

AN ROINN OIDEACHAIS

(Department of Education).

BRAINNSE AN MHEADHON-OIDEACHAIS

(Secondary Education Branch).

INTERMEDIATE CERTIFICATE EXAMINATION, 1940.

SCIENCE (Syllabus B).

WEDNESDAY, 19th JUNE. AFTERNOON, 4 TO 6 P.M.

[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. All questions are of equal value.]

SECTION I.

1. What are the common gases in the air? State their properties. How would you find experimentally the volume of the part of the air that is used up, when phosphorus is burned in a closed vessel containing air?

2. How would you demonstrate the "principle of the lever" experimentally?

A uniform lever is suspended at a point 10 cms. distant from its centre of gravity. The lever hangs horizontally when a weight of 15 grams is suspended from it at a distance of 21.4 cms. from its mid-point. Find the weight of the lever.

3. Explain the "principle of Archimedes." The specific gravity of ether is 0.736. If a glass stopper weighs 100 grams in air and 60 grams in water, what will be its apparent weight in ether?

4. What advantages has mercury over alcohol as a thermometric fluid? Explain a method you would use to graduate a thermometer.

What reading on the Fahrenheit scale corresponds to a reading of x° on the Centigrade scale?

5. How is nitric acid prepared in the laboratory? State its chief properties. Describe how you would distinguish between Nitric acid and a solution of Hydrochloric acid gas.

6. Describe the changes which take place when the following substances are heated strongly in the air:—magnesium, calcium carbonate, potassium chlorate, red oxide of lead, charcoal.

SECTION II.

7. What conditions are necessary for (a) germination, (b) carbon-assimilation? Describe an experiment in support of your answer in each case.

8. Compare the monocotyledonous and the dicotyledonous plants with respect to (a) roots, (b) stems, (c) leaves. Give diagrams. Which is the easier to destroy—the monocotyledonous or the dicotyledonous plants, when they have established themselves in a garden? Give reasons for your answer.

9. Describe the course of (a) raw materials, (b) manufactured foods in a plant. What modifications do plant parts undergo for the purpose of food storage?

10. Describe with the aid of a diagram the function and position of the pancreas. Name three digestive juices, and state how any one of them assists in the digestion of food.

11. What are the functions of the blood? Describe with the aid of a diagram the circulation of the blood in the human body.

12. Give an account of the respiratory organs. What changes does (a) the air, (b) the blood undergo during respiration?