

AN ROINN OIDEACHAIS

(Department of Education).

LEAVING CERTIFICATE EXAMINATION, 1954.

CHEMISTRY.—PASS.

WEDNESDAY, 16th JUNE.—AFTERNOON, 3 TO 5.

Not more than *six* questions to be answered.

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

Atomic Weights : Fe=56 ; S=32 ; O=16.

1. Define the chemical equivalent of an element.

Describe fully how you would measure the chemical equivalent of copper, and mention the precautions you would take to obtain a reasonably accurate result.

Write a note on the valency of copper, giving examples to illustrate your answer.

[66 marks.]

2. Describe, with a sketch of the apparatus, how you would prepare a few gas jars of nitrogen from atmospheric air. What is the chief impurity in nitrogen prepared in that way?

Describe how you would prepare pure nitrogen and given an account of its properties.

[66 marks.]

3. Give an account of the properties of the allotropic modifications of carbon.

Describe how you would prepare (a) carbon dioxide from carbon, and (b) carbon monoxide from carbon dioxide. Mention one industrial use of each of those oxides.

[66 marks.]

4. Describe, with a sketch of the apparatus, how you would prepare and collect sulphuretted hydrogen, and give an account of its properties.

Describe how you would show that it contains hydrogen and sulphur.

[66 marks.]

5. Starting with calcium, describe how you would prepare a reasonably pure sample of each of the following:—(a) quicklime, (b) slaked lime, (c) chalk, (d) calcium chloride, (e) calcium sulphate. Give a brief account of the properties of those substances.

[66 marks.]

6. Describe fully, with a sketch of the apparatus, how you would prepare dry hydrogen and pass it over heated cupric oxide.

Describe how that experiment could be used to find the gravimetric composition of water. Explain how it may be deduced from the gravimetric composition of water that a molecule of it contains at least two hydrogen atoms.

[66 marks.]

7. What is meant by vapour density ?

Describe fully, with a sketch of the apparatus, how you would measure the vapour density of a volatile liquid such as ether.

[67 marks.]

8. Give an account of the preparation and properties of the oxides and chlorides of iron.

What weight of iron would be required to make 10 gms. of crystalline ferrous sulphate ($\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$) ?

[67 marks.]

9. Give an account of the preparation and properties of sulphur dioxide, and describe an experiment to show that any volume of it contains its own volume of oxygen.

[67 marks.]

10. Describe, with sketch of the apparatus, how you would prepare and collect chlorine gas in the laboratory. Give two examples to show that chlorine acts as an oxidising agent and explain how the oxidation occurs.

How did it happen that for some time after its discovery chlorine was thought to be a compound ?

[67 marks.]