AN ROINN OIDEACHAIS

(Department of Education).

INTERMEDIATE CERTIFICATE EXAMINATION, 1954.

SCIENCE (Syllabus B).

WEDNESDAY, 16th JUNE.—EVENING, 3 TO 5.

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

SECTION I.

1. Describe fully, with the aid of a diagram, how you would construct a simple mercury barometer and how you would use it to measure the pressure of the atmosphere.

Explain why mercury is more suitable than water for use in the construction of a barometer.

[66 marks.]

2. Describe (*a*) how you would show by experiment that the atmosphere contains water vapour, (*b*) how you would measure the dew point.

What information regarding the state of the atmosphere may be obtained from measuring the dew point?

Explain how each of the following occurs: (i) clouds, (ii) fog, (iii) dew.

[66 marks.]

3. Show, with the aid of a diagram, how you would prepare and collect dry hydrogen. Give an account of its properties and tell how you would show that it is a constituent of water.

[66 marks.]

4. Explain, giving one example in each case, what is meant by, each of the following: (*a*) physical change, (*b*) chemical change, (*c*) mixture, (*d*) compound, (*e*) element.

Describe how you would obtain from a solution of common salt in water a pure sample of (i) water, (ii) common salt.

[67 marks.]

5. State the law of flotation and describe an experiment to demonstrate it.

Describe, with the aid of a diagram, any form of hydrometer and explain how you would use it to measure the density of a given liquid.

Give a brief outline of the changes which occur in a mass of ice as its temperature is being raised from -5°C to 10°C.

[67 marks.]

Section II.

6. Describe how you would show by experiment that germinating seeds absorb portion of the air and replace it by something else. Name the substances thus exchanged and give an account of their properties.

[66 marks.]

7. Name any green plant and give an account, with the aid of diagrams, of the appearance of its roots and leaves.

State the chief functions of roots and green leaves in plant life and refer to those external features in their structure which suit them to the functions you have stated.

Give two examples to illustrate food storage in plant life, and refer briefly to the importance in plant and animal life of the food thus stored.

[66 marks.]

8. The diaphragm divides the cavity of the human body into two parts. Name the parts. Give a brief account of the organs situated in the lower one and show by means of a diagram their relative positions.

Describe how the diaphragm works as a part of the mechanism of breathing.

[66 marks.]

9. What is meant by (*a*) pollination, (*b*) fertilization, in plant life? In the case of any named plant, describe with the aid of diagrams the parts connected with the processes of pollination and fertilization.

Name one insect which obtains its food from plants and which benefits the plants at the same time. Give a brief account of how it benefits the plants which it visits.

[67 marks.]

10. Give an account, with the aid of a simple diagram, of the circulation of the blood in the human body and refer to the changes which take place in the blood during circulation.

Explain why (*a*) the rate of circulation, and (*b*) the rate of breathing increase during strenuous exercise.

[67 marks.]