

# AN ROINN OIDEACHAIS

(Department of Education).

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LEAVING CERTIFICATE EXAMINATION, 1952.

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## CHEMISTRY.—PASS.

WEDNESDAY, 18th JUNE.—AFTERNOON, 3 TO 5.

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Not more than *six* questions to be answered.

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

Atomic Weights: O=16; H=1.

The gram-molecular volume=22.4 litres.

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1. State the law of multiple proportions and show how it is explained by the atomic theory.

Three oxides of a metal contain 7.2, 9.39 and 13.44 per cent. of oxygen respectively. Show how these figures are in agreement with the law.

[66 marks.]

2. State Avogadro's Law.

Give reasons for assuming that the oxygen molecule contains two atoms.

[66 marks.]

3. When one gram of a metal was dissolved in dilute sulphuric acid, 422 c.c. of hydrogen measured dry at 17°C. and 760 mm. pressure were displaced.

Calculate the equivalent of the metal.

Describe a suitable apparatus for this experiment.

[66 marks.]

4. What experiments would you perform to find out whether a sample of water is hard or soft?

How does water acquire temporary hardness and how may it be removed?

[66 marks.]

5. Name the principal constituents of the atmosphere, and show how the weight of oxygen in a given volume of air may be determined.

[66 marks.]

6. What is meant by the vapour pressure of a liquid ?

Describe an experiment for the measurement of the vapour pressure of water at various temperatures.

What effect has increase in temperature on the vapour pressure of water ?

[66 marks.]

7. What happens when the following substances are exposed to the atmosphere :—(a) washing soda, (b) anhydrous calcium chloride, (c) solid sodium hydroxide, (d) quicklime ?

How would you confirm your answer experimentally in one case ?

[66 marks.]

8. "Chlorine is a product of oxidation of hydrogen chloride." Illustrate this statement by describing two different methods for the preparation of chlorine.

How does chlorine react with sulphurous acid ?

[66 marks.]

9. State what you know about the preparation and properties of (a) the oxides of lead, (b) the sulphates of iron.

[67 marks.]

10. Define base, alkali, hydroxide, giving two examples of each. Indicate how to prepare (a) sodium hydroxide from sodium carbonate, (b) ferric hydroxide from ferric chloride.

[67 marks.]

11. Describe the allotropes of sulphur.

Name two other elements which exhibit allotropy.

[67 marks.]

12. Describe the action of heat on (a) sal-ammoniac, (b) ammonium nitrite, (c) copper nitrate, (d) sodium bicarbonate, (e) potassium permanganate.

[67 marks.]