

# AN ROINN OIDEACHAIS.

(Department of Education).

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INTERMEDIATE CERTIFICATE EXAMINATION, 1944.

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## SCIENCE (Syllabus D).

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TUESDAY, 20th JUNE.—MORNING, 10 TO 12.

[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.]

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### SECTION I.

1. Describe, with the aid of a diagram, a lactometer and state the principle on which it is based.

Tell how you would use it to test samples of milk, and explain why it is not absolutely reliable for that purpose.

2. Draw a diagram of a common pump and describe how it works.

Why is the height to which water can be raised by it limited?

3. What is meant by (a) latent heat of vapourisation, (b) latent heat of fusion?

In the case of either (a) or (b) describe a laboratory experiment to demonstrate the truth of your answer.

Give two everyday examples to illustrate latent heat.

4. You are given a rectangular block of metal, describe how you would determine (a) its volume, (b) the density of the metal. If you were given a thin rectangular sheet of the same metal, what further work would you do in order to determine its average thickness?

5. What do you understand by (a) temperature, (b) specific heat, (c) conduction of heat, (d) radiation of heat?

A certain metal is a good conductor of heat, has a rough surface, and has a low specific heat. Another metal is a bad conductor of heat, has a polished surface, and has a high specific heat. Discuss the suitability of these materials in the construction of a tea-pot.

SECTION II.

6. How would you recognise (a) a compound fracture of the shin, (b) bleeding from a vein in the arm, (c) a broken collar bone? Describe with the aid of a diagram the first aid treatment which you would consider suitable in any one of these cases.

7. Draw diagrams of the apparatus you would use to collect the products obtained by the action of (a) heat, (b) vinegar on washing soda.

Mention the chief properties of these products.

8. What do you understand by hard water and why is it unsuitable for washing?

Explain as fully as you can (a) the action of boiling, (b) the use of lime in softening water.

Describe a laboratory experiment in support of your answer to (a).

9. Draw sketches to show the action of the chief muscles which enable a person (a) to bend and straighten his arm at the elbow, (b) to walk.

In the case of (a), sketch the lever in operation and indicate the position of the fulcrum and, also, the directions of the acting forces.

10. Describe how you would obtain (a) clear water from muddy water, (b) pure water from sea water, (c) sal ammoniac from a mixture of common salt and sal ammoniac.