CHEQ 1094 EMPIRCAL FORMULAS

1. Quinine is 74.05% C, 7.46% H, 9.86% O and 8.63% N. Calculate its empirical formula.

2. Putrescine, a product of decaying flesh, is 54.50% C, 13.72% H and 31.78% N. What is its empirical formula?

3. Hydroxyl apatite, an important constituent of bones and teeth, is 39.895% Ca, 18.498% P, 41.406% O and 0.201% H. Calculate its formula.

4. Indigo, an important dye, is 73.25% C, 3.85% H, 10.7% N and 12.2% O.
   (i) Calculate the empirical formula of indigo.
   (ii) The molecular weight of indigo was found to be about 260 (± 5). Determine the molecular formula of indigo.

5. Vitamin C contains only carbon, hydrogen and oxygen atoms. Vitamin C is 40.92% C and 4.58% H and has a molecular weight of approximately 177. Determine the molecular formula of Vitamin C.

6. 8.26 g of calcium combine with nitrogen to form 10.19 g of a compound. Determine the empirical formula of the compound.

7. Thermal decomposition of 2.3527 g of $Na_2CO_3 \cdot nH_2O$ gave 0.8719 g of Na_2CO_3. Calculate the value of n (n is a whole number).

8. $CaSO_4 \cdot XH_2O$ is 20.91% H_2O by mass. Calculate the value of X (X is a whole number).

9. A 0.5826 g sample of $MSO_4 \cdot 7H_2O$ gave 0.2846 g of MSO_4 on heating. Calculate the atomic weight (molar mass) of the metal M and hence identify M.