is $\pm 2^0 c$ of the school value.

IV. Trend (1mk)

Award 1mk for constants up to 1 minute followed by a decrease in temperature then a rise in temperature readings.

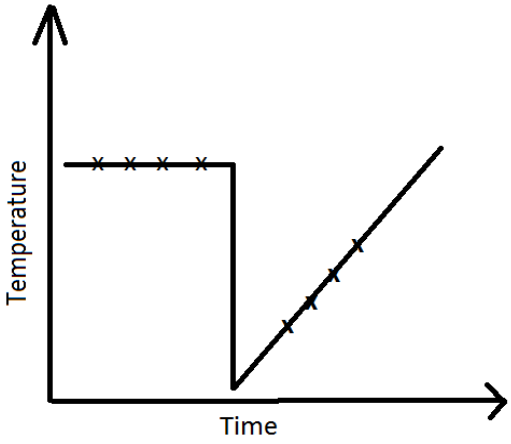
Or constants upto 1min, a drop, constants, continuous rise.

- Penalise ½mk if reading at time 5 minutes is above the initial temperature at T= 0 MIN

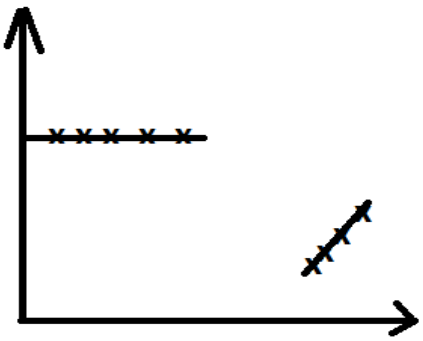
a) **Graph**

- Labelling of axes ½mk
- Scale (consistent and covering more than ½page) ½mk
- Plotting (1mk)
- Lines (1mk) (with extrapolation)

Award ½mk for lines if no extrapolation is done.



✓1mk



✓½mk

b) Correct Δ T read from a correctly drawn graph. (1mk)

c) Δ H = mcΔT

$= 50 \times 4.2 \times Answer in (b) above$ ✓½

= CORRECT ANSWER ✓½

d) $\frac{1.5}{84} = 0.0179$ ✓½

$\frac{CORRECT ANSWER (c)}{0.0179}$ ✓½

= CORRECT ANSWER ✓½ ΔH = + ve

(Penalise ½mk if units or sign are missing)

PROCEDURE II

Table II

- Complete table (1mk)
- Decimal place (1mk)
- Accuracy (1mk)

e) – Principles of averaging (1mk)

- Final accuracy (1mk)

5mks

f) $\frac{12}{40} = 0.3$ ✓½

$\frac{0.3\times1000}{500} = 0.6M$ ✓½

(Penalise ½mk for wrong formula)

g) i) $\frac{0.6\times25}{1000}$ ✓½ = 0.015✓½

ii) Mole ratio 1:1

$\frac{100\times0.015}{answer(e)AV}$ ✓½

ANSWER ✓½

iii) Moles of HCl that reacted with R = 0.0179

Moles that were 100cm³ of R = answer g(ii)

Moles of HCl in 50cm³ of P = 0.0179 + answer g(ii)✓1

= answer ✓½

iv) $\frac{answerg(ii)\times1000}{50}$ ✓½ = answer ✓½

QUESTION 2

a) i)

Observations	Inferences
White ppt✓½ Soluble in excess✓½	Pb^{2+}, Zn^{2+} , Al^{3+} 3✓1mk 2✓½mk 1- 0mk

ii)

Observations	Inferences
White ppt✓½ Insoluble in excess✓½	Pb^{2+}✓½, Al^{3+}✓½

iii)

Observations	Inferences
No white ppt✓1	$Cl^-, SO_4^{2-}, CO_3^{2-}\ SO_3^{2-}\ Br^-$ Each ion ½mk to maximum of 2mks Penalise ½mk for each contradicting ion up to a maximum of 2mks

iv)

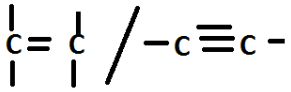
Observations	Inferences
Yellow ppt✓1	Pb^{2+} ✓1mk Penalise fully for any contradicting ion

v)

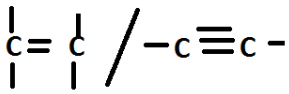
Observations	Inferences
- Effervescence✓½ - Colourless gas with pungent smell✓½ - Red litmus changes to blue✓½ - Blue litmus remains blue ✓½	NO_3^- ✓1 Penalise fully for any contradictory ion

Question 3

a)

Observations	Inferences
- Melts✓½ - Burns with a yellow sooty flame✓½	 ✓1 Or long chain organic substance or high ratio of C:H

b)i)

Observations	Inferences
- purple colour acidified potassium manganate (vii) persists ✓1	 ✓½ And R-OH Absent✓½

ii)

Observations	Inferences
- Orange colour of acidified potassium dichromate (vi) persists✓1	R-OH absent✓1

iii)

Observations	Inferences
- PH = 4/5 ✓1	Weakly acidic✓1