

**AN ROINN OIDEACHAIS**  
(Department of Education).

**BRAINNSE AN MHEADHON-OIDEACHAIS**  
(Secondary Education Branch).

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INTERMEDIATE CERTIFICATE EXAMINATION, 1938.

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LOWER COURSE.

**SCIENCE (Syllabus A).**

MONDAY, 20th JUNE.—AFTERNOON, 4 TO 6 P.M.

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[Not more than *six* questions to be attempted. All questions carry equal marks. Illustrate your answers wherever possible.]

1. Explain briefly the action of:—

- (a) the syphon;
- (b) the hydrometer.

2. What do you understand by specific gravity?

An empty specific gravity bottle weighs 22.64 gm. Filled with water it weighs 72.46 gm., and filled with another liquid its weight is 62.50 gm.

What is the specific gravity of this liquid?

3. What is a barometer?

Describe a mercury barometer.

How does the reading of a barometer enable us to calculate the pressure of the atmosphere?

4. Distinguish between conduction, convection, and radiation of heat, and give an example of each that occurs in your everyday experience.

5. Describe the processes of evaporation and boiling.

How is the boiling point of a liquid affected by changes of pressure?

Describe experiments in illustration of your answer.

6. Explain why a mercury thermometer can measure temperature.

How are the scales on (a) the Fahrenheit, (b) the Centigrade thermometer determined?

Convert 90°C. to the Fahrenheit scale.

7. What do you understand by the expression "chemical equivalent of an element"?

0.35 gram of a metal on dissolving in hydrochloric acid liberated 340 c.c. of hydrogen at 13°C. and 740 mm.

Calculate the equivalent of the metal. 1 litre of hydrogen at S.T.P. weighs 0.09 gm.

8. How is hydrogen usually prepared?

Make a sketch of the apparatus.

What are the chief properties of the gas?

What is the oxide of hydrogen?

9. What do you understand by:—

(a) physical change;

(b) chemical change;

(c) indestructibility of matter;

(d) water of crystallisation;

(e) the law of constant composition?

Give one example in each case.

10. State the "Triangle of Forces".

A weight of 20 lbs. is attached by means of a string to a fixed point.

Make a drawing showing the angle which the string makes with the vertical when the weight is pulled aside by a horizontal force of 15 lbs. weight and calculate the tension on the string.

11. Define:—

(a) force;

(b) work;

(c) stable equilibrium;

(d) friction;

(e) centre of gravity.

12. State the "Principle of Moments".

A plank 17 feet long rests on a horizontal surface and projects 7 feet over the edge. A weight of 20 lbs. rests on the plank 5 feet out from the edge, and the plank is then just in equilibrium.

What is the weight of the plank?