

LEAVING CERTIFICATE EXAMINATION, 1963.

CHEMISTRY - PASS

TUESDAY, 18th JUNE - Morning, 10 to 12.30.

Not more than six questions may be attempted.

Atomic weights:- H = 1, C = 12, O = 16, Na = 23, S = 32, Cl = 35.5, Ca = 40, Cu = 63.5.

Gram-molecular volume = 22.4 litres.

1. Describe, with the aid of a sketch of the apparatus, how you would prepare and collect dry ammonia.
Give an account of the properties of ammonia.
What products are formed when dry ammonia is passed over heated copper oxide ?
(66 marks.)
2. Outline the properties of carbon dioxide.
Describe what happens when carbon dioxide is passed (i) over strongly-heated carbon, (ii) into lime-water.
0.45 gm. of a sample of impure calcium carbonate on treatment with excess dilute hydrochloric acid liberated 97 c.c. of carbon dioxide at 18°C. and at a pressure of 750 mm. of mercury. Find the percentage purity of the sample.
(66 marks.)
3. Give an account of the preparation and properties of hydrogen sulphide.
What is the effect of the gas on (a) sulphur dioxide, (b) chlorine water, (c) acidified potassium permanganate solution ?
(66 marks.)
4. How does phosphorus occur in nature ?
Outline the properties of the two common allotropes of phosphorus.
Name two oxides and two acids of phosphorus and indicate the preparation of the compounds you have named.
(66 marks.)
5. Define (i) equivalent weight, (ii) atomic weight, and state the relation between them.
Describe how you would measure (a) the equivalent weight of zinc, (b) the exact atomic weight of zinc.
(66 marks.)
6. Describe fully, with the aid of a sketch of the apparatus, how you would prepare and collect nitrogen peroxide (nitrogen dioxide) and give an account of its properties.
Write an equation which shows that nitrogen peroxide is an oxidising agent.
Give the name and formula for each of two other oxides of nitrogen.
(66 marks.)
7. Starting with copper, show how you would prepare a reasonably pure sample of crystalline copper sulphate.
Calculate the percentage of water of crystallisation in crystalline copper sulphate.
Briefly outline how copper may be obtained from (a) copper oxide, (b) copper sulphate solution.
(67 marks.)
8. (i) What products are formed when each of the following is heated:-
(a) potassium chlorate, (b) ammonium nitrate, (c) calcium carbonate, (d) sodium bicarbonate, (e) crystalline ferrous sulphate ? Give a chemical equation for each of these reactions.
(ii) What is the action of water on (a) sodium, (b) sulphur dioxide, (c) calcium oxide ?
(67 marks.)
9. Describe fully, with the aid of a labelled diagram, an experiment on the electrolysis of water.
Show how the formula for water may be deduced from this experiment.
(67 marks.)
10. Write notes on each of the following:- (a) electron, (b) proton, (c) neutron, (d) atomic number.
Show, by means of a diagram, the structure of (i) an atom of sodium, (ii) an atom of chlorine.
(67 marks.)