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M.53

# LEAVING CERTIFICATE EXAMINATION, 1962

CHEMISTRY — PASS

MONDAY, 18th JUNE—Morning, 10 to 12.30.

Not more than six questions may be attempted.

Atomic weights:- C = 12, N = 14, O = 16.
Gram-molecular volume = 22·4 litres.

1. Describe, with the aid of a sketch of the apparatus, how you would prepare and collect nitrogen from atmospheric air. Mention the impurities in nitrogen prepared in this way.
Describe how you would prepare pure nitrogen and give an account of its physical and chemical properties. (66 marks.)

2. In the case of each of the following give an account of the appearance and properties of the substance and describe what happens when it is exposed to the atmosphere:- (i) anhydrous copper sulphate, (ii) anhydrous calcium chloride, (iii) washing soda, (iv) concentrated sulphuric acid. (66 marks.)

3. Define (i) chemical equivalent, (ii) atomic weight, (iii) atomic number.
State Dulong and Petit's Law.
When 0·51 gm. of a metal was heated in air 0·635 gm. of the oxide was obtained. If the specific heat of the metal is 0·09, find (i) the valency of the metal, (ii) the atomic weight of the metal. (66 marks.)

4. Describe, with the aid of a sketch of the apparatus, how you would prepare dry hydrogen, pass it over heated cupric oxide, and collect and weight the product formed.
Show how this experiment may be used to measure (i) the chemical equivalent of copper, (ii) the composition of water. (66 marks.)

5. Describe the preparation and properties of the allotropes of sulphur.
Name two other elements which show allotropy and mention their chief allotropes. (66 marks.)

6. Describe two different methods by which sulphur dioxide may be prepared.
Give an account of the properties of sulphur dioxide. Mention one of its uses. (66 marks.)

7. Describe how you would prepare and collect nitric oxide and give an account of its properties.
Describe how you would show that nitric oxide contains (i) nitrogen, (ii) oxygen.
Show by means of a diagram the structure of (i) an atom of nitrogen, (ii) an atom of oxygen. (67 marks.)

8. Describe fully how you would measure the molecular weight of any compound you name. (67 marks.)

9. Make a simple comparison between the chemistry of nitrogen and that of phosphorus.
Describe the properties of any acid which contains (i) the element nitrogen, (ii) the element phosphorus. (67 marks.)

10. Describe how you would prepare and collect carbon monoxide and give an account of its properties.
Calculate the mass of (i) carbon, (ii) oxygen, in 10 litres of carbon monoxide at S.T.P. (67 marks.)