KENYA NATIONAL EXAMINATION COUNCIL
REVISION MOCK EXAMS 2016
TOP NATIONAL SCHOOLS

ALLIANCE GIRLS HIGH SCHOOL

CHEMISTRY

PAPER 1

MARKING SCHEME

SCHOOLS NET KENYA
Osiligi House, Opposite KCB, Ground Floor
Off Magadi Road, Ongata Rongai | Tel: 0711 88 22 27
E-mail:infosnkenya@gmail.com | Website: www.schoolsnetkenya.com

ALLIANCE GIRLS HIGH SCHOOL KCSE TRIAL AND PRACTICE EXAM 2016

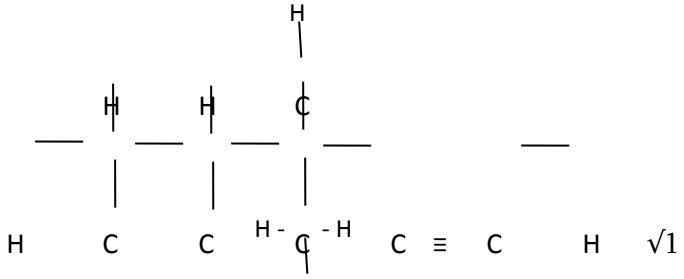
QUESTION PAPER 1

MARKING SCHEME

1. Add water to the mixture. Water **mixes with ethanol** and forms the lower layer while the upper layer is pentane. Use **separating funnel** √ ½ to separate pentane and use **fractional distillation** √ ½ to obtain ethanol from water. √ (2mks)

2. (i) white fumes √
   (ii) Phosphorus (V) chlorite //Phosphorous (III) chloride

3. (a)



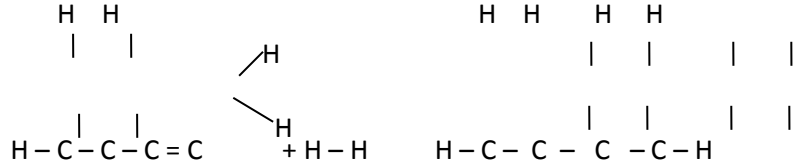
(b) (i) Propyl ethanoate √ 1
(ii) 3-Bromo-2-methylpent-1-ene √1

4. Gas **P** - Hydrogen √½
   Solid **R** – Magnesium oxide √
   Solid **T** – Copper metal √½
   Liquid **S** – water √½ (total 2mks)

5. (i) $4NH_{3(g)} + 5O_{2(g)} \xrightarrow{Pt/Ni} 4NO_{(g)} + 6H_2O_{(l)}$ (*penalize ½mk for wrong or missing state symbol*)
   (ii) Provide activation energy for the reaction √1mk
   (iii) $[Zn(NH_3)_4]^{2+}$ √1mk

6. Mass of saturated soln. = (192 – 23)
   = 169g
   Mass of solid = (142 – 23)
   = 119g √½
   Mass of solution (water) = (169 -119)g
   = 50g √½ (2mks)
   If 50g of water = 119g of solid
   100g of water = (119 x 100) √½
   50 = 238g of sugar/100g of water √½

7.



$\Delta H = 7 \times 413 + 610 + 2 \times 346 + 432 - (10 \times 413 + 3 \times 346)$
$= 2891 + 610 + 792 + 432 - 4130 - 1038$
$= 4725 - 5168$ √1
$= -443KJ/mol$ √1

8. (i) Gas electrode for gas **U** – Anode √½
   Electrode for gas **V** – Cathode √½ (1mk)
   (ii) Gas **U** – oxygen √½
   Gas **V** – Hydrogen √½ (1mk)

(iii) $4OH^-_{(aq)} \longrightarrow 2H_2O_{(l)} + O_{2(g)} + 4e^-$ (*penalize ½mk for wrong or missing state symbols*)

9. (a) 54g of Al react with $7200cm^3$
3g = ? √½
= $\frac{3 \times 7200}{54}$ √½ = $4000cm^3$ √½ (1½mks)

(b) 54g produce 267g of $AlCl_3$ √½
3g = $\frac{3 \times 267}{54}$ √½
= 14.83g √½ (1½mks)

10. Protons – 30 √1
Neutrons = 65-30 = 35 √1

11. Add excess Zinc powder to Nitric (V) acid
$Zn_{(s)} + 2HNO_{3(aq)} \longrightarrow Zn(NO_3)_{2(aq)} + H_2O_{(l)}$ √1
$Na_2CO_{3(s)} \longrightarrow Na_2CO_{3(aq)}$ √1
$Na_2CO_{3(aq)} + Zn(NO_3)_{2(aq)} \longrightarrow ZnCO_{3(s)} + 2NaNO_{3(aq)}$ √1
Or $Zn^{2+}_{(aq)} + CO_{3(aq)} \longrightarrow ZNCO_{3(s)}$ √ *(max 3mks)*

12.

13. (a) Insoluble **Lead (II) chloride** formed **coats** Lead (II) Carbonate preventing further reaction.
(b) Hydrogen chloride ionizes in water to form acidic solution (H^+ions) while it remains in molecular form in carbon tetra chloride.

14. (a) Atomic No. of A 23 – 12 = 11
A = 2. 8 . 1 √
B = 2 . 1 √1 (2mks)

(b) **B**√1, Its outermost electron√1 experience stronger nuclear attraction / **B** has smaller atomic radius/ has fewer energy levels.

15. (a) B √1– Reaction faster, acid more concentrated. √1(2mks)
(b) The rate of reaction is **faster** √at the beginning due to high concentration of the reactants. (1mk)

16. If $1000cm^3$ of HNO^3 = 2moles
$50cm^3$ of HNO^3 = $\frac{2 \times 50}{1000}$ = 0.1moles √½
1:1
0.1: 0.1
If $50cm^3$ of KOH = 0.1mole √½
$100cm^3$ of KHO = $\frac{0.1 \times 100}{50}$ √½
= 0.2moles √½
$\frac{D}{56} = 0.2$
D = (0.2 x 56) √½ = 11.2g √½ (3mks)

17. (a) **Coat** or **cover** √1the metal surfaces to avoid contact of air and water with the metal(1mk)
(b) Zinc is **more reactive** than iron hence reacts with an oxygen available √1mk (*sacrificial method)*

18. - Increase pressure √1
- Lower the temperature √1 (2mks)

19. **K** and **M**
K and **M** – Aluminium hydroxide is amphoteric (reacts with both acids and bases) √1mk)

20. Q = 1t t = (32 x 60 + 10)
= 0.5 x 1930 = 1930 √½
= 965C √½
If 0.44g = 965C
88g = 965 x 88
0.44 √½
= 193000C √½
1mole of e- = 96500
193000 = 193000
96500 √½
= 2moles of e^- (Q^{2+})
Charge = +2 √½

21. - Arch welding √1
- Bulbs to prevent oxidation of the filament √1 (2mks)

22. $\frac{24 \times 82.8 + 25 \times 8.1 + 26 \times 9.1}{100}$
$= \frac{1987.2 + 202.5 + 236.6}{100}$ √1
$= \frac{2426.3}{100}$ **= 24.263** √1

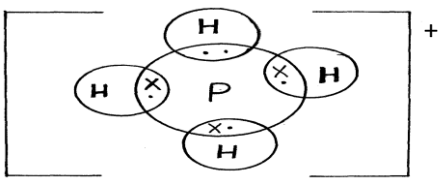
23. (a) Filtration √1–$NaHCO_3$ residue and NH_4Cl as filtrate
(b) Decomposition of $NaHCO_3$ √1
(c) Slaking– mixture of Ammonium is heated to give $CaCl_2$, water and Ammonia//
$NH_4Cl + Ca(OH)_2$

24. - Monoclinic (β) prismatic
- Rhombic (α), octahedral

25. - Add **ethen** √1 to the mixture and stir **B** dissolves
- **Filter** √½to obtain **A** and **C** as a residue
- Add **alcohol** √½to the residue **C** dissolves
- **Filter** √½and **evaporate** √½the filtrate to dryness. (3mks)

26. $\frac{TQ}{TO_2} = \sqrt{\frac{MQ}{MO_2}}$
TQ = 12.6sec
TO_2 = 22.4sec √½
$MO_2 = 2 \times 16 = 32$
$\frac{12.6}{22.4}$ √½= $\sqrt{\frac{MQ}{32}}$
$MQ = \frac{0.3164063 \times 32}{10.125002}$ √½
= 10.13 √ (3mks)

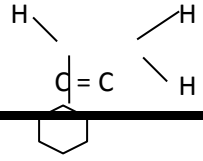
27. Let an e of P = **.**
Let an e of H = x



+

√ (2mks)

28. (a) Polyphenylethene or polystyrene (√1mk)
(b)



29.

Elements	**C**	**H**	**O**
% mass	26.7 √½	2.2	71.1 √½
No. of moles	$^{26.7}/_{12}$ = 2.225	$^{22.2}/_{1}$ = 2.1	$^{71.1}/_{16}$ = 4.44375
Ratio of moles	$^{2.225}/_{2.2}$ =1	$^{2.2}/_{2.2}$ = 1	$^{4.44375}/_{2.2}$ = 2
No. of atoms	1	1	2 √½
			(2mks)

Empirical formula **CHO_2** √½

30.