

CHEMISTRY

Form III

Summer, 1965

*Answer ALL the questions in PART I and  
THREE questions from PART II.*

*Credit will be given for accurate diagrams and equations which help  
to answer the question.*

*PART I.*

1. State whether the following are element, compound or mixture:  
(a) ice, (b) diamond, (c) air, (d) limestone.
2. Give the name and formula of:—  
(a) an alkaline oxide, (b) an acid oxide, (c) a peroxide, (d) a neutral oxide.
3. For each of the metals (a) copper, (b) lead, give the name and formulae of *TWO* compounds, in which the valencies of the metals are different.
4. Calculate the percentage of water of crystallisation in sodium sulphite crystals,  $\text{Na}_2\text{SO}_3 \cdot 7\text{H}_2\text{O}$   
(Na = 23; S = 32; O = 16; H = 1).
5. Find the simplest molecular formula of a compound containing: potassium 26.53 per cent, chromium 35.37 per cent, the rest being oxygen.  
(K = 39; Cr = 52; O = 16).
6. Draw a diagram of the apparatus you would use to obtain pure water from sea water.

*PART II.*

7. Describe how you would prepare and collect (a) carbon monoxide, (b) carbon dioxide.  
Explain how one of these oxides is the cause of temporary hardness of water.

P.T.O.

8. Describe the action of sodium on water.  
Give details of (a) one other method of obtaining this gaseous product from water. (b) and one method by which it can be obtained from an acid.
9. Give the names and formulae of *THREE* compounds of nitrogen with oxygen and *ONE* compound of nitrogen with hydrogen. Describe the preparation of one of these compounds. Give *SEVEN* properties of it.
10. Define equivalent weight.  
Describe how you would determine the equivalent weight of a metal. 2 gm. of a metallic element gave 2.92 gm. of oxide. Calculate its equivalent weight.
11. Give a simple chemical test, one for each substance, which would enable you to distinguish between the following pairs of substances:—
  - (a) carbon monoxide and hydrogen.
  - (b) manganese dioxide and powdered charcoal.
  - (c) hydrogen chloride and sulphur dioxide.