

AN ROINN OIDEACHAIS

(Department of Education)

LEAVING CERTIFICATE EXAMINATION, 1960.

CHEMISTRY.—PASS.

MONDAY, 20th JUNE.—MORNING, 10 TO 12.30.

Not more than six questions may be attempted.

A litre of hydrogen at S.T.P. weighs 0.09 gm.
Atomic weight : $O=16$.

1. Write the names and formulae for the oxides and hydroxides of iron and give an account of their properties.

Starting from iron, describe how you would prepare a sample of one of these substances.

[66 marks.]

2. Describe, with the aid of a sketch of the apparatus, how you would prepare from lead nitrate a reasonably pure sample of nitrogen peroxide and write the chemical equation for the reaction which takes place.

Give an account of the properties of nitrogen peroxide.

[66 marks.]

3. Define : (a) atomic weight, (b) equivalent weight, (c) valency. Describe fully how you would measure the equivalent weight of any named metal.

Outline what further work would be necessary to find the valency and the exact atomic weight of the metal.

[66 marks.]

4. Describe, with the aid of a sketch of the apparatus, how you would measure the molecular weight of a volatile liquid.

When 0.53 gm. of a liquid was evaporated, 160 c.c. of vapour, measured at S.T.P., were obtained. Calculate the molecular weight of the liquid.

[66 marks.]

5. Name the oxides of sulphur, write their chemical formulae and give an account of their properties. These oxides are said to be acid anhydrides. Give experimental evidence in support of that statement.

[66 marks.]

6. Write the names and formulae for the phosphoric acids and indicate the relationship between them.

Starting from phosphorus, describe how any one of these acids may be prepared and give an account of its properties.

[66 marks.]

7. Describe, with the aid of a sketch of the apparatus, how you would measure the gravimetric composition of water.

Ten litres of hydrogen, measured at 12°C. and at a pressure of 700 mm. of mercury, were burned in air. Calculate the mass of the water formed and, also, the mass of oxygen required for the combustion.

[67 marks.]

8. Describe, with the aid of a sketch of the apparatus, how dry ammonia may be prepared and collected in the laboratory.

Describe how you would measure the relative density of ammonia.

[67 marks.]

9. Name the products obtained when each of the following is heated and illustrate by means of a chemical equation, the change which takes place: (a) potassium nitrate, (b) crystals of ferrous sulphate, (c) a mixture of carbon and lead monoxide, (d) a mixture of ammonium chloride and sodium nitrite, (e) potassium permanganate.

[67 marks.]

10. Show by means of a diagram the structure of an atom of sodium.

Give an account of the properties of the following and mention two uses of each of them: (a) sodium hydroxide, (b) sodium chloride, (c) sodium nitrate, (d) sodium bicarbonate.

Starting from sodium, describe how you would prepare a reasonably pure sample of sodium nitrate.

[67 marks.]