AN ROINN OIDEACHAIS
(Department of Education).

BRAINSE AN MHEÁN-OIDEACHAIS
(Secondary Education Branch).

LEAVING CERTIFICATE EXAMINATION, 1931.

PASS.

CHEMISTRY.

FRIDAY, 12*th JUNE*.—Afternoon, 4 p.m. to 6 p.m.

(*a*) Not more than *six* questions to be answered. 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. What volume of hydrogen, measured at 15° C. and 750 mm. pressure, is theoretically obtainable by dissolving 5 grm. of zinc in dilute sulphuric acid ? (Zn = 65 : a litre of hydrogen at standard temperature and pressure weighs ·09 grm.)

2. Describe the preparation and properties of sulphuretted hydrogen. What is the action of the gas on solutions of (*a*) lead nitrate, (*b*) copper sulphate ?

3. State the Law of Multiple Proportions. The oxides of a metal contain 70·0% and 77·7% of the metal, respectively ; determine if they conform to the law.

4. What is meant by the terms ' temporary hardness ' and ' permanent hardness ' as applied to water ? To what is the hardness in each case due ? How may the hardness of water be removed ?

5. You are provided with a number of jars of a gas which may be either oxygen, nitrous oxide, or nitric oxide. Give, in tabular form, the tests you would employ to determine which gas is present.

6. Explain the meaning of the following terms :— (a) oxidation, (b) reduction, (c) molecule, (d) base, (e) salt. Give one example in each case.

7. Describe the action of hydrochloric acid on (a) sodium carbonate, (b) iron, (c) potassium nitrite, (d) ammonia, (e) sodium sulphite. Give equations and name the products formed.

8. Describe laboratory methods for the preparation of carbon monoxide and carbon dioxide. How may each of these gases be converted into the other ?

9. How would you demonstrate the presence of (a) carbon, (b) hydrogen, (c) nitrogen in an organic compound ? Write the structural formulae of ethylene, and ethyl alcohol.

10. What is meant by a ' normal ' solution ? If provided with pure sodium bicarbonate, and a solution of sulphuric acid, describe fully how you would prepare a decinormal solution of the acid. ($Na=23$; $C=12$; $O=16$; $H=1$; $S=32$.)