AN ROINN OIDEACHAIS

(Department of Education).

BRAINSE AN MHEAN-OIDEACHAIS

(Secondary Education Branch).

INTERMEDIATE CERTIFICATE EXAMINATION, 1933.

SCIENCE (Syllabus B).

MONDAY, 19th JUNE.—AFTERNOON, 4 TO 6 P.M.

[Not more than *six* questions to be attempted. All the questions are of equal value. Illustrate your answers wherever possible.]

1. Describe how you would proceed to compare the densities of two liquids by means of (*a*) a loaded test-tube, (*b*) a solid which will sink in both liquids. Explain clearly the underlying principle in each case.

2. Being given an ungraduated thermometer, describe how, using it and no other thermometer, you would proceed to find the temperature of the laboratory on the Fahrenheit scale. Give three important reasons why water is an unsuitable liquid for use in thermometers.

3. What do you understand by the moment of a force? How would you proceed to verify the principle of the lever when it is acted on by two forces, one of which is not perpendicular to the lever?

4. Explain, with the help of a diagram, how a "Thermos" flask keeps liquids warm. Describe an experiment you would perform in order to ascertain whether a hot-water radiator should have a dull or polished surface. What result would you expect to obtain?

5. Give two independent methods of obtaining hydrogen from water, stating the other substances which are formed in each case. State and give a reason for an important precaution you would take in experimenting with hydrogen.

6. State in tabular form the nature of the products formed when the following substances are burned separately in oxygen:—(*a*) a candle, (*b*) phosphorus, (*c*) sulphur, (*d*) iron wire. What tests would you apply to demonstrate the properties of each product?

7. Describe the following, giving illustrative sketches:—(*a*) rhizome, (*b*) tuber, (*c*) bulb, (*d*) runner and give an example of each.

8. What simple experiments would you perform to prove that (*a*) chlorophyll, (*b*) light, (*c*) carbon dioxide are necessary for carbon-assimilation?

9. State the difference between a fruit and a seed. Illustrate and describe the structure of any *one* fruit. Name *four* different agencies by which plants can disperse their seeds and fruits and describe the action of each.

10. Describe the important changes that take place in the food we eat on its passage through the stomach.

11. Comment briefly on the rules that should be observed with regard to clothing. Tabulate the advantages and disadvantages, if any, of the following as a material for clothing:—(*a*) silk, (*b*) cotton, (*c*) wool, (*d*) linen.

12. What changes take place during respiration (*a*) in the air, (*b*) in the blood?

Air is rendered impure by the breath of animals. By what agents are these impurities removed? Explain the action of each.