

AN ROINN OIDEACHAIS.
(Department of Education).

INTERMEDIATE CERTIFICATE EXAMINATION, 1942.

SCIENCE (Syllabus D).

FRIDAY, 12th JUNE.—AFTERNOON, 4 TO 6.

[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 measure as accurately as possible (a) the diameter of a saucer, (b) the volume of a large potato, (c) the number of drops in a cubic centimetre of water.

2. State the principle on which the laboratory balance is based, and describe in detail, mentioning the precautions which should be observed, how you would use it to find the wt. of milk which would fill a small bottle. What further work would you do in order to be able to determine the specific gravity of milk, and how would you make the calculation?

3. What is meant by ventilation? Explain its necessity and importance. Show with the aid of diagrams how a sitting-room may be ventilated, and explain how the exchange of air takes place. Explain why faulty ventilation may be a cause of dampness in a room.

4. Explain why a glass test-tube loaded with lead shot may float in water while pieces of glass and lead sink. Show clearly how such a tube may be used to determine the specific gravity of a given liquid and explain the method.

5. Write brief explanatory notes on each of the following :—

(a) wet clothes dry more quickly on a windy day than on a calm day ;

(b) the small bubbles which appear in a glass of cold water after standing for some time in a warm room ;

(c) the coldness of the air during a thaw.

Describe fully an experiment which you would perform in support of your answer in the case of (b) or (c).

6. Describe the most important features of a mercury thermometer and explain how it works. What reading on the Centigrade scale corresponds to 98° on the Fahrenheit scale?

SECTION II.

7. Name the two principal gases of which ordinary air is composed. Describe, with the aid of a diagram, how you would determine the percentage of each by volume in a sample of air. Name two other substances usually present in atmospheric air and explain their presence.

8. Name one common acid and one common alkali and describe their properties. Explain fully how you would use them to obtain a pure sample of a salt and name the salt.

9. In the kitchen some sulphur was mixed accidentally with sugar. Describe carefully how you would obtain pure samples of sulphur and sugar from the mixture.

10. Describe, with diagrams, the shape and structure of the lungs and explain the changes which take place (*a*) in the air, (*b*) in the blood as each passes through the lungs. Describe briefly experiments in support of your answer to (*a*). Explain how the lungs would be affected if the walls of the chest were punctured.

11. Describe briefly, with the aid of diagrams, the structure of the skin and explain how it functions in regulating the body temperature. Account for (*a*) the rosy appearance of the skin after exercise, (*b*) the blue appearance on exposure to cold.

12. What is muscle ?

Describe, with the aid of diagrams, how the muscles enable one to (*a*) nod the head, (*b*) bend the knee. Describe the type of lever in operation in each case and mark clearly on your diagrams the position of the fulcrum and the directions of the forces.