

GOLDEN ELITE EXAMINTIONS 2020

Kenya Certificate of Secondary Education

233/3

CHEMISTRY

PAPER 3

PRACTICAL

MARKING SCHEME

Question one

(a)

- | | |
|--------------------------------|-------|
| i. Complete table | √1mk |
| Complete table with 3 titres | √1mk |
| Incomplete table with 2 titres | √½ mk |
| Incomplete table with 1 titre | -0 mk |

Conditions

- ✓ Penalize ½ mk for unrealistic values unless where explained
 - ✓ Penalize ½ mk for any inversion of table
 - ✓ Penalize ½ mk for any arithmetic error
- NB: penalize a maximum of ½ mk for any of the conditions above.*

- ii. Decimal √1mk
Award 1mk for 1d.p. or 2 d.p used consistently
If 2d.p used, 2ndd.p. can only be "0" or "5"

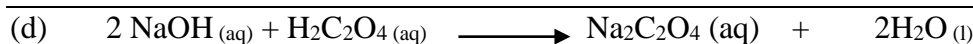
- iii. Accuracy √1mk
Award 1mk for any value ± 0.1 of s.v.
Award ½ mk for any value ± 0.2 of s.v.
Award 0mk (penalize fully) for any value beyond ± 0.2 of s.v.

- iv. Principles of averaging √1mk
Values averaged must be consistent
If 3 titres but only 2 are consistent and averaged award 1mk
If 3 titres done and averaged award 1mk
If 3 titres done and inconsistent and averaged award 0mk
If 3 titres done and all are consistent but only 2 are averaged award 0mk

- v. Final answer √1mk
Award 1mk for ans. ± 0.1 of s.v.
Award ½mk for ans. ± 0.2 of s.v.
Award 0mk if ans not within ± 0.2 of s.v.
Marks awarder as follows:
- | | |
|----|-------------|
| CT | 1mk |
| D | 1mk |
| A | 1mk |
| PA | 1mk |
| FA | 1mk |
| | <u>5mks</u> |

(b) Average titre = $\frac{t_1 + t_2 + t_3}{3}$ = ___ ($\sqrt{\frac{1}{2} mk}$) *Correct Ans $\frac{1}{2} mk$*

(c) Moles of NaOH = $\frac{M \times V}{1000}$
= $\frac{0.1 \times 25 \sqrt{1mk}}{1000}$ = 0.0025 moles $\sqrt{1mk}$



Moles ratio = 2 : 1

Therefore moles of organic acid = $\frac{1}{2} \times 0.0025$ moles $\sqrt{1mk}$
 = 0.00125 moles $\sqrt{1mk}$

(e) Ans (b) cm^3 \longrightarrow has 0.00125 moles
 1000 cm^3 \longrightarrow ?
 = $\frac{0.00125 \times 1000}{\text{Ans (b)}}$ $\sqrt{1mk}$
 = _____ Correct answer $\sqrt{1mk}$

(f) Ans (e) moles / L \longrightarrow has 6.3 g/l
 1 mole \longrightarrow ? $\sqrt{1mk}$
 = $\frac{6.3}{1} \times 1$ $\sqrt{1mk}$
 Ans (e) = _____ Correct answer $\sqrt{1mk}$

(g) Value of n
 Ans (f) = $\text{H}_2\text{C}_2\text{O}_4 \cdot n\text{H}_2\text{O}$
 Ans (f) = $2 + 24 + 64 + 18n$ $\sqrt{1mk}$
 N = $\frac{\text{ans f} - 90}{18}$ $\sqrt{1mk}$
 = _____ correct ans $\sqrt{1mk}$

Question two

	Observation	Inferences
a)	Yellow flame $\sqrt{1mk}$	Na^+ ions $\sqrt{1mk}$
b)	- Colourless, odourless gas produced - Gas turns moist blue litmus paper red - Red litmus paper remains red - Droplets of colourless liquid on cooler parts of test tube <i>Any 2 x 1/2 = $\sqrt{1mk}$</i>	Gas acidic CO_3^{2-} , HCO_3^- ions Hydrated salt / water of crystallization <i>Any 2 correct x 1/2 = $\sqrt{1mk}$</i>
c)	- Effervescence / bubbles - Colourless, odourless gas produced - Gas turns moist blue litmus paper red - Red litmus paper remains red <i>Any 4 x 1/2 = $\sqrt{2mks}$</i>	CO_3^{2-} , HCO_3^- ions Gas acidic <i>Any 2 x 1 = $\sqrt{2mks}$</i>
	Observation	Inferences
3. (a)	Pale green ppt $\sqrt{1/2}$ mk insoluble in excess $\sqrt{1/2}$ mk	Fe^{2+} $\sqrt{1mk}$
(b) (i)	Pale green ppt $\sqrt{1/2}$ mk Insoluble in excess $\sqrt{1/2}$ mk	Fe^{2+} $\sqrt{1mk}$
(ii)	- Gas with pungent, choking smell 1mk - Moist red litmus paper turns to blue 1mk - Blue litmus paper remains blue <i>any 2 x 1 = $\sqrt{2mks}$</i>	Gas basic $\sqrt{1/2}$ mk NH_4^+ ions present $\sqrt{1/2}$ mk
C. (i)	White ppt	CO_3^{2-} , Cl^- ions, SO_3^{2-}
(ii)	White ppt $\sqrt{1/2}$ mk Insoluble / persists $\sqrt{1/2}$ mk	Cl^- ions $\sqrt{1mk}$ Confirmed

D.	White ppt $\sqrt{1/2}$ mk Insoluble $\sqrt{1/2}$ mk	SO ₄ ²⁻ ions $\sqrt{1}$ mk
E.	Pale green solution turns to yellow solution $\sqrt{1}$ mk Brown ppt insoluble in excess $\sqrt{1}$ mk	Fe ²⁺ oxidized to Fe ³⁺ ions $\sqrt{1/2}$ mk Fe ³⁺ ions confirmed $\sqrt{1/2}$ mk