KENYA NATIONAL EXAMINATION COUNCIL
REVISION MOCK EXAMS 2016
TOP NATIONAL SCHOOLS

MANG'U HIGH SCHOOL

CHEMISTRY

PAPER 1

MARKING SCHEME

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MANG'U HIGH SCHOOL KCSE TRIAL AND PRACTICE EXAM 2016

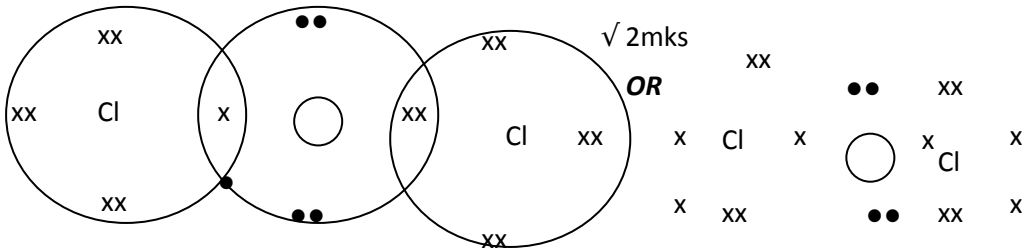
QUESTION PAPER 1

MARKING SCHEME

1. (a) Group 6 √ ½
period 2 √ ½

(b) A_2B_3 √ 1

2. (a)

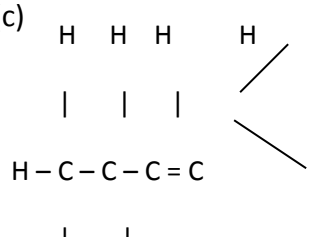


(b) It forms a molecular structure with weak vander waals forces that are easily broken √ ½

3. (a) $(CH_2)n = 42$
$(12 + 2)n = 42$
$14n = 42$
$n = 3$ √ ½
$Mf = 3(CH_2)$ C_3H_6 √ ½

(b) CnH_2n √ 1

(c)



But-1-ene/ -1- butane √ ½/ Butene

4. Cpd - 3.22g mass of $NaSO_4$ = 1.42g
Mass of H_2O = 3.22 – 1.42 = 1.8g √ ½

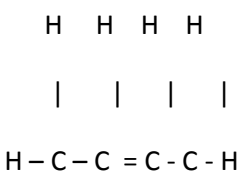
	Na_2SO_4	H_2O	
Mass	1.42	1.8	
Moles	1.42 = 0.01	√ ½	1.8 √ ½ = 0.1
	142		18
Mole ratio	0.01√ ½	0.1	
	0.01	0.1	
	1:10		
	X = 10 √ ½		

5. (i) A white ring/solid was formed inside the combustion tube closer to the cotton wool soaked in concentrated Hydrochloric acid. √ ½ Ammonia is lighter and diffuse faster. √ 1

(ii) $NH_{3(g)} + HCl_{(g)} \rightarrow NH_4Cl_{(s)}$ √ 1

6. Add water √ ½ to the mixture and stir to dissolve sodium carbonate. Filter √ ½ to remove sodium carbonate as filtrate and lead (II) carbonate as residue. Heat √ ½ filtrate until saturation √ ½ and cool √ ½ to obtain sodium carbonate as crystals.

7. (i) But-2-ene



(ii) Potassium chromate (VI) changes from orange to green because G is unsaturated.

8. Both diamond and graphite have giant atomic structure but diamond has strong covalent bonds throughout its structure but graphite has weak vander waals forces between its layers thus requiring less energy to break

9. Acid - NH_4^+ √ 1
Base – H_2O √ 1

10. Cl + (-2 x 4) = -1
Cl – 8 = -1
Cl = -1 + 8 = +7√ 1

11. (i) Zinc/Zinc metal
(ii) $Zn(NH_3)_4^{2+}$
(iii) $Ba_{(aq)} + SO_4^{2-}{}_{(aq)} \rightarrow BaSO_{4(s)}$

12. (i) $CH_3CH_2OH \xrightarrow{Conc.\ H_2SO_4} CH_2 = CH_{2(g)} + H_2O_{(l)}$

(ii) $CH_3CH_3 \xrightarrow{1\ mole\ Cl_{2(g)}} CH_3CH_2Cl_{(g)} + HCl_{(g)}$

13. (a) – Gas cannot be collected by downward delivery as it is lighter than air√ 1
- No gas collected as dilute Nitric acid would oxidize it to water √ 1
b)- Hydrogen brakes the double bonds in liquid oil making it saturated thus solidifies.

14. (a) A – Nitrogen (IV) oxide √ 1/ $NO_{2(g)}$
B – Oxygen/ $O_{2(g)}$ √ 1
(b) $2Pb(NO_3)_{2(s)} \longrightarrow 2PbO_{(s)} + 4NO_{2(g)} + O_{2(g)}$ √ 1

15. $2HNO_{3(aq)} + MCO_{3(s)} \longrightarrow M(NO_3)_{2(aq)} + H_2O_{(l)} + CO_{2(g)}$
moles of $HNO_3 = 2 \times \frac{100}{1000} = 0.2$moles
$HNO_3 : MCO_3$
2 : 1 √ ½
Moles of MCO_3 = ½ x 0.2 = 0.1moles
R.F.m = $\frac{12.5}{0.1}$ =125
M + 12 + (16x3) = 12 √ ½
M = 125 – 60 = 65 √ ½

16. (a) $Na_2S_{(s)} + 2HCl_{(aq)} \longrightarrow 2NaCl_{(aq)} + H_2S_{(g)}$ √ 1
(b) Turns Lead acetate black √ 1
Forms a dark brown /black ppt. when bubbled in a solution of metal ions.

17. (i) $4OH^-_{(aq)} \longrightarrow 2H_2O_{(l)} + O_{2(g)} + 4e$ √ 1
(ii) $4H^+_{(aq)} + 4e \longrightarrow 2H_{2(g)}$ √ 1

18. $(^{90}/_{100} \times 16) + (^{10}/_{100} \times 18)$ √ 1
$= 14.4 + 1.8 = 16.2$ √ 1

19. (i) Carbon (II) oxide √ 1
(ii) To convert it into Carbon (IV) oxide that is less poisonous √ 1
(iii) $2KOH_{(aq)} + CO_{2(g)} \xrightarrow{K_2CO_3} H_2O_{(l)}$ √ 1

20. Aluminium reacts with oxygen to from aluminium oxide which coats the surface of he article and prevents further reaction with air and water. √ 1

21. (a) Yellow √ 1 deposits of sulphur are seen in the gas jars.
(b) Hydrogen sulphide reduces sulphur (IV) oxide to sulphur and water. √ 1

22. Q = It
Q = 2.5 x 25 x 60 = 3750C √ ½
N^{2+} - 2 faradays √ ½
1 faraday – 96500 x 2 √ ½
3750C -= 0.36g
$\therefore 96500 \times 2 = \frac{0.36}{3850} \times 96500 \times 2$
$= 18.528$
$= 18.5$ √ ½

23. 0.1M H_2SO_4 has fully ionized √1 thus a stronger acid than $5MH_2SO_4$ which only ionizes partially √1 thus a weaker acid.

24. (a) Helium is light and inert thus will not burn in air like Hydrogen. √1
(b) Boiling and melting points of alkali metals decreases down the group due to increase in atomic radius thus reducing the nuclear force of attraction √1
- melting and boiling points of halogens increase due to increase in the molecular size that requires more energy to break.

25. (a) $^{40}_{19}\mathbf{K}$ has more neutrons (21) √1 than $^{39}_{19}\mathbf{K}$ which has 20 neutrons.

(b) Beta (β)√ ½ particle decay because an electron has been lost.

(c) $4 \xrightarrow{1.3 \times 10^9} 2 \xrightarrow{1.3 \times 10^9} 1$

$1.3 \times 10^9 \times 2 = 2.6 \times 10^9$ years
1 Half life = 1.3×10^9 years
$\therefore$ 2 half lifes = $1.3 \times 10^9 \times 2 = 2.6 \times 10^9$ years √1
¼ = $^1/_2{}^2$ = 2 half lifes

26. (a) (i) Froth floatation √1
(ii) Concentrating the mineral ore by making impurities to sink at the bottom √1
(iii) Tin √1

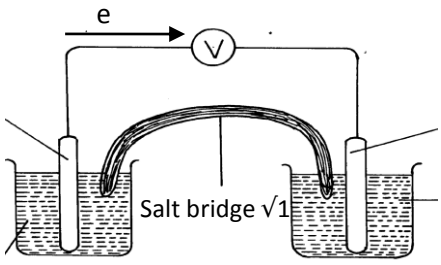
27. To react with Sodium Hydrogen Carbonate to produce Carbon (IV) oxide √1 that will make the dough to swell as it tires to escape. √1

28. (i) Increase in temperature favours the forward reaction √1 because it is endothermic √ ½
(ii) Increase in pressure will have no effect on the equilibrium as the number of molecules are equal on both sides. √ ½

29. $\Delta H^{\theta}f\ (CO) + \Delta H^{\theta}c(CO) = \Delta H^{\theta}c(C)$
$-105 + \Delta H\theta c(C) = -393$ √1
$\Delta H_c^{\theta} = -393 - {}^{-}105$ √1 $= -188KJmol^{-1}$ √1

30. (a) Exp. 1 – No change on the dry cloth because of the absence of hypoochlorous acid r esponsible for bleaching.
Exp. 2- The wet cloth turned white due to bleaching as chlorine dissolves in water in the wet cloth to form hypochlorous
(b) $Cl_{2(g)} + H_2O_{(l)} \longrightarrow HCl_{(aq)} + HOCl_{(aq)}$
(c) $Dye + HOCl_{(aq)} \longrightarrow \{Dye + [O]\} + HCl$ √1

31. (a) a & (b)



(c) $Zn_{(s)} + Cu^{2+}_{(aq)} \rightarrow Zn^{2+}_{(aq)} + Cu_{(s)}$ √1