

**AN ROINN OIDEACHAIS**  
(Department of Education).

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LEAVING CERTIFICATE EXAMINATION, 1950.

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**CHEMISTRY.—PASS.**

THURSDAY, 15th JUNE.—MORNING, 10 TO 12.

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Not more than *six* questions to be answered. All the questions have the same value.

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

The gram-molecular volume = 22.4 litres.

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1. Describe, with a sketch of the apparatus, the preparation of nitrous oxide in the laboratory. Give an account of the properties of nitrous oxide.
2. State Dulong and Petit's Law.  
445.5 c.c. of hydrogen, measured at 27° C. and 750 mm., were liberated by dissolving one gram of a metal in dilute acid. If the specific heat of the metal was 0.11, calculate its exact atomic weight.
3. Describe, with a sketch of the apparatus, a method for the preparation and collection of chlorine in the laboratory.  
How does chlorine react with (a) aluminium, (b) sulphurous acid, (c) hydrogen sulphide, (d) slaked lime?
4. State Avogadro's Law.  
Give reasons for assuming that the molecule of hydrogen contains two atoms.
5. Describe how you would remove oxygen, carbon dioxide and water-vapour from ordinary air.  
How would you prove that the residual gas was free from these substances?
6. Describe the preparation of:
  - (a) sulphuric acid from sulphur dioxide,
  - (b) sulphur dioxide from sulphuric acid.

7. Describe briefly the preparation and the properties of :
- (a) the oxides of copper,
  - (b) the sulphates of iron.
8. How would you distinguish between the substances in each of the following groups :
- (a) sodium nitrate and sodium chloride,
  - (b) cupric oxide and ferrous sulphide,
  - (c) ammonium carbonate and ammonium chloride ?
9. State Graham's Law of Diffusion, and describe an experiment to show that gases diffuse at different rates.
10. Define vapour density.  
Describe a method for measuring vapour density.
11. Illustrate the differences between metallic and non-metallic elements by reference to the properties of iron and sulphur. Describe three tests to prove that the substance formed on heating a mixture of iron filings and sulphur differs from the original mixture.
12. Name three elements which exhibit allotropy, and describe the allotropes of one of them.