

AN ROINN OIDEACHAIS
(Department of Education).

BRAINSE AN MHEÁN-OIDEACHAIS
(Secondary Education Branch).

LEAVING CERTIFICATE EXAMINATION, 1929.

HONOURS

PHYSICS.

THURSDAY, 20th JUNE.—MORNING, 10 A.M. TO 12 NOON.

Not more than *six questions* may be attempted.

All questions are of equal value.

1. Draw a diagram to shew the formation of a real inverted image of an object by a convex lens. Proceeding from a consideration of your diagram establish a formula connecting u , v , and f . (u is the distance of the object, v that of the image and f that of the focus from the centre of the lens.)
2. Draw a diagram to shew the formation of the image of an object as seen through a microscope formed by two lenses. How do you measure the magnification produced?
3. Draw diagrams to show how a source of white light, a slit, a triangular prism and a convex lens should be arranged to obtain a pure spectrum on a screen.
Give with diagram an explanation of the phenomenon of the rainbow.
4. A body weighing 3 lbs. is placed on a plane inclined at 30° to the horizontal and the coefficient of friction between the body and the plane is 0.5. What is the resultant force acting on the body parallel to the plane? What will be its velocity after slipping one foot down the plane if it start from rest?
5. Explain the terms "Momentum," "Impulse" and "Impulsive Force." Explain clearly how you would verify the principle of "Conservation of Momentum" experimentally.
6. Describe an experiment from the results of which a numerical relation can be arrived at between mechanical energy and heat. In what units are these quantities usually measured?

7. Explain fully what is meant by the capacity of a condenser. Describe experiments you would perform to shew that the capacity of a condenser is influenced by (1) the size of the plates, (2) their distance apart, (3) the nature of the insulator between them.

8. How, by chemical means, can you produce an electrical current in a wire? What do you call such an arrangement?

A large current is flowing through a rigid copper rod. How would you place a small piece of iron wire with respect to it so that the iron may be magnetised in the direction of its length? Assuming the direction of the current, state which end of the iron will be a north seeking pole. Draw diagrams to explain your answers.

9. Describe experiments to illustrate the truth of Ohm's Law. The poles of a battery of three cells (each having an internal resistance = 2 ohms and an E.M.F. = 1.2 volt) are joined by a wire having a resistance of 0.5 ohm. Find the magnitude of the current produced

(i.) with the three cells in series,

(ii.) with the three cells in parallel.

Illustrate your answer with diagrams.

10. What is a dynamo? Describe, with diagrams, how one works.