Revision Unit 1
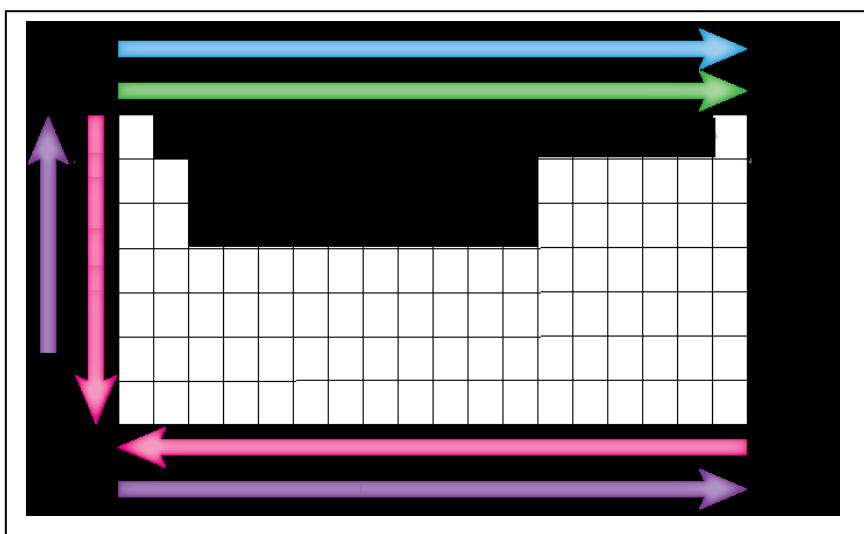
1) What is the percentage of carbon, by mass, in octane?

2) What is the empirical formula for a compound containing 38.8% carbon, 16.2% hydrogen and 45.1% nitrogen?

3) A compound was analysed and found to contain, 20.6% of oxygen, 15.5% carbon, 18.1% nitrogen and 45.8% chlorine, by mass. If its molar mass is 232.4 g/mol find its molecular formula

4) Draw the structural and semi-structural formulae of
   a) 2,3-dibromohex-3-ene
   b) 4-methylpentanoic acid

5) An atom "A" with atomic number 12 and an atom "B" with atomic number 17 react.
   a) What is the type of bond formed between them
   b) What is the formula of the compound that is formed between A and B?
   c) Describe the properties of this compound.

6) Complete the table below.

Molecular formula	Intra-molecular bonding	Inter –molecular bonding
CH_4		
CO_2		
Cl_2		
CH_3CH_2OH		

7) Place the following in order of increasing melting temperature. Give a reason
   i. $CH_3CH_2CH_2CH_3$
   ii. $CH_3CH_2CH_2\ OH$
   iii. CH_3OH
   iv.   NaCl

8) Write the formula for:
   a) sodium carbonate
   b) ammonium phosphate
   c) aluminium sulphate

9) Write balanced chemical equations for the following reactions.
   a) Combustion of hexane
   b) Aluminium metal reacts with oxygen gas
   c) Copper metal reacts with sulphuric acid to produce an ionic compound and hydrogen gas.

10) What trends could be represented by the coloured arrows? Select the colour that best describes the following characteristics.

a) Electronegativity _____

b) First ionisation energy_____

c) Atomic radius_____

d) Metallic character_____

11) Using structural formulae write balanced chemical equations for:

a. The addition reaction between gaseous propene and HCl gas.

b. The condensation reaction between propanol and butanoic acid.

12) Consider pure samples of bromine and iodine.

a. Describe the :

-intra-molecular bonding in each sample.

-inter-molecular bonding in each sample.

b. Which has the highest melting temperature? Explain why