CHAPTER -7 - ATOMS & MOLECULES

I. Short answers:

1. Give the difference between atoms and molecules.
2. Define (i) Mass number, (ii) Relative atomic mass, (iii) Relative molecular mass, (iv) Mole, (v) Molar volume, (vi) Avagadro Hypothesis, (vii) Atomicity, (viii) Isotones, (ix) Average atomic mass, (x) Gram atomic mass, (xi) Gram molecular mass and (xii) Vapour density.
3. What is a molecule?
4. What are homoatomic molecule? Give example.
5. What are heteroatomic molecule? Give example.
6. What are polyatomic molecule? Give example.
7. Give the applications of Avagadro's Law.
8. Formula for % composition.

II. Long answers:

1. Give the salient features of Modern Atomic theory.
2. Derive the relationship between Relative molecular mass and vapour density.

III. Problems:

1. Calculation of molar mass of the following.
   1) H_2O 2) CO_2 3) $Ca_3(PO_4)_2$
2. Calculation based on number of moles from mass and volume
   1) Calculate the number of moles in 46 g of sodium?
   2) 5.6 litre of oxygen at S.T.P
   3) Calculate the number of moles of a sample that contains 12.046×10^{23} atoms of iron?
3. Calculation of mass from mole of the following
   1) 0.3 mole of aluminium (Atomic mass of Al = 27)
   2) 2.24 litre of SO_2 gas at S.T.P
   3) 1.51×10^{23} molecules of water
   4) 5×10^{23} molecules of glucose ?
4. Calculation based on number of atoms/molecules.
   1) Calculate the number of molecules in 11.2 litre of CO_2 at S.T.P
   2) Calculate the number of atoms present in 1 gram of gold (Atomic mass of Au = 198)
   3) Calculate the number of molecules in 54 gm of H_2O?
   4) Calculate the number of atoms of oxygen and carbon in 5 moles of CO_2.
5. Calculation based on molar volume occupied by:
   1) 2.5 mole of CO_2 at S.T.P
   2) 3.011×10^{23} of ammonia gas molecules
   3) 14 g nitrogen gas
6. Calculation based on % composition of S in H_2SO_4