AN ROINN OIDEACHAIS

(Department of Education).

BRAINNSE AN MHEADHON-OIDEACHAIS

(Secondary Education Branch).

LEAVING CERTIFICATE EXAMINATION, 1935.

FULL COURSE.

PHYSICS.

SATURDAY, 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. State the laws of reflection of light. Explain the formation of the multiple images of an object placed between two parallel plane mirrors. Draw a diagram showing the pencil of rays by which an eye sees the third image in one of the mirrors.

2. A concave lens is placed close to a concave mirror of 15 cms. focal length, and it is found that the image and object coincide when the latter is 60 cms. from the combination. Explain how the image is formed and calculate the focal length of the lens.

3. Mention three methods by which the velocity of light has been determined and give a complete account of one of them.

4. 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.

5. Two masses $\frac{1}{4}$ oz. and $7\frac{3}{4}$ oz. connected by an inextensible string 5 ft. long lie on a smooth table $2\frac{1}{2}$ ft. high. The string being straight and perpendicular to the edge of the table, the lighter mass is drawn gently just over the edge of the table. Find (*a*) the time that elapses before the lighter mass reaches the floor, and (*b*) the time that elapses before the heavier mass reaches the edge of the table.

6. Describe experiments you have carried out illustrating the relation between the force acting on a body, and the change in motion produced.

7. A motor car, running at the rate of 15 miles per hour, can be stopped by its brakes in 10 yards. Prove that the total resistance to the car's motion when the brakes are on is approximately one-quarter of the weight of the car.

8. A bar magnet of magnetic length 16 cms. is placed in the meridian with its N pole pointing south. A neutral point is found 30 cms. to the south of the centre of the magnet. If the horizontal component of the earth's field is 0·18 dynes per unit pole, calculate the magnetic moment of the magnet.

9. Describe the mode of action of an electrophorus, giving diagrams to show the arrangement of the charges and the lines of force. Where does the energy of the electric charges produced come from ?

10. Give a brief account of the construction and action of a Daniell cell and explain how you would measure its internal resistance.

11. Explain the principle of the Wheatstone bridge method of comparing resistances. Describe how you would measure the specific resistance of the material of a wire, giving all the precautions necessary to secure an accurate result.

12. Describe how the laws of electromagnetic induction can be demonstrated experimentally. Describe the application of these laws in the case of an induction coil.