

# AN ROINN OIDEACHAIS

(Department of Education).

## BRAINSE AN MHEÁN-OIDEACHAIS

(Secondary Education Branch).

**INTERMEDIATE CERTIFICATE EXAMINATION, 1926.**

### SCIENCE (Syllabus A).

TUESDAY, 22nd JUNE.—MORNING, 10 A.M. TO 12 NOON.

Not more than *six* questions are to be attempted.

Sketches should be made where necessary.

1. You are given a prism whose base is an irregular figure. How would you measure (a) the area of the base; (b) the height of the prism? If from these measurements you calculated the volume, how would you check your result by experiment?

2. How would you set up apparatus in order to measure the extensions produced in a spiral spring by the suspension from it of weights? With such an apparatus the following results were obtained:—

Weight suspended } }	10	20	50	70	100	150	200	grams
Extension produced } }	.8	1.4	4.5	10.2	19.0	33.5	48.3	mm.

Plot a graph of these results and state what you can deduce from it.

3. When the rubber tubing attached to the gas supply is immersed vertically in a beaker of water it is found that the gas will not issue if the open end is more than  $2\frac{1}{2}$  inches under the surface of the water. If the atmospheric pressure is normal, what is the pressure exerted by the gas?

[The relative density of mercury is 13.6.]

4. What do you understand by the "Latent Heat of Steam"? Describe an experiment to determine its value, and explain how the experimental results are used in the determination.

5. Define "Coefficient of Linear Expansion."

If the coefficient for steel—using the Centigrade scale of temperature—is  $.000011$ , by how much does a 40 foot steel rail change in length between midsummer and midwinter if the extreme range of temperature is  $45^{\circ}\text{C}$ . (Suggest appropriate temperatures to give this range).

6. From a wet mixture of sand and salt you are requested to get clean dry specimens of each and also some water free from either. Describe exactly how you would proceed.

7. You are given some nitric acid and some potassium carbonate. How would you proceed in order to obtain some neutral crystals of potassium nitrate?

8. Describe the preparation of Nitric Oxide. Compare, in tabular form, its properties with those of Hydrogen and Chlorine.

9. How would you find the position of the Centre of Gravity of a flat piece of cardboard? Explain the reasons for your way of doing it.

10. What is a lever? What is its fulcrum? Give two instances of levers in ordinary use, one with its fulcrum at the end and the other with the fulcrum not at the end. What advantage is gained by the use of the lever in each case?