AN ROINN OIDEACHAIS

(Department of Education).

BRAINSE AN MHEÁN-OIDEACHAIS

(Secondary Education Branch).

LEAVING CERTIFICATE EXAMINATION, 1926.

PASS

CHEMISTRY.

TUESDAY, 22nd JUNE.—MORNING, 10 A.M. TO 12 NOON.

Not more than *six* questions are to be attempted.

Illustrate your answers by diagrams wherever possible.

1. What is flame? Describe the construction of a Bunsen burner and the nature of the combustion in:—

(*a*) a jet of coal-gas burning from a circular orifice; and

(*b*) the flame of a Bunsen burner.

2. Explain the chemical changes that occur in (*a*) the burning of phosphorous and (*b*) the rusting of iron. Describe experiments to determine quantitatively the products of these changes.

3. Explain the causes of the hardness of water and the methods by which it may be removed. How may the total hardness of two samples of water be compared?

4. What is meant by the equivalent of a substance? Mention three common methods of determining equivalents.

Ten grams of a metal formed 13·427 grams of the chloride; what was the equivalent of the metal? (Atomic weight of chlorine = 35·5).

5. Describe the preparation and properties of (*a*) chlorine and (*b*) Hydrochloric acid gas; on what evidence is the formula H Cl. assigned to the latter?

6. How may sulphuretted hydrogen (hydrogen sulphide) be prepared from sulphur, and how may sulphur be prepared from hydrogen sulphide ?

When hydrogen sulphide is decomposed it yields its own volume of hydrogen ; the vapour density of hydrogen sulphide is 17, and the atomic weight of sulphur is 32. What is the formula of hydrogen sulphide ?

7. Describe the preparation of ethylene, and discuss the structure of the molecule of the gas.

8. How may the vapour density of a liquid be formed ?

In a Victor Meyer apparatus one quarter of a gram of an organic liquid expelled 71·2 c.c. of air at 15°C and 740 m.m. pressure. Find the molecular weight of the liquid.

9. Write a short account of the contributions to scientific knowledge made by any two of the following :—Dalton, Black, Priestley, Cavendish, Boyle, Davy, Dumas, Lavoisier.

10. Describe the preparation of ammonia gas. How could the strength of a solution of ammonia be estimated ?