

AN ROINN OIDEACHAIS
(Department of Education).

BRAINNSE AN MHEADHON-OIDEACHAIS
(Secondary Education Branch).

LEAVING CERTIFICATE EXAMINATION, 1936.

LOWER COURSE.

CHEMISTRY.

FRIDAY, 19th JUNE.—AFTERNOON, 4 P.M. TO 6 P.M.

(a) Not more than *six* questions to be attempted. All questions are of equal value.

(b) Chemical reactions should be expressed in words and represented by chemical equations.

(c) Answers should be illustrated by sketches wherever possible.

1. Give a brief account of the method by which Dumas or Morley determined the composition of water.

2. How may hydrochloric acid gas be prepared? Describe the properties of this gas and explain how its formula has been deduced.

3. What are the chief sources of nitric acid? Describe briefly one method of manufacturing nitric acid.

Starting from nitric acid, how would you obtain (a) nitrogen peroxide, (b) nitrous oxide, (c) potassium nitrite?

4. Give the chemical names and formulæ of the following substances: (a) washing soda, (b) baking soda, (c) red lead, (d) superphosphate.

Give methods for the manufacture of *any two* of the above substances.

5. Give a method for the manufacture of carbon dioxide and give a description of its properties. Mention the chief technical uses of carbon dioxide.

6. State Gay-Lussac's Law of Volumes. What effect had this law on the development of chemical theory?

7. How would you prepare ferrous sulphate?

How is ferrous sulphate acted on (a) by air and (b) by potassium permanganate and sulphuric acid. What volume of oxygen measured at 0° C. and 760 mm. pressure would be absorbed by a solution of 1 gram of anhydrous ferrous sulphate?

[Atomic weights Fe, 56; S, 32; O, 16.]

8. How is ethylene usually prepared and how does it act on bromine? What volume of oxygen would be required for the complete combustion of one cubic metre of ethylene and what volume of carbon dioxide would result?

9. Describe the properties of sulphur dioxide.

How would you demonstrate that sulphur dioxide contains its own volume of oxygen? How has the formula for the substance been deduced?

10. How is phosphorus manufactured? How may it be converted into red phosphorus? Draw up a table comparing the properties of red and yellow phosphorus. How are these two substances related to one another?

11. Write the formula for alum. From alum how would you obtain (a) alumina, (b) aluminium metal, (c) aluminium chloride?

12. How has the composition of the air been determined? Give some reasons for regarding air as a mixture and not a chemical compound.