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(Department of Education).

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(Secondary Education Branch).

LEAVING CERTIFICATE EXAMINATION, 1940.

PASS.

CHEMISTRY.

WEDNESDAY, 19*th JUNE*.—Afternoon, 4 p.m. to 6. p.m.

(*a*) Not more than *six* questions to be attempted. All questions are of equal value.

(*b*) Chemical reactions should be expressed in words *and represented by chemical equations*.

(*c*) Answers should be illustrated by sketches wherever possible.

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1. What is meant by the chemical equivalent of an element ?

What experiment would you perform to determine the equivalent of zinc ?

2. Explain the following terms, illustrating your answer by *one* suitable example in each case :—

   (*a*) Efflorescence, (*b*) molecule, (*c*) anhydride, (*d*) oxyacid.

3. Give the chemical names and molecular formulae of any *four* of the following :—

   (*a*) Nitre, (*b*) quicklime, (*c*) baking soda, (*d*) green vitriol, (*e*) litharge, (*f*) bluestone.

   Give an account of an experiment in which any *one* of the above substances is used.

4. How may nitrogen be prepared in the laboratory ?

   Summarise the properties of the gas.

   Name *two* important compounds of which nitrogen is a constituent.

5. Calculate the percentage composition, by weight, of pure sulphuric acid.

What is the basicity of sulphuric acid ?

Give the names and molecular formulae of the sodium salts of sulphuric acid.

($H=1$, $O=16$, $S=32$.)

6. Describe the laboratory preparation of nitric acid.

Nitric acid is said to be a strong acid and an energetic oxidizing agent. Give examples to illustrate these characteristics.
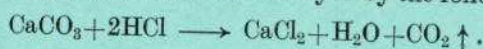
7. What is a " solubility curve " ?

How may the solubility of potassium nitrate in water at $35°$ C. be determined ?

8. Compare and contrast the properties of two oxides of carbon.

9. What is meant by (a) a saturated hydrocarbon, (b) an unsaturated hydrocarbon, (c) a substitution compound, (d) an addition compound ? Give examples to illustrate your answers.

10. State fully the information conveyed by the following equation:
$$CaCO_3 + 2HCl \longrightarrow CaCl_2 + H_2O + CO_2 \uparrow .$$
($H=1$, $C=12$, $O=16$, $Cl=35·5$, $Ca=40$. Gram-molecular volume of a gas $=22·4$ litres at S.T.P.).

11. What is (a) an empirical formula, (b) a molecular formula, (c) a structural formula ?

Write the empirical, molecular, and structural formulae of acetic acid.

Write, also, the structural formula of potassium acetate.

12. How may chemical compounds be distinguished from mixtures ?

Which of the following are true compounds :—

(a) Coal gas, (b) beet-sugar, (c) air, (d) water, (e) washing soda ?