AN ROINN OIDEACHAIS
(Department of Education).

BRAINSE AN MHEÁN-OIDEACHAIS
(Secondary Education Branch).

INTERMEDIATE CERTIFICATE EXAMINATION, 1930.

SCIENCE (Syllabus B).

WEDNESDAY, 18th JUNE.—MORNING, 10 A.M. TO 12 NOON.

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

1. Describe the differences between sea-water, rain-water, spring-water, and distilled-water. [35 marks.]

2. Make drawings to show the structure of a rain-gauge. Assume certain measurements for the apparatus and show how the rainfall of a district is calculated. [35 marks]

3. The arms of a lever are 4 inches and 4 feet, and it is found that to overcome a resistance of 120 lbs. wt. a force of 10.3 lbs. wt. must be exerted, some of the work done being lost in friction. What fraction of the work done is lost? [35 marks]

4. A quantity of ice at minus 10° C. is gradually heated until steam is formed. Describe the changes in volume which occur. [35 marks]

5. Describe the experiments you would perform in order to show the conditions necessary for the rusting of iron. [50 marks]

6. Substances are said to gain in weight when burned—discuss this. How do you account for the total disappearance of a burning candle? Why does a candle quench when air is blown on the flame? [50 marks]

7. Describe the action of an acid on a metal, giving an actual example. What proof have you that this is not a case of ordinary solution? How can it be shown that plants produce some acid substances? [50 marks]

8. Three bean seeds of equal weight are germinated. One of the seedlings is then kept in darkness for two weeks, another is exposed to sunlight in an atmosphere of oxygen, and the third is exposed to sunlight in ordinary air. Explain how these various conditions affect the quantity of dry matter in the seedlings at the end of the experiment. [50 marks]

9. Describe briefly the formation and principal characteristics of any rock in the district in which your school is situated. (Give the name of the district at the head of your answer.) [50 marks]

10. The volume of a cube of wood lighter than water is determined by measurement. Describe in detail how you would confirm your answer by using the Principle of Archimedes. [50 marks]

11. A loaded test-tube sinks 16.8 c.ms. in water and 15 c.ms. in brine. What is the density of the brine? Make a drawing of a lactometer showing how you would graduate it. [50 marks]

12. Explain the following facts :—

(*a*) When a flask of water is suddenly heated the level of the water falls.

(*b*) Beakers containing equal weights of mercury and water placed upon a hot plate for the same length of time do not reach the same temperature.

(*c*) On a cold evening moisture is deposited on the inside of the windows of a warm living room.

[50 marks]