AN ROINN OIDEACHAIS
(Department of Education).

BRAINSE AN MHEÁN-OIDEACHAIS
(Secondary Education Branch).

LEAVING CERTIFICATE EXAMINATION, 1930.

PASS.

PHYSICS.

FRIDAY, 20th JUNE.—AFTERNOON, 1.30 TO 3.30 P.M.

Not more than *six* questions may be attempted.

All questions are of equal value.

1. Describe an experimental method of comparing the illuminating powers of two sources of light.

Two lights have to be placed 100 cm. and 40 cm. respectively from a screen in order to produce equal intensity of illumination. Compare the illuminating powers of the two lights.

2. An object 3″ high is placed at a distance of 12″ from a concave mirror and perpendicularly to its axis. The radius of curvature of the mirror is 8″. Draw a dimensioned diagram showing the paths of rays of light which determine the nature, position and size of the image formed.

Describe how to verify experimentally the position and size of the image formed in the above example.

3. Explain the term "refractive index." Describe a method of determining the position of the image of an object lying at the bottom of a vessel of water. How would you calculate the refractive index of water from observations of the apparent depth and real depth of the object?

4. Define the following :—(*a*) Uniform Acceleration, (*b*) Erg, (*c*) Horse-Power.

Describe how to determine experimentally the relation between force and acceleration when the mass is kept constant.

5. What is understood by Kinetic and Potential Energy?

In the case of a vibrating pendulum bob state when it has (*a*) Kinetic Energy only, (*b*) Potential Energy only, (*c*) both Kinetic and Potential Energy.

A pendulum bob weighing 1 oz. has risen through a height of 6″ when it reaches the extremity of its swing. Determine the magnitude of the energy of the bob (*a*) at the end of its swing, and (*b*) at its lowest point. Deduce the velocity of the bob at its lowest point of swing.

6. Describe an experiment to show the relation between the velocity acquired and the time taken in the case of a body moving with uniform acceleration.

A body is projected upwards with a velocity of 200′ per second. Find the height to which it will rise and the time it takes to arrive at its highest position.

7. What is understood by (*a*) the pole, (*b*) pole strength, and (*c*) the moment of a magnet.

Describe how to locate as accurately as possible with the aid of a small compass needle the position of the N-seeking pole of a bar magnet.

8. Show by means of circuit diagrams how to obtain (*a*) a current of 1 ampère in a piece of wire about 5 ohms resistance, and (*b*) a current of 2 ampères in the same wire.

Name the various parts of the circuit and explain your answer.

9. What variation, if any, is produced in the strength of the current from a simple cell when (*a*) the distance between the plates is altered, (*b*) the area of the plates is altered, and (*c*) a period of time elapses between two successive readings of the current ?

How would you investigate this experimentally ? Explain the results.

10. How would you show experimentally that there is a definite relation between the current strength in a wire and the heat produced ?

If the heat produced in a wire during 3 minutes by a current of 1 ampère is equal to 20 calories, find the heat produced in it in the same time by currents of 1·5, 2·0, and 2·5 amperes respectively.