**SET 8**

**233/1**

**CHEMISTRY**

**PAPER 1**

MARKING SCHEME

1. a.
2. Fractionating column; allow water vapour to condense into liquid and flow back to the flask before boiling point of water is reached. √1mk
3. Glass beads; - increase the surface area for condensation of water to take place. √1
	1. - Distillation of liquid Air in the manufacture of nitrogen and oxygen √1mk or

- Distillation of crude oil.

2.

1. R = 2.8.8.2 √ ½ mk

 S = 2 . 6 √ ½ mk

1. RO √1mk

 SCl2 √1mk

1. Moles of oxygen gas. = $\frac{0.83}{32}$

 = 0.02594 √1mk

 Moles of 2NaNo3 : O2

 2 : 1

 Moles of NaNo3 = 2 x 0.02594.

 = 0.05188 moles √ ½ mk

 Mass of NaNo3 = 85 x 0.05188

 = 4.4098g √ ½ mk

Mass of NaNo3 = 8.53 - 4.4098

 = 4.1202g

 % of NaNO3 = $\frac{4.1202 }{8.53}x 100\% $

 = 48.30% √1mk

1.
2. A = Non Luminous √1mk
3. When the air hole is closed. √1mk
4.
5. Double decomposition (precipitation ) √1mk
6. Ag+(aq) + Cl-(aq) AgCl(s) √1mk
7. Empirical formula

Compounds present : CuSo4 : nH2O

Mass present 3.2 1.8

R.F.M 160.5 18√1mk

No of moles $\frac{3.2}{160.5}$ $\frac{1.8}{18}$√ ½ mk

 0.02 : 0.1

Mole ratio $\frac{0.02}{0.02}$ : $\frac{0.1}{0.02}$√ ½ mk

 1 : 5

 E.F. CuSo4 . 5H2O √1mk

1. a) Ammonia gas does not burn in air thus did not ignite. √1mk

 b)

* + 1. The gas ignites with a green yellow flame √1mk
		2. 4NH3(g) + 3O2(g) → 2N2(g) + 6H2O √1mk
1.

+ √1mk

H

H

H

H

X

X

X

 √1mk

1.
2. Variety B √1mk
3. 5.5 – 6.5 soil PH √1mk
4. Add lime water which is basic for the soil PH to be neutral. √1mk
5. a ) Carbon (iv) oxide √1mk and water √1mk

b) Carbon √1mk and hydrogen √1mk

1.
2.
3. I mole of a gas occupy - 22.4dm3 at s.t.p

? - 11.2dm3 √1mk

$\frac{11.2 x 1}{22.4}$ = 0.5mol √1mk

1. 22.4dm3 → 64g/l

11.2dm3 → ?

$\frac{11.2 x 64}{22.4 }=32g $ √1mk

1.
2. Temporarily permanent change √1mk
3. Physical change √1mk
4. Permanent chemical change √1mk
5. I. C(s) + O2(g) → Co2(g)

 II. 2CO(g) + O2(g) → Co2(g)

1.
2. Iron (ii) sulphide √1mk
3. Fe(s)  + S(s) → Fes √1mk
4. A gas with rotten egg smell is produced √1mk
5. R.A.M = $\frac{ 54 x 6+ 56 x 92 + 57 x 2}{100}$ √1mk

= $\frac{324 + 5152 + 114}{100}$ √1mk

= $\frac{5590}{100}$

= $55.9$ √1mk

1. RSTQ √1mk increasing reactivity √1mk
2. * + 1. Ammonia gas does not burn in air. Thus it did not ignite. √1mk

b)

1. The gas ignites with green – yellow flame √1mk
2. 4NH3(g) + 3O2(g)  → 2N2(g) + 6H2O(g) √1mk
3.
4. a) Manganese (iv) oxide √1mk
	* + 1. Water √1mk
5. Oxy – hydrogen √1mk very hot flames for cutting of metal

Oxy – acetylene

1.
2. X – green copper (ii) carbonate changes to black copper (ii) oxide. √1mk

 Y – The colorless solution of limewater turns to a white ppt. √1mk

 heat

1. CuCo3(s) →  CuO(s) + CO2(g)  √1mk
2.
3. By use of universal indicator solution √1mk and compairing the colour obtained with the PH scale.
4. Basicity - 2 √1mk

 3 √1mk

22. a) Protons 18 √1mk neutrons 22√1mk

1. X : 2,8,8 √1mk

23. i) Yellow colour of chlorine turns to colourless √1mk and a purple vapour which solidifies at the bottom of the solution is formed.

ii) 2KI (aq) + Cl2(g) → 2KCl(aq) + I2(g)

 Chlorine is the oxidizing agent √1mk because its oxidation number changes form 0 to -1

24. i) Sublimation √1mk

 ii) Oxidation √1mk

 iii) Dehydration √1mk

25. i) U , T , S , R , Q , P √1mk

 Increasing atomic size

 ii) Both P and Q need to loose √1mk elements to become stable, therefore they cannot react to form a compound.

26. i) A yellow deposit of sulphur is observed and a white powder of MgO formed.

 ii) 2Mg(s)  + SO2(g) → 2MgO(s) + S(s) √1mk

27. a) A method used to separate coloured pigments. √1mk

 b) i) In the pharmaceutical industry √1mk to test purity of drugs.

 ii) In food industry to indentify contaminants in food and drinks. √1mk

 iii) In sports to identify substances e.g steroids in urine or blood samples. √1mk

28. i) X – Covalent bond √1mk

 Y – Hydrogen bond √1mk

 ii) Water has hydrogen bonds √ ½ mk other than the covalent bonds hence higher melting points than methane which

 has weak van-der waals √ ½ mk forces of attraction and require less energy.

29. Fe(s)  + CuSO4(aq) → FeSO4(aq + Cu(s)

 1mol 1mol

 Moles of iron used = $\frac{3.36}{56}$

 = 0.06moles √1mk

 Mole ratio of reaction

 Fe : Cu

 1 : 1√1

 Moles of Cu produced is 0.06.

 Thus mass of copper deposited

 = 0.06 x 63.5

 = 3.81g√1