AN ROINN OIDEACHAIS
(Department of Education).

BRAINSE AN MHEÁN-OIDEACHAIS.
(Secondary Education Branch).

LEAVING CERTIFICATE EXAMINATION, 1930.

HONOURS.

CHEMISTRY.

WEDNESDAY, 18th JUNE.—MORNING, 10 A.M. TO 12 NOON.

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

(*b*) Chemical reactions must be expressed in words, and represented by chemical equations.

(*c*) Chemical operations must be illustrated by sketches.

1. State Avogadro's Hypothesis. Assuming the volumetric composition of steam, show that the molecule of oxygen contains at least two atoms.

2. Describe an electrolytic (*e.g.* Castner) process for the commercial production of chlorine. What are the important bye-products of this manufacture ?

3. Describe, with all essential practical details, the method you would adopt to determine the equivalent weight of *either* silver *or* copper.

4. 1,000 c.c. of hydrogen chloride (at standard temperature and pressure) are passed into a litre of 1·2 deci-normal sodium hydroxide. Determine the weight of sodium chloride formed and the weight of sodium hydroxide left unattacked. (Na = 23 ; O = 16 ; H = 1 ; Cl = 35·5. Molecular Volume = 22·4 litres.)

5. Sketch and explain the apparatus you would employ to prepare a specimen of sulphur trioxide. Outline the contact method of manufacture of sulphuric acid.

6. An aqueous solution of a metallic salt gives a permanent white precipitate with excess of dilute hydrochloric acid. What tests would you employ to identify and confirm the metal present in the solution ?

7. If provided with an aqueous solution of acetic acid, describe how you would prepare from it, a sample of glacial acetic acid. State the structural formula of this acid.

8. A compound on analysis was found to have the following percentage composition :—Calcium, 31·25% ; Carbon, 18·75% ; Oxygen, 50·00%. Determine its empirical formula. Explain fully the method involved in the calculation. (Ca = 40 : C = 12 : O = 16.)

9. Atmospheric nitrogen is now being used for the commercial production of nitrogenous products. Describe as fully as possible any *one* method with which you are acquainted.

10. Give the names and formulae of four oxy-acids of phosphorus, and, starting with phosphorus, describe how any two of them may be prepared.