AN ROINN OIDEACHAIS.

(Department of Education).

LEAVING CERTIFICATE EXAMINATION, 1959.

PHYSICS.—PASS.

TUESDAY, JUNE 9—AFTERNOON, 3 TO 5.30.

Not more than six questions to be answered.

One question, at least, must be answered from each section.

SECTION I.

1. State Newton's laws of motion.

A body is projected vertically upwards from the ground with an initial velocity of 1000 feet per second; find (i) the velocity of the body after 5 seconds, (ii) the greatest height to which it rises, (iii) the time the body takes to return to the ground.

[66 marks.]

2. State the law of moments and describe an experiment to test the law.

A uniform bar, AB, 10 feet long and weighing 100 lbs. rests horizontally on two supports, P and Q. If P is 2 feet from A and Q is 3 feet from B, find the normal reaction at P and Q, respectively.

What is the magnitude of the least force acting vertically at A that would lift the bar off the support P?

[66 marks.]

3. Distinguish between kinetic energy and potential energy.

A body weighing 100 lbs. is at rest at a point A which is 50 feet above the ground. What is the energy of the body at A? Show that when the body has fallen a certain distance its loss in potential energy is equal to its gain in kinetic energy.

What is the kinetic energy of the body when it has fallen a distance of 20 feet?

[67 marks.]

SECTION II.

4. Describe an experiment to measure the latent heat of fusion of ice.

200 grams of water at 20°C. are contained in a calorimeter of mass 30 grams and specific heat 0·1. What is the least mass of ice at 0°C. which should be added to the water to lower its temperature to 10°C.?

[Latent heat of fusion of ice=80 calories per gram.]

[66 marks.]

5. Describe an experiment to measure the focal length of a convex lens.

An object 4 cm. in height stands vertically on the axis of a convex lens at a distance of 15 cms. from the centre of the lens. If the focal length of the lens is 10 cms., find the position and size of the image.

Draw a ray-diagram to show how the image is formed.

[66 marks.]

6. Distinguish between deviation and dispersion of light.

Describe experiments, one in each case, to show (*a*) how light may be deviated, (*b*) how light may be dispersed.

Give an example from everyday life of the dispersion of light and explain how this dispersion occurs.

[67 marks.]

Section III.

7. Define magnetic moment of a bar magnet.

Describe a method of comparing the magnetic moments of two bar magnets of unequal length.

[66 marks.]

8. Describe the gold-leaf electroscope.

Explain (*a*) how to place by induction a positive charge on an electroscope, (*b*) how to test the nature of the charge on a charged electroscope.

[66 marks.]

9. Describe the tangent galvanometer. Describe, also, how the tangent galvanometer may be used to compare the strengths of the electric currents flowing in two different circuits.

[67 marks.]

10. State the laws relating to the development of heat in a conductor in which an electric current flows.

Describe how these laws may be tested in the laboratory.

[67 marks.]