AN ROINN OIDEACHAIS.

(Department of Education).

INTERMEDIATE CERTIFICATE EXAMINATION, 1945.

SCIENCE (Syllabus D).

TUESDAY, 19th JUNE.—MORNING, 10 TO 12.

[Not more than *six* questions to be attempted of which *three* must be taken from Section I, and *three* from Section II. Illustrate your answers wherever possible. All questions are of equal value.]

SECTION I.

1. Describe an ordinary household spring balance and tell how it works.

Give a full account of a laboratory experiment to demonstrate the law on which its working is based.

2. Describe, with the aid of a diagram, how you would use a laboratory balance to weigh an object in a given liquid.

An object weighs 34·40 grms. in air and 30·01 grms. in water and 29·88 grms. in milk. Calculate the volume of the object and the density of milk.

3. A tube, open at both ends, is held in a vertical position with one end under water. Explain (*a*) why water rises in the tube when the top end is sucked, (*b*) why the water remains in the tube when the suction is stopped and the top end immediately closed with the finger, (*c*) why it is more difficult to suck mercury up to the same height as the water, (*d*) why it is impossible to completely fill the tube in this manner if the tube be more than a certain length?

4. What do you understand by boiling?

Describe with the aid of a diagram how you would find out by experiment the boiling point of a given liquid.

Explain the difficulty of cooking at high altitudes and describe how the difficulty may be overcome.

5. Explain what is meant by each of the following and give one suitable example in each case to illustrate your answer:—(*a*) conduction of heat, (*b*) convection of heat, (*c*) latent heat.

Explain (i) how the water in a lake loses heat as the weather gets colder, (ii) why ice forms on the surface and not at the bottom.

Section II.

6. Mention the properties of the two principal gases in ordinary air and describe in detail how you would prepare and collect samples of any *one* of them in the laboratory.

State the main differences between ordinary air and breathed air, and explain how the differences you mention are caused.

7. Explain the action of (*a*) soap in washing, (*b*) bread soda in baking.

How would you make a sample of soap in the laboratory?

8. Describe, with the aid of a diagram, how you would prepare and collect hydrogen in the laboratory.

How would you show that the gas is (*a*) lighter than air, (*b*) a constituent of water?

9. Draw a diagram to show the position, shape and relative sizes of the following organs of the body: (*a*) the stomach, (*b*) the pancreas, (*c*) the kidneys.

Explain briefly the function of each of them.

10. Describe the instrument you would use, and tell how you would use it, to measure the temperature of the human body. Explain how the body (*a*) obtains its internal heat, (*b*) loses heat, and (*c*) maintains a constant temperature when in proper health.