AN ROINN OIDEACHAIS
(Department of Education).

BRAINSE AN MHEÁN-OIDEACHAIS
(Secondary Education Branch).

LEAVING CERTIFICATE EXAMINATION, 1933.

HONOURS.

PHYSICS.

THURSDAY, 22nd JUNE.—Afternoon, 1.30 to 3.30 p.m.

Not more than *six* questions may be attempted.
All questions are of equal value.

1. Explain the parallax methods used in optical experiments. Describe how you would find the focal length of a concave mirror by locating the position of (*a*) a real image and (*b*) a virtual image by parallax methods.

2. What is meant by the minimum deviation of a prism? Establish the relation between the angle of minimum deviation, the angle of the prism and the index of refraction.

3. Describe the astronomical telescope and explain its action, illustrating your answer by a diagram. Explain how the relation between the magnifying power and the focal lengths of the lenses may be established.

4. What is meant by the statement that one Horse-Power equals 33,000 foot-pounds per minute? Calculate the work done and the average rate of working in horse-power when a man weighing 11 stone mounts 10 steps, each eight inches high, in three seconds.

5. Discuss the difficulties which arise in determining accurately the acceleration due to gravity, using Atwood's machine. How may these difficulties be met?

6. A body is hung from a spring-balance, which is supported in a lift. How will the reading of the spring-balance vary, while the lift is being operated? Give reasons for your statements.

7. Describe the construction and the principle of the tangent galvanometer. Discuss the factors on which the sensitivity depends.

8. Describe how the laws of electromagnetic induction can be demonstrated experimentally. Describe the application of these laws in the case of:—

   (i) a dynamo

  or (ii) an induction coil

  or (iii) any other apparatus.

9. Four cells, each of E.M.F. 1·5 volts and internal resistance one ohm, are joined in series. The battery so formed sends current through two conductors of resistances 20 ohms and 30 ohms respectively, joined in parallel. Find the current in each conductor and the heat produced per minute in each conductor.

10. Explain the theory of the potentiometer and describe how the potentiometer may be used to determine the internal resistance of a cell.