# KENYA NATIONAL EXAMINATION COUNCIL
# REVISION MOCK EXAMS 2016
## TOP NATIONAL SCHOOLS

**KAPSABET BOYS HIGH SCHOOL**

**CHEMISTRY**

**PAPER 1**

***MARKING SCHEME***

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## KAPSABET BOYS KCSE TRIAL AND PRACTICE EXAM 2016
## QUESTION PAPER 1
## MARKING SCHEME

| NO | | MS |
|---|---|---|
| 1 | Both ammonia and Calcium hydroxide solutions<br>(a) React acids//dilute acids // $HCl_{(aq)}$ // any specific acid named to form salt and water only<br>(b) Have pH value above 7<br>(c) Turn red litmus to blue<br>(d) Turn phenolphthalein indicator from colourless to pink<br>(e) Turn methyl orange to pink (*any 3 1mk each*) | 33 |
| 2 | Add separate small portion of each to boiling tubes containing hydrogen peroxide<br>$MnO_2$ – effervescence occurs, CuO no effervescence<br>// Add separate small portions to $H_2SO_{4(aq)}$ CuO blue solution forms, $MnO_2$ Colourless solution<br>// Add $HCl_{(aq)}$ $MnO_2$ effervescence//green yellow gas// colourless solution.<br>CuO – no effervescence//green/blue solution<br>//Add $HNO_{3(aq)}$ 1mk for reagent 1mk for each obs. | 3 |
| 3 | $2Mg_{(s)} + O_{2(g)} \rightarrow 2MgO_{(s)}$<br>$6Mg_{(s)} + 2N_{2(g)} \rightarrow Mg_3N_{2(s)}$<br>$2Mg_{(s)} + CO_{2(g)} \rightarrow 2MgO_{(s)} + C_{(s)}$<br>$Mg_{(s)} + H_2O_{(g)} \rightarrow MgO_{(s)} + H_{2(g)}$<br>(*any three 1mk each balanced with correct s.s. penalize ½ for missing // wrong s.s* | 3 |
| 4 | (a) **F** – pale blue zone<br>**G** – almost colourless zone<br>**H** – chimney ( ½mk each)<br>(b) Slip a piece of manila paper /wooden splint into region and quickly remove before it catches fire. The inner part remains unburnt// not charred ( 1½mks)<br>(c) //Hold a match stick on a pin and let the head rest on the chimney when the chimney is lit the head of the match stick in the zone does not light. | 3 |
| 5 | (a) Simple distillation<br>(b) Drying<br>(c) Filtration<br>(d) Diffusion ( ½mk each) | 2 |
| 6 | (a) Anion is a negative charged ion<br>(b) Atomic number is the number of protons in an atom of the element<br>(c) Isotopes are different atoms of the same element with same atomic number but different mass number . (1mk each) | 3 |
| 7 | (a) (i) $Zn_{(s)} + HNO_{3(aq)}$ - $HNO_3$ is oxidizing agent, $H_2O$ immediately.<br>(ii) $Pb_{(s)} + HCl_{(aq)}$ - $PbCl_2$ formed is insoluble, prevents further reaction.<br>(iii) $K_{(s)} + H_2SO_{4(aq)}$ - Reaction of K(s) with $H_2SO_{4(aq)}$ is explosive (½mk each)<br>(b) **Q** is water (1mk) | 3 |
| 8 | (a) Prevent water formed to run back to hot part which could crack<br>(b) Blue solid turns white //crystals form powder //colourless drops of liquid on cooler parts<br>(c) G is water | 3 |

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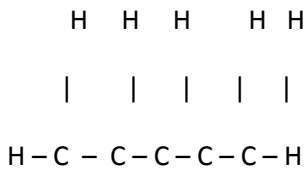
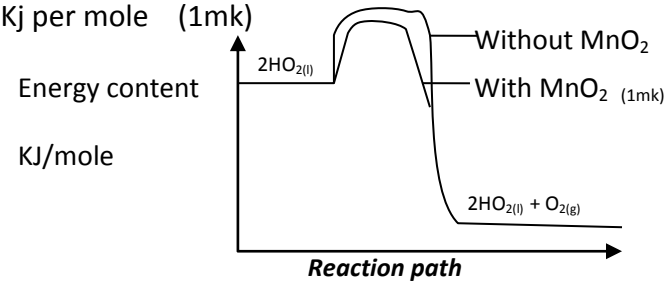
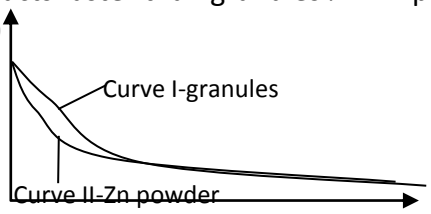
| 9 | (a) Alkanol B is<br>  <br><br>(b) Dehydration<br>(c) Concentrated sulphuric acid | 3 |
| 10 | (a) Brown fumes are formed (1mk)<br>(b) $C_{(s)} + 4HNO_{3(l)} \rightarrow 4NO_{2(g)} + CO_{2(g)} + 2H_2O_{(l)}$ (1mk)<br>(c) A reducing agent (1mk) | 3 |
| 11 | (a) Moles of $H_2O_2$ = $\frac{50 \times 3.5}{1000}$ = 0.175moles<br>(b) heat given out (50 x (64 – 21) x 4.2) J<br>= 50 x 43 x 4.2<br>= 9030J // 9.03kJ<br>ΔH of $H_2O_2$ = -9.03 = -5.16 Kj per mole (1mk)<br>  <br> | 3 |
| 12 | (a) **Q** – 2.8.82 (1mk) **P** – 2. 8.6 (1mk)<br>(b) oxide of **P** has simple molecular structure (1mk) | 3 |
| 13 | (a) Compare diffusion of gases in **K**<br>(b) Litmus turns blue $NH_3$ diffuses faster since it is lighter ( 2mks) | 3 |
| 14 | (a) Reagent In Step I is Dilute Nitric Acid (1mk)<br>(b) Soid A is Lead (II) Sulphate (1mk)<br>(c) The Amphoteric Hydroxide Reacts Basic Sodium hydroxide 91mk) | 3 |
| 15 | (a) Experiment with zinc powder took a shorter time (1mk)<br>$Zn_{(s)}$ powder reacts faster than granules ½mk . powder offers larger surface area for reacton (½mk)<br>(b)<br>  <br> | 3 |
| 16 | (a) Q = It = 2.0 x 9 x 60C<br>= 1080C<br>(b) 1080 = 0.36g of T<br>$\frac{2 \times 96500 \times 0.36}{1080} = 64.33$<br>R.A.M = 64.33 (1mk)<br>(c) T is less reactive thatn hydrogen ½mk because $T^{2+}$ ions are preferentially discharged (½mk) | 3 |
| 17 | $60cm^3$ of $O_3$ takes 80sec<br>$90cm^3$ of $O_3$ takes 120sec<br>$NO_2$ = 56 $O_3$ = 48<br>$\frac{TNO_2}{} = \frac{}{RMN\ NO_2}$ | 3 |

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| | $TO_3$ RMM$O_3$<br><br>$TNO_2$ = 120 $\sqrt{\frac{56}{48}}$ = 129.6sec (3mks) | |
| 18 | (a) A double salt is a compound containing two different anions or cations (1mk)<br>(b) (i) Trona<br>$Na_2CO_3.NaHCO_{3(s)} + 3HCl_{(aq)} \rightarrow NaCl_{(aq)} + 2CO_{2(g)} + 2H_2O_{(l)}$ (1mk)<br><br>(ii) $MgCO_3.Mg(OH)_{2(s)} + 4HCl \rightarrow 2MgCl_{2(aq)} + CO_{2(g)} + 3H_2O_{(l)}$ | 3 |
| 19 | (a) (i) Increase in temeprature lower the production of HI(g) ( ½ mk)<br>Reaction is endothermic ( ½ mk)<br>(ii) Decrease pressure had no effect on production HI(g); ( ½ mk) No. of moles of gases on<br>both sides equal ( ½ mk)<br>(b) $\Delta H_f$ or HI = $\frac{+52.4}{2}$ KJ<br>= +26.2KJ per mole (1mk) | 3 |
| 20 | Empirical mass = 278 = R.F.M<br>Fe O S $H_2O$<br>20.2 23.0 11.5 45.3<br>56 16 32 18<br>0.36 1.44 0.36 2.52<br>1 4 1 7<br>E.F = $FeSO_4.7H_2O$ Hence formula $FeSO_4 7H_2O$ (3mks) | 3 |
| 21 | (a) Two elements $O_2$ and $Cl_2$ in chlorine water (½mk each)<br>(b) Compounds in chlorine water<br>HCl, HOCl, $H_2O$ ½ mk each for two<br>(c) – belaching agent - oxidizing agent - acidic reactions (any two – ½mk each) | 3 |
| 22 | Mles of $ZnCO_3$ = $\frac{17}{125.4}$ = 0.1356<br>Moles of $HNO_3$ = $\frac{50 \times 4}{1000}$ = 0.2moles<br>1mole $ZnCO_3$ = 2moles $HNO_3$<br>0.1moles $ZnCO_3$ react<br>0.0356 moles of $ZnCO_3$ excess<br>Mass $ZnCO_3$ = 0.0356 x 65.4 = 2.328g (3mks) | 3 |
| 23 | (a) Addition reaction (1mk)<br>(b) $C_4H_8 + Br_{2(g)} \rightarrow C_4H_8Br_{2(l)}$ (1mk) | 2 |
| 24 | (a) HCl solution in water forms ions which conduct electricity. (1mk)<br>(b) HCl solution inpropanone does not form ions// is molecular (1mk) | 2 |
| 25 | (a) $^{233}Fr \longrightarrow {}^{233}Pa + e$ (1mk0<br>Chemical \| Nuclear<br>Valency \| Nucleus<br>Little energy \| A lot of energy<br>Now new element \| New element<br>Depends on temperature//pressure \| Does not depend on temperature//pressure (*any two (2mks)* | 3 |
| 26 | $\frac{V_1P_1}{T_1} = \frac{V_2P_2}{T_2}$, $T_2$ = 373K B.p of water | |

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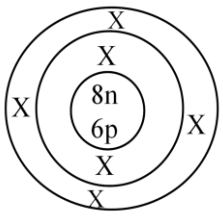
| | $\frac{760}{298} = \frac{P_2}{373}$<br>$P_2 = \frac{373 \times 760}{298}$ = 951.3mmHg (3mks) | |
| 27 | (a) 2.4 (1mk)<br>(b)  | |
| 28 | (a) Yellow solid formed (1mk)<br>(b) $Cl_2$<br>$MnO_{2(s)} + 4HCl_{(aq)} \rightarrow MnCl_2 + Cl_2 + 2H_2O_{(l)}$ //$KMnO_{4(s)}$ (1mk)<br>$FeS_{(s)} + 2HCl_{(aq)} \rightarrow FeCl_{2(aq)} + H_2S_{(g)}$ (1mk) | 3 |