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(Department of Education).

BRAINNSE AN MHEADHON-OIDEACHAIS
(Secondary Education Branch).

LEAVING CERTIFICATE EXAMINATION, 1935.

LOWER COURSE.

CHEMISTRY.

MONDAY, 17th 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. Write a concise account of the work carried out by Cavendish on the composition of atmospheric air.

How is the constancy of composition of the air maintained?

2. State Avogadro's Hypothesis and explain the meaning of the term gram-molecule.

The gram-molecular volume of a gas at S.T.P. is 22.4 litres. How many grams of ammonia are present in 100 litres of the gas measured at 26°C and 779 mms. pressure?

H = 1 ; N = 14.

3. Mention four fuels in common use. What are the constituents of fuels which render them useful for heating purposes? Explain the essential reactions taking place when fuels are burnt.

4. What do you understand by (a) the valency, and (b) the equivalent of an element ?

The iodide of a metal contains 76.5% of iodine. What is the equivalent of the metal ?

$$H = 1; I = 127.$$

5. Give equations for interaction between the following substances and name the products formed :—

- (a) carbon and carbon dioxide ;
- (b) sodium bicarbonate and hydrochloric acid ;
- (c) nitric acid and ammonia ;
- (d) zinc and oxygen ;
- (e) water and sodium.

6. If you were given the following substances separately in the form of powders, how would you proceed to identify each ?

- (a) copper oxide ; (b) charcoal ; (c) coal ; (d) manganese dioxide ;
- (e) iodine.

7. What do you understand by "saturated" and "unsaturated" compounds ?

Explain your answer by reference to ethylene and methane.

Describe the preparation of *one* of these gases.

8. What is meant by a hard water ?

What substances cause hardness ?

How may hard water be softened ?

9. Explain the meaning of allotropy, illustrating your answer by reference to sulphur.

10. What is the chemical nature of fat ?

How may soap be prepared from fat ?

11. Explain the meaning of the following terms and give a specific illustration in each case : (a) basicity ; (b) acid salt ; (c) fermentation ; (d) oxyacid ; (e) precipitation.

12. Describe a method for the preparation of nitric oxide and explain how this substance may be used for the production of nitric acid.