AN ROINN OIDEACHAIS
(Department of Education).

BRAINNSE AN MHEADHON-OIDEACHAIS
(Secondary Education Branch).

LEAVING CERTIFICATE EXAMINATION, 1935.

FULL COURSE.

CHEMISTRY.

MONDAY, 17*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 with sketches wherever possible.

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1. How may sulphuretted hydrogen be prepared, and how may it be shown that it contains its own volume of hydrogen ?

2. How would you prepare and standardize a deci-normal solution of potassium permanganate ?

25 c.c. of a ferrous solution required on titration 20·3 c.c. of deci-normal permanganate. Find the weight of iron per litre of the ferrous solution.

$O=16$; $K=39$; $Mn=55$; $Fe=56$.

3. Give the formulae and mention one commercial application of each of the following : limestone, iron pyrites, Chile saltpetre, gypsum, rocksalt.

4. Compare the properties of chlorine, iodine, bromine, and those of their compounds with a view to classifying the elements in the same group in the Periodic Table.

5. Write down the empirical, molecular, and structural formulae for acetic acid.

How has the structural formula been established ?

6. If you were given a powdered mixture of barium sulphate, ammonium chloride, sulphur, and sodium chloride, how would you proceed to obtain a pure specimen of each constituent?

7. What are the formulae and common names of sodium carbonate and bicarbonate?

Give some purpose for which each is used in the household and explain the function of each.

8. How would you prepare dry ammonia?

State three properties of ammonia.

Give equations for the interaction of ammonia with (a) chlorine; (b) sulphuric acid.

9. Describe a process for the *commercial* production of hydrogen and give an important industrial application of the gas.

10. If you were given a mixture of the following gases confined over mercury, how would you proceed to ascertain approximately the proportion by volume of each gas in the mixture? Carbon monoxide; nitric oxide; hydrogen; carbon dioxide; nitrogen.

11. Give equations for interaction between the undermentioned substances, naming the products formed:

(a) manganese dioxide and hydrochloric acid;

(b) acetylene and oxygen;

(c) lead acetate and sulphuretted hydrogen;

(d) carbon monoxide and ferric oxide;

(e) chlorine and calcium hydrate;

12. State Dulong and Petit's Law.

1·00 gr. of a metallic oxide, when reduced in a current of hydrogen, gave 0·3375 gr. of water. Find the equivalent of the metal and its *exact* atomic weight.

Specific heat of metal = 0·119. $H = 1$; $O = 16$