KENYA NATIONAL EXAMINATION COUNCIL
REVISION MOCK EXAMS 2016
TOP NATIONAL SCHOOLS

FRIENDS SCHOOL KAMUSINGA HIGH SCHOOL

CHEMISTRY

PAPER 1

MARKING SCHEME

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FRIENDS SCHOOL KAMUSINGA KCSE TRIAL AND PRACTICE EXAM 2016
QUESTION PAPER 1
MARKING SCHEME

1. (i) **A** – Hexane **√** **B** – Water **√**
   (ii) They are immiscible **√**
2. (i) $H_2SO_{4(l)} + 2NH_{3(g)} \rightarrow (NH_4)_2SO_{4(aq)}$ **√**
   (ii) Calcium oxide // CaO **√**
3. (i) $^{+}1+x + {}^{-}8 = 0$
   $x = {}^{+}7$ **√1**
   (ii) $2Cr + {}^{-}14 = {}^{-}2$
   $Cr = {}^{+}6$ **√1**
4. Dissolve Lead (II) oxide in dilute Nitritic (V) acid **√½** . To the Lead (II) nitrate **√½**solution obtained react it with sulphuric (VI) aicd **√½**or any soluble sulphate solution. A white precipitate. **√½**of Lead (II) sulpahte is obtained. Filter **√½**and wash the residue with distilled **√½**water and dry.
5. (i) $2XOH_{(s)} + H_2SO_{4(aq)} \rightarrow X_2SO_{4(aq)+} 2H_{2)(l)}$ **√**1
   Moles of acid = $\frac{20 \times 2}{1000} = 0.04$ moles
   Moles of XOH = 0.04 x 2 **√½**= 0.08moles
   Molar mass = $^{3.2}/_{0.08}$ **√½**= 40
   x + 17 = 40
   x = 40 – 17 = 23**√½**

6. (i) - Cracking of crude oil
   - A reaction between natural gas and stem (*any one correct*)
   (ii) Finely divided iron
   (iii) Decreases. √½ Equilibrium shifts to the left since high temperature decomposes√½ the products.
7. (a) Reduces the melting point √ of Al_2O_3 from $2015^{o} – 800^{o}C$ √ ½ hence reduces cost.
   (b) Graphite reacts with oxygen gas √ ½ produced at the anode hence gets eroded. √ ½
8. (i) – Chlorine √ ½
   - Oxygen √ ½
   (ii) Chlorine gas was produced due to high concentration√ of Cl^- ions. With time the Cl^- ions decreased leading to discharge of OH^- ions and oxygen gas being liberated.
9. $CH_4 + 4Cl_2 \rightarrow CCl_4 + 4HCl$ √ ½ (*ignore s.s*)
   4(414) + 4(244) – [4(326) + 4(431)]
   1656 + 976 – (1304+ 1724) √
   2632- 3028 = -396kJ √
10. (a) A green solid is observed
    (b) (i) $Fe_{(s)} + 2HCl_{(g)} \rightarrow FeCl_{2(s)} + H_{2(g)}$ √
    (ii) $2H_{2(g)} + O_{2(g)} \rightarrow 2H_2O_{(g)}$ √
11. (i) Nylon 66
    (ii) $HO - C(=O) - (CH_2)_4 - C(=O) - OH$ √

    O O
    ‖ |
    H and H

12. (i) They are both metals √
(ii) $ECO_{3(s)} \rightarrow EO_{(s)} + CO_{2(g)}$
(iii) F^- √

13. (a) (i) B (ii) A
(b) Sodium hydroxide and hydrochloric acid are fully ionized hence more free ions to react while ammonia solution and ethanoic acid are partially ionized hence less ions to react.

14. (a) $^{226}_{}R \longrightarrow {}^{226}_{}X + {}^{0}_{}e$

(b)

Nuclear	**Chemical**
(i) Involves nuclear particles namely protons and neutrons (ii) Not influenced by environment (iii) New elements formed	(i) Involves valence electrons (ii) Influenced by environment (iii) No new elements formed

N/B – award for any correct two

15. Yellow √ solution is observed. More OH- ions are added to the mixture and react with H^+ shifting equilibrium√ to the left.

16. (i) Different forms in which an element exists in the same physical state.
(ii) The fourth valency electron of Carbon in graphite is delocalized √ while the four valency electrons of Carbon atoms in diamond√ are used up in the covalent bonding.

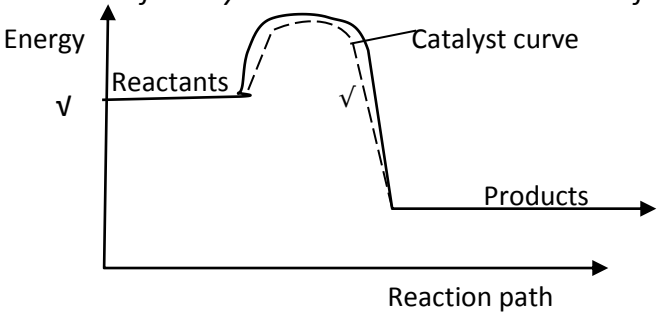
17. Q = 2 x 15 x 60 = 1800C √ ½
$Cu^{2+}_{(aq)} + 2e^- \rightarrow Cu_{(s)}$ √
(96500 x 2)c 63.5g Cu
1800C $\rightarrow$ $\frac{1800 \times 63.5}{96500 \times 2}$ √ ½ √ ½
= 0.5922g of Copper √ ½

18. (i) – Chemical process. √ ½ It is an exothermic process giving rise to acidic solution which is a new substance.
(ii) - Blue litmus turns red √ ½ while the red litmus unchanged. √ ½
- Hydrolysis occurred √
OR $AlCl_{3(s)} + 3H_2O \rightarrow Al(OH)_{3(s)} + 3HCl_{(aq)}$

19. (i) **X** - soapy detergent √ ½ **Y** – Soapless//synthetic detergent √ ½
(ii) $(R-COO)_2Ca$
(iii) It is non-biodegradable hence a pollutant

20. (i) –Use of vanadium (V) oxide catalyst √
- Increase in pressure √
- Lower temperature√
N/B – Name of catalyst must be mentioned Award for any two correct ones

(ii)



21. CO is oxidized√ to CO_2. High level of CO_2 and NO_2 in the atmosphere causes global warming√ which results into melting of polar ice caps hence rise in level of seas. √

22. (a) (i) Copper (II) hydroxide /$Cu(OH)_2$ √
(ii) Tetra ammine Copper (II) ions. √
(b) $Cu(OH)_{2(s)} + 4NH_{3(aq)} \rightarrow [Cu(NH_3)_4]^{2+}{}_{(aq)} + 2OH^-_{(aq)}$ √

23. $\frac{RN_2}{RCO_2} = \sqrt{\frac{RMMCO_2}{RMM\ N_2}}$

$RN_2 = \frac{280}{70} = 4cm^3/sec$

$RCO_2 = {}^{400}/_{X}$

$\frac{4}{RCO_2} = \sqrt{\frac{44}{28}}$

$16 = 44$

$(RCO_2)_2 \quad 28$

$(RCO_2)_2 = \frac{16 \times 28}{44}$

$= 3.1908cm^3/sec$

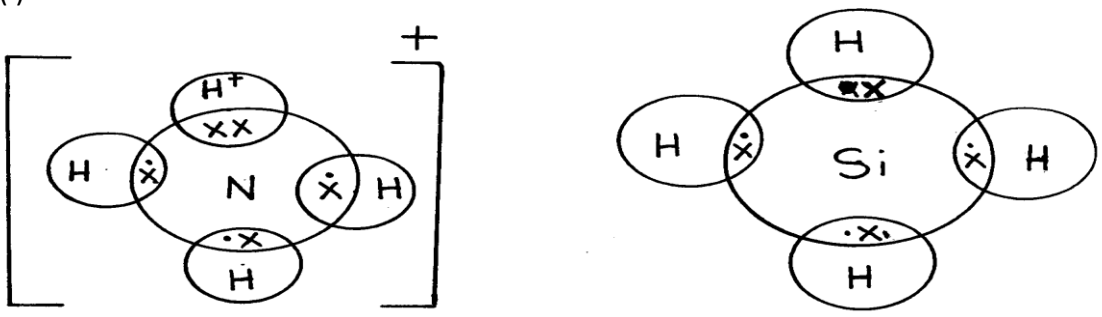
$X = \frac{400}{3.1908}$

$= 125.36seconds$

24. (i) Zinc√ ½ and Lead√ ½ respectively
(ii) $Zn_{(s)} + Pb^{2+}{}_{(aq)} \rightarrow Zn^{2+}{}_{(aq)} + Pb_{(s)}$ √
(iii) Sodium nitrate √ or Potassium nitrate solutions. NOT sodium chloride solution.

25. (i) - A brown gas of Nitrogen (IV) oxide produced. √
- A brown solid of Lead (II) oxide. √
(ii) $2Pb(NO_3)_{2(s)} \rightarrow 2PbO_{(s)} + 4NO_2 + O_{2(g)}$ √

26 (i)



27. (i) A yellow √ solid is deposited. Chlorine gas reduces sulphide ions (S^{2-}) in solution to sulphur.
(ii) It should be done in a fume chamber or in the open air. √

28. - Thermosoftening plastics are those that can be remelted √ when heated without losing their properties.
- Thermosetting cannot be remelted once formed √