KENYA NATIONAL EXAMINATION COUNCIL
REVISION MOCK EXAMS 2016
TOP NATIONAL SCHOOLS

PRECIOUS BLOOD HIGH SCHOOL

CHEMISTRY

PAPER 1

MARKING SCHEME

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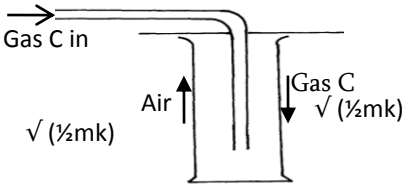
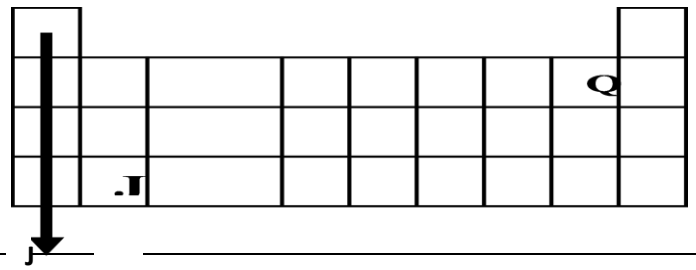
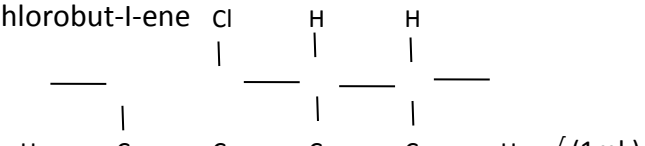
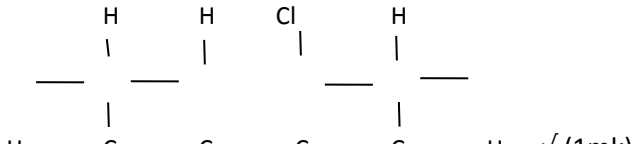
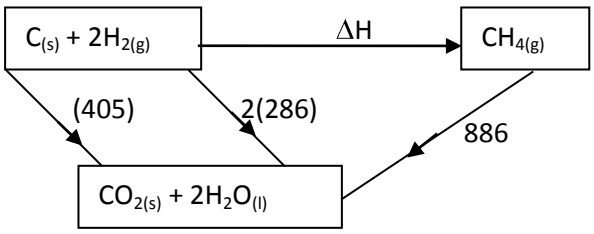
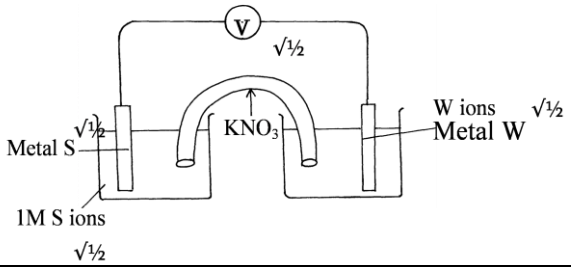
PRECIOUS BLOOD KCSE TRIAL AND PRACTICE EXAM 2016
QUESTION PAPER 1
MARKING SCHEME

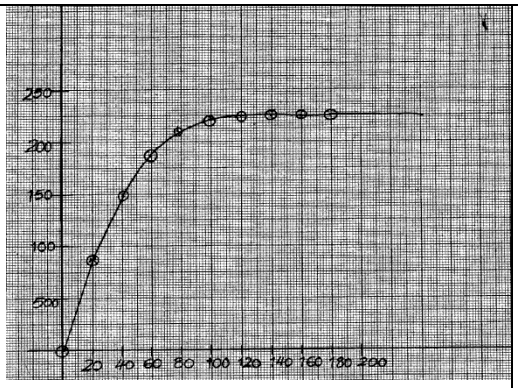
No.	Answer(s)	Marks	Comments
1	(a) Water which contains **Ca^{2+}/Mg^{2+}** ionsV (1mk) (b) – Addition of a few drops of hydrochloric acid V (½mk) - Gas bubbles/effervescence V (½mk) (c) – Brewing industries V (1mk) - Tie dye, textile industries - processing of mineral water } √ (1mk)	1 ½ ½ 1	Accept any 2 correct answers
		3	
2	(a) - Gas C is **denser than air** V (1mk) (b) – Nitrogen (IV) oxide - Dinitrogen tetraoxide - Sulphur (IV) oxide - Sulphur (VI) oxide - Carbon (IV) oxide - Chlorine gas - Hydrogen chloride 	2 1	Accept any two correct answers
		3	
3	(i) $O_{2(g)} + 2Mg_{(s)} \longrightarrow 2MgO_{(s)}$ V (1mk) (ii) $CO_{2(g)} \longrightarrow C_{(s)} + O_{2(g)}$ V (1mk)	1 1	
		2	
4	(a) 7 V (1mk) (b) let % isotope -7 = x Isotope -6 = 100 - x $\frac{7x}{100} + \frac{6(100-x)}{100} = \frac{6.94}{1}$ V (½mk) $7x + 600 - 6x = 694$ $x + 600 = 694$ V (½mk) $x = 694 - 600$ Isotope -7 is x = 94% V (½mk) Isotope -6 is = 100 – 94 = 6% V (½mk)	 1 ½ ½ ½ ½	
		3	
5.	(i) A smell that hinders breathingV (1mk) (ii) a smell that causes, coughing and/or sneezing. V (1mk) (iii) A gas which is insoluble in water V (1mk)	1 1 1	
		3	
6	(a) 	1 ½ 1½	Both must be correct V (½mk)

	(b) – **J** ion has the **largest cation** √ (½mk) – **Q** ion has the **smallest anion** √ (½mk) - No **electron –sharing between ions**√ (½mk)		
		3	
7	(a) $(C_2H_3)_n = 54$ $n(24 + 3) = 54$ $27n = 54$ $n = \frac{54}{27} = 2$ √ (½mk) $(C_2H_3)_2 = C_4H_6$√ (½mk) (b) – Alkynes √ (½mk) - Hydrocarbon Has –C ≡ C- √ (½mk) ***Or*** Triple Bond (c) 2-Chlorobut-I-ene  √ (1mk) ***OR***  √ (1mk) 2-Chlorobut-2-ene	½ ½ ½ ½ 1	Accept either of correct name structural formula not necessary
		3	
8	- Sodium chloride is // or immobile ions in **solid state**√ (1mk) - The melting point of Sodium **chloride is much higher** than **the temperature of the bunsen burner flame**√ (1mk)	1 1 1	
		3	
9	RFM $CaCO_3 = 40 + 12 + 48 = 100$ Moles of $CaCO_3 = {}^{1}/_{100} = 0.01$ √ (½mk) Moles of HCl = $\frac{0.25 \times 200}{1000} = 0.025$mol √ (½mk) $CaCO_3$: $HCl_{(aq)}$ 0.01mol : 0.020mol Mol. excess HCl = 0.0250 – 0.020 √ (½mk) = 0.005mol$HCl_{(aq)}$ √ (½mk) If 100cm^3 acidic solution = 0.005mol$HCl_{(aq)}$ 1000cm^3 acidic solution = $\frac{1000 \times 0.005}{100}$√ (½mk) = 0.05M$HCl_{(aq)}$ √ (½mk)		
		3	
10	- Mix With Cold Water, Sodium Carbonate Dissolves√ (½mk) - **Filter** off Lead (II) Chloride And Calcium sulphate as residue √ (½mk) - **Evaporate** to obtain sodium chloride - **Mix the residue** with hot water to dissolve Lead (II) chloride√ (½mk) - **Filter** off Calcium sulphate as a residue dry over dessicator - **Cool the filtrate** to precipitate Lead (II) chloride √ (½mk) - **Filter off residue** as Lead (II chloride and dry √ (½mk)	½ ½ ½ ½ ½ ½	
	-	3	

11	(a) Polychloroethene or Polyvinyl chloride √ (1mk) (b) Manufacture of:- packaging bags √ (½mk) - guttering for roofing materials √ (½mk)	1 1	
12	(a) $H_2SO_{4(aq)} + 2H_2O_{(l)} \longrightarrow 2H_3O^+_{(aq)} + SO_4^{2-}{}_{(aq)}$ or $H^+_{(aq)} + H_2O_{(l)} \longrightarrow H_3O^+_{(aq)}$ Manufacture of: - Ammonium sulphate fertilizer - Dyes - Explosives - Paints - Detergents - Pickling of metals - Car batteries, accumulators - Refining petroleum	1 1	Accept any one correct equation Accept any 2 correct answer
		2	
13	(a) Platinum Rod Does Not Form platinum ions in The Solution // Does Not Dissolve In the Electrolyte. √ (1mk) (b) Water Molecules Ionize $H_2O_{(l)} \longrightarrow OH^-_{(aq} + H^+$ Ions - Hydrogen ions $H^+_{(aq)}$ are discharged at the cathode to produce hydrogen gas ***Or*** - $2H^+_{(aq)} + 2e^- \longrightarrow H_{2(g)}$	1 1 1	
		3	
14	 ΔH + 886 = 405 + 2(286) √ (½mk) ΔH = 405 + 572 – 886 √ (½mk) ΔH = 977 – 886 = -91kJmol^{-1} √ (½mk)	1 ½ ½ ½ ½	Correct energy cycle √ (1mk) Correct sign or penalize √ (½mk)
		3	
15	(a) $H_2O_{(l)} + Cl_{2(g)} \longrightarrow HCl_{(aq)} + HOCl_{(aq)}$ (b) Sodium hychlorite √ (½mk) (c) All Sodium salts are soluble	1 1 1	
		3	
16	(a) $\frac{P_1V_1}{T_1} = \frac{P_2V_2}{T_2}$; $P_1 = 750$ $V_1 = 250$, $T_1 = 27 + 273 = 300k$ $P_2 = 750$, $T_2 = 41 + 273 = 311k$ $V_2 = \frac{P_1V_1T_2}{T_1 \times P_2} = \frac{750 \times 250 \times 311}{300 \times 750}$ √ (1mk) $= \frac{311 \times 5}{6}$ $= 259.167cm^3$√ (1mk) (b) The volume of a given mas of a gas at constant temeprature is inversely proportional to its pressure√ (1mk)	1 1 1	
		3	

17	- The red litmus paper changes to **<u>blue then to red</u>** √ (1mk) - Ammonium chloride decomposes into ammonia and - hydrogen chloride √ (1mk) - Ammonia gas diffuse faster than√ hydrogen chloride gas. √ (1mk) - Changes blue litmus paper to red √ 1/2	1 1 1	
		3	
18	(a) $H_2S_{(g)} + 2FeCl_{3(aq)} \longrightarrow 3FeCl_{2(aq)} + S_{(s)} + 2H^+_{(aq)}$ (b) -Pass excess gas, H_2S through ecess concentrated sulphuric acid √ (½mk) to absorb H_2S gas. o*r* $3H_2S_{(s)} + H_2SO_{4(l)} \longrightarrow 4S_{(s)} + 4H_2O_{(l)}$ - Hydrogen sulphide gas is poisonous √ (½mk) (c) - Pass H_2S **<u>through Lead (II) nitrate</u>** solution √ (½mk) - A black shinny solid precipitate is formed √ (½mk)	1 ½ ½ 1	
		3	
19	**Alkanes** | **Alkenes** Contain - C – C - √ (½mk) Or single carbon- carbon bonding only. | Contain at least one C = C √ (½mk) Double carbon –carbon bond (ii) **Alkanes** | **Alkenes** - presence of U.V light √(½mk) | - Both in U.V light and in the dark √ (½mk) - Substitution reaction √(½mk) | - addition reaction (½ mk) - A halogen alkane and hydrogen halide gas are formed.(½ mk) | - - one product – a halogen alkane only √(½mk) - decolourize bromine in the U.V light only √(½mk) | - decolourize bromine in the dark /absence of U.V light √(½mk)	1 2	Accept any two correct
		3	
20	E^θcell = -1.36 + 1.23 √(½mk) = -0.13V √(½mk) - E^θcell is negative at room temperature - Concentrated hydrochloric acid√ (½mk) and heat are used - To raise √ (½mk) the E^θcell so that the reaction √ (½mk) takes place	1 1 1	
		3	
21	(a) Spontenous disintegration of unstalbe nucleus, accompanied by emmision of radioactive radiations and heat. √ (1mk) (b) No. of t ½ = $^{80}/_{20}$ = 4 √(½mk) (c) $\frac{1}{(2)^4} = \frac{1}{16}$ √(½mk) $= \frac{7}{Q}$ √ (½mk) Q = 7 x 16 = 112g √(½mk)	1 2	
		3	
22	-Graphite has very high sublimation temperature which is above tempearutr of moving parts. √ (1mk) - Oil vaporizes and can ignite easily at its ignition temperature √ (1mk)	1 1	
		2	
23	- Blue litmus has no effect on alkaline and neutral substances√(½mk)	½	

	but changes red colour in acidic medium. √(½mk) - Red litmus paper has no effect on both neutral and acidic substance while changes to blue√ (½mk) in alkaline medium √ (½mk)	½ ½ ½	
		2	
24.	Moles $Cu_{(s)}$ = $\frac{1.27}{63.5}$ = 0.02mol √(½mk) $Cu^{2+}_{(aq)} + 2e^- \longrightarrow Cu_{(s)}$ 1.0 mol $Cu_{(s)}$ = 2 Farads 0.02mol Cu(s) = 0.02 x 2 = 0.04 Faradays √(½mk) Mol. G = $\frac{0.6}{60}$ = 0.01mol 0.01 mol. **G** = 0.04 Farad 1.0 mol. **G** = $\frac{1 \times 0.04}{0.01}$ √(½mk) = 4F √(½mk) 4 Farads deposit 1mole **G** *x* = +4 √(½mk)	½ ½ ½ 1 ½	
		3	
25	(a) Fused calcium oxide or Fused calcium chloride (b) (i) Hydrogen (ii) 	1 1 2	
		4	
26	- Heating a mixture of an ammonium salt and alkali√ (½mk) - Forward reaction is endothermic √ (½mk)	1 1	
		2	
27	- Aluminium ions are above hydrogen ions in the electro-chemical series √(½mk) - Hydrogen gas evolved instead aluminium deposited √(½mk) - Copper II ions below H^+ ions Cu^{2+} ions are dishcarged Copper is deposited at the cathode. √(½mk)	1 ½ ½	
28.	(a) Either $CH_{4(g)} + O_{2(g)} \longrightarrow CO_{2(s)} + 2H_2O_{(g)}$ $2C_2H_{6(g)} + 7O_{2(g)} \longrightarrow 4CO_{2(g)} + 6H_2O_{(l)}$ $C_3H_{8(g)} + 5O_{2(g)} \longrightarrow 3CO_{2(g)} + 4H_2O_{(l)}$ $2C_4H_{10(g)} + 13O_{2(g)} \longrightarrow 8CO_{2(g)} + 10H_2O_{(l)}$ (b) Yellow/orange √(½mk) // sooty Large, unsteady, unsteady √(½mk)	 1 ½ ½	Accept any one correct ½ for any other one correct

29	 Rate = $\frac{250 - 125}{100 - 20}$ √(½mk) = $\frac{125}{80}$ = $1.5625cm^3S^{-1}$ √(½mk) $\frac{\Delta y}{\Delta x}$ – shown on the graph ½ mk each (a) - increase concentaron of $HCl_{(aq)}$ √(½mk) – use powdered Zinc √(½mk)	½ ½ ½ x 2 1	Accept anyone correct