

# AN ROINN OIDEACHAIS

(Department of Education)

---

LEAVING CERTIFICATE EXAMINATION, 1961.

---

## CHEMISTRY.—PASS.

SATURDAY, 17th JUNE.—MORNING, 10 TO 12.30.

---

Not more than six questions may be attempted.

Atomic weights : C=12, O=16, Cl=35.5.  
Gram-molecular volume=22.4 litres.

---

1. What causes (i) temporary hardness, (ii) permanent hardness, in water ?

Describe how you would compare the hardness of two samples of water.

Describe a chemical method for the removal of permanent hardness from water.

[66 marks.]

2. Define : (i) element, (ii) compound, (iii) mixture.

Classify the following under the above headings, giving reasons for your answer : water, ordinary air, hydrogen.

[66 marks.]

3. Give an account of the preparation and properties of carbon dioxide.

Calculate the mass of carbon dioxide obtained by the complete combustion of 3 gm. of carbon.

[66 marks.]

4. Give an account of the properties of the *two* chief allotropes of phosphorus.

Describe how you would prepare (i) phosphorus pentoxide, (ii) ortho-phosphoric acid.

[66 marks.]

5. Give an account of the element calcium, with regard to its properties and its general chemistry. Give the chemical formulae for the calcium compounds you refer to in your answer.

[66 marks.]

6. Describe, with the aid of a sketch of the apparatus, how you would prepare and collect dry chlorine.

Give an account of the properties of chlorine.

What volume, at S.T.P., does 7 gm. of chlorine occupy ?

[66 marks.]

7. Describe the effect of heat on each of the following : (a) potassium chlorate, (b) lead nitrate, (c) ammonium chloride, (d) ammonium nitrite, (e) potassium nitrate, (f) crystalline copper sulphate.

[67 marks.]

8. Give an account of the preparation of nitrous oxide.

Compare and contrast the properties of nitrous oxide with those of oxygen.

[67 marks.]

9. Define : (i) chemical equivalent, (ii) molecular weight.

Describe fully how you would measure the chemical equivalent of zinc.

[67 marks.]

10. Write a short account of the structure of the atom. Refer in your answer to the atoms of at least three different elements.

[67 marks.]