CHEMISTRY PAPER 1 FORM FOUR
MARKING SCHEME.

1. It is very hot.
   Does not from soot each ½ mks

2. R.A.M=35.5

   35.5= ¾ ×35 + ¼ × x (1mk)
   142=105 + x (1mk)

   X = 37 (1mk)

3. (a) ChloroHorocarbon (1mk)

   (b) When ozone layer is depleted high energy radiation reach the earth and may cause cancer to human beings. (1mk)

   (c) Global warming. (1mk)

4. (a) $NH_4NO_{3(S)} \xrightarrow{heat} N_2O_{(3)} + 2H_2O_{(3)}$ (1mk)

   (b) Over warm water, it's fairly soluble in cold water (1mk)

   (c) Both red blue litmus paper were not affected / did not change. (1mk)

5. $\frac{RS0_2}{R_G} = \frac{\sqrt{M_G}}{\sqrt{M\ SO_2}}$ 1mk

   $\frac{25}{26.26} = \sqrt{\frac{MG}{64}}$

   $M_G = \frac{25\ \sqrt{64}}{26.26}$ 1mk

   $= 7.6166$

   $M_G = 58$ 1mk

6. (a) Group I (½ mk)

   Period 6 (½ mk)

b. $2Y_{(S)} + CL_{2\,(g)} \longrightarrow 2YCL_{(s)}$ (1mk

7. $C_2H_3CL_3$

(Each 1mk)

8. $H_2SO_{4(aq)} + 2NaOH_{(aq)} \longrightarrow Na_2SO_{4(aq)} + 2H_2O_{(l)}$

Moles of KOH $\frac{30\times0.2}{1000}$

= 6/1000

=0.006 MOLES (1MK)

Moles of H_2SO_4 reacting ratio 1:2

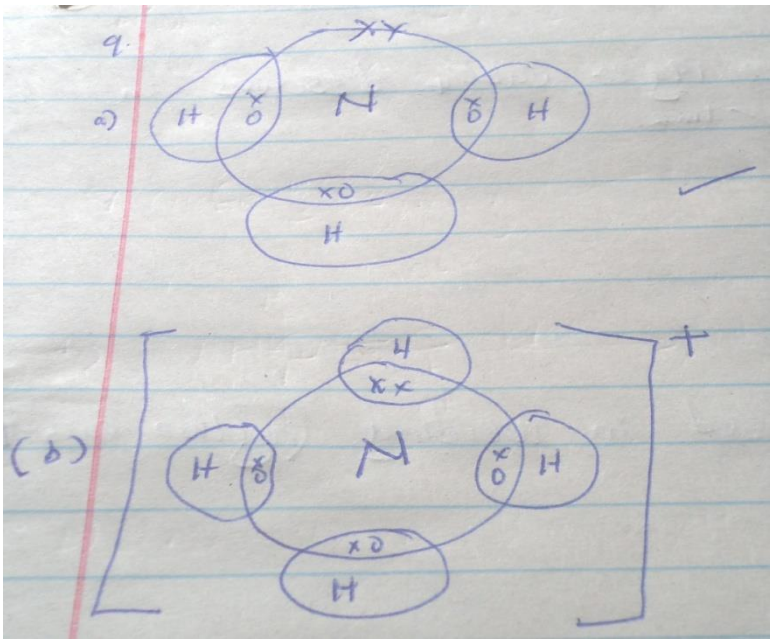
= moles of $H_2SO_4 = \frac{0.006}{2}$

= 0.003 moles (1MK)

$0.003 = \frac{0.6\times V}{0.6}$

= 3/0.6 = $5cm^3$ (1MK)

9.



	C	H	O	
10. % Composition	69.42	4.13	26.45	½ MK

R.A.M	12	1	16	
MOLES	5.785	4.13	1.653	½ MK
MOLES RATIO	$\frac{5.785}{1.653}$	$\frac{4.13}{1.653}$	$\frac{1.653}{1.653} = 1$	
	3.5	2.5		
Whole number ratio	3.5×2=7	2.5×2=5	1×2=2	½ mk

EF $C_7H_5O_2$ ½ MK

$(C_7H_5O_2)_n = 242$

$(84+5+32)_n = 242$

$121n = 242$

$n = 2$ (½ mk)

$MF = (C_7H_5O_2)_2$

$= C_{14}H_{10}O_4$ ½ MK

11. It means that a maximum of 19g of $cuso_4$ dissolves in 100g of water at 15^0c. 1mk

12. - Manufacture of $O_2Hcl_{(aq)}$
    - Manufacture of ammonia
    - Hardening of oils into fats.
    - In hydrogen flame which is used in welding (any two 1mk)

13. Add water to the mixture potassium chloride dissolves it is ionic while sulphure is molecular. Filter the mixture to obtain sulphure as residue and potassium chloride as filtrate. Evaporate the filtrate to obtain solid KCL.

14. Pale blue precipitate is formed. 1mk

b. Deep blue solution will be formed. 1mk

15. with water

$Mg_{(s)} + 2H_2O_{(l)} \rightarrow Mg(OH)_{2(aq)} + H_{2(g)}$ 1mk

With steam

$Mg_{(s)} + H_2O_{(g)} \rightarrow M_gO_{(S)} + H_{2(g)}$ 1mk

16. (a) Y 1mk

(b) Y and Z (1mk) because they have the same (1mk) number of protons but different number of neutrons.

17. (i) An element is a substance made of one kind of atom and cannot be split into simpler substance by chemical means. 1mk

(ii) Atomic number is the number of protons in an atom of an element.

(b) $Ti_2(SO_4)_3$

18. Anion SO_4^{2-} 1MK
    Cation Zn^{2+} 1mk

    $Ba^{2+}_{(aq)}$ $SO^{2+}_{4\,(aq)}$ $BaSO_{4\,(S)}$ 1mk

19. Sublimation 1mk

20. $Ca(OH)_2 + CO_{2\,(g)} \rightarrow CaCO_{3\,(S)} + H_2O$
    The white precipitate would dissolve due to formation of soluble calcium hydrogen carbonate. 1mk

21. 2, 2 –dimethylpropane.
    Pent-2-yne

22. Burning magnesium produces a lot of heat which breaks the bond between sulphur and oxygen in SO_2. Magnesium then uses the oxygen which was broken from sulphure to continue burning; a burning splint does not produce a lot of heat.

23. Yellow solid (sulphur) is deposited. 1mk
    $H_2s_{\,(3)} + 2FeCl_{3\,(aq)} \rightarrow 2Fecl_{2\,(aq)} + S_{\,(S)} + 2Hcl_{\,(aq)}$
    H_2s is oxidized to sulphur 1mk

24. This existence of an element in more than one form in the same physical state. 1mk
    Diamond 1mk
    Graphite 1mk

25. $2NH_{3\,(s)} + H_{2(l)}SO_4 \rightarrow (NH_4)_2\,SO_{4\,(aq)}$
    R.M.M of $(NH_4)_2\,SO_4 = 28+8+32+64$
    $=132$
    Moles required to produce 25kg
    25000g
    Moles $= \frac{25000g}{132} = 189.39$ moles 14mks
    Moles of H_2SO_4 required $=189.39$ moles
    R.M.M of $H_2SO_4 = 98$
    Mass $= 98 \times 189.39$ 1mk
    $=18560g$
    $=18.56kg$ 1mk

26. $6NaOH_{(aq)}\ 3Cl_{2\,(g)} \longrightarrow NaClO_3 + 5Nacl_{(aq)} + 3H_2O_{(l)}$
    Manufacture of bleaching agents.

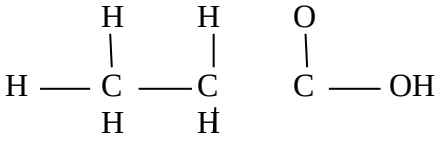
27. Methylbenzene is a non- polar compound hence hydrogen chloride in it does not ionize but exist as a molecule substance but in water hydrogen chloride ionizes to give H^+ and cl^- ions that's why it conduct electricity in water.

28. It is endothermic 1mk . This is because the products are heavy more than energy than the reactants. 1mk.

29. These are oxides which react with both acids and alkalis. 1mk
Al_2O_3, ZnO and Pbo. Any two

30. It would react with $HCl_{(g)}$ since it is basic and Hcl is acidic to form calcium chloride and water.
Concentrated H_2SO_4
Anhydrous calcium chloride.

31. (a) Propanoic acid 1mk



1mk

(b) Esters

32. (a) X^{2+} 2.8.8
Y^{2-} 2.8

(b) XY