

# AN ROINN OIDEACHAIS

(Department of Education).

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LEAVING CERTIFICATE EXAMINATION, 1953.

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## CHEMISTRY.—PASS.

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

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Not more than *six* questions to be answered.

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

Atomic weights : Ca=40 ; C=12 ; O=16.

The gram-molecular volume=22.4 litres.

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1. Describe the action of heat on the following :

- (a) copper nitrate,
- (b) crystals of ferrous sulphate,
- (c) potassium chlorate,
- (d) ammonium bicarbonate,
- (e) concentrated hydrochloric acid,
- (f) chalk.

[66 marks.]

2. State Dulong and Petit's law.

Describe fully how (a) the equivalent, and (b) the exact atomic weight of magnesium may be measured.

[66 marks.]

3. Describe, with the aid of a diagram, how dry ammonia may be prepared and collected in the laboratory.

State what may be observed when dry ammonia is passed over hot cupric oxide. What information regarding the composition of ammonia may be obtained from that experiment ?

[66 marks.]

4. Describe, with a sketch of the apparatus, how dry hydrogen chloride may be prepared in the laboratory.

What products are obtained when dry hydrogen chloride is passed over (a) hot sodium, (b) hot zinc oxide, (c) hot manganese dioxide, and how may they be identified? Illustrate the reactions which take place by means of chemical equations.

[66 marks.]

5. Give a full account of how a reasonably pure sample of each of the following may be prepared from lead: (a) lead nitrate, (b) lead carbonate, (c) lead peroxide.

Give an account of the properties of lead nitrate and of lead carbonate.

[66 marks.]

6. Describe the allotropes of phosphorus.

How may it be shown that they are allotropes and how may each of them be obtained from the other? Mention one industrial use of phosphorus.

[66 marks.]

7. Calculate the volume of gas measured at 15° C. and at a pressure of 720 mm. of mercury which could be obtained by dissolving 5 gms. of pure calcium carbonate in hydrochloric acid.

[67 marks.]

8. Starting with sodium, describe how a reasonably pure sample of each of the following may be prepared and give an account of their properties: (a) caustic soda, (b) sodium chloride, (c) crystals of sodium carbonate.

[67 marks.]

9. Describe how sulphur dioxide may be prepared from (a) sulphuric acid, (b) sulphur, and give an account of its physical properties.

Give an account of the action of sulphur dioxide on the following and illustrate your account with chemical equations: (i) water, (ii) a solution of sodium hydroxide in water, (iii) hydrogen sulphide, (iv) lead peroxide.

[67 marks.]

10. Describe the preparation and properties of nitrous oxide.

How may it be shown that any volume of nitrous oxide contains its own volume of nitrogen? What additional information would be required to ascertain the volume composition of nitrous oxide?

[67 marks.]