

AN ROINN OIDEACHAIS
(Department of Education).

BRAINNSE AN MHEÁN-OIDEACHAIS
(Secondary Education Branch).

LEAVING CERTIFICATE EXAMINATION, 1934.

LOWER COURSE.

CHEMISTRY.

FRIDAY, 15th 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. What is meant by the chemical equivalent of an element? A stream of hydrogen was passed over 2 gr. of heated copper oxide. The residual copper weighed 1.597 gr. while the water produced weighed 0.453 gr. Calculate from these data the equivalents of copper and oxygen.

2. Explain the meaning of the terms "volumetric" and "gravimetric"; outline two experiments in each case to illustrate your answer.

3. How would you test (a) a solution containing sodium carbonate and sodium chloride for chloride, and (b) a solution of sodium carbonate and sodium sulphate for sulphate? Give equations for the reactions involved.

4. Manganese dioxide is said to act as a catalyst in the preparation of oxygen from potassium chlorate. Explain the meaning of this statement and suggest experiments which might be employed to verify it.

5. Explain the meaning of "allotropy" by reference to carbon. Give as many applications as you can of the allotropes of carbon.

6. If you were supplied with iron, sulphur, concentrated sulphuric acid and ordinary laboratory facilities, describe *in detail* how you would prepare sulphuretted hydrogen. Explain the principal application of this substance in the laboratory.

7. What salt is formed when nitric acid and sodium hydroxide interact? 50 c.c. of a solution of nitric acid was neutralized by 45 c.c. of a solution containing 60 gr. sodium hydroxide per litre. What weight of nitric acid was present in a litre of its solution?
 $H=1$; $N=14$; $O=16$; $Na=23$.

8. How would you prepare hydrochloric acid gas? What happens when the gas is passed over heated (a) zinc, (b) zinc oxide, (c) manganese dioxide? Give equations.

9. Give structural formulae for methane, ethylene, ethyl alcohol, acetaldehyde and acetic acid.

Describe a method for the preparation of *any one* of these substances.

10. Nitrogen and phosphorus are placed in the same group in the Periodic Classification.

Explain how such a grouping is justified.