

AN ROINN OIDEACHAIS
(Department of Education).

BRAINSE AN MHEÁN-OIDEACHAIS
(Secondary Education Branch).

LEAVING CERTIFICATE EXAMINATION, 1931.

HONOURS.

PHYSICS.

WEDNESDAY, 17th 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 (a) an optical method (b) some other method of determining the radius of curvature of a concave mirror. Justify any formulæ you would use in your determination.
2. Describe, with sketch, an optical arrangement by means of which you could throw a spectrum on a screen using a prism to disperse the light. If a hollow prism is used, containing (a) water, refractive index 1.33, (b) carbondisulphide, refractive index 1.63, describe and explain any differences you would observe.
3. Prove that the refractive index of a liquid can be found by comparing the apparent depth and the real depth of an object in the liquid. Describe the experimental determination of the refractive index of water by this method.
4. State the principle of the conservation of energy. Describe experiments with an inclined plane to illustrate the principle (a) when there is no friction, (b) when there is friction.
5. Give a brief account of two experiments you have carried out on the connection between (a) force and acceleration and (b) mass and acceleration.
6. What is the tension in a chain supporting a mass of 200 lbs. when it is moving upwards (a) with a uniform velocity of 10' per sec. (b) with an acceleration of 2' per sec. per sec., (c) with a retardation of 2' per sec. per sec. The mass of the chain may be neglected.
7. Describe the gold leaf electroscope and explain its use with reference to experiments on electrification by induction. A con-

ductor A has a capacity of 10 units and a potential of 50 units, another conductor B has capacity of 6 units and potential of 65 units. Calculate the charges on A and B respectively after they have been connected by a wire.

8. A rectangular coil of copper wire is rotated between the poles of an electro magnet. Describe the changes which take place in the magnitude and direction of the current induced in the coil. Describe with a sketch a suitable device for obtaining a direct current from the coil.

9. Describe and explain the Wheatstone Bridge method of comparing resistances. A battery of which the resistance is 5 ohms, and voltage 8 is put in series with a resistance of 6 ohms. Calculate the current and the difference of potential at the poles of the battery.

10. Describe the changes which occur inside a secondary cell during the processes of charging and discharging. What happens when an unduly large current is taken from a secondary cell for a few minutes. Enumerate the precautions to be observed in the use of secondary cells.