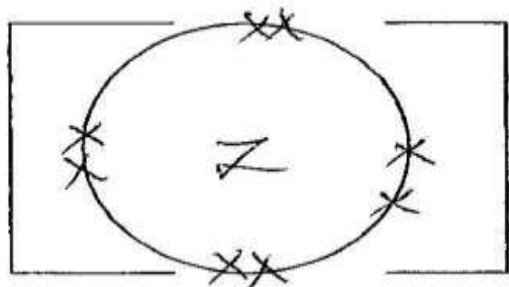**TERM TWO**

CHEM P2 FORM 3
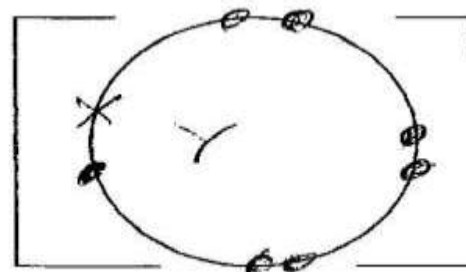
MARKING SCHEMES

a) 1.(a) Alkali metals

b) (i) GR_2 OR CO_2

c) (ii) covalent bond

d) Z – It has 4 energy levels hence its outermost electron is weakly held by the nucleus hence has greater tendency to lose electrons.

e) T_2O

f) T_2O_2

g) It is below P

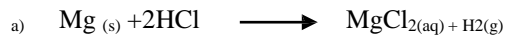h) Ionic radius of W is greater that of S. W has an energy 3 level while S has 2 energy levels.

i)

2.

a) $Mg_{(s)} + 2HCl \longrightarrow MgCl_{2(aq)} + H_{2(g)}$
b) Scale -1
c) Plotting – 1
    Curve – 1
d)
(i) $150 \pm 2cm^3$
(ii) $30cm^3$
e) $Mg_{(s)} + 2Hcl_{(aq)} \longrightarrow MgCl_{2(aq)} + H_{2(g)}$
    Mole ratio   1:2
    If $24,000cm^3 = 1$ mole
    Therefore $300cm^3 = \dfrac{300 \times 1}{24,000}$
                    $= 0.0125$ mole

    Moles = $\dfrac{mass}{Rmm}$

Rmm = $\dfrac{0.3}{0.0125}$

= 24g

3.
a)
   (i) Fractional distillation of liquid air
   (ii) Natural gas
      By product of crocking of long chain alkanes

b)
- Carbon (iv) oxide
- Sulphur (iv) oxide
- Dust particles

c) Temp – 500oC
    Pressure – 200 atmospheres

d) The compression enhances faster reaction between $N_{2(g)}$ and $H_{2(g)}$ hence increases high yield of Ammonia.

e) Iron to reduce wastage

f)
- As a fertilizer
- As a refrigerant
- Softening hard water
- Removal of greasy stains
- Manufacture of hydrazine used in rocket fuels

g) The black CuO turns to a red brown is related to Cu(s) by ammonia

h) $\dfrac{P1V1}{T_1} = \dfrac{P_2V_2}{T_2}$

    $V_2 = \dfrac{250 \times 200 \times 273}{293 \times 300}$

       = 155.29cm3

1.
a) A salt is a substance found when the Hydrogen ion of an acid is replaced directly or indirectly by a metal or ammonia ion.

b)
(i) Deliquescent self – is one which absorbs water for the atmosphere to form a solution.
    Hydroscopic salt – is one which absorbs water from the atmosphere but does not form solution.
(ii) Used as a drying agent.

c)
(i) Oxygen gas O_2(g0
(ii) Thermal decomposition

d) Add water to the mixture, Nacl dissolves while CuO does not. Filter and heat the filtrate to dryness then cool the Nacl crystals.

e)
(i) $Pb_2+(aq) + SO_4^{2-}{}_{(aq)} \longrightarrow PbSO_{4(s)}$
(ii) $Pb(NO_3)_2 + Na2SO_4 \longrightarrow PbSO_4 + 2NaNO_3$

    Moles of Pb: $\dfrac{3.4}{207} = 0.016425$

    Mole Ratio Pb: $PbSO_4$
            1:1
      Therefore moles of $PbSO_4$ = 0.16425
         Hence mass = 0.16425 x 303
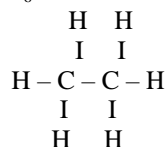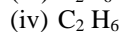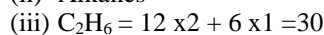   (Rmm = 207 + 207 + 32 + 64 = 303)
         Therefore mass = 4.9768g

2.
a)

(i)   2methylbustance
(ii) Pent -2 –ene
(iii) Propyne

b)
(i) $C_n H_{2n+2}$
(ii) Alkanes
(iii) $C_2H_6 = 12 \times 2 + 6 \times 1 = 30$
(iv) $C_2 H_6$

$$
\begin{array}{ccc}
 & H & H \\
 & | & | \\
H - & C - C & - H \\
 & | & | \\
 & H & H
\end{array}
$$

c)
(i)   Hydrogen chloride gas
(ii)   Hydrogen gas
(iii) Soda lime (sodium hydroxide)
(iv) $2C_2H_2 (g) + 5O_2(g) \longrightarrow 4CO_2 + 2H_2O(l)$
(v)   Polymerization
 d) $C_xH_y + \underline{3}O_2(g) \longrightarrow 1CO_2(g) + 1 H_2O(l)$

Mass 5028g   2.16g

Moles $\dfrac{5.28}{44} = 0.12$ $\dfrac{2.16}{18} = 0.12$

Mola Ratio = 1:1

Hence $C_xH_y \longrightarrow C_1H_2$ therefore EF $\longrightarrow CH_2$
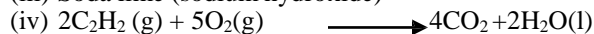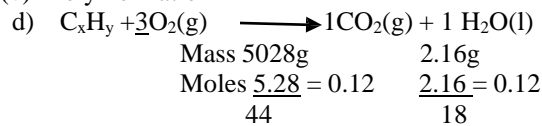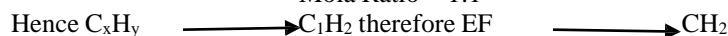
3.
a)   (a) $2Pb(NO_3)3(s) \longrightarrow 2PbO(s) + 4 No2(g)$
b)
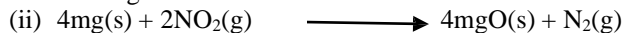(i)   Oxygen gas
(ii) Dinitrogen tetra oxide
c)   Nitrogen (IV) Oxide is easily liquefied
d)
-   H is red brown in colour
-   Has a pungent, irritating smell
-   It is denser than air
-   Is soluble in water
-   Is easily liquefied to form yellow N2O4
-   Is poisonous

e)
(i)   Burning Nitrogen Magnesium alit of heat which makes NO2 to dissociate to NO and O2 (g) which supports burning.
(ii) $4mg(s) + 2NO_2(g) \longrightarrow 4mgO(s) + N_2(g)$
f)   It should be prepared in a fume chamber or open space.
     This is because NO_2 (g) is poisonous.
g) $Pb(NO3)2(aq) + 2Nacl(aq) \qquad Pbcl2(s) + 2 NaNO3(aq)$
     Mole ratio   1;2
     Moles = $\dfrac{8.34}{278}$

     Therefore mass = $0.06 \times 58.5 = 3.51$
4.   A)
a)   Period 4
b) B^{3+} - 2.8 D^- - 2.8.8
c)   D
d)   C

e) D – Its melting point is – 101°C therefore at room temperature (25°C) it has already melted into a liquid.