AN ROINN OIDEACHAIS

(Department of Education.)

LEAVING CERTIFICATE EXAMINATION, 1945.

CHEMISTRY.—PASS.

TUESDAY, 19*th JUNE*.—MORNING, 10 TO 12.

Not more than *six* questions to be answered.

Chemical changes should be expressed by equations as well as in words.

(Atomic weights: H; 1. C; 12. O; 16. S; 32. Ca; 40. Cu; 63. Gram-molecular volume: 22·4 litres.)

1. What is meant by the equivalent of an element?
Describe an experiment to determine the equivalent of magnesium.

2. Write an equation for the action of heat on chalk.
What volume of carbon dioxide, measured at 10°C and 720 mm. could be obtained by heating 5 grams of chalk?

3. Describe a method of preparation and the properties of hydrochloric acid.

4. Describe the action of heat on *any three* of the following:—

(*a*) copper nitrate;

(*b*) copper and strong sulphuric acid;

(*c*) Ammonium chloride and slaked lime;

(*d*) potassium chlorate;

(*e*) baking soda.

5. Give an account of the allotropes of carbon. How would you show that they are all merely different forms of carbon?

6. What is meant by the temporary hardness of water, and how does it originate in the water?
How may temporary hardness in water be removed?

7. How is nitrous oxide prepared? Give an account of the properties of nitrous oxide.

8. From sulphur, how would you prepare (*a*) sulphurous anhydride, (*b*) sulphuric anhydride and (*c*) sulphuric acid?

9. What is meant by water of crystallisation?
Crystalline copper sulphate contains 36·15% of water. Find the number of molecules of water of crystallisation in it.

10. Describe (with diagram and equation) a method for the preparation of nitric acid in the laboratory.
How does nitric acid act on copper?

11. Explain (with examples) the following terms: (*a*) catalysis, (*b*) acid, (*c*) base, (*d*) saturated solution, (*e*) supersaturated solution.

12. State the law of multiple proportions and show how it supports the atomic theory.