

AN ROINN OIDEACHAIS.

(Department of Education).

BRAINNSE AN MHEADHON-OIDEACHAIS

(Secondary Education Branch).

INTERMEDIATE CERTIFICATE EXAMINATION, 1940.

SCIENCE (Syllabus D).

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

[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 fully how you would use an ungraduated spiral spring, a known weight and a metre stick to find the weight of a potato.

A potato, suspended from a sensitive spring balance by means of a piece of thread, is lowered slowly into water until it is completely immersed. What change would you expect in the reading of the spring balance during the experiment? Explain the cause of this change.

2. Define "density."

Write an account of the experiments you would perform in the laboratory to determine (a) the density of an egg, (b) the density of milk.

What information regarding the egg may be obtained from your result in (a) above?

3. Describe fully how you would determine the weight of a litre of air at the temperature of the laboratory.

4. What thermometers would you use and how would you use them to determine the following temperatures:

(a) the temperature of the body;

(b) the temperature of a school room;

(c) the highest temperature on a summer's day;

(d) the temperature of melted fat suitable for cooking?

What approximate result would you expect in each case?

5. Explain carefully the difference between "boiling" and "evaporation." In what way does the rate of evaporation of water depend on the following conditions:—

- (a) temperature of the water ;
- (b) condition of the air above the surface of the water ;
- (c) area of the surface exposed to the air ?

Explain your answers and describe an experiment in support of your answer in the case of (c) above.

6. Describe experiments to show that (a) a solid, (b) a liquid, (c) a gas, expand when the temperature is raised. *One* experiment is sufficient in each case.

SECTION II.

7. What products are obtained when a piece of coal is heated strongly in the absence of air ? Describe, with the aid of a diagram, how you would perform the above experiment and how you would collect the products.

8. Mention two different ways in which carbon dioxide may be prepared in the laboratory. Using a diagram, describe one of them fully. How would you show the presence of carbon dioxide in the air ? How do you account for the presence of this gas in the air ?

9. Name two solids and two gases usually found in solution in ordinary water. If you were given a sample of ordinary water describe, with the aid of a diagram, how you would obtain a sample of water free from dissolved solids. Would there be any difference in properties between this sample and the original one ? Explain your answer.

10. Write a short note on the composition and functions of the blood. Draw a simple diagram to illustrate the circulation of the blood.

11. Draw diagrams to show the positions in the body and the structure of each of the following:—(a) the liver, (b) the kidneys.

Explain briefly the functions of each.

12. What first aid would you give in the following cases :

- (a) bleeding from an artery ;
- (b) a broken shin-bone ;
- (c) bleeding from the nose ;
- (d) a sprained ankle ;
- (e) unconsciousness due to an accident ?